

# FUJITSU Server PRIMERGY TX2540 M1

## Upgrade and Maintenance Manual

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

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Feel free to send us your comments by e-mail to [manuals@ts.fujitsu.com](mailto:manuals@ts.fujitsu.com).

## **Certified documentation according to DIN EN ISO 9001:2008**

To ensure a consistently high quality standard and user-friendliness, this documentation was created to meet the regulations of a quality management system which complies with the requirements of the standard DIN EN ISO 9001:2008.

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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 these safety notes are understood before using the product. Keep this manual and the manual "Safety Notes and Regulations" 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 product's printed circuit board assemblies 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.

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.

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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, use of an AC 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.

### **Only for the Japanese market: About SATA hard disk drives**

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

Please refer to the following internet address for further information on the usage and operation conditions of each available type of hard disk drive:

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

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**Only for the Japanese market:**



Although described in this manual, some sections do not apply to the Japanese market. These options and routines include:

- CSS (Customer Self Service)

# Version history

| Issue number        | Reason for update   |
|---------------------|---|
| 1.0 / March 2014    | Initial release   |
| 2.0 / August 2014   | Hot-plug PSU 800 W (Titanium) added, updated power-on indicator modes, updated charging duration for deeply discharged BBUs   |
| 3.0 / December 2014 | Added hint for LTO3 cabling, revised cable plans, revised sections related to BitLocker functionality, added section "Resetting the error status after replacing memory modules or processors", added iRMC-related status signals |
| 4.0 / June 2015     | iRMC microSD card   |
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# 1 Introduction

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 section ["Documents you need at hand" on page 30](#)).










## **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 24](#).

### 1.1 Notational conventions

The following notational conventions are used in this manual:

|  |  |
|--|--|
| <i>Text in italics</i>   | indicates commands or menu items   |
| fixed font   | indicates system output  |
| semi-bold fixed font   | indicates text to be entered by the user   |
| "Quotation marks"  | indicate names of chapters and terms that are being emphasized   |
| ▶  | describes activities that must be performed in the order shown   |
|    | 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</a> " on page 24            |
|   | indicates the average task duration, see " <a href="#">Average task duration</a> " on page 27  |

---

## 2 Before you start

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

- ▶ Carefully read the safety instructions in chapter "[Important information](#)" on [page 33](#).
- ▶ Make sure that all necessary manuals are available. Refer to the documentation overview in section "[Documents you need at hand](#)" on [page 30](#). Print the PDF files if required.
- ▶ Make yourself familiar with the procedure categories introduced in section "[Classification of procedures](#)" on [page 24](#).
- ▶ Ensure that all required tools are available according to section "[Tools you need at hand](#)" on [page 28](#).

### 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 web frontend to prepare hardware expansions. ServerView Suite documentation is available online at <http://manuals.ts.fujitsu.com> (<http://jp.fujitsu.com/platform/server/primergy/manual/> for the Japanese market). Please refer to the following ServerView Suite topics:

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



For the latest information on hardware options, refer to your server's hardware configurator available online at the following address:  
for the EMEA market:

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

for the Japanese market:

<http://jp.fujitsu.com/platform/server/primergy/system/>

Please contact your local Fujitsu customer service partner for details on how to order expansion kits or spare parts. Use the Fujitsu Illustrated Spares Catalog to identify the required spare part and obtain technical data and order information. Illustrated Spares catalogs are available online at [http://manuals.ts.fujitsu.com/illustrated\\_spares](http://manuals.ts.fujitsu.com/illustrated_spares) (EMEA market only).

### Replacing a defective component

The global error indicators on the front and rear sides of the server as well as local diagnostic LEDs on the front panel report defective hardware components that need to be replaced. For further information on the controls and indicators of your server, refer to the operating manual of your server and section ["Connectors and indicators" on page 412](#).

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 further information, please refer to sections ["Using diagnostics information" on page 45](#) and ["Connectors and indicators on the front panel" on page 419](#).

If the defective component is a customer replaceable unit included in the CSS concept (Customer Self Service, only available for EMEA market), the CSS indicators on the front and rear side of the server will light up.

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

## 2.1 Classification of procedures

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.

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



Please ask your local Fujitsu service center for more detailed information.

## 2.1.1 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.

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.

### Components that are handled as Customer Replaceable Units

- Hot-plug power supply units
- Hot-plug fan modules
- Hot-plug HDD / SSD modules

### Peripherals that are handled as Customer Replaceable Units

- Keyboard
- Mouse

## 2.1.2 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*).



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

- Processors (upgrade kits)
- Optical disk drives
- Backup drives
- Expansion cards
- Battery backup units
- Memory modules
- USB Flash Module (UFM)

### Components that are handled solely as Repair Units

- CMOS battery
- Non hot-plug fans
- Non hot-plug hard disk drives

## 2.1.3 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

- Processor (replacement)
- SAS / SATA backplanes
- Power backplane
- Front panel module
- Management and diagnostics modules
- System board
- Standard power supply unit
- Trusted Platform Module (TPM)
- USB Flash Module (UFM)

## 2.2 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.

Refer to the following table for an overview of steps taken into account for calculating the average task duration:

| Step                      | included   | Explanation  |
|---------------------------|------------|--|
| Server shutdown           | no         | Shutdown time depends on hardware and software configuration and may vary significantly.<br><br>Software tasks necessary before maintenance are described in section <a href="#">"Starting the maintenance task" on page 77</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.  |

Table 1: Calculation of the average task duration

## Before you start

| Step                        | included | Explanation  |
|-----------------------------|----------|--|
| Maintenance procedures      | yes      | 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 | yes      | 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

## 2.3 Tools you need at hand

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




| Screw driver / Bit insert                          | Screw   | Usage                                       | Type                                    |
|--|---|---|---|
| Phillips PH2 / (+) No. 2 hexagonal cross SW5 / PZ2 |   | Backup drives, optical disk drives, chassis | M3 x 4.5 mm (silver)<br>C26192-Y10-C67  |
| Phillips PH2 / (+) No. 2 hexagonal cross SW5 / PZ2 |  | Slot brackets for controllers               | M3 x 3.5 mm (silver)<br>C26192-Y10-C151 |
| Phillips PH2 / (+) No. 2 hexagonal cross SW5 / PZ2 |  | System board                                | M3 x 6 mm (silver)<br>C26192-Y10-C68    |

Table 2: List of required tools and used screws

| Screw driver / Bit insert  | Screw   | Usage                                   | Type   |
|--|---|---|--|
| Phillips<br>PH2 / (+) No. 2<br>hexagonal cross<br>SW5 / PZ2  |    | Backup<br>drives with<br>UNC thread     | UNC<br>6-32 x 4.76 mm<br>(black)<br>C26192-Y10-C75                   |
| Phillips<br>PH2 / (+) No. 2  |    | USB 3.0<br>interface<br>card D3305      | M3 x 5 mm<br>(silver)<br>(contained in card kit<br>S26361-D3305-A10) |
| Phillips<br>PH0 / (+) No. 0  |    | 2.5-inch<br>HDDs / SSDs                 | M3 x 3.5 mm<br>Wafer head screw<br>(silver)<br>C26192-Y10-C102       |
| TPM bit insert<br>Dedicated TPM<br>screw driver /<br>TPM fixing tool<br>(for the Japanese<br>market) |    | TPM screw<br>One way<br>head<br>(black) | REM 3 x 15 mm<br>(black)<br>C26192-Y10-C176                          |
| Phillips<br>PH1 / (+) No. 1  |  | UFM nylon<br>screw                      | M3 x 4.5 mm<br>(white)<br>A3C40109082                                |
| Phillips<br>PH1 / (+) No. 1  |  | TFM                                     | M2.5 x 4 mm<br>(silver)<br>C26192-Y10-C103                           |

Table 2: List of required tools and used screws

## 2.4 Documents you need at hand

Maintenance procedures may include references to additional documentation. When preparing the maintenance task, ensure that all required manuals are available according to the overview below.



- Ensure to store all printed manuals enclosed with your server in a save place for future reference.
- Unless stated otherwise, all manuals are available online at <http://manuals.ts.fujitsu.com> under *x86 Servers*.

For the Japanese market please use the following address:  
<http://jp.fujitsu.com/platform/server/primergy/manual/>

| Document  | Description   |
|---|---|
| "Quick Start Hardware - FUJITSU Server PRIMERGY TX2540 M1" leaflet                | Quick installation poster for initial operation, available online                     |
| "ServerView Quick Start Guide" " ServerView クイックスタートガイド " for the Japanese market | Information on initial server setup and software configuration, available online      |
| "Safety notes and regulations" manual " 安全上のご注意 " for the Japanese market         | Important safety information, available online, or as a printed copy                  |
| "FUJITSU Server PRIMERGY TX2540 M1Operating Manual"                               | available online  |
| "D3099 BIOS Setup Utility for FUJITSU Server PRIMERGY TX2540 M1 Reference Manual" | Information on configurable BIOS options and parameters, available online             |
| System board label  | Label inside the side / top server cover outlining connectors, indicators and jumpers |

Table 3: Documentation you need at hand

| Document  | Description   |
|---|---|
| Software documentation  | <ul style="list-style-type: none"> <li>– "ServerView Suite Local Service Concept (LSC)" user guide</li> <li>– "ServerView Operations Manager - Server Management" user guide</li> <li>– "iRMC S4 - Integrated Remote Management Controller" user guide</li> </ul>   |
| Illustrated Spares catalog                                      | Spare parts identification and information system (EMEA market only), available for online use or download (Windows OS) at <a href="http://manuals.ts.fujitsu.com/illustrated_spares">http://manuals.ts.fujitsu.com/illustrated_spares</a> or from the CSS component view of the ServerView Operations Manager  |
| Glossary  | available online  |
| "Warranty" manual<br>"保証書" for the Japanese market              | Important information on warranty regulations, recycling and service, available online, or as a printed copy  |
| "Returning used devices" manual                                 |   |
| "Service Desk" leaflet<br>"サポート & サービス" for the Japanese market | Recycling and contact information, available online, or as a printed copy   |
| Additional documentation  | RAID documentation, available online at <a href="http://manuals.ts.fujitsu.com">http://manuals.ts.fujitsu.com</a> under <i>x86 Servers - Expansion Cards - Storage Adapters</i><br>For the Japanese market please use the following address:<br><a href="http://jp.fujitsu.com/platform/server/primergy/manual/">http://jp.fujitsu.com/platform/server/primergy/manual/</a> |
| Third party documentation                                       | <ul style="list-style-type: none"> <li>– Operating system documentation, online help</li> <li>– Peripherals documentation</li> </ul>  |

Table 3: Documentation you need at hand



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## 3 Important information



### CAUTION!

Before installing and starting up a device, 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 device and endanger the data base.

### 3.1 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 device 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 device that do not relate to CSS failures shall be performed by service personnel. Please note that unauthorized interference with the system 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.
- Before installing/removing internal options 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.

#### Before starting up

- During installation and before operating the device, observe the instructions on environmental conditions for your device.
- If the device is brought in from a cold environment, condensation may form both inside and on the outside of the device.

## Important information

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

- Transport the device only in the original packaging or in packaging that protects it from knocks and jolts.  
For the Japanese market, transporting the device in its original packaging does not apply.

## Installation and operation

- This unit should not be operated in ambient temperatures above 35 °C. For servers with Cool-safe® Advanced Thermal Design the ambient temperature can increase to 40 °C.
- If the unit 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 unit automatically adjusts itself to a mains voltage in a range of 100 VAC to 240 VAC. Ensure that the local mains voltage lies within these limits.
- This device must only be connected to properly grounded power outlets or connected to the grounded rack internal power distribution system with tested and approved power cords.
- Ensure that the device is connected to a properly grounded power outlet close to the device.
- Ensure that the power sockets on the device and the properly grounded power outlets are easily accessible.
- The On/Off button or the main power switch (if present) does not isolate the device from the mains power supply. In case of repair or servicing disconnect the device completely from the mains power supply, unplug all power plugs from the properly grounded power outlets.
- Always connect the server and the attached peripherals 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.
- Data cables must be adequately shielded.

- 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 (make sure no-one can trip over them) and that they cannot be damaged. When connecting the server, refer to the relevant instructions in this manual.
- Never connect or disconnect data transmission lines during a storm (risk of lightning hazard).
- Make sure 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 system administrator or your customer service team. Only disconnect the system from the mains power supply if there is no risk of harming yourself.
- Proper operation of the system (in accordance with IEC 60950-1 resp. EN 60950-1) is only ensured if the casing is completely assembled and the rear covers for the installation slots have been fitted (electric shock, cooling, fire protection, interference suppression).
- Only install system 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 system or violate the safety regulations. Information on which system 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 system 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.
- Before installing/removing internal options to/from the server, turn off the server, all peripheral devices, and any other connected devices. Also unplug all power cords from the outlet. Failure to do so can cause electric shock.

## Important information

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- Do not damage or modify internal cables or devices. Doing so may cause a device failure, fire, or electric shock and will void the warranty and exempt the manufacturer from all liability.
- Devices inside the server remain hot after shutdown. Wait for a while after shutdown before installing or removing internal options.
- The circuit boards and soldered parts of internal options are exposed and can be damaged by static electricity. To ensure reliable protection, if you are wearing an earthing band on your wrist when working with this type of module, connect it to an unpainted, conducting metal part of the system.
- 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 device/position. To use a screw of the different kind can cause a breakdown of equipment.
- The installation indicated on this document is sometimes changed to the kind of possible options without notice.

## 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.
- Make sure that you insert the battery the right way round.
- The battery used in this device may present a fire or chemical burn hazard if mistreated. Do not disassemble, heat about 100 °C (212F), or incinerate the 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

### Working with optical disk drives and media

When working with optical disk drives, 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 optical disk drive (equipment damage) and can fly out of the device (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 optical disk drive.
- Before use, clean the optical disk tray using a soft, dry cloth.
- As a precaution, remove disks from the optical disk drive when the drive is not to be used for a long time. Keep the optical disk tray closed to prevent foreign matter, such as dust, from entering the optical disk drive.
- Hold CDs/DVDs/BDs by their edges to avoid contact with the disk surface.

## Important information

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- 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.
- 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 optical disk drive 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.

## Laser information

The optical disk drive complies with IEC 60825-1 laser class 1.



### **CAUTION!**

The optical disk drive 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 optical disk drive casing!**

## Modules with Electrostatic-Sensitive Devices

Modules with electrostatic-sensitive devices are identified by the following sticker:



Figure 1: ESD label

When you handle components fitted with ESDs, you must always observe the following points:

- Switch off the system and remove the power plugs from the power outlets before installing or removing components with ESDs.
- 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 system.
- 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 system unit.
- Always hold components with ESDs at the edges or at the points marked green (touch points).
- Do not touch any connectors or conduction paths on an ESD.
- Place all the components on a pad which is free of electrostatic charge.



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

### Transporting the server

- Only transport the server in its original packaging or in packaging that protects it from impacts and jolts.  
For the Japanese market, transporting the device 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.  
Because the PRIMERGY TX2540 M1 is large and heavy, at least two people are needed.
- Never lift or carry the device by the handles on the front panel.

### Notes on installing the server in the rack

- **For safety reasons, at least two people are required to install the server in the rack because of its weight and size.**  
(For the Japanese market, please refer to "安全上のご注意".)
- Never lift the server into the rack using the handles 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, make sure that the anti-tilt protection is correctly fitted.
- For safety reasons, no more than one unit may be removed from the rack at any one time during installation and maintenance work.
- If several units are simultaneously removed from the rack, there is a risk that the rack could tip over.
- The rack must be connected to the power supply by an authorized specialist (electrician).
- 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 CE conformity



The system complies with the requirements of the EC directives 2004/108/EC regarding "Electromagnetic Compatibility" and 2006/95/EC "Low Voltage Directive" and the directive of the European Parliament and Council 2011/65/EU. This is indicated by the CE marking (CE = Communauté Européenne).

## 3.3 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.

## Important information

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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.

### **WARNING:**

This is a class A product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

## 3.4 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. Further information can be found at:

- [http://ts.fujitsu.com/products/standard\\_servers/index.html](http://ts.fujitsu.com/products/standard_servers/index.html) (for the global market)
- <http://jp.fujitsu.com/platform/server/primergy/concept/> (for the Japanese market)

### **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 doesn't apply to the Japanese market.

Do not throw away the packaging. You may need it later for transporting the system. 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

### 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 2002/96/EC 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. Further information can be found at

<http://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 from our recycling center in Paderborn:

## Important information

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Fujitsu Technology Solutions  
Recycling Center  
D-33106 Paderborn

Tel. +49 5251 525 1410

Fax +49 5251 525 32 1410

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## 4 Basic hardware procedures

### 4.1 Using diagnostics information

Use the Fujitsu ServerView Suite management software to plan the upgrade or replacement of hardware components. Please refer to the following ServerView Suite topics:

- Operation
- Maintenance

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

Please contact your local Fujitsu customer service partner for details on the service concept and on how to order expansion kits or spare parts. Use the Fujitsu Illustrated Spares Catalog to identify the required spare part and obtain technical data and order information. Illustrated Spares catalogs are available online at [http://manuals.ts.fujitsu.com/illustrated\\_spares](http://manuals.ts.fujitsu.com/illustrated_spares) (EMEA market only).

Perform the following diagnostics procedures to identify defective servers and components.

#### 4.1.1 Locating the defective server

When working in a datacenter environment, switch on the ID indicator on the front and rear connector panels of the server for easy identification.

- ▶ Press the ID button on the front panel or use the ServerView Operation Manager user interface to switch on the system ID indicator LEDs.



For further information, refer to the "ServerView Suite Local Service Concept (LSC)" manual.

- ▶ When using ServerView Operations Manager to toggle the ID indicator, choose *Single System View* and press the *Locate* button.
- ▶ Remember to switch off the ID indicator after the maintenance task has been concluded successfully.

### 4.1.2 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** events that need to be resolved by maintenance personnel
- **Customer Self Service (CSS)** error events that may be resolved by operating personnel

Global Error and CSS LEDs indicate, if the defective component is a customer replaceable unit or if maintenance personnel needs to be dispatched to replace the part.



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

#### 4.1.2.1 Global Error indicator

- ▶ Check the Global Error indicator on the front or connector panel of the server
- ▶ For further diagnostics, proceed as follows:

- Hardware errors:

Check the System Event Log (SEL) as described in section "[Viewing the SEL](#)" on page 100.

- Software / agent related errors:

Check the ServerView System Monitor, available on Windows or Linux based servers with ServerView agents installed.



For further information, please refer to the "ServerView System Monitor" user guide.

#### 4.1.2.2 Customer Self Service (CSS) indicator

- ▶ Check the CSS indicator on the front panel or connector panel of the server:

### 4.1.3 Locating the defective component

After determining the error class by the CSS or Global Error indicators (see section ["Determining the error class" on page 46](#)) local diagnostic indicators on the front panel and system board allow you to identify the defective component.



For further information, refer to the "ServerView Suite Local Service Concept (LSC)" manual.

#### 4.1.3.1 Local diagnostic indicators on the front

- ▶ Check the CSS indicator on the front and connector panels of the server:



In addition to local diagnostic indicators, CSS or Global Error LEDs indicate, if the defective component is a customer or field replaceable unit (see section ["Determining the error class" on page 46](#)).

#### 4.1.3.2 Local diagnostic indicators on the system board

##### Using the Indicate CSS button

- ▶ Shut down and power off the server.
- ▶ Disconnect the AC power cord from the system.



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

- ▶ Press the Indicate CSS button to highlight defective components (see section ["Onboard indicators and controls" on page 414](#)).



In addition to local diagnostic indicators, CSS or Global Error LEDs indicate, if the defective component is a customer replaceable unit or if a service technician needs to be dispatched to replace the part (see section ["Determining the error class" on page 46](#)).

If the system has been powered off to replace a non hot-plug unit, a system of PRIMERGY diagnostics indicators guides you to the faulty component.

### 4.2 Shutting down the server



#### CAUTION!

For further safety information, please refer to chapter ["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, pressing the On / Off button will perform a graceful shutdown.

- ▶ Switch on the ID indicator on the front and rear connector panels of the server as described in section ["Locating the defective server" on page 45](#).

### 4.3 Disconnecting the server from the mains

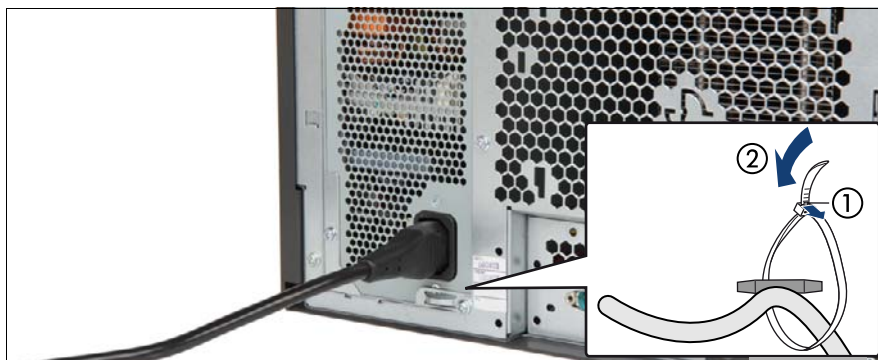


Figure 2: Removing the power cord from the cable tie

- ▶ Pull out on the locking lever on the cable tie (1) and loosen the loop (2).
- ▶ Disconnect the power cord from the PSU and remove it from the cable tie.

## 4.4 Getting access to the component



### CAUTION!

- Before removing or installing covers, turn off the server and all peripheral devices. Also unplug all power cables from the outlet. Failure to do so can cause electric shock.
- In order to comply with applicable EMC regulations (regulations on electromagnetic compatibility) and satisfy cooling requirements, the server must not run while the top / side cover is removed.
- For further safety information, please refer to chapter ["Important information" on page 33](#).

### 4.4.1 Rack model

#### 4.4.1.1 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 further safety information, please refer to chapter ["Important information" on page 33](#).

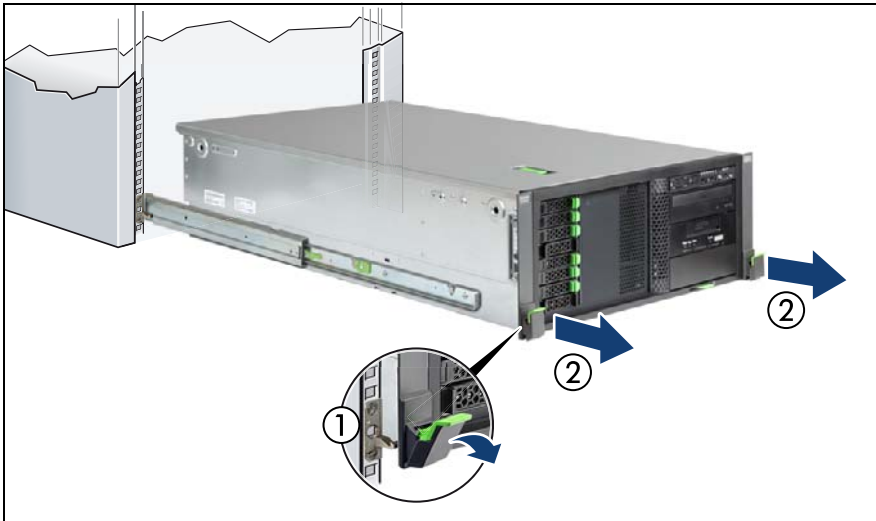


Figure 3: Extending the server out of the rack

- ▶ Remove all remaining external cables from the rear connector panel and expansion cards (see section "[Connectors and indicators](#)" on page 412).
- ▶ If you are not using a cable mounting 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.
- ▶ Fold down the two quick release levers (1) and 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.

#### 4.4.1.2 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 the Japanese market, please refer to "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 installed above the height of 25 U.

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

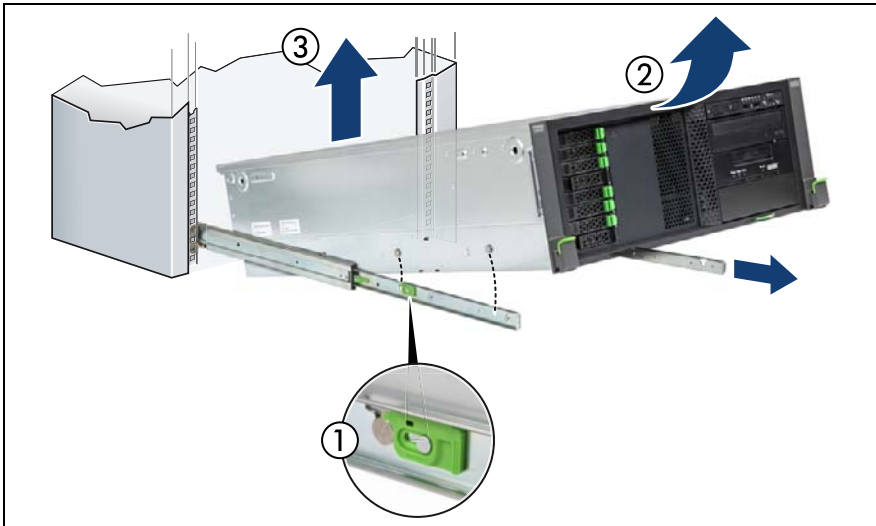


Figure 4: Removing the server from the rack

- ▶ Release the locking bars on both rails (1).
- ▶ Lift up the front of the server as shown so that the front and middle rack mounting bolts are disengaged from the mounting points on the telescopic rails (2).
- ▶ Lift the server out of the rear mounting points (3) and place it on an even surface.

#### 4.4.1.3 Removing the top cover

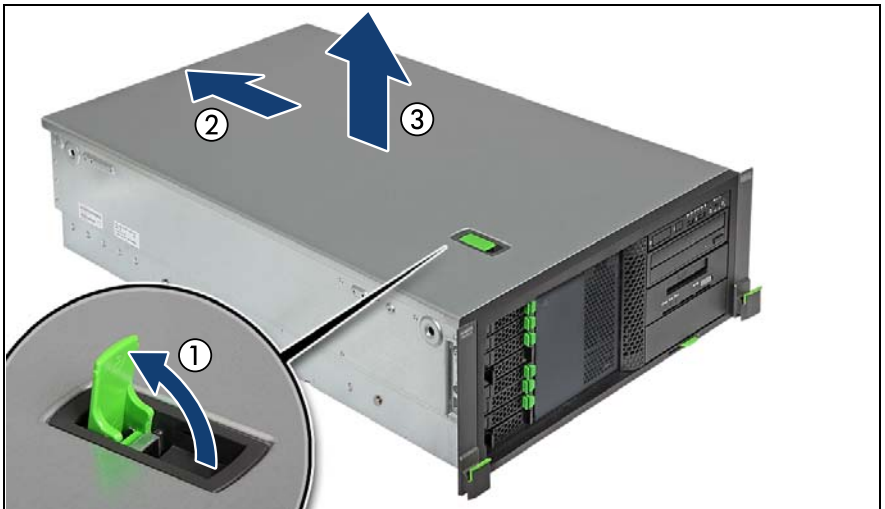


Figure 5: Removing the top cover (rack server)

- ▶ Open the locking lever (1). This will slide the top cover back disengaging the locking mechanism (2).
- ▶ Remove the top cover (3).

### 4.4.1.4 Removing the rack front cover

- i** You remove the rack front cover when installing/removing accessible drives or HDD extension boxes.



Figure 6: Removing the ID card (rack server)

- ▶ Remove the ID card from the server.

- i** It may be necessary to pull out on the ID card rather firmly. However, do not apply excessive force.



Figure 7: Removing the rack front cover (A)

- ▶ Remove two screws (see circles) from the side brackets on either side.

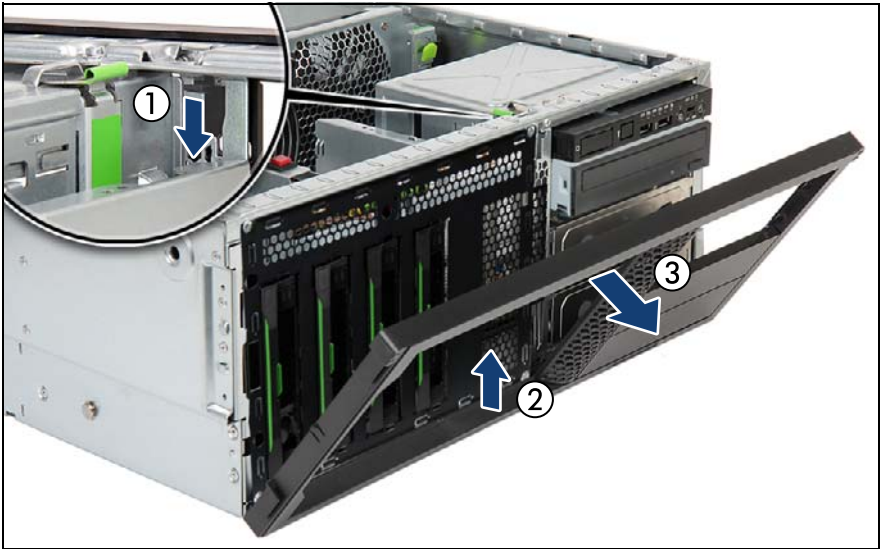


Figure 8: Removing the rack front cover (B)

- ▶ Press down on the upper locking latch (1) while slightly folding out the rack front cover.
- ▶ Press up on the rack front cover to disengage the lower locking latch (2).
- ▶ Carefully fold open and remove the rack front cover (3).

## 4.4.2 Tower model

### 4.4.2.1 Unlocking the server

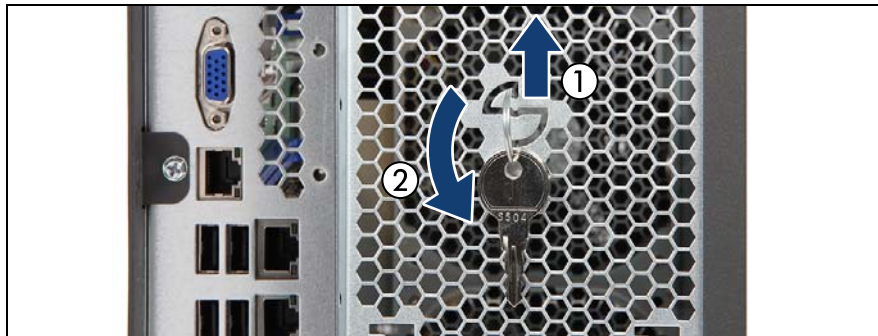


Figure 9: Removing the key

- ▶ Lift the key ring to unlatch it (1).
- ▶ Turn the key ring counter-clockwise by 90 degrees (2).
- ▶ Remove the key from the server rear.

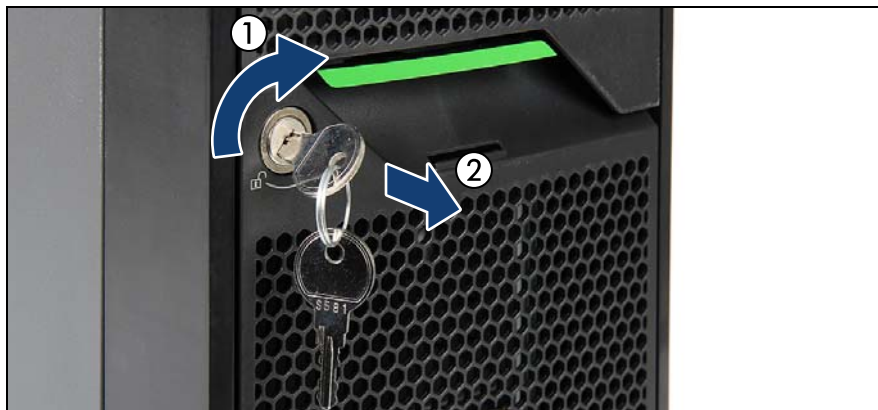


Figure 10: Unlocking the server

- ▶ Insert the key into the lock on the server front.
- ▶ Turn the key clockwise to unlock the front and side covers (1).
- ▶ Remove the key from the server front (2) and set aside for later use.

#### 4.4.2.2 Removing the side cover



Figure 11: Removing the side cover (tower server)

- ▶ Open the locking lever (1). This will slide the side cover back disengaging the locking mechanism (2).
- ▶ Remove the side cover (3).

### 4.4.2.3 Removing accessible drive and HDD bay covers



Figure 12: Removing the accessible drive bay cover

- ▶ Press up on the locking latch (1) and fold out the accessible drive bay cover (2).
- ▶ Remove the accessible drive bay cover from the front cover.



Figure 13: Removing the HDD bay cover

- ▶ Pull out on the handle on the upper edge of the HDD bay cover.
- ▶ Fold out and remove the HDD bay cover from the front cover.

#### 4.4.2.4 Removing the front cover



You remove the front cover when:

- installing/removing accessible drives or HDD extension boxes
- converting a tower model to a rack model



Figure 14: Removing the ID card (tower server)

- ▶ Remove the ID card from the server.



It may be necessary to pull out on the ID card rather firmly. However, do not apply excessive force.



Figure 15: Removing the front cover (tower server)

- ▶ Pinch the locking clips to disengage the front cover (1) while slightly pulling out.
- ▶ Carefully fold out the bottom end of the front cover (2).
- ▶ Unhook and remove the front cover (3).

### 4.4.3 Removing the system air duct

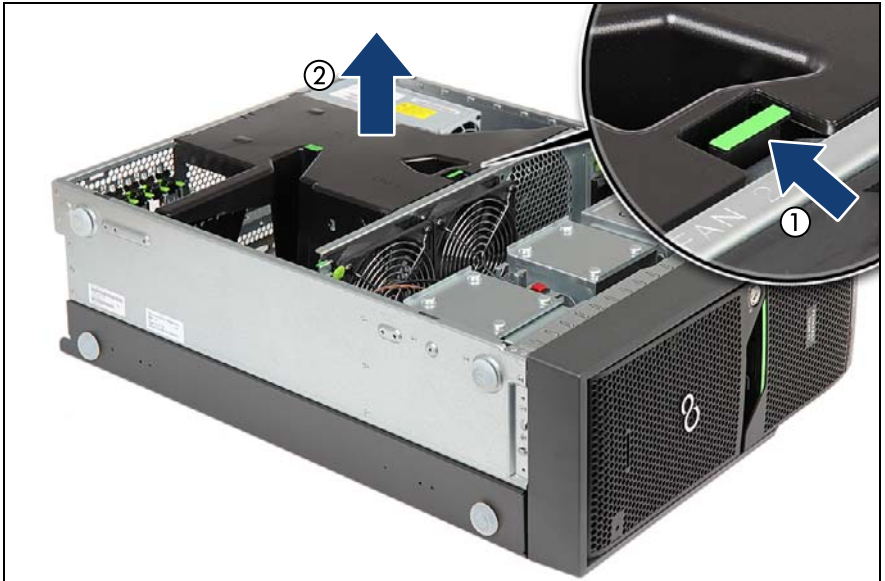


Figure 16: Removing the system air duct

- ▶ Press in on the green locking latch to disengage the system air duct (1).
- ▶ Hold the system air duct by the two green touch points and lift it out of the chassis (2).

## 4.5 Reassembling



### CAUTION!

- Before attaching the covers, make sure no unnecessary parts or tools are left inside the server.
- In order to comply with applicable EMC regulations (regulations on electromagnetic compatibility) and satisfy cooling requirements, the server must not run while the top / side cover is removed.
- For further safety information, please refer to chapter "[Important information](#)" on page 33.

### 4.5.1 Installing the system air duct

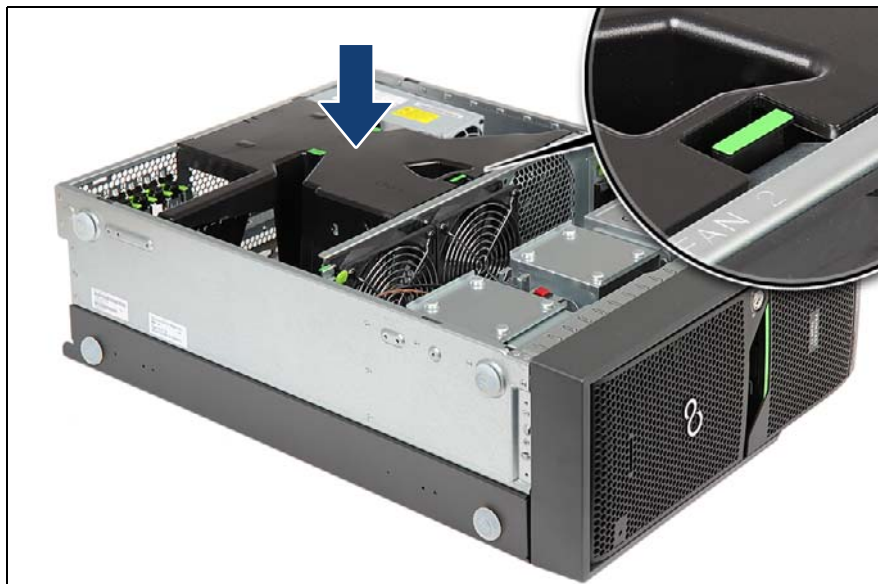


Figure 17: Installing the system air duct

- ▶ Hold the system air duct by the two green touch points and lower it into the chassis until the green locking latch clicks in (see close-up).

## 4.5.2 Rack model

### 4.5.2.1 Installing the rack front cover

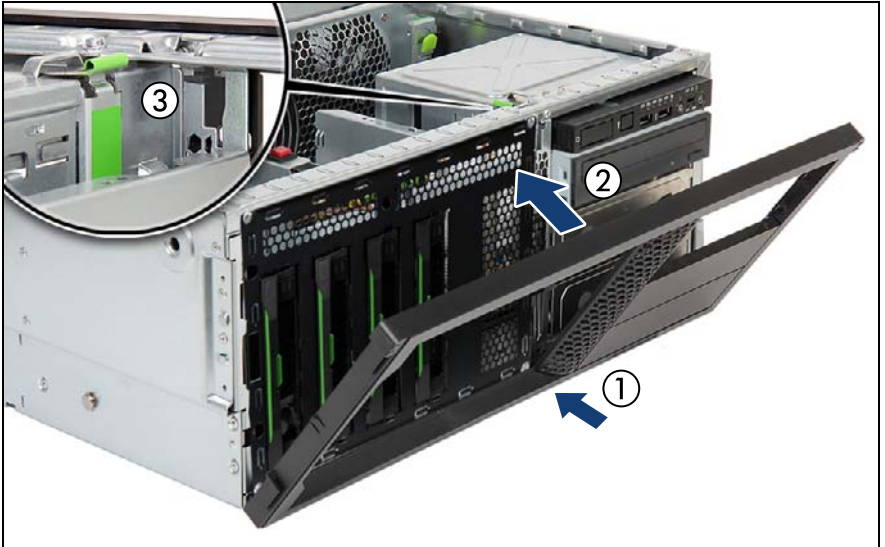


Figure 18: Installing the rack front cover

- ▶ Fit the rack front cover on the server front (1).
- ▶ Carefully fold close (2) until the upper locking latch engages (3).
- ▶ Secure the rack front cover to the chassis with two screws on either side (see figure 7 on page 54).
- ▶ Insert and slide the ID card into its slot until it locks in place (see figure 6 on page 54).

### 4.5.2.2 Installing the top cover

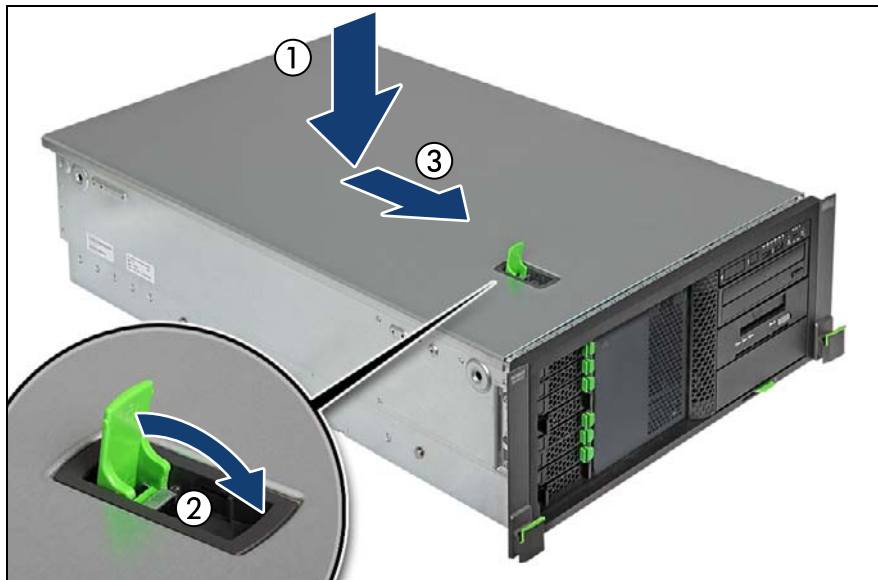


Figure 19: Installing the top cover (rack server)

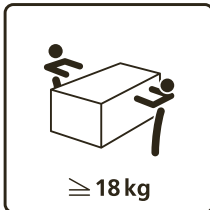
- ▶ Check if the locking lever on the top cover is open.
- ▶ Lower the top cover onto the chassis, recessed by 2 cm (1).
- ▶ Close the locking lever on the top cover (2). This will slide the top cover shut engaging the locking mechanism (3).

#### 4.5.2.3 Mounting the server in the rack



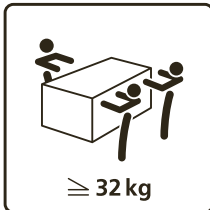
#### CAUTION!

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



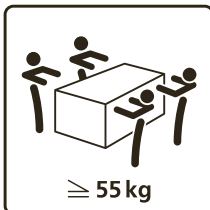
#### For configurations below 32 kg:

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.

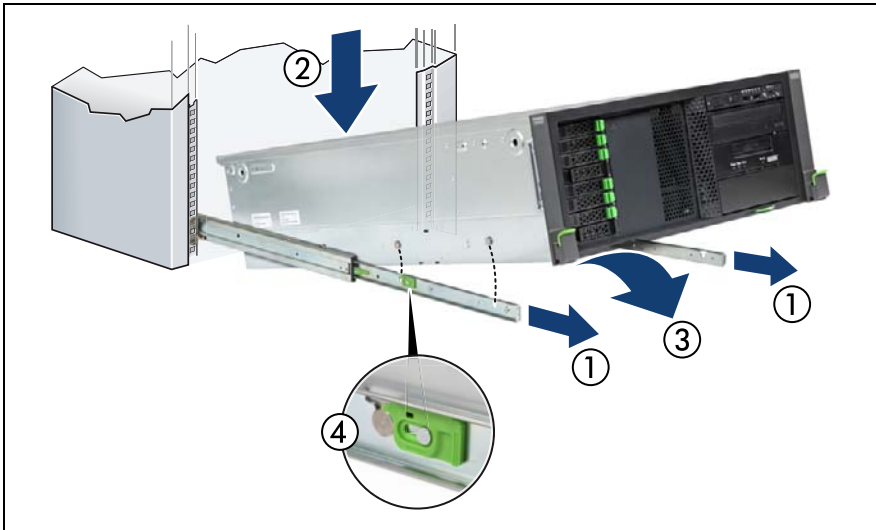


Figure 20: Mounting the server onto the rack rails

- ▶ Fully extend the telescopic rails until they lock in place (1).
- ▶ At a slight angle, lower the server onto the rear mounting point on the telescopic rails (2).
- ▶ Fold down the server (3). Ensure that all six rack mounting bolts are properly seated in the mounting points on the telescopic rails and that the locking bars engage (4).

#### 4.5.2.4 Sliding the server into the rack

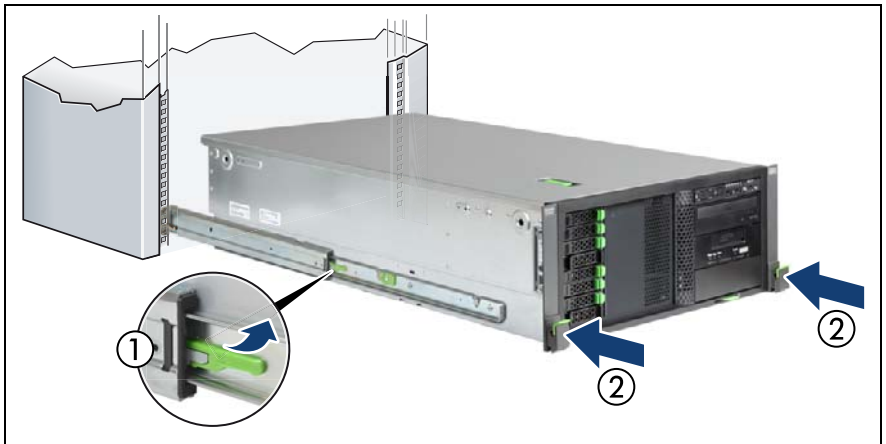


Figure 21: Sliding the server into the rack

- ▶ Pull up on the locking latch on both telescopic rails (1).
- ▶ Slide the server inside the rack as far as it will go (2) until the quick release levers lock into place.
- ▶ Reconnect all cables except the power cord to the server rear.



If you are not using a cable mounting 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.

Use cable ties to prevent loose cables from blocking the air flow.

### 4.5.3 Tower model

#### 4.5.3.1 Installing the front cover



Figure 22: Installing the front cover (tower server) (A)

- ▶ Hook the two tabs of the front cover into the notches in the chassis.



Figure 23: Installing the front cover (tower server) (B)

- ▶ Fold down the front cover (1) until the locking clip on the bottom edge engage (2).
- ▶ Insert and slide the ID card into its slot until it locks in place (see figure 14 on page 59.)

#### 4.5.3.2 Installing accessible drive and HDD bay covers

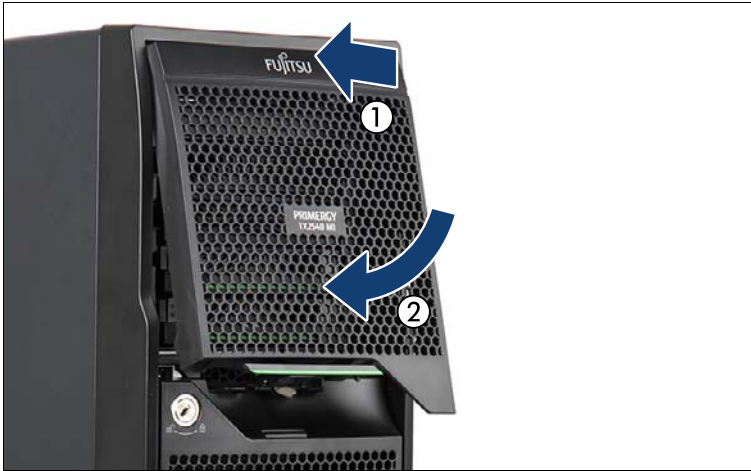


Figure 24: Installing the accessible drive bay cover

- ▶ Insert the accessible drive bay cover into the front cover as shown (1).
- ▶ Fold in the accessible drive bay cover until it locks in place (2).



Figure 25: Installing the HDD bay cover

- ▶ Insert the HDD bay cover into the front cover as shown (1).
- ▶ Fold in the HDD bay cover until it locks in place (2).

### 4.5.3.3 Installing the side cover



Figure 26: Installing the side cover (tower server)

- ▶ Open the locking lever on the side cover.
- ▶ Fit the side cover on the chassis, recessed by 2 cm (1).
- ▶ Close the locking lever on the side cover (2). This will slide the top cover shut engaging the locking mechanism (3).
- ▶ Reconnect all cables except the power cord to the server rear.

#### 4.5.3.4 Locking the server



Figure 27: Locking the server

- ▶ Insert the key (1) and turn it counter-clockwise (2).
- ▶ Remove the key from the server front.

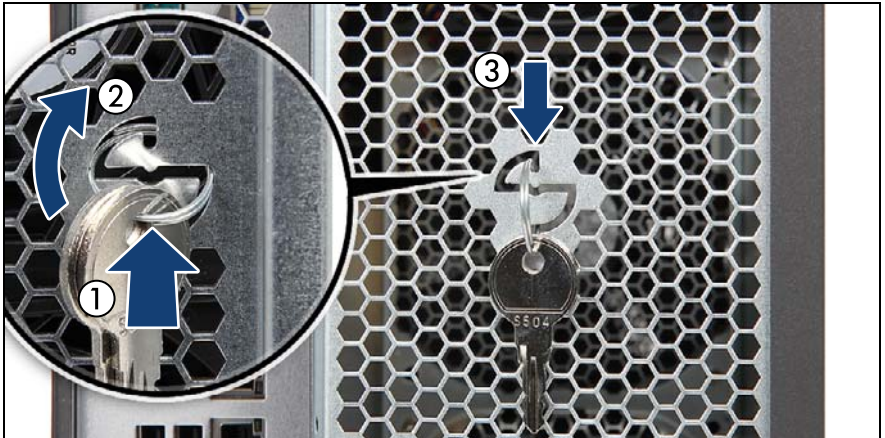


Figure 28: Storing the key ring

- ▶ Insert the key ring into the slot on the server rear (1).
- ▶ Turn the key ring clockwise by 90 degrees (2) until it latches in place as shown (3).

## 4.6 Connecting the server to the mains



### CAUTION!

The server supports a mains voltage in the range of 100 VAC to 240 VAC. You may only operate the server if its rated voltage range corresponds to the local mains voltage.

- ▶ Connect the power cords to the power supply units.
- ▶ Connect the mains plugs to grounded mains outlets in the in-house power supply network or power outlets of the rack socket strip.



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

### Securing power cords

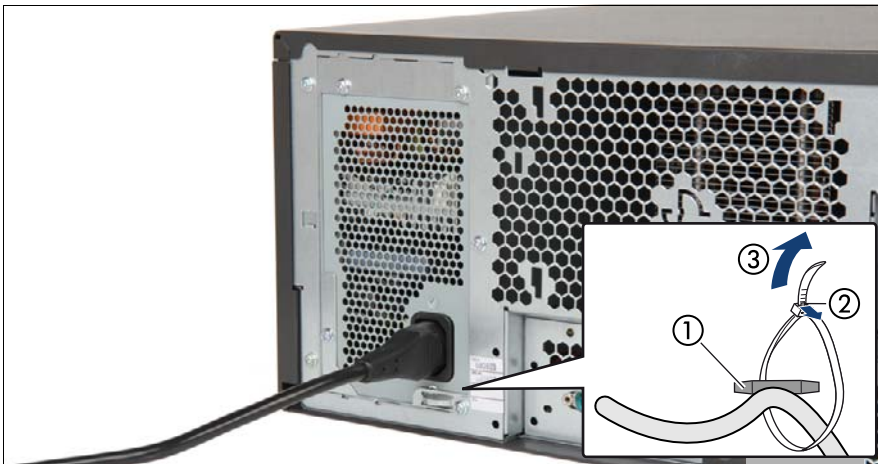


Figure 29: Securing power cord

- ▶ Loop the cable past the cable tie mounting bracket as shown (1).
- ▶ Close the cable tie around the power cord (2) and pull tight (3) to secure the power cord.

## 4.7 Switching on the server



### CAUTION!

- Before switching on the server, make sure the top / side 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 / side cover is removed.
  - Follow the safety instructions in chapter ["Important information" on page 33](#).
- ▶ Press the On / Off button to start up the server.
  - ▶ Ensure that the power-on indicator above the On / Off button is lit green.
  - ▶ Perform the required procedures described in the concluding steps of each upgrade or maintenance task.

## 4.8 Handling the system fan holder

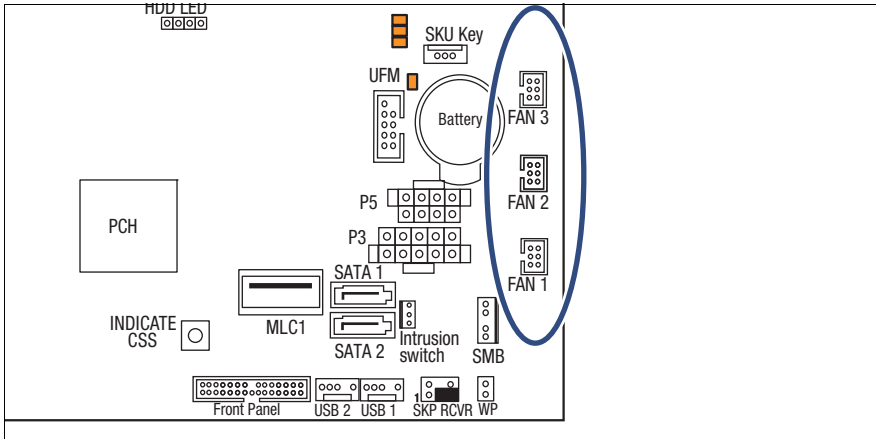


Figure 30: Position fan connectors

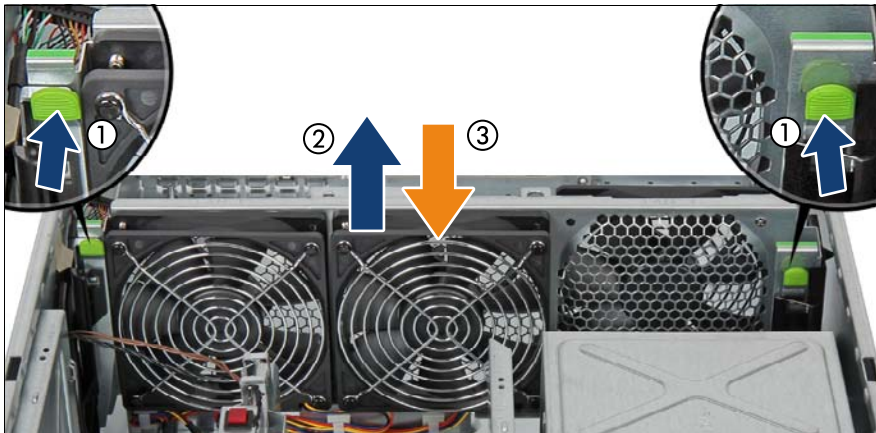


Figure 31: Handling the system fan holder

### Removing the system fan holder

- ▶ Press on the two locking tabs (see close-ups) while slightly lifting up the system fan holder (1).
- ▶ Lift up the system fan holder and remove it from the chassis (2).

### Installing the system fan holder

- ▶ Insert the system fan holder into its two guides (3).
- ▶ Carefully lower the system fan holder into the chassis until the two locking tabs (see close-ups) engage.

## 4.9 Handling the anti-tilt bracket

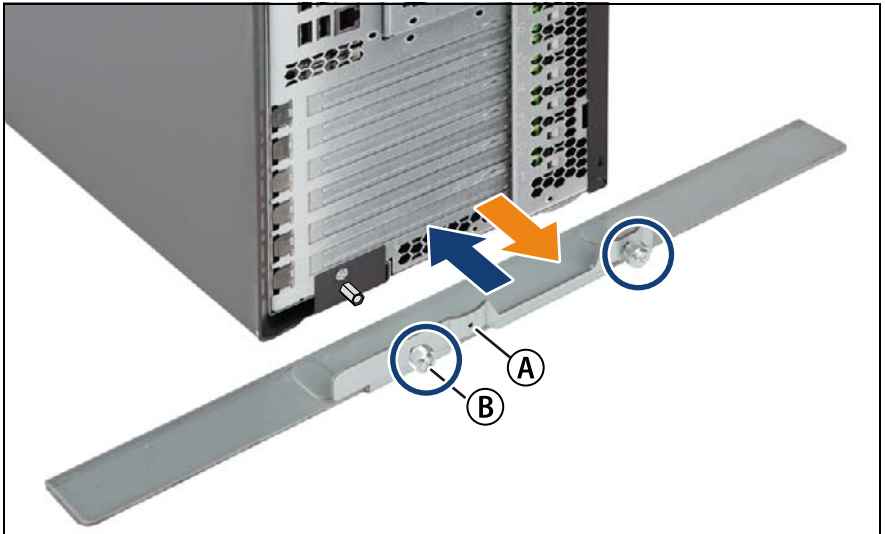


Figure 32: Handling the anti-tilt bracket

### Removing the anti-tilt bracket

- ▶ Loosen the two knurled thumb screws on the anti-tilt bracket (see circles).
- ▶ Remove the anti-tilt bracket.

### Installing the anti-tilt bracket

- ▶ If applicable, remove the left knurled thumb screw from the middle screw hole (A) and assemble it to the left screw hole (B).
- ▶ Fit the anti-tilt bracket onto the bottom edge of the server rear.
- ▶ Secure the anti-tilt bracket on the rear of the server with two knurled thumb screws (see circles). Screw the knurled thumb screw of the left side first.

## 4.10 Handling rubber feet

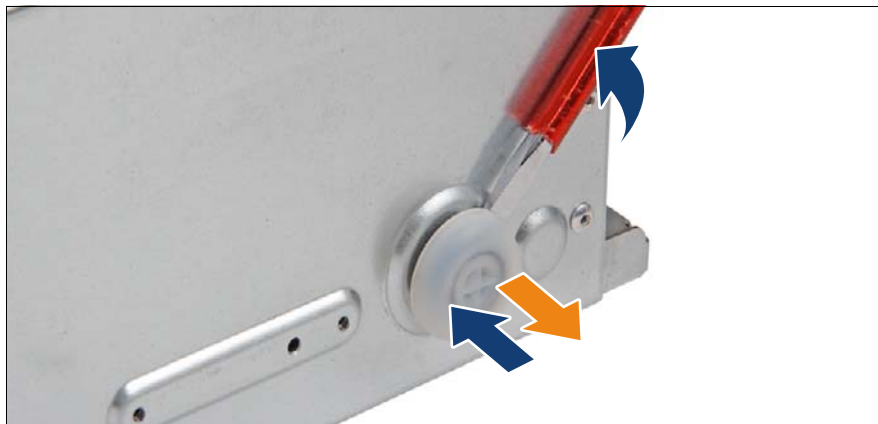


Figure 33: Handling the rubber feet

### Removing rubber feet

- ▶ Lay the server on its right-hand side.

**i** At least two people are needed to turn over a fully equipped server. Remove hard disk drives and power supply modules in order to facilitate the task.

- ▶ Using a slotted screw driver, slightly pry up on each rubber foot until it detaches.

### Installing rubber feet

- ▶ Push in each rubber foot.
- ▶ Bring the server back to its vertical position.


---

# 5 Basic software procedures

## 5.1 Starting the maintenance task

### 5.1.1 Suspending BitLocker functionality

BitLocker Drive Encryption provides protection for operating system 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 additional information on how to use BitLocker on a computer without a compatible TPM, please refer to the "BitLocker Drive Encryption" documentation page at <http://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 to 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.

*For Windows Server 2008:*

- ▶ Open BitLocker Drive Encryption by clicking the *Start* button, clicking *Control Panel*, clicking *Security*, and then clicking *BitLocker Drive Encryption*.
- ▶ Select the system volume, and click *Turn Off BitLocker*.
- ▶ From the *Turn Off BitLocker* dialog box, click *Disable BitLocker*.

*For Windows Server 2008 R2 and above:*

- ▶ Open BitLocker Drive Encryption by clicking the *Start* button, clicking *Control Panel*, clicking *System and Security*, and then clicking *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 further information on how to suspend BitLocker drive encryption, please refer to the Microsoft TechNet library at <http://technet.microsoft.com/library/cc731549.aspx>.

Fujitsu service partners will find additional information (also available in Japanese) on the Fujitsu Extranet web pages.

### 5.1.2 Disabling SVOM boot watchdog functionality

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

#### 5.1.2.1 Viewing boot watchdog settings

##### Viewing boot watchdog settings in the BIOS

- ▶ Enter the BIOS.
- ▶ Select the *Server Mgmt* menu.

- ▶ Under *Boot Watchdog*, you can obtain detailed information about the current watchdog status, time out intervals and actions that are triggered if watchdog time outs are exceeded.



For detailed information on BIOS settings, refer to the corresponding BIOS Setup Utility reference manual.

### Viewing boot watchdog settings in the iRMC web frontend

- ▶ Enter the ServerView iRMC web frontend.
- ▶ Select the *Server Management* menu.
- ▶ Under *Watchdog Settings*, you can obtain detailed information about the current watchdog status, time out intervals and actions that are triggered if watchdog time outs are exceeded.



For detailed information on iRMC settings, refer to the "Integrated Remote Management Controller" user guide.

### Viewing boot watchdog settings in ServerView Operations Manager

- ▶ In ServerView Operations Manager *Single System View* select *Maintenance* from the *Information / Operation* menu.
- ▶ Under *ASR&R* select the *Watchdog* tab to obtain detailed information about the current watchdog status, time out intervals and actions that are triggered if watchdog time outs are exceeded.



For more detailed information, refer to the "ServerView Operations Manager - Server Management" user guide.

#### 5.1.2.2 Configuring boot watchdog settings

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 ServerView iRMC web frontend:

### Configuring boot watchdog settings in the BIOS

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



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

### Configuring boot watchdog settings using the iRMC web frontend

- ▶ Enter the ServerView iRMC web frontend.
- ▶ Select the *Server Management* menu.
- ▶ Under *Watchdog Settings* select *Continue* from the *Boot Watchdog* drop down list.
- ▶ Click *Apply* for the changes to take effect.



For detailed information on iRMC settings, refer to the "Integrated Remote Management Controller" user guide.

## 5.1.3 Removing backup and optical disk media

- ▶ Ask the system administrator to eject all remaining backup or optical media from the backup or optical disk drive 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.

For further information on "forcible" tape ejection, please refer to the "Tape Facts" guide available to Fujitsu service partners from the following https address:

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

For the Japanese market, 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.

### 5.1.4 Verifying and configuring the backup software solution



This task only applies to the Japanese market.

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.

This is the case for the following backup software solution:

- BackupExec



Procedures may differ depending on the backup software. For details, refer to the dedicated documentation provided separately.

Further information on suitable backup software solutions and related documentation is available to Fujitsu service partners from the Fujitsu Extranet pages.

### 5.1.5 Note on server maintenance in a Multipath I/O environment

When booting your server offline from the ServerView Suite DVD to perform an offline BIOS / firmware update using the ServerView Update DVD or collect diagnostic data using PrimeCollect in a Multipath I/O environment, there is a risk of damaging the system configuration which may leave the system unable to boot.



This is a known restriction of Windows PE with Multipath drivers.

#### Using Update Manager Express

- ▶ If performing an offline BIOS / firmware update, first of all prepare the ServerView Update DVD or USB stick:
  - ▶ Download the latest ServerView Update DVD image from Fujitsu:
    - for the EMEA market  
<ftp://ftp.ts.fujitsu.com/images/serverview>
    - for the Japanese market:  
<http://jp.fujitsu.com/platform/server/primergy/products/note/svsdvd/dvd/>

- ▶ Burn the image to a DVD.
- ▶ In order to create a bootable USB stick, please proceed as described in the "Local System Update for PRIMERGY Servers" user guide.
- ▶ Before using the ServerView Update DVD or USB stick in an offline environment, properly shut down the server and disconnect all external I/O connections (like LAN, FC or SAS cables) from the system. Only keep mouse, keyboard, video cable and AC power cord connected.



Ensure that all external I/O connections are uniquely identified so that you can reconnect them into their original locations after concluding the task.

To start Update Manager Express from the (physical) Update DVD or from a USB stick, proceed as follows:

- ▶ Prepare your Update DVD or USB stick as described in the "Local System Update for PRIMERGY Servers" user guide.
- ▶ Boot the server from the prepared Update DVD or USB stick:

**DVD:** ▶ Switch on the server.

- ▶ Right after switching on the server, insert the Update DVD into the DVD drive and close the tray.

**USB:** ▶ Connect the USB stick to the server.

- ▶ Switch on the server.

If the server does not boot from DVD or USB stick, proceed as follows:

- ▶ Reboot the server, e.g. by pressing the reset button on the front or switching the server off and then on again after a few seconds.
- ▶ Once the server has been started, press **[F12]** to enter the boot menu.
- ▶ Use the **[↑]** and **[↓]** cursor keys to select your DVD drive or USB stick as boot device and press **[ENTER]**.

The server will now boot from the Update DVD or USB stick.

- ▶ After the boot process is complete, select your preferred GUI language. The Update Manager Express main window will be displayed.
- ▶ Finish the intended maintenance task.



For further information, refer to the "Local System Update for PRIMERGY Servers" user guide.

### Using PrimeCollect

To start PrimeCollect, proceed as follows:

- ▶ Before using PrimeCollect in an offline environment, properly shut down the server and disconnect all external I/O connections (like LAN, FC or SAS cables) from the system. Only keep mouse, keyboard, video cable and AC power cord connected.



Ensure that all external I/O connections are uniquely identified so that you can reconnect them into their original locations after concluding the task.

- ▶ Switch on the server.
- ▶ Right after switching on the server, insert the ServerView Suite DVD into the DVD drive and close the drive tray.

If the server does not boot from DVD, proceed as follows:

- ▶ Reboot the server, e.g. by pressing the reset button on the front or switching the server off and then on again after a few seconds.
- ▶ Once the server has been started, press **F12** to enter the boot menu.
- ▶ Use the **↑** and **↓** cursor keys to select your DVD drive as boot device and press **ENTER**.

The server will now boot from the ServerView Suite DVD.

- ▶ After the boot process is complete, select your preferred GUI language.
- ▶ In the initial Installation Manager startup window, choose *PrimeCollect* from the *Installation Manager mode* section.
- ▶ Click *Continue* to proceed.
- ▶ Finish the intended maintenance task.




For further information, refer to the "PrimeCollect" user guide.

### Concluding the procedure

- ▶ After the update or diagnostic procedure has been completed, shut down the server, reconnect all external I/O connections and bring the system back to normal operation.
- ▶ If necessary, perform this procedure for all remaining servers within the Multipath environment.


## 5.1.6 Switching on the ID indicator

When working in a datacenter environment, switch on the ID indicator on the front and rear connector panels of the server for easy identification.

 For further information, refer to section "[Locating the defective server](#)" on [page 45](#) or to the "ServerView Suite Local Service Concept (LSC)" and "Integrated Remote Management Controller" user guides.

### Using the ID button on the front panel

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

 For further information, refer to section "[Front panel controls and indicators](#)" on [page 420](#).

### Using the iRMC web frontend

- ▶ Enter the ServerView iRMC web frontend.
- ▶ Under *System Overview*, click *Identify LED On* to switch on the ID indicators.

### Using ServerView Operations Manager

- ▶ In ServerView Operations Manager *Single System View* press the *Locate* button in the title bar to switch on the ID indicators.

## 5.2 Completing the maintenance task

### 5.2.1 Updating or recovering the system board BIOS and iRMC



For the Japanese market, follow the instructions provided separately.

After replacing the system board, memory or a CPU, it is essential to upgrade the BIOS and iRMC to the latest version. The latest BIOS and iRMC versions are available from the Fujitsu support internet pages at:

<http://ts.fujitsu.com/support/> (EMEA market)

<http://jp.fujitsu.com/platform/server/primergy/downloads/> (Japanese market)



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

#### 5.2.1.1 Updating or recovering the system board BIOS

##### BIOS flash procedure

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

##### BIOS recovery procedure

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

#### 5.2.1.2 Updating or recovering the iRMC

##### iRMC flash procedure

- ▶ Prepare a USB stick including the bootable iRMC firmware update image.
- ▶ Connect the USB stick to the USB port.



Ensure that only the USB device with the iRMC firmware is connected to the USB port. Remove all other USB devices temporarily.

- ▶ Restart the server.
- ▶ The system will detect the USB stick.



If the BIOS cannot identify the USB stick, the pop-up message Failed to boot for Emergency flash. Please Reset now. will show up in the center of the screen.

- ▶ 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!**

Do not interrupt the iRMC upgrade process after it has started. If the process is interrupted, the iRMC BIOS may be permanently corrupted.



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 as described in section ["Shutting down the server" on page 48](#).
- ▶ Connect the USB stick to the USB port.



Ensure that only the USB device with the iRMC firmware is connected to the USB port. Remove all other USB devices temporarily.

- ▶ 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 starts the POST process.



In iRMC recovery mode, the "FUJITSU" logo does not show up.

- ▶ The system will detect the USB stick.



If the BIOS cannot identify the USB stick, the pop-up message Failed to boot for Emergency flash. Please Reset now. will show up in the center of the screen.

- ▶ Choose the *Recovery\_L* option from the update tool menu to start the iRMC update process.



### **CAUTION!**

Do not interrupt the iRMC upgrade process after it has started. If the process is interrupted, the iRMC BIOS may be permanently corrupted.



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.

## 5.2.2 Verifying system information backup / 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.

In order to verify whether the backup or restore process has been successful, check the System Event Log (SEL) using the ServerView Operations Manager (see also section "[Viewing and clearing the System Event Log \(SEL\)](#)" on [page 100](#)).

### After replacing the system board

- ▶ Check the SEL log files as described in section "[Viewing and clearing the System Event Log \(SEL\)](#)" on page 100 to verify whether the backup data on the Chassis ID EPROM has been restored to the system board:

```
Chassis IDPROM: Restore successful
```

### After replacing the Chassis ID EPROM

- ▶ Check the SEL log files as described in section "[Viewing and clearing the System Event Log \(SEL\)](#)" on page 100 to verify whether a backup copy of the system board settings has been transferred to the Chassis ID EPROM:

```
Chassis IDPROM: Backup successful
```

## 5.2.3 Updating RAID controller firmware

After replacing the RAID controller, it is essential to upgrade the firmware to the latest version. The latest RAID controller firmware version is available from the Fujitsu support web pages at:

<http://ts.fujitsu.com/support/> (EMEA market)

<http://jp.fujitsu.com/platform/server/primergy/downloads/> (Japanese market)



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

For the Japanese market, follow the instructions provided separately.

### Using the ServerView Update Manager

For a detailed description on how to update the RAID controller firmware using the ServerView Update Manager or Update Manager Express (UME), please refer to 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 DOS tools from the Fujitsu support web pages at:

<http://ts.fujitsu.com/support/> (EMEA market)

<http://jp.fujitsu.com/platform/server/primergy/downloads/> (Japanese market)

- ▶ Select *Drivers & Downloads*.
- ▶ From the *Select Product* drop down lists, choose your PRIMERGY server or enter its serial or ident number into the search field.
- ▶ Select your operating system and version.
- ▶ Select the desired component type (e.g. SAS RAID).
- ▶ Select your controller from the device list to expand a compilation of available drivers and firmware.
- ▶ Select the desired file and click *Download* for further instructions.

### 5.2.4 Enabling Option ROM scan

In order to configure an expansion card that has been installed or replaced, the card's Option ROM has to be enabled in the system board BIOS. The card's firmware is called by the system BIOS upon reboot and can be entered and configured.

Option ROM can be enabled permanently (e.g. in case of a boot controller that may require frequent setup) or temporarily for one-time configuration. When permanently enabling a controllers's Option ROM, keep in mind that only two Option ROMs can be activated in the system board BIOS at a time.

- ▶ Enter the BIOS.
- ▶ From the *Advanced* menu select *Option ROM Configuration*.
- ▶ Identify the desired PCI slot and set its *Launch Slot # OpROM* setting to *Enabled*.
- ▶ Save your changes and exit the BIOS.



Up to two Option ROMs can be activated in the system board BIOS at a time.

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


When the enabled expansion card is initialized during the POST phase of the boot sequence, a key combination is displayed temporarily to enter the expansion card's firmware.

- ▶ Press the displayed key combination.
- ▶ Modify the expansion card firmware options as desired.
- ▶ Save your changes and exit the firmware.

 The expansion card's option ROM can now be disabled in the system board BIOS.

Exception: If the expansion card controls a permanent boot device, the card's Option ROM has to remain enabled.

## 5.2.5 Verifying and configuring the backup software solution


 This task only applies to the Japanese market.

### 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.

This is the case for the following backup software solutions:

- Netvault for Windows
- ARCServe
- BackupExec

 Procedures may differ depending on the backup software. For details, refer to the dedicated documentation provided separately.

Further information on suitable backup software solutions and related documentation is available to Fujitsu service partners from the Fujitsu Extranet pages.

### Re-enabling backup drives

If a backup drive has been disabled or deleted from the backup software drive list as described in section [5.1.4 on page 82](#), it has to be re-enabled to complete the maintenance task.

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



Detailed information on suitable backup software solutions and related documentation is available to Fujitsu service partners from the Fujitsu Extranet pages

### 5.2.6 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.

#### 5.2.6.1 Viewing the boot retry counter

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

- ▶ Enter the BIOS.
- ▶ Select the *Server Mgmt* 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.

#### 5.2.6.2 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 *Server Mgmt* 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 the ServerView Operations Manager

- ▶ In the ServerView Operations Manager *Administration* view, select *Server Configuration*.
- ▶ If more than one server is managed in SVOM, select the target server and click *Next*.
- ▶ From the *Server Configuration* menu pane, choose *Restart Options*.
- ▶ Under *Reboot Retries*, specify the maximum number of boot attempts (0 to 7) in the *Default for reboot tries* field.

### Resetting the boot retry counter using iRMC web frontend

- ▶ Enter the ServerView iRMC web frontend.
- ▶ 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 operating system (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 detailed information on iRMC settings, refer to the "Integrated Remote Management Controller" user guide.

### 5.2.7 Resetting the error status after replacing memory modules or processors

#### 5.2.7.1 Memory modules

ServerView Operations Manager may report a defective memory module in case of a memory error.



#### Important note

After replacing a defective memory module, please check if the error counter has been reset automatically. If the memory slot is still marked as failed, please reset the error counter manually using one of the methods below.

#### Using the iRMC web frontend

- ▶ Enter the ServerView iRMC web frontend.
- ▶ Select the *System Information* menu.
- ▶ Under *System Components*, select the check boxes next to the affected memory modules.
- ▶ From the drop down list, select *Reset Error Counter*.
- ▶ Click *Apply* for the changes to take effect.

#### Using ServerView Maintenance Tools (Windows only)

- ▶ Launch the ServerView Maintenance Tools:
  - Windows Server 2008 R2 and below:  
*Start > (All) Programs > Fujitsu > ServerView Suite > Agents > Maintenance Tools*
  - Windows Server 2012 and above:  
*Start > Apps > Fujitsu > Maintenance Tools*
- ▶ Choose the *Memory* status tab.
- ▶ Select the memory module which shows the pre-failure status.
- ▶ Click on *Reset Status*.




The *Reset Status* button will only be available if the selected memory module contains errors.

- ▶ Ensure that all pre-fail / fail status issues have been resolved in ServerView Operations Manager.

### Using the command line interface (Linux only)

The memory error counter can be reset using the `meclear` utility which is part of the ServerView agents for Linux.


 `meclear` (Memory Module Error Counter Reset Utility) allows to reset the error count collected for a memory module, for example after it has been replaced.

For further details, please refer to the `meclear` manual pages.

- ▶ Log in as root.
- ▶ Enter the command below, followed by **ENTER**:  
`/usr/sbin/meclear`
- ▶ Select the number of a memory module with a status other than "OK" or "Not available".
- ▶ Repeat the step above until all memory modules show the "OK" status.
- ▶ Ensure that all pre-fail / fail status issues have been resolved in ServerView Operations Manager.

#### 5.2.7.2 Processors

ServerView Operations Manager may report a defective processor in case of a critical error.

 **Important note**  
After replacing a defective CPU, the error counter must be reset manually using one of the methods below.

### Using ServerView Maintenance Tools (Windows only)

- ▶ Launch the ServerView Maintenance Tools:
  - Windows Server 2008 R2 and below:  
*Start > (All) Programs > Fujitsu > ServerView Suite > Agents > Maintenance Tools*
  - Windows Server 2012 and above:  
*Start > Apps > Fujitsu > Maintenance Tools*

## Basic software procedures

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- ▶ Choose the *CPU* status tab.
- ▶ Select the CPU which shows the pre-failure status.
- ▶ Click on *Reset Status*.
- ▶ Ensure that all pre-fail / fail status issues have been resolved in ServerView Operations Manager.

### Using the command line (Linux only)

Proceed as follows to reset the error counter of a specific processor:

- ▶ Log in as root.
- ▶ Enter the command below, followed by **[ENTER]**:
  - For rack and tower servers (RX and TX server series):  
`/usr/sbin/eecdcp -c oc=0609 oi=<CPU#>`
  - For blade and scale-out servers (BX and CX server series):  
`/usr/sbin/eecdcp -c oc=0609 oi=<CPU#> cab=<cabinet nr>`

To identify the cabinet number, enter the following command:

```
/usr/sbin/eecdcp -c oc=E204
```



<CPU#> parameters are "0" for CPU 1 and "1" for CPU 2.

- ▶ If the error status cannot be reset with the method above, please use the following procedure for resetting the error counter of all processors:
  - ▶ Log in as root.
  - ▶ Enter the commands below, followed by **[ENTER]**:
    1. `/etc/init.d/srvmagt stop`  
`/etc/init.d/srvmagt_scs stop`  
`/etc/init.d/eecd stop`  
`/etc/init.d/eecd_mods_src stop`
    2. `cd /etc/srvmagt`
    3. `rm -f cehist.bin`
    4. `/etc/init.d/eecd_mods_src start`  
`/etc/init.d/eecd start`  
`/etc/init.d/srvmagt start`  
`/etc/init.d/srvmagt_scs start`

- ▶ Ensure that all pre-fail / fail status issues have been resolved in ServerView Operations Manager.

## 5.2.8 Enabling SVOM boot watchdog functionality

If ServerView Operations Manager boot watchdog functionality has been disabled for firmware upgrade purposes (see section [5.1.2 on page 78](#)), it has to be re-enabled to complete the maintenance task.

Timer settings can be configured in the BIOS or using the ServerView iRMC web frontend:

### Configuring boot watchdog settings in the BIOS

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



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

### Configuring boot watchdog settings using the iRMC web frontend

- ▶ Enter the ServerView iRMC web frontend.
- ▶ Select the *Server Management* menu.
- ▶ Under *Watchdog Settings* ensure that the check box next to *Boot Watchdog* is selected. From the drop down list choose *Reset* and specify the desired timeout delay.
- ▶ Click *Apply* for the changes to take effect.



For detailed information on iRMC settings, refer to the "Integrated Remote Management Controller" user guide.

### 5.2.9 Enabling replaced components in the system BIOS

When a processor, an expansion card, or a memory module fails, the defective component will be set to *Disabled* or *Failed* in the system BIOS. The server will then reboot with only the intact hardware components remaining in the system configuration. After replacing the defective component, it needs to be re-enabled in the system board BIOS.

- ▶ Enter the BIOS.
- ▶ Select the *Advanced* menu.
- ▶ Select the status menu of the desired component:

- Processors: *CPU Status*



This option is only available for multi-processor systems.

- Memory: *Memory Status*
- Expansion cards: *PCI Status*

- ▶ Reset replaced components to *Enable*.
- ▶ Save your changes and exit the BIOS.



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

### 5.2.10 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 operation mode (e.g. Mirrored Channel mode) may no longer be available due to a lack of identical memory module pairs. In this case, the operation mode will automatically revert to Independent Channel Mode.




For detailed information on memory operation modes available for your server, refer to section ["Basic information" on page 264](#).


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

- ▶ Enter the BIOS.

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

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


## 5.2.11 Verifying the system time settings

 This task only applies to Linux environments.


After the system board 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 OS is used and the hardware clock has been configured as UTC (Universal Time, Coordinated) in the operating system, the BMC local time may not be mapped correctly.


- ▶ After replacing the system board, 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.

- ▶ Enter the BIOS.
- ▶ Select the *Main* 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 detailed information on how to access the BIOS and modify settings, refer to the corresponding BIOS Setup Utility reference manual

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

#### 5.2.12.1 Viewing the SEL

You can view the System Event Log (SEL) using the ServerView Operations Manager or the ServerView iRMC web frontend:

#### Viewing the SEL in ServerView Operations Manager

- ▶ In ServerView Operations Manager *Single System View* select *Maintenance* from the *Information / Operation* menu.
- ▶ Under *Maintenance* select *System Event Log*.
- ▶ Select the message type(s) you want to display:
  - Critical events
  - Major events
  - Minor events
  - Informational events



#### Note on the SVOM Driver Monitor

The *Driver Monitor* view gives you an overview of the monitored components as well as the associated events contained in the system event log on the managed server.


Under *Monitored Components* the monitored components are listed. If a component has the status *Warning* or *Error*, you can select it in the list and click *Acknowledge*. This confirms the event on the server side. You may have to log on to the server beforehand. The status of the component will then be reset to *ok*. To see the new status you must refresh the *Driver Monitor* view with *Refresh*.



For detailed information on how to view and sort the SEL using ServerView Operations Manager, refer to the "ServerView Operations Manager - Server Management" user guide.

### Viewing the SEL using the iRMC web frontend

- ▶ Enter the ServerView iRMC web frontend.
- ▶ Select the *Event Log* and choose the *Internal Event Log* submenu.
- ▶ Under *Internal Event Log Content* the SEL is being displayed. In order to filter the list, select the check boxes next to the desired event types and press *Apply* for the changes to take effect.

 For detailed information on iRMC settings, refer to the "Integrated Remote Management Controller" user guide.

#### 5.2.12.2 Clearing the SEL

You can clear the System Event Log (SEL) using the ServerView iRMC web frontend:

- ▶ Enter the ServerView iRMC web frontend.
- ▶ Select the *Event Log* and choose the *Internal Event Log* submenu.
- ▶ Under *Internal Event Log Information* click *Clear Internal Event Log* to clear the SEL.

 For detailed information on iRMC settings, refer to the "Integrated Remote Management Controller" user guide.

### 5.2.13 Updating the NIC configuration file in a Linux 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 OS.

When replacing a network controller or the system board with onboard LAN controllers in a server running Linux 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.

To update the MAC address, proceed as follows:

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

- ▶ After replacing a network controller or the system board, switch on and boot the server as described in section "[Switching on the server](#)" on page 73.

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

**i** *kudzu* may not launch at boot depending on the client's environment.

- ▶ Select *Keep Configuration* and *Ignore* to complete the boot process.
- ▶ Use the *vi* text editor to specify the MAC address in the *HWADDR* section of the *ifcfg-eth<x>* file:

**i** The MAC address can be found on the type label attached to the system board or network controller.

*Example:*

In order to modify the definition file for network controller 1, enter the following command:

```
# vi /etc/sysconfig/network-scripts/ifcfg-eth1
```

In *vi*, specify the new MAC address as follows:

```
HWADDR=xx:xx:xx:xx:xx:xx
```

- ▶ Save and close the definition file.
- ▶ For the changes to take effect, you need to reboot the network by entering the following command:


```
# service network restart
```

**i** 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.

## 5.2.14 Resuming BitLocker functionality

If BitLocker Drive Encryption has been suspended for maintenance purposes (see section "[Suspending BitLocker functionality](#)" on page 77), it has to be re-enabled to complete the service task.


-  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.
- ▶ In this case, ask the system administrator to enter the recovery key in order to boot the operating system.
  - ▶ Ask the system administrator to enable the previously suspended BitLocker-protection on the system volume, using the *BitLocker Drive Encryption* control panel item:

*For Windows Server 2008:*

- ▶ Open BitLocker Drive Encryption by clicking the *Start* button, clicking *Control Panel*, clicking *Security*, and then clicking *BitLocker Drive Encryption*.
- ▶ Select the system volume, and click *Turn On BitLocker*.

*For Windows Server 2008 R2 and above:*

- ▶ Open BitLocker Drive Encryption by clicking the *Start* button, clicking *Control Panel*, clicking *System and Security*, and then clicking *BitLocker Drive Encryption*.
- ▶ Select the system volume, and click *Resume Protection*.

-  For further information on how to resume BitLocker drive encryption, please refer to the Microsoft TechNet library at <http://technet.microsoft.com/library/cc731549.aspx>.

Fujitsu service partners will find additional information (also available in Japanese) on the Fujitsu Extranet web pages.

### 5.2.15 Performing a RAID array rebuild

After replacing a hard disk drive 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.

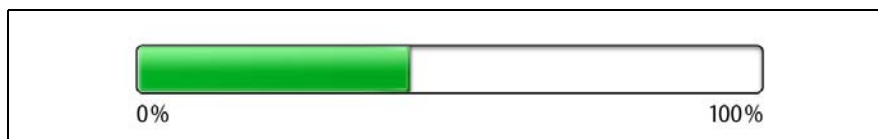


Figure 34: Progress bar (RAID array rebuild)



#### CAUTION!

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



You may notice a slight performance impact during rebuild.

### 5.2.16 Looking up changed MAC / WWN addresses

When replacing a network controller, the MAC (Media Access Control) and WWN (World Wide Name) addresses will change.



In addition to the procedures described below, MAC / WWN addresses can also be found on the type label attached to a network controller or system board.

#### 5.2.16.1 Looking up MAC addresses

- ▶ Enter the ServerView iRMC web frontend.
- ▶ Select the *System Information* menu.

- ▶ Under *Network Inventory*, 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 S4 or above.

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

- ▶ Inform the customer about the changed MAC address.

### 5.2.16.2 Looking up WWN addresses

#### Emulex FC / FCoE adapters

- ▶ Enable the network controller's Option ROM in the system board BIOS as described in section ["Enabling Option ROM scan" on page 90](#).
- ▶ Restart the server.
- ▶ During boot, as soon as the Emulex BIOS utility option appears, press **[ALT] + [E]** or **[CTRL] + [E]**.
- ▶ Under *Emulex Adapters in the System* you will find all available Emulex adapters and their WWN addresses.
- ▶ Note down the new 16-digit WWN address.
- ▶ Press **[Esc]** to exit the Emulex BIOS utility.
- ▶ Inform the customer about the changed WWN address.

#### QLogic FC adapters

- ▶ Enable the network controller's Option ROM in the system board BIOS as described in section ["Enabling Option ROM scan" on page 90](#).
- ▶ Restart the server.
- ▶ During boot, as soon as the QLogic BIOS utility option appears, press **[ALT] + [Q]** or **[CTRL] + [Q]**.
- ▶ Under *Select Host Adapter* use the arrow keys **[↑]/[↓]** to select the desired FC / FCoE adapter and press **[Enter]**.
- ▶ From the *Fast!UTIL Options* menu, select *Configuration Settings*, and press **[Enter]**.
- ▶ From the *Configuration Settings* menu, select *Adapter Settings*, and press **[Enter]**.

- ▶ Note down the new 16-digit WWN address found under *Adapter Port Name*.
- ▶ Press **[Esc]** to return to the main menu and exit the QLogic BIOS utility.
- ▶ Inform the customer about the changed WWN address.

### 5.2.17 Using the Chassis ID Prom Tool

The Chassis ID EPROM located on a dedicated Chassis ID board or on your server's front panel board contains system information like server name and model, housing type, serial number and manufacturing data.

In order to integrate your system into the ServerView management environment and to enable server installation using the ServerView Installation Manager, system data needs to be complete and correct.

After replacing the Chassis ID EPROM, system information has to be entered using the Chassis ID Prom tool. The tool and further instructions are available to maintenance personnel from the Fujitsu Technology Solutions Extranet:

<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 the Japanese market, follow the instructions provided separately.

#### Note on Cool-safe® Advanced Thermal Design (ATD)



If the Cool-safe® 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 further information on Cool-safe® Advanced Thermal Design (ATD), please refer to your server's operating manual.

**CAUTION!**

Please note that you can only set the ATD flag. Resetting the ATD flag using the Chassis ID Prom Tool is not possible!

## 5.2.18 Configuring LAN teaming

Use ServerView Operations Manager to obtain detailed information on existing LAN teams:

- ▶ In ServerView Operations Manager *Single System View* select *System Status* from the *Information / Operation* menu.
- ▶ Under *Network Interfaces* select *LAN Teaming*.
- ▶ The *Network Interfaces (Summary)* overview shows all configured LAN teams and their components. Choose a LAN team to display further details:
  - *LAN Team Properties*: Properties of the selected LAN team
  - *LAN Team Statistics*: Available statistics about the selected LAN team



For more detailed information, refer to the "ServerView Operations Manager - Server Management" user guide.

### 5.2.18.1 After replacing / upgrading LAN controllers

Please note when re-using a replaced LAN controller:

- ▶ Confirm with the customer whether the 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 after replacing the LAN controller.

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



For details, refer to the relevant LAN driver manual.

### 5.2.18.2 After replacing the system board

- ▶ 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 after replacing the system board.



For details, refer to the relevant LAN driver manual.

### 5.2.19 Switching off the ID indicator

Press the ID button on the front panel, or use the iRMC web frontend or ServerView Operations Manager to switch off the ID indicator after the maintenance task has been concluded successfully.



For further information, refer to section "[Locating the defective server](#)" on [page 45](#) or to the "ServerView Suite Local Service Concept (LSC)" and "Integrated Remote Management Controller" user guides.

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

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

#### Using the iRMC web frontend

- ▶ Enter the ServerView iRMC web frontend.
- ▶ Under *System Overview*, click *Identify LED Off* to switch off the ID indicators.

#### Using ServerView Operations Manager

- ▶ In ServerView Operations Manager *Single System View* and press the *Locate* button in the title bar to switch off the ID indicator.

### 5.2.20 Specifying the chassis model

In order to have your server displayed correctly as a rack system in the ServerView management user interface after a chassis conversion, the chassis model setting needs to be updated.

This can be accomplished using the ServerView Installation Manager or Maintenance Tools:

### Using the ServerView Installation Manager

- ▶ Boot the system from the ServerView Suite DVD. The ServerView Installation Manager is being started.
- ▶ Select your preferred user interface language.
- ▶ Under *Status backup media* select *No status backup* and click *Continue*.
- ▶ Select *Maintenance*.
- ▶ Select *Server Configuration Manager*.
- ▶ Check the box for rack model and save the setting by clicking *Save*.

### Using the ServerView Maintenance Tools

On Windows-based servers with ServerView agents installed, proceed as follows:

- ▶ Click *Start*, point to *All Programs*, and then point to *Fujitsu - ServerView Suite - Agents - Maintenance Tools*.
- ▶ In the *Maintenance Tools* menu pane, click the *Chassis Model Configuration* tab.
- ▶ Under *Convert to* click the *Rack Model* button.
- ▶ Click *Exit* to close the *Maintenance Tools* menu pane.



For more detailed information on installing ServerView agents, refer to the "ServerView Operations Manager - Installation ServerView Agents for Windows" user guide.

## 5.2.21 Performing a fan test after replacing a defective fan

After replacing a defective system fan or power supply unit 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 Web interface

- ▶ Log into the iRMC web interface.
- ▶ Under *Sensors* select *Fans*.

- ▶ Select the replaced fan in the system fans group and click *Start Fan Test*.



For detailed information on iRMC settings, refer to the "Integrated Remote Management Controller" user guide.

### Executing the fan test via ServerView Operations Manager

- ▶ Open the ServerView Operations Manager and log in.
- ▶ Under *Administration* select *Server Configuration*.
- ▶ In the hierarchy tree of the *Server list* tab, select the server to be configured.
- ▶ In the right-hand side of the window, specify the details on the selected server and confirm your entries by clicking *GO...*

In the left-hand section of the window, the *Configuration* tab is being activated.

- ▶ In the navigation area of the *Configuration* tab, select *Other Settings*.
- ▶ Under *Daily Fan Test*, set the daily fan test time to a few minutes from the current time. (Ensure to note down your previous setting.)
- ▶ Click *Save Page*.  
The fan test will be started at the specified time.
- ▶ After the fan test is complete, restore the time setting to its initial value and click *Save Page*.



For more detailed information, refer to the "ServerView Operations Manager" user guide.

### For the Japanese market: Executing the fan test via Chassis ID Prom Tool



Please follow the instructions provided separately.

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## 6 Power supply units

### Safety notes



#### CAUTION!

- Do not disassemble the power supply unit. Doing so may cause electric shock.
- Areas around the power supply unit may remain extremely hot after shutdown. After shutting down the server, wait for hot components to cool down before removing the power supply unit.
- When installing a power supply unit, ensure that the connector of the power supply unit is not damaged or bent.
- If the power supply unit is hard to remove, do not pull it out by force.
- The power supply unit is heavy, so handle it carefully. If you drop it by mistake, injuries may result.
- For further safety information, please refer to chapter "[Important information](#)" on page 33.

### 6.1 Basic information

The server can be equipped:

- with a standard power supply unit (permanently built-in)

The power supply unit adjusts automatically to any mains voltage in the range of 100 V - 240 V.

- or up to two hot-plug power supply units (slide-in units)

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



#### **CAUTION!**

The server supports a mains voltage in the range of 100 VAC to 240 VAC. You may only operate the server if its rated voltage range corresponds to the local mains voltage.

#### **Power supply unit configurations**

Depending on the server model, the following power supply unit configurations are possible:

| Standard PSU | Hot-plug PSU   |                         |
|--------------|--|-------------------------|
| 800 W        | max 2x 800 W (Platinum) /<br>max 2x 800 W (Titanium) | max 2x 450 W (Platinum) |

### Assembly rules for hot-plug PSUs

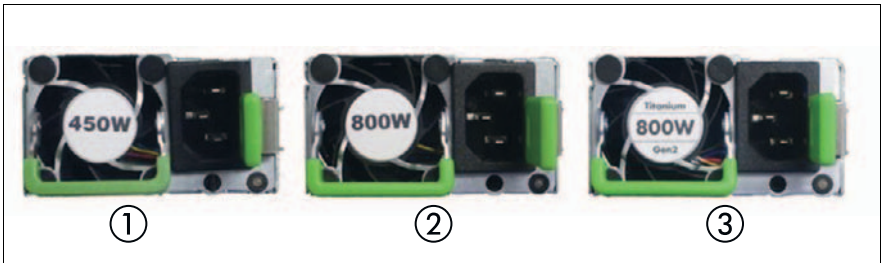


Figure 35: Variants of the hot-plug PSUs

|   |                               |
|---|-------------------------------|
| 1 | Hot-plug PSU 450 W (Platinum) |
| 2 | Hot-plug PSU 800 W (Platinum) |
| 3 | Hot-plug PSU 800 W (Titanium) |

- Mixed assembly of different hot-plug PSUs is not supported.
- Always install dummy modules into unused PSU bays to comply with applicable EMC regulations and satisfy cooling requirements.

## 6.2 Standard power supply



Figure 36: Standard power supply unit 800 W

### 6.2.1 Replacing the standard power supply unit



**Field Replaceable Unit (FRU)**



**Hardware: 10 minutes**

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

#### 6.2.1.1 Preliminary steps

- ▶ ["Suspending BitLocker functionality" on page 77](#)
- ▶ ["Locating the defective server" on page 45](#)
- ▶ ["Shutting down the server" on page 48](#)
- ▶ ["Disconnecting the server from the mains" on page 48](#)
- ▶ ["Getting access to the component" on page 49](#)
- ▶ ["Removing the system fan holder" on page 74](#)

### 6.2.1.2 Removing the defective standard power supply unit

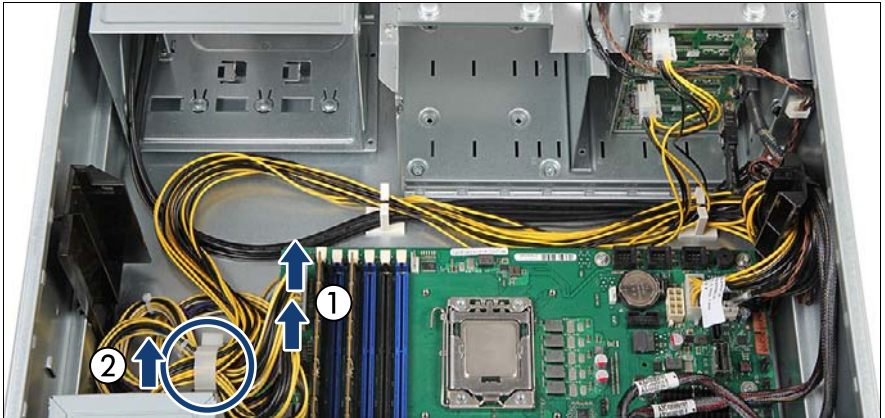


Figure 37: Disconnecting power cables

- ▶ Open the cable clamp and disconnect the short power cable from the system board (1).
- ▶ Disconnect the long power cable from the connector on the power supply unit (2). The power cable can remain in the cable clamps.
- ▶ Note the position of the power cables.

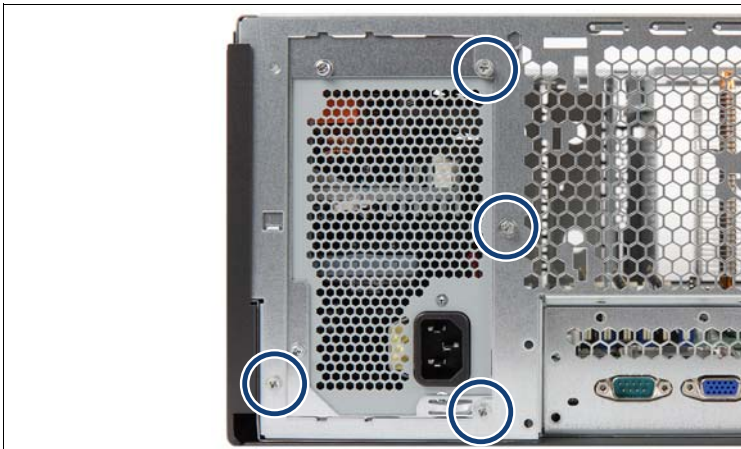


Figure 38: Detaching the standard power supply unit

- ▶ Remove the four screws (see circles).

## Power supply units

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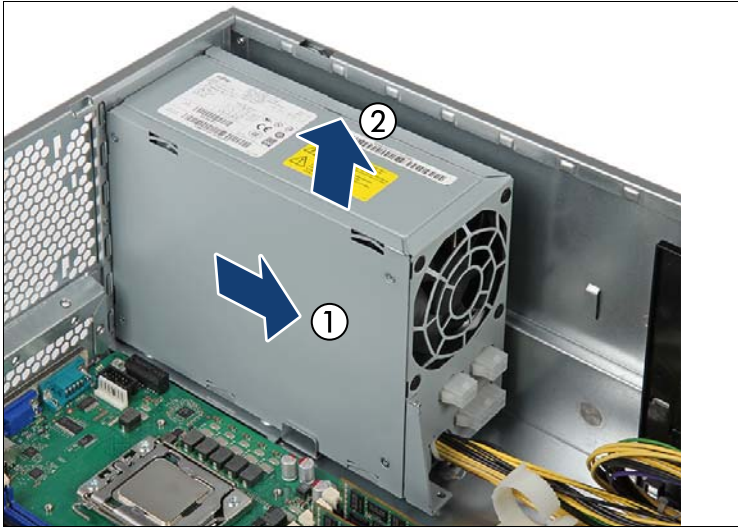


Figure 39: Removing the standard power supply unit

- ▶ Slide the power supply unit inside the chassis by 3 cm (1).
- ▶ Lift the power supply unit out of the chassis (2).



Figure 40: Removing the installation frame (A)

- ▶ Remove the two screws (see circles).



Figure 41: Removing the installation frame (B)

- ▶ Remove the installation frame from the power supply unit.

### 6.2.1.3 Installing the new standard power supply unit

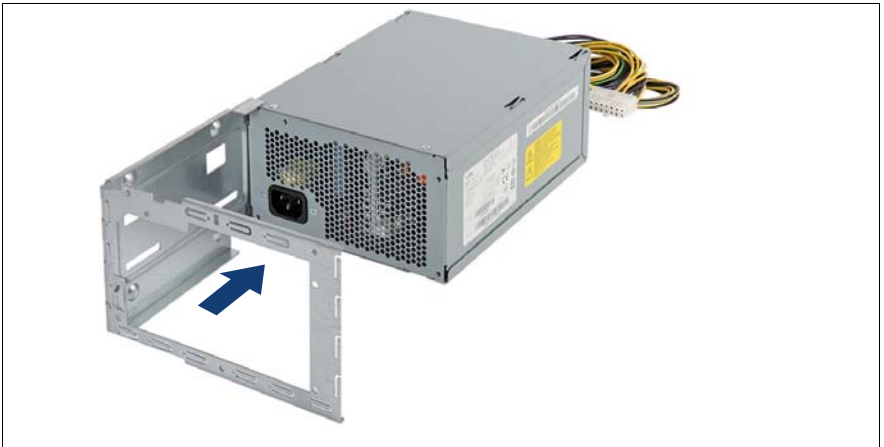


Figure 42: Installing the installation frame (A)

- ▶ Fit the installation frame to the power supply unit.
- ▶ Ensure that the installation frame is correctly seated on the power supply unit.

## Power supply units

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Figure 43: Installing the installation frame (B)

- ▶ Secure the installation frame to the power supply unit with two screws (see circles).

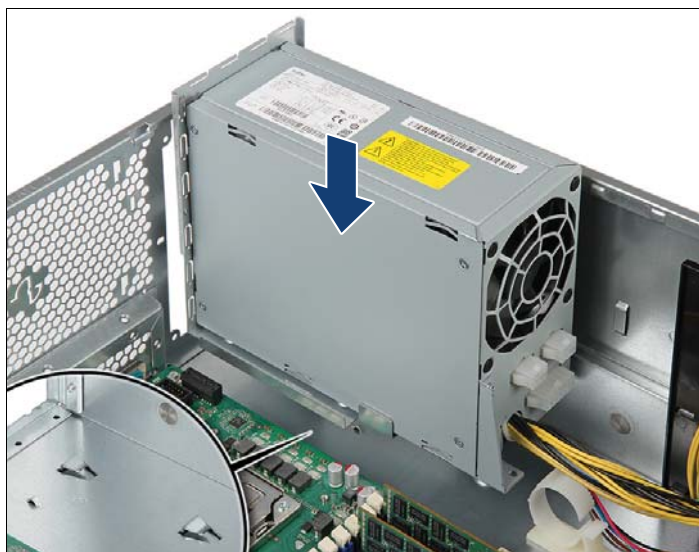


Figure 44: Installing PSU in the chassis (A)

- ▶ Lower the power supply unit into the chassis so that the two hooks on the server floor (see close-up) rest in the recesses in the installation frame.



Figure 45: Installing PSU in the chassis (B)

- ▶ Slide the power supply unit towards the server rear as far as it will go.

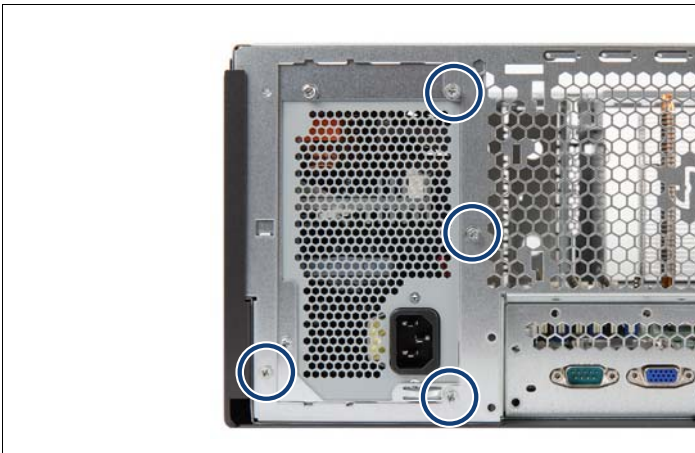


Figure 46: Installing PSU in the chassis (C)

- ▶ Secure the power supply unit to the chassis with four screws (see circles).
- ▶ Connect the power cables see section "[Cabling plans](#)" on page 399.
- ▶ Run the power cable through the cable clamp (see figure 37).

### 6.2.1.4 Concluding steps

- ▶ ["Installing the system fan holder" on page 75](#)
- ▶ ["Reassembling" on page 62](#)
- ▶ ["Connecting the server to the mains" on page 72](#)
- ▶ ["Resuming BitLocker functionality" on page 103](#)

## 6.3 Redundant power supply

### 6.3.1 Installing hot-plug power supply units



Customer Replaceable Unit  
(CRU)



Hardware: 5 minutes

**Tools:** tool-less

#### 6.3.1.1 Preliminary steps

No steps needed.

#### 6.3.1.2 Removing the PSU dummy cover

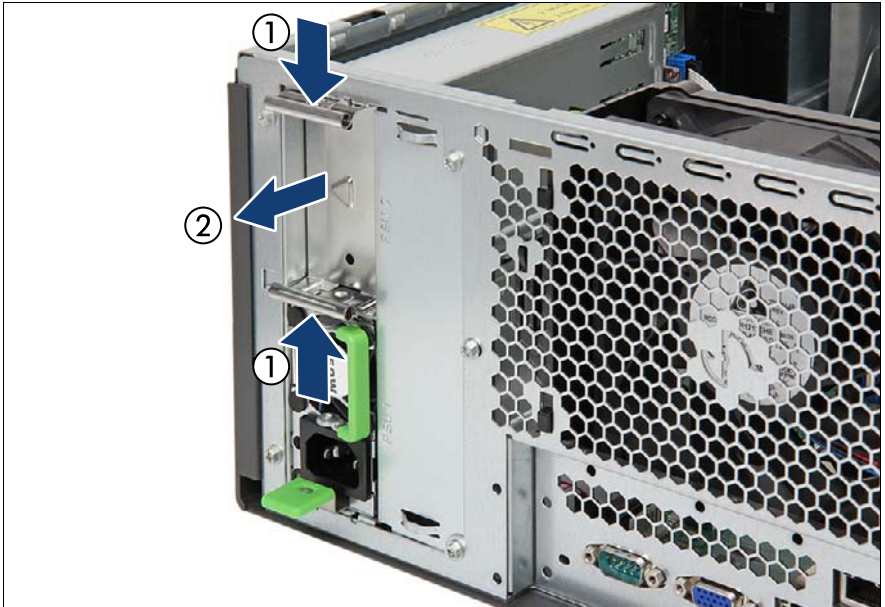


Figure 47: Removing a PSU dummy cover (A)

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



### CAUTION!

Keep the dummy cover for future use. If a hot-plug PSU is removed and not immediately replaced by a new one, a PSU dummy cover must be reinstalled in the bay to comply with applicable EMC regulations and satisfy cooling requirements.

### 6.3.1.3 Installing a hot-plug PSU



Figure 48: Installing a hot-plug PSU

- ▶ Push the hot-plug PSU into its bay (1) as far as it will go until the release latch snaps in place (A).
- ▶ If applicable, fold down the handle on the hot-plug PSU.

### 6.3.1.4 Concluding steps

- ▶ ["Connecting the server to the mains" on page 72](#)

## 6.3.2 Removing a hot-plug PSU



**Customer Replaceable Unit (CRU)**



**Hardware: 5 minutes**

**Tools:** tool-less



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

Since the installed CMA is blocking hot-plug PSUs, additional steps are required in order to remove or replace a hot-plug PSU:

- ▶ Unlock the CMA stopper.
- ▶ Remove the CMA stopper with the mounted crossbar.
- ▶ Support the CMA stopper, the crossbar and the CMA including cables with your right hand.
- ▶ Remove the hot-plug PSU and install a PSU dummy cover into the empty bay.
- ▶ Remount the complete assembly (CMA stopper, crossbar and CMA) into the rail.

### **6.3.2.1 Preliminary steps**

No steps needed.

### 6.3.2.2 Removing a hot-plug PSU

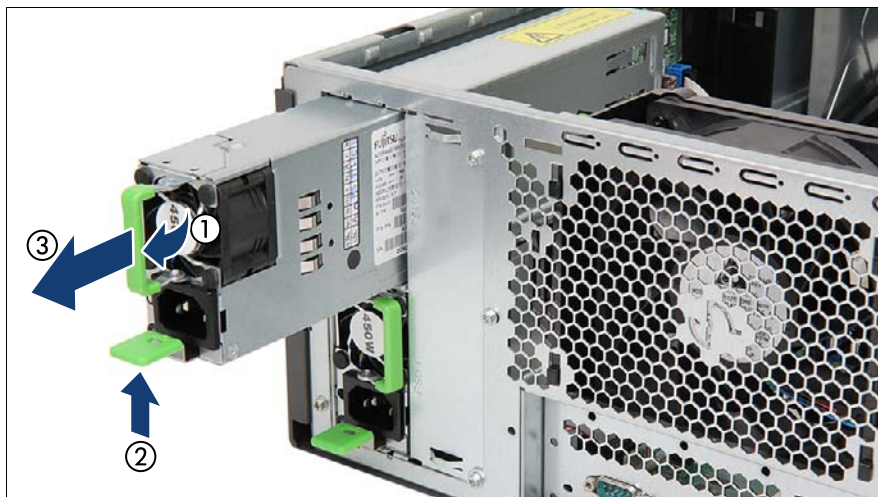


Figure 49: Removing a hot-plug PSU

- ▶ Fold up the handle on the hot-plug PSU (1).
- ▶ Press in on the green release latch (2).
- ▶ While keeping the green release latch pressed, pull the hot-plug PSU out of its bay (3).

### 6.3.2.3 Installing a PSU dummy cover



Figure 50: Installing a PSU dummy cover

- ▶ Insert the PSU dummy cover into the empty PSU bay with the impressed arrow symbol facing to the left (see circle).
- ▶ Push the PSU dummy cover into its bay until it locks in place.



#### **CAUTION!**

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

### 6.3.3 Replacing a hot-plug PSU



**Customer Replaceable Unit (CRU)**



**Hardware: 5 minutes**

**Tools:** tool-less



#### **CAUTION!**

- When replacing a hot-plug PSU in a non-redundant PSU configuration, the server must be switched off first.
- Ensure to replace a defective hot-plug PSU by a new module of the same type.



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

Since the installed CMA is blocking hot-plug PSUs, additional steps are required in order to remove or replace a hot-plug PSU:

- ▶ Unlock the CMA stopper.
- ▶ Remove the CMA stopper with the mounted crossbar.
- ▶ Support the CMA stopper, the crossbar and the CMA including cables with your right hand.
- ▶ Remove the hot-plug PSU and carefully install a new hot-plug PSU.
- ▶ Remount the complete assembly (CMA stopper, crossbar and CMA) into the rail.

#### **6.3.3.1 Preliminary steps**

- ▶ ["Locating the defective server" on page 45](#)
- ▶ Only when replacing a power supply module in a non-redundant configuration: ["Disconnecting the server from the mains" on page 48](#)

#### **6.3.3.2 Removing the defective hot-plug PSU**

- ▶ Identify the defective hot-plug PSU using the server management software.
- ▶ Remove the hot-plug PSU as described in ["Removing a hot-plug PSU" on page 124](#).

### 6.3.3.3 Installing the new hot-plug PSU

- ▶ Install the hot-plug PSU as described in ["Installing a hot-plug PSU" on page 122](#).

### 6.3.3.4 Concluding steps

- ▶ Connect the power cord to the new hot-plug PSU and secure it with a cable tie as described in section ["Connecting the server to the mains" on page 72](#).
- ▶ Only when replacing a hot-plug PSU in a non-redundant configuration: ["Switching on the server" on page 73](#).
- ▶ ["Performing a fan test after replacing a defective fan" on page 109](#)

## 6.3.4 Replacing the power backplane



**Field Replaceable Unit (FRU)**



**Hardware: 15 minutes**

**Tools:** tool-less

### 6.3.4.1 Preliminary steps

- ▶ ["Locating the defective server" on page 45](#)
- ▶ ["Shutting down the server" on page 48](#)
- ▶ ["Disconnecting the server from the mains" on page 48](#)
- ▶ ["Getting access to the component" on page 49](#)
- ▶ ["Removing the system fan holder" on page 74](#)

### 6.3.4.2 Removing the hot-plug PSUs

- ▶ Remove all hot-plug PSUs as described in ["Removing a hot-plug PSU" on page 124](#).

### 6.3.4.3 Replacing the defective power backplane

- ▶ Disconnect all cables from the power backplane.

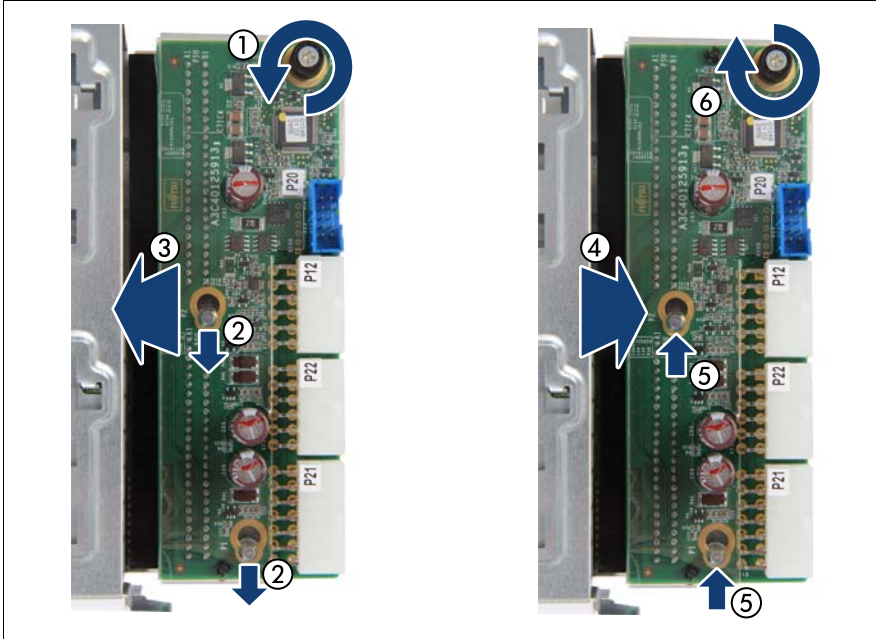


Figure 51: Replacing the power backplane

- ▶ Loosen the captive screw (1).
- ▶ Push the power backplane in direction of the arrow (2).
- ▶ Remove the power backplane (3).
- ▶ Insert the new power backplane in the PSU cage (4).
- ▶ Push the power backplane in direction of the arrow (5).
- ▶ Fasten the captive screw (6).

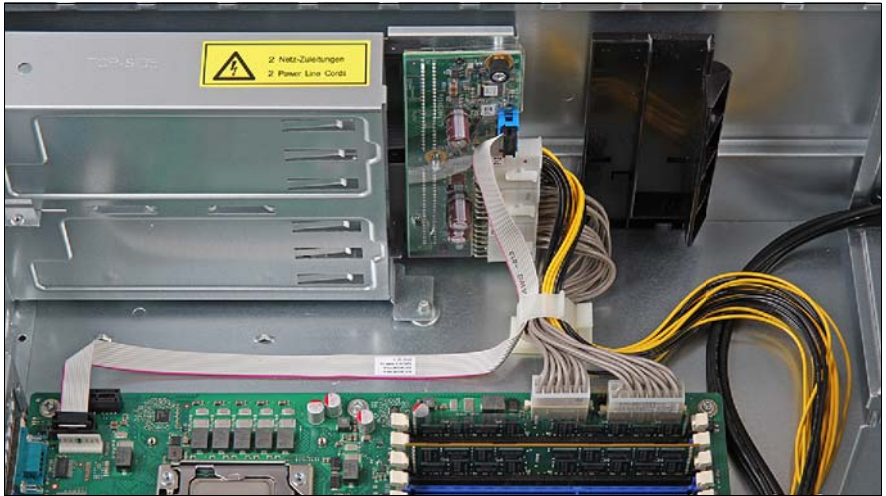


Figure 52: Reconnecting all cables to the power backplane

- ▶ Reconnect all cables to the power backplane.

### 6.3.4.4 Concluding steps

- ▶ ["Installing the system fan holder" on page 75](#)
- ▶ ["Reassembling" on page 62](#)
- ▶ ["Connecting the server to the mains" on page 72](#)
- ▶ ["Switching on the server" on page 73](#)

### 6.4 Converting a standard power supply to a redundant power supply

The standard power supply can be replaced by a redundant power supply. The redundant power supply consists of up to two hot-plug PSUs. The upgrade kit contains only one hot-plug PSU (for power supply redundancy the second hot-plug PSU must be additionally ordered).

The upgrade kit for the redundant power supply consists of the following parts:

- PSU cage with power backplane (incl. power cables)
- one hot-plug PSU
- PSU dummy cover (if only one hot-plug PSU is installed, you have to install the PSU dummy cover in the second bay)
- several screws



**Field Replaceable Unit (FRU)**



**Hardware: 15 minutes**

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

#### 6.4.1 Preliminary steps

- ▶ ["Suspending BitLocker functionality" on page 77](#)
- ▶ ["Shutting down the server" on page 48](#)
- ▶ ["Disconnecting the server from the mains" on page 48](#)
- ▶ ["Getting access to the component" on page 49](#)
- ▶ ["Removing the system fan holder" on page 74](#)

#### 6.4.2 Removing the standard power supply unit

- ▶ Remove the standard PSU as described in section ["Removing the defective standard power supply unit" on page 115](#).

### 6.4.3 Installing the hot-plug power supply units

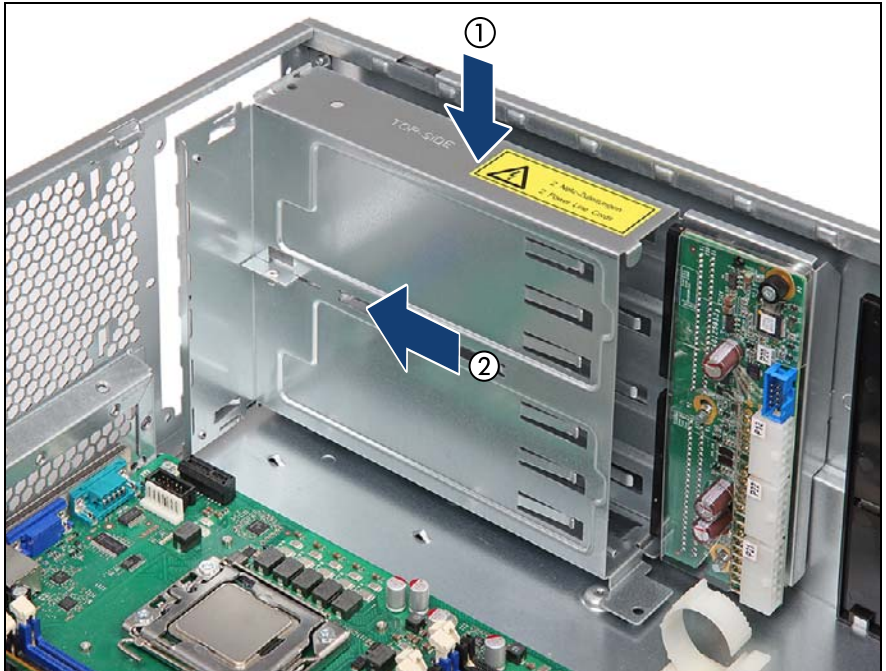


Figure 53: Installing the PSU cage

- ▶ Insert the PSU cage into the chassis (1).
- ▶ Slide the new PSU cage towards the rear of the chassis (2).



Figure 54: Securing the PSU cage (A)

- ▶ Secure the PSU cage with one screw (see circle).

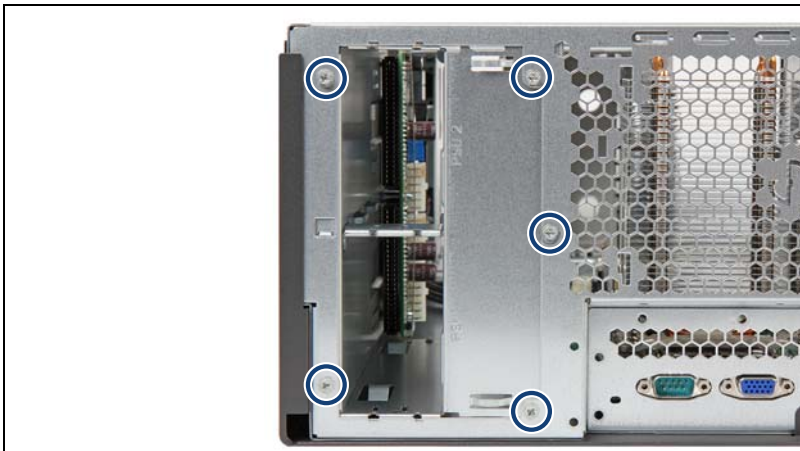


Figure 55: Securing the PSU cage (B)

- ▶ Secure the PSU cage to the chassis with five screws (see circles).



Figure 56: Connecting cables (A)

- ▶ Connect the power cable (1):
  - connector P22 to power backplane connector "P22"
  - connector P1 to system board connector "PWR 1"
- ▶ Connect power cable (2):
  - connector P21 to power backplane connector "P21"
  - connector P2 to system board connector "PWR 2"



Figure 57: Connecting cables (B)

- ▶ Connect the signal cable (3):
  - connector P20 to power backplane connector "P20"
  - connector P30 to system board connector "P30"
- ▶ Connect the power cable (4):
  - 12-pin connector to power backplane connector "P12"

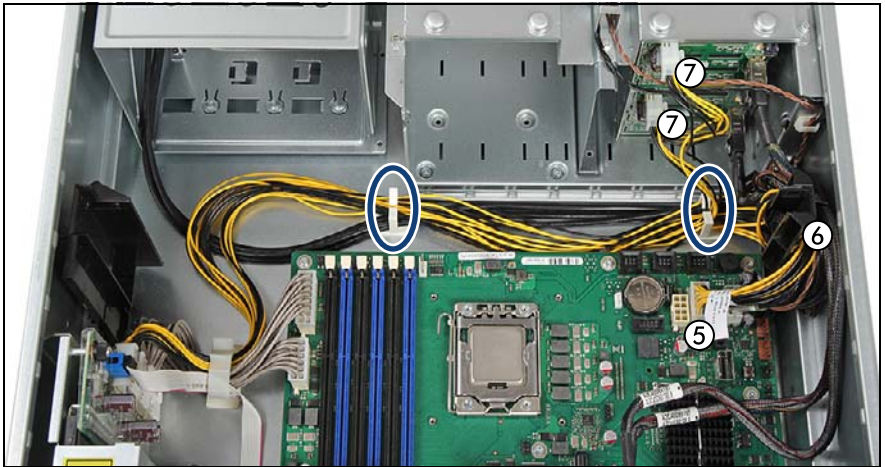


Figure 58: Connecting cables (C)

- ▶ Connect the power cable (4 in figure 57) to the system board and the SAS backplane:
  - 10-pin connector to system board connector "P3(PWR3)" (5)
  - Run the cable through the cable guide (6) as shown.
  - 2.5-inch HDD configurations (7): see section ["Cabling plans" on page 399](#)
  - 3.5-inch HDD configurations (7): see section ["Cabling plans" on page 399](#)
- ▶ Run the cable through the two cable clamps (see circles).



### CAUTION!

Installed LTO drive: ensure that the power cables are routed under the cant of the LTO drive and have no contact with the LTO drive.



Figure 59: Routing power cables with installed LTO drive

- ▶ Install the hot-plug PSU(s) as described in ["Installing a hot-plug PSU" on page 122](#).
- ▶ If one of the PSU bays remains empty, install the PSU dummy cover as described in ["Installing a PSU dummy cover" on page 125](#).

### 6.4.4 Concluding steps

- ▶ ["Installing the system fan holder" on page 75](#)
- ▶ ["Reassembling" on page 62](#)
- ▶ ["Connecting the server to the mains" on page 72](#)
- ▶ ["Resuming BitLocker functionality" on page 103](#)

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# 7 Hard disk drives / solid state drives

## Safety notes



### CAUTION!

- The hard disk drive must not be removed from the installation frame by anyone except a service technician.
- HDD / SSD modules must all be marked clearly so that they can be reinstalled into their original mounting locations after replacement. Otherwise, data may be lost.
- Do not touch the circuitry on boards or soldered parts. Hold the metallic areas or the edges of the circuit boards.
- Before removing a hard disk drive, wait for about 30 seconds until the disk has stopped spinning completely.
- When a hard disk drive 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 hard disk drives. If a power failure should occur while the write cache is enabled, cached data may be lost.
- When disposing of, transferring, or returning a hard disk or solid state drive, wipe out the data on the drive for your own security.
- Rough handling of hard disk drives may damage the stored data. To cope with any unexpected problems, always back up important data. When backing up data to another hard disk drive, you should make backups on a file or partition basis.
- Handle the device on a shock and vibration free surface.
- Do not use the device in extremely hot or cold locations, or locations with extreme temperature changes.
- Never attempt to disassemble a hard disk or solid state drive.
- For further safety information, please refer to chapter ["Important information"](#) on page 33.

### 7.1 Basic information

- Mixed configurations with Eco SATA drives and SAS drives are not allowed.
- 2.5-inch SAS drives and 2.5-inch BC SATA drives can be mixed, but not used in one logical RAID volume.
- Hot replace is only possible with running RAID.
- Please refer to section ["2.5-inch HDD / SSD configurations" on page 139](#) and section ["3.5-inch HDD configurations" on page 165](#) for a complete overview of the mounting sequences.
- Install dummy modules into unused HDD / SSD bays.

## 7.2 2.5-inch HDD / SSD configurations

### 7.2.1 2.5-inch HDD backplane overview



Figure 60: 2.5-inch SAS backplanes - maximum configuration, rack version



Figure 61: 2.5-inch SAS backplanes - maximum configuration, tower version

|              |  |
|--------------|--|
| <b>1 / 2</b> | SAS backplanes 1 and 2 in HDD cage 1 (basic configuration)       |
| <b>3 / 4</b> | SAS backplanes 3 and 4 in optional HDD cage 2                    |
| <b>5 / 6</b> | SAS backplanes 5 and 6 in optional 8x 2.5-inch HDD extension box |

## 7.2.2 8x 2.5-inch HDD / SSD configuration

### Mounting order



Figure 62: Mounting order with up to 8 2.5-inch HDDs (2 SAS backplanes)

### HDD / SSD naming scheme



Figure 63: Naming scheme with 8 2.5-inch HDDs (2 SAS backplanes)

| Position | Logical drive number | ServerView RAID Manager display name |
|----------|----------------------|--------------------------------------|
| ①        | 0                    | HDD vendor name (0)                  |
| ②        | 1                    | HDD vendor name (1)                  |
| ③        | 2                    | HDD vendor name (2)                  |
| ④        | 3                    | HDD vendor name (3)                  |
| ⑤        | 4                    | HDD vendor name (4)                  |
| ⑥        | 5                    | HDD vendor name (5)                  |
| ⑦        | 6                    | HDD vendor name (6)                  |
| ⑧        | 7                    | HDD vendor name (7)                  |

## 7.2.3 16x 2.5-inch HDD / SSD configuration

### Mounting order



Figure 64: Mounting order with up to 16 2.5-inch HDDs (4 SAS backplanes)

### HDD / SSD naming scheme



Figure 65: Naming scheme with 16 2.5-inch HDDs (4 SAS backplanes)

## Hard disk drives / solid state drives

---

### With SAS expander board:

| Position | Logical drive number | ServerView RAID Manager display name |
|----------|----------------------|--------------------------------------|
| ①        | 0                    | HDD vendor name (1:0)                |
| ②        | 1                    | HDD vendor name (1:1)                |
| ③        | 2                    | HDD vendor name (1:2)                |
| ④        | 3                    | HDD vendor name (1:3)                |
| ⑤        | 4                    | HDD vendor name (1:4)                |
| ⑥        | 5                    | HDD vendor name (1:5)                |
| ⑦        | 6                    | HDD vendor name (1:6)                |
| ⑧        | 7                    | HDD vendor name (1:7)                |
| ⑨        | 8                    | HDD vendor name (1:8)                |
| ⑩        | 9                    | HDD vendor name (1:9)                |
| ⑪        | 10                   | HDD vendor name (1:10)               |
| ⑫        | 11                   | HDD vendor name (1:11)               |
| ⑬        | 12                   | HDD vendor name (1:12)               |
| ⑭        | 13                   | HDD vendor name (1:13)               |
| ⑮        | 14                   | HDD vendor name (1:14)               |
| ⑯        | 15                   | HDD vendor name (1:15)               |

## 7.2.4 24x 2.5-inch HDD / SSD configuration



This configuration requires the 8x 2.5-inch HDD extension box (see section ["HDD extension boxes" on page 181](#)).

### Mounting order

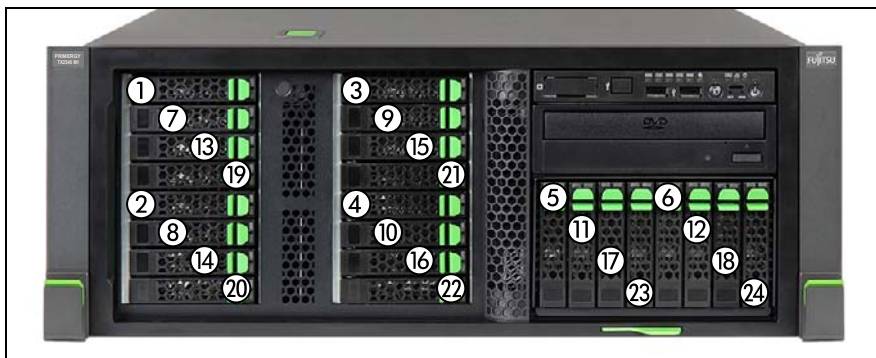


Figure 66: Mounting order with up to 24 2.5-inch HDDs (6 SAS backplanes)

### HDD / SSD naming scheme



Figure 67: Naming scheme with 24 2.5-inch HDDs (6 SAS backplanes)

**With SAS expander board and two SAS controllers**

| Position | Logical drive number | ServerView RAID Manager display name |          |
|----------|----------------------|--------------------------------------|----------|
| 1        | 0                    | HDD vendor name (0)                  | Ctrl (0) |
| 2        | 1                    | HDD vendor name (1)                  | Ctrl (0) |
| 3        | 2                    | HDD vendor name (2)                  | Ctrl (0) |
| 4        | 3                    | HDD vendor name (3)                  | Ctrl (0) |
| 5        | 4                    | HDD vendor name (4)                  | Ctrl (0) |
| 6        | 5                    | HDD vendor name (5)                  | Ctrl (0) |
| 7        | 6                    | HDD vendor name (6)                  | Ctrl (0) |
| 8        | 7                    | HDD vendor name (7)                  | Ctrl (0) |
| 9        | 0                    | HDD vendor name (1:0)                | Ctrl (1) |
| 10       | 1                    | HDD vendor name (1:1)                | Ctrl (1) |
| 11       | 2                    | HDD vendor name (1:2)                | Ctrl (1) |
| 12       | 3                    | HDD vendor name (1:3)                | Ctrl (1) |
| 13       | 4                    | HDD vendor name (1:4)                | Ctrl (1) |
| 14       | 5                    | HDD vendor name (1:5)                | Ctrl (1) |
| 15       | 6                    | HDD vendor name (1:6)                | Ctrl (1) |
| 16       | 7                    | HDD vendor name (1:7)                | Ctrl (1) |
| 17       | 8                    | HDD vendor name (1:8)                | Ctrl (1) |
| 18       | 9                    | HDD vendor name (1:9)                | Ctrl (1) |
| 19       | 10                   | HDD vendor name (1:10)               | Ctrl (1) |
| 20       | 11                   | HDD vendor name (1:11)               | Ctrl (1) |
| 21       | 12                   | HDD vendor name (1:12)               | Ctrl (1) |
| 22       | 13                   | HDD vendor name (1:13)               | Ctrl (1) |
| 23       | 14                   | HDD vendor name (1:14)               | Ctrl (1) |
| 24       | 15                   | HDD vendor name (1:15)               | Ctrl (1) |

**With SAS expander board and one SAS controller**

| Position | Logical drive number | ServerView RAID Manager display name |
|----------|----------------------|--------------------------------------|
| 1        | 0                    | HDD vendor name (1:0)                |
| 2        | 1                    | HDD vendor name (1:1)                |
| 3        | 2                    | HDD vendor name (1:2)                |
| 4        | 3                    | HDD vendor name (1:3)                |
| 5        | 4                    | HDD vendor name (1:4)                |
| 6        | 5                    | HDD vendor name (1:5)                |
| 7        | 6                    | HDD vendor name (1:6)                |
| 8        | 7                    | HDD vendor name (1:7)                |
| 9        | 8                    | HDD vendor name (1:8)                |
| 10       | 9                    | HDD vendor name (1:9)                |
| 11       | 10                   | HDD vendor name (1:10)               |
| 12       | 11                   | HDD vendor name (1:11)               |
| 13       | 12                   | HDD vendor name (1:12)               |
| 14       | 13                   | HDD vendor name (1:13)               |
| 15       | 14                   | HDD vendor name (1:14)               |
| 16       | 15                   | HDD vendor name (1:15)               |
| 17       | 16                   | HDD vendor name (1:16)               |
| 18       | 17                   | HDD vendor name (1:17)               |
| 19       | 18                   | HDD vendor name (1:18)               |
| 20       | 19                   | HDD vendor name (1:19)               |
| 21       | 20                   | HDD vendor name (1:20)               |
| 22       | 21                   | HDD vendor name (1:21)               |
| 23       | 22                   | HDD vendor name (1:22)               |
| 24       | 23                   | HDD vendor name (1:23)               |

## 7.2.5 Installing 2.5-inch HDD / SSD modules



Customer Replaceable Unit (CRU)



Hardware: 5 minutes

Tools: tool-less

### 7.2.5.1 Preliminary steps

- ▶ ["Removing accessible drive and HDD bay covers" on page 58](#)
- ▶ Locate the correct drive bay as described in section ["2.5-inch HDD / SSD configurations" on page 139](#).

### 7.2.5.2 Removing a 2.5-inch HDD / SSD dummy module

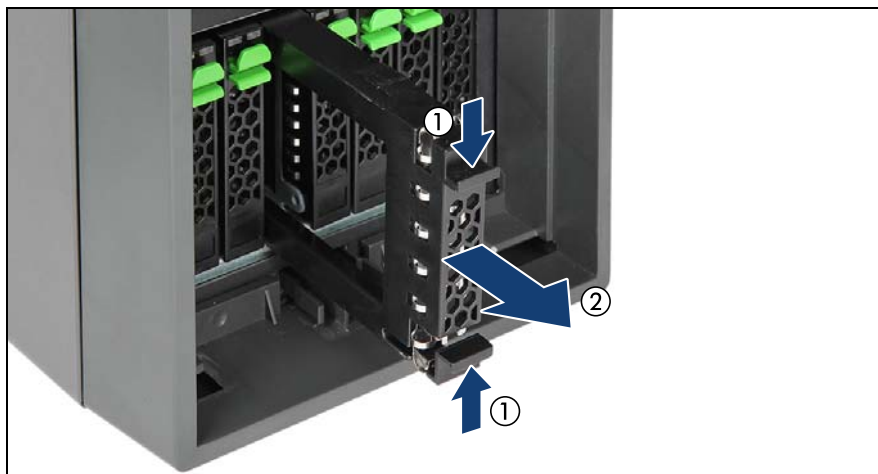


Figure 68: Removing a 2.5-inch dummy module

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



#### CAUTION!

Save 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.

### 7.2.5.3 Installing a 2.5-inch HDD / SSD module



Figure 69: Opening the 2.5-inch HDD / SSD module locking lever

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



Figure 70: Inserting 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.
- ▶ Close the locking lever to lock the hard disk drive in place.

### 7.2.5.4 Concluding steps

- ▶ ["Installing accessible drive and HDD bay covers" on page 69](#)
- ▶ ["Performing a RAID array rebuild" on page 104](#)

## 7.2.6 Removing 2.5-inch HDD / SSD modules



**Customer Replaceable Unit (CRU)**





**Hardware: 5 minutes**

**Tools:** tool-less

### 7.2.6.1 Preliminary steps

- ▶ If the HDD / SSD module to be removed is combined into a RAID array, please proceed as follows:

| RAID level       | Procedure  |
|------------------|--|
| RAID 0           | <p>Only remove an HDD module combined in a RAID 0 array if defective.</p> <p> <b>CAUTION!</b><br/>Removing an operational HDD module will result in data loss!</p>  |
| RAID 1<br>RAID 5 | <p>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.</p> <p> After replacing the HDD module, RAID rebuild will be performed as a background process as described in section <a href="#">"Performing a RAID array rebuild" on page 104</a>.</p> |

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 ServerView RAID Manager or BIOS Utility (see "ServerView Suite RAID Management" user guide and manuals of RAID controller).



#### **CAUTION!**

All data on all HDDs / SSDs in the array will be lost! Be sure to back up your data before deleting a RAID array.

- ▶ ["Removing accessible drive and HDD bay covers" on page 58](#)

### 7.2.6.2 Removing a 2.5-inch HDD / SSD module



Figure 71: Removing a 2.5-inch HDD / SSD module

- ▶ Pinch the green locking clips and fully open the locking lever (see figure 69).
- ▶ Wait about 30 seconds to allow the hard disk drive to spin down.
  - i** This is not necessary when removing a solid state drive.
- ▶ Pull the HDD / SSD module completely out of its bay.

### 7.2.6.3 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 72: Installing a 2.5-inch HDD / SSD dummy module

- ▶ Slide the HDD dummy module into the drive bay until it locks in place.

### 7.2.6.4 Concluding steps

- ▶ ["Installing accessible drive and HDD bay covers" on page 69](#)

## 7.2.7 Replacing a 2.5-inch HDD / SSD module



**Customer Replaceable Unit (CRU)**



**Hardware: 5 minutes**

**Tools:** tool-less



### **CAUTION!**

- Only remove an HDD / SSD module during operation if the drive is not currently being accessed. Observe the indicators on the HDD / SSD module, as described in the operating manual of your server.
- Under no circumstances should you remove an HDD / SSD module while the system is in operation if you are not sure that the drive is operated by a RAID controller and belongs to a disk array that is operating in RAID level 1, 1E, 10, 5, 50, 6 or 60.

An HDD / SSD module can only be replaced during operation in conjunction with a corresponding RAID configuration.

- All HDD / SSD modules (drives) must be uniquely identified so that they can be reinstalled in their original mounting locations later. If this is not done, existing data can be lost.

### 7.2.7.1 Preliminary steps

- ▶ ["Locating the defective server" on page 45](#)
- ▶ ["Removing accessible drive and HDD bay covers" on page 58](#)
- ▶ Locate the defective HDD / SSD module as described in section ["Local diagnostic indicators on the front" on page 47](#).

#### **Only applicable for removing intact HDD / SSD modules:**

- ▶ Before removing a non-defective HDD / SSD module, put the drive into "Offline" mode using your RAID configuration software.

### 7.2.7.2 Removing a 2.5-inch HDD / SSD module

- ▶ Remove the HDD / SSD module to be replaced from the server as described in section ["Removing a 2.5-inch HDD / SSD module" on page 150](#).

### 7.2.7.3 Installing a 2.5-inch HDD / SSD module

- ▶ Install the new HDD / SSD module into the empty drive bay as described in section ["Installing 2.5-inch HDD / SSD modules" on page 146](#).

### 7.2.7.4 Concluding steps

- ▶ ["Installing accessible drive and HDD bay covers" on page 69](#)
- ▶ ["Performing a RAID array rebuild" on page 104](#)

## 7.2.8 Replacing a 2.5-inch HDD SAS backplane



**Upgrade and Repair Unit (URU)**



**Hardware: 15 minutes**

|   |
|---|
| <b>Tools:</b> Phillips PH2 / (+) No. 2 screw driver |
|---|

### 7.2.8.1 Preliminary steps

- ▶ ["Shutting down the server" on page 48](#)
- ▶ ["Disconnecting the server from the mains" on page 48](#)
- ▶ ["Getting access to the component" on page 49](#)
- ▶ ["Removing the system fan holder" on page 74](#)
- ▶ ["Removing 2.5-inch HDD / SSD modules" on page 149](#)

### 7.2.8.2 Removing the defective SAS backplane

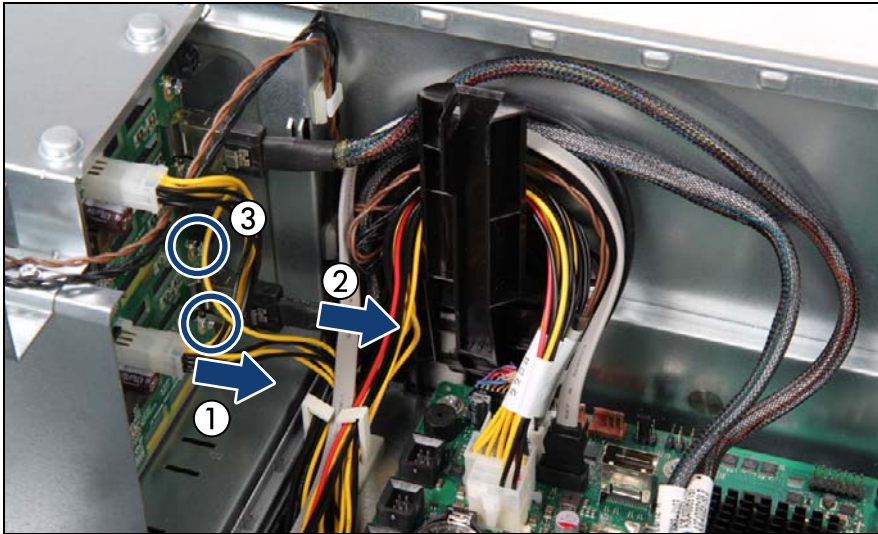


Figure 73: Disconnecting cables

- ▶ Disconnect the power cable (1) and the SAS cable (2) from the SAS backplane.
- ▶ Remove the two screws (3, see circles).

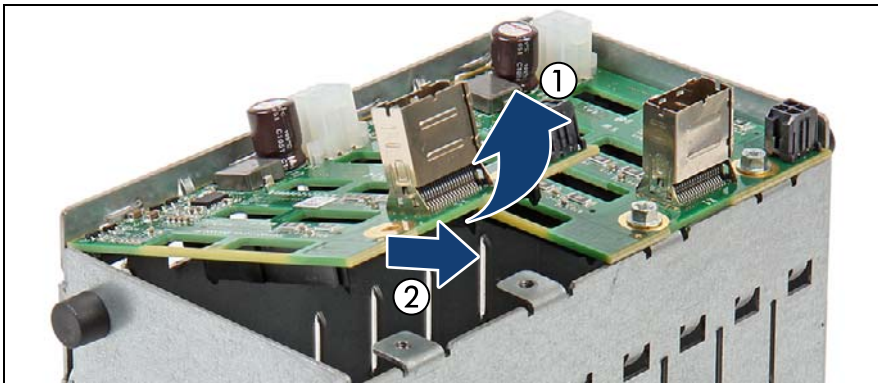


Figure 74: Removing the 2.5-inch HDD SAS backplane

- ▶ Lift up the SAS backplane (1) and at a slight angle, remove it from the guides on the HDD cage (2).

### 7.2.8.3 Installing the new SAS backplane

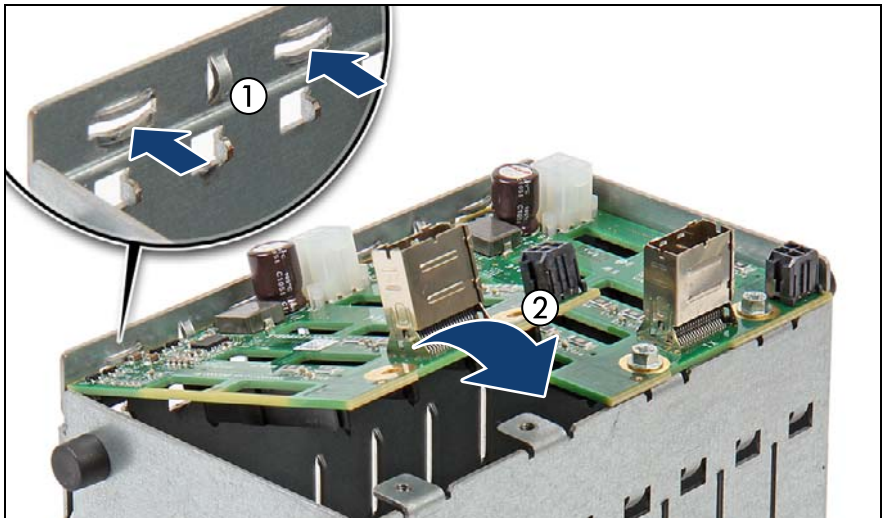


Figure 75: Installing the 2.5-inch HDD SAS backplane

- ▶ At a slight angle, fit the SAS backplane into the two guides on the HDD cage (1).
- ▶ Fold down the SAS backplane (2).
- ▶ Secure the SAS backplane with the two screws (see figure 73).
- ▶ Connect the power cable and the SAS cable to the SAS backplane (see figure 73).

### 7.2.8.4 Concluding steps

- ▶ ["Installing the system fan holder" on page 75](#)
- ▶ ["Reassembling" on page 62](#)
- ▶ ["Installing a 2.5-inch HDD / SSD module" on page 147](#) and ["Installing a 2.5-inch HDD / SSD dummy module" on page 151](#).



For detailed information on HDD mounting order, refer to section ["2.5-inch HDD / SSD configurations" on page 139](#).

- ▶ ["Connecting the server to the mains" on page 72](#)
- ▶ ["Switching on the server" on page 73](#)

## 7.2.9 Upgrading to 16x 2.5-inch HDD / SSD configurations



Upgrade and Repair Unit (URU)



Hardware: 20 minutes

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

### 7.2.9.1 Preliminary steps

- ▶ ["Suspending BitLocker functionality" on page 77](#)
- ▶ ["Shutting down the server" on page 48](#)
- ▶ ["Disconnecting the server from the mains" on page 48](#)
- ▶ ["Getting access to the component" on page 49](#)
- ▶ ["Removing the system fan holder" on page 74](#)
- ▶ ["Removing 2.5-inch HDD / SSD modules" on page 149](#)

### 7.2.9.2 Removing the 8x 2.5-inch HDD front panel

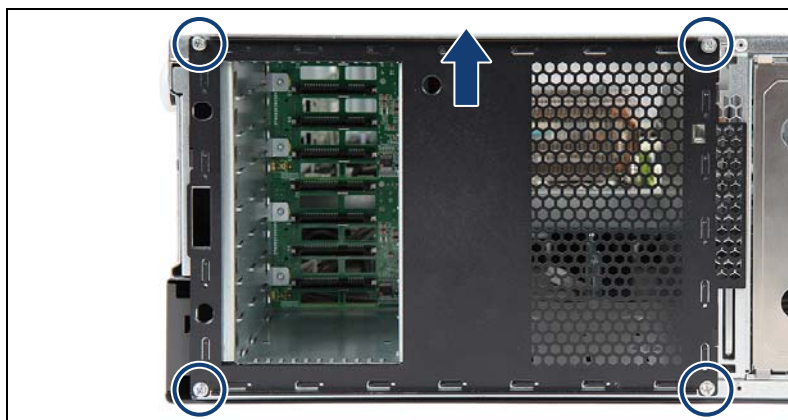


Figure 76: Removing the 8x 2.5-inch HDD front panel

- ▶ Remove four screws from the 8x 2.5-inch HDD front panel.
- ▶ Pull up on the 8x 2.5-inch HDD front panel to disengage it from the chassis.

- ▶ Remove the 8x 2.5-inch HDD front panel.

### 7.2.9.3 Mounting the second 2.5-inch HDD drive cage

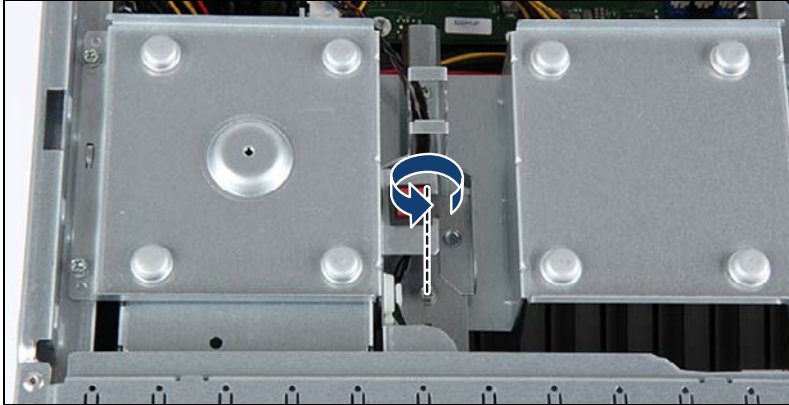


Figure 77: Removing the intrusion switch holder (A)

- ▶ Remove one screw from the intrusion switch holder as shown.

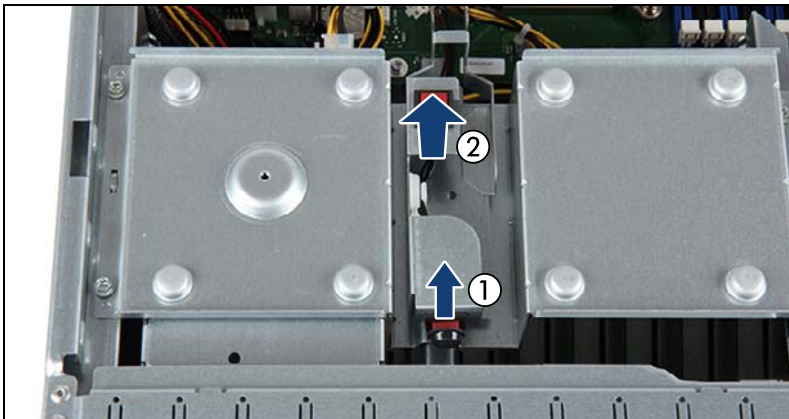


Figure 78: Removing the intrusion switch holder (B)

- ▶ Slide back the intrusion switch holder until it disengages from the HDD bay top cover (1).
- ▶ Remove the intrusion switch holder (2) and set aside.
- ▶ Leave the intrusion switch cable connected to the system board.

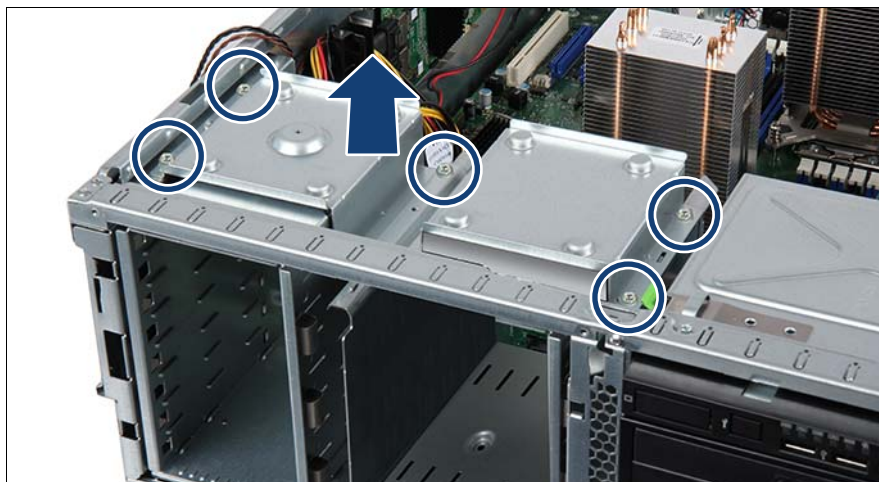


Figure 79: Removing the 2.5-inch HDD bay top cover

- ▶ Remove five screws from the 2.5-inch HDD bay top cover (see circles).
- ▶ Remove the 2.5-inch HDD bay top cover from the chassis.

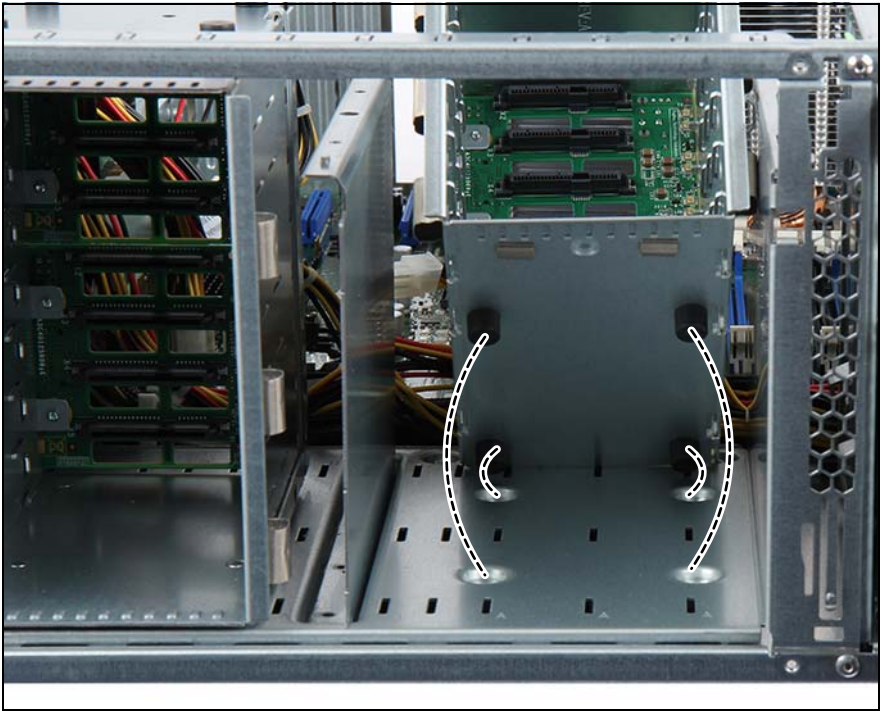


Figure 80: Mounting the second 2.5-inch HDD drive cage (A)

- ▶ Locate the four rubber bolts on the bottom of the cage and the corresponding dents in the chassis floor.

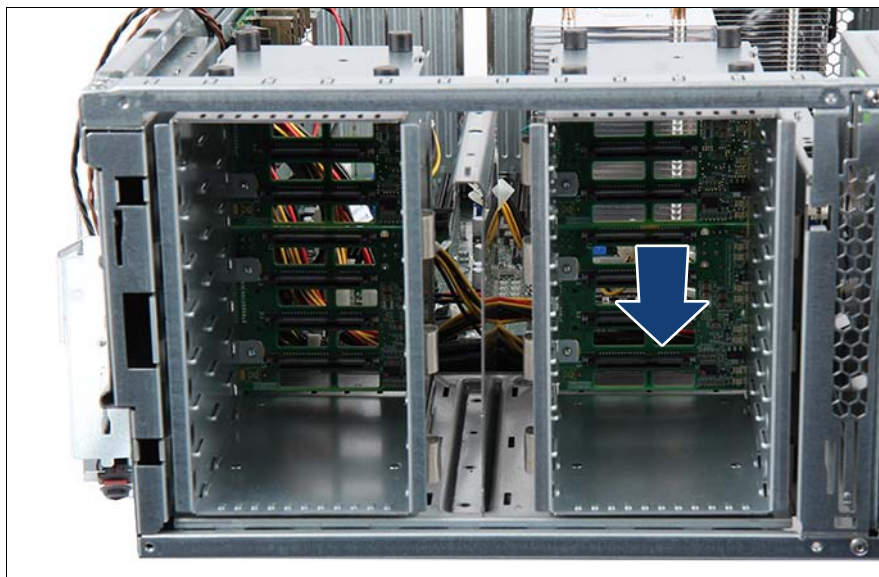


Figure 81: Mounting the second 2.5-inch HDD drive cage (B)

- ▶ Lower the 2.5-inch HDD cage into the right HDD installation bay.
- ▶ Ensure that the four rubber bolts on the bottom of the cage properly engage with the corresponding dents in the chassis floor.

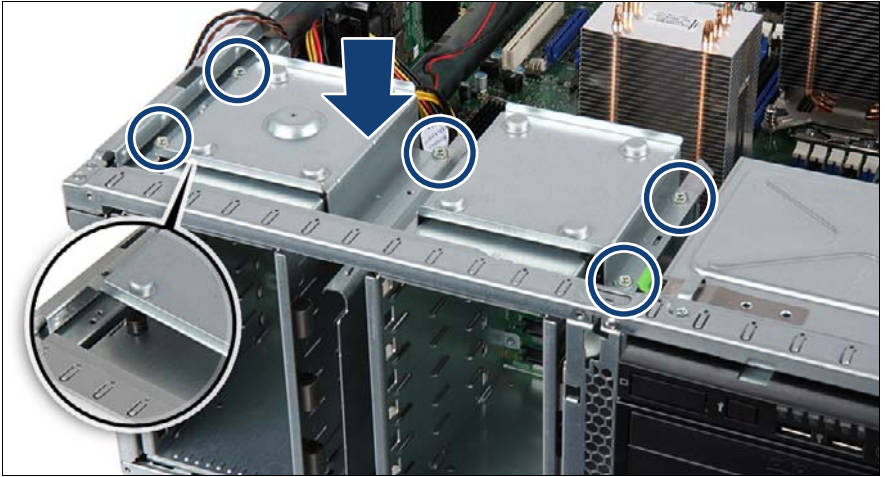


Figure 82: Mounting the 2.5-inch HDD bay top cover

- ▶ Lower the 2.5-inch HDD bay top cover onto the HDD installation bays.
- ▶ Ensure that the four rubber bolts on top of the cage properly engage with the corresponding dents in the HDD bay top cover (see close-up).
- ▶ Secure the HDD bay top cover to the chassis with five screws (see circles).

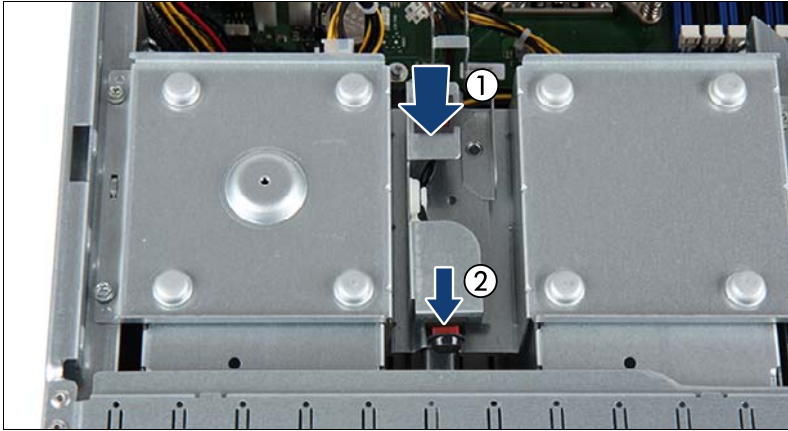


Figure 83: Installing the intrusion switch holder (A)

- ▶ Place the intrusion switch holder on the HDD bay top cover as shown (1).
- ▶ Slide the intrusion switch holder under the front chassis rim as far as it will go (2).

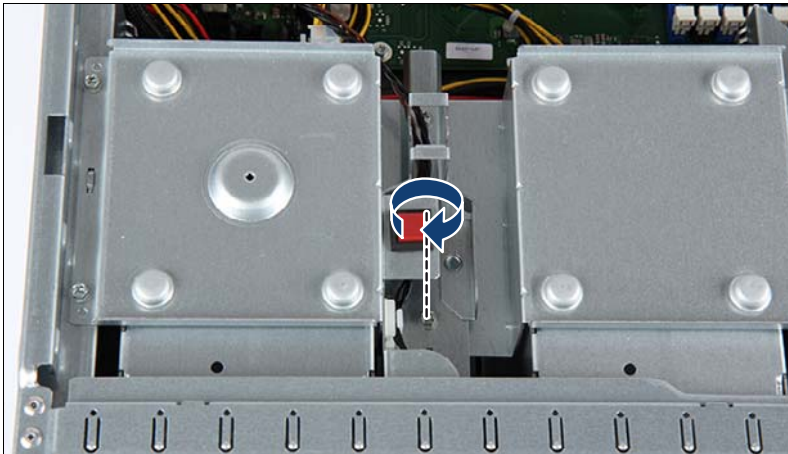


Figure 84: Installing the intrusion switch holder (B)

- ▶ Secure the intrusion switch holder on the HDD bay top cover with one screw.
- ▶ Connect SAS and power cables to the 2.5-inch SAS backplanes as described in section ["Cabling plans" on page 399](#).

#### 7.2.9.4 Installing the 16x 2.5-inch HDD front panel

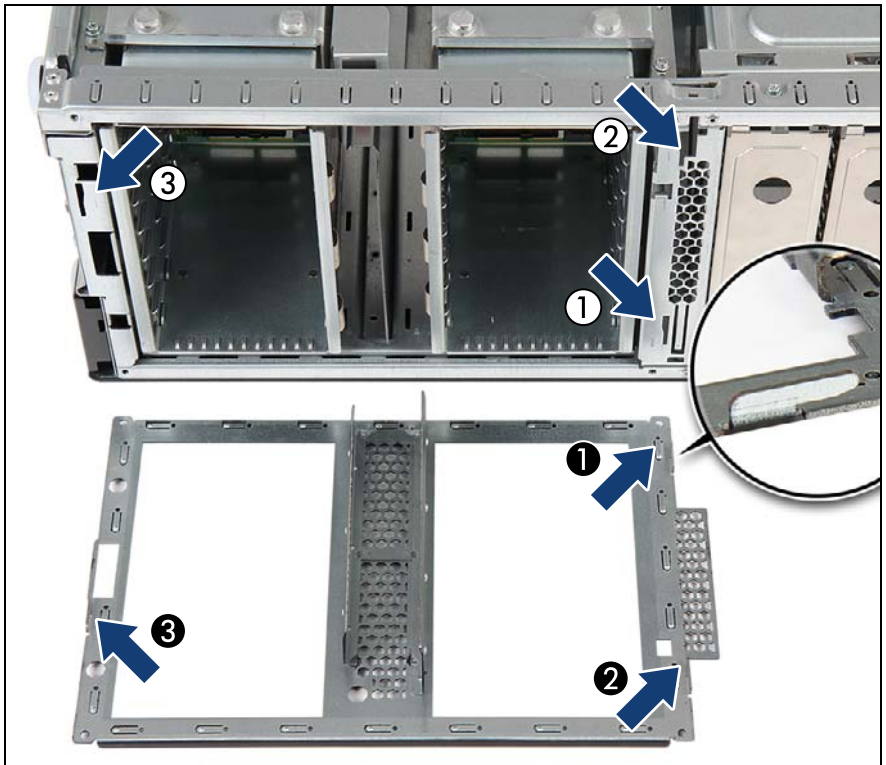


Figure 85: Installing the 16x 2.5-inch HDD front panel

- ▶ Locate the three hooks on the HDD front panel (see close-up and black numbers 1-3).
- ▶ Locate the corresponding installation slots on the server front (see white numbers 1-3).
- ▶ Fit the three hooks on the HDD front panel into the slots in the server front.

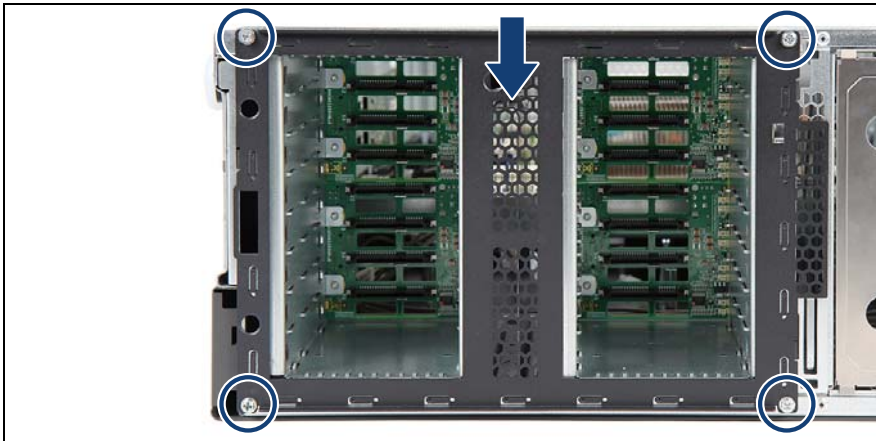


Figure 86: Securing the 16x 2.5-inch HDD front panel

- ▶ Firmly press down on the HDD front panel until its upper edge is flush with the chassis (see arrow).
- ▶ Secure the HDD front panel to the server front with four screws (see circles).

### 7.2.9.5 Concluding steps

- ▶ ["Installing the system fan holder" on page 75](#)
- ▶ ["Reassembling" on page 62](#)
- ▶ Install HDD / SSD modules or HDD dummy modules into the additional HDD slots as described in sections ["Installing a 2.5-inch HDD / SSD module" on page 147](#) and ["Installing a 2.5-inch HDD / SSD dummy module" on page 151](#).

**i** For detailed information on HDD mounting order, refer to section ["2.5-inch HDD / SSD configurations" on page 139](#).

- ▶ ["Connecting the server to the mains" on page 72](#)
- ▶ ["Switching on the server" on page 73](#)
- ▶ ["Resuming BitLocker functionality" on page 103](#)

## 7.3 3.5-inch HDD configurations

### 7.3.1 3.5-inch HDD backplane overview



Figure 87: 3.5-inch SAS backplanes - maximum configuration, rack server



Figure 88: 3.5-inch SAS backplanes - maximum configuration, tower server

|   |   |
|---|---|
| 1 | SAS backplane 1 in HDD cage 1 (basic configuration)       |
| 2 | SAS backplane 2 in optional 4x 3.5-inch HDD extension box |

### 7.3.2 4x 3.5-inch HDD configuration

#### Mounting order



Figure 89: Mounting order with up to 4 3.5-inch HDDs (1 SAS backplane)

#### HDD / SSD naming scheme



Figure 90: Naming scheme with 4 3.5-inch HDDs (1 SAS backplane)

| Position | Logical drive number | ServerView RAID Manager display name |
|----------|----------------------|--------------------------------------|
| ①        | 0                    | HDD vendor name (0)                  |
| ②        | 1                    | HDD vendor name (1)                  |
| ③        | 2                    | HDD vendor name (2)                  |
| ④        | 3                    | HDD vendor name (3)                  |

### 7.3.3 8x 3.5-inch HDD configuration



This configuration requires the 4x 3.5-inch HDD extension box (see section "[HDD extension boxes](#)" on page 181).

#### Mounting order

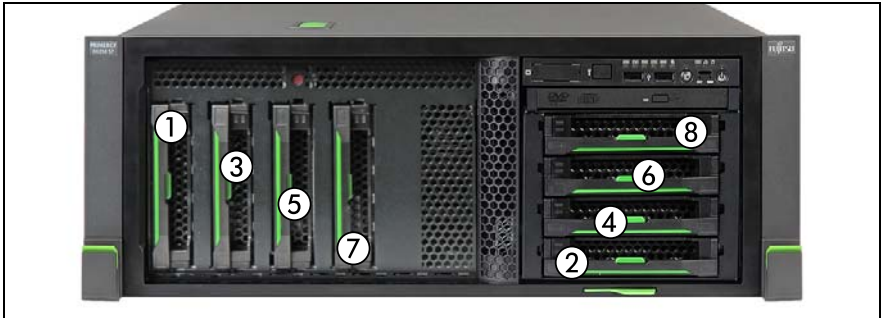


Figure 91: Mounting order with up to 8 3.5-inch HDDs (2 SAS backplanes)

#### HDD / SSD naming scheme

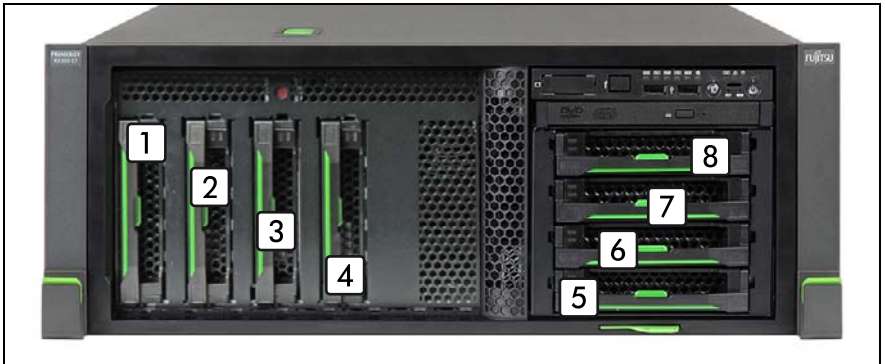


Figure 92: Naming scheme with 8 3.5-inch HDDs (2 SAS backplanes)

| Position | Logical drive number | ServerView RAID Manager display name |
|----------|----------------------|--------------------------------------|
| 1        | 0                    | HDD vendor name (0)                  |
| 2        | 1                    | HDD vendor name (1)                  |
| 3        | 2                    | HDD vendor name (2)                  |
| 4        | 3                    | HDD vendor name (3)                  |
| 5        | 4                    | HDD vendor name (4)                  |
| 6        | 5                    | HDD vendor name (5)                  |
| 7        | 6                    | HDD vendor name (6)                  |
| 8        | 7                    | HDD vendor name (7)                  |

### 7.3.4 Installing 3.5-inch HDD modules



**Customer Replaceable Unit (CRU)**



**Hardware: 5 minutes**

**Tools:** tool-less

#### 7.3.4.1 Preliminary steps

- ▶ ["Removing accessible drive and HDD bay covers" on page 58](#)
- ▶ Locate the correct drive bay as described in section ["3.5-inch HDD configurations" on page 165](#).

### 7.3.4.2 Removing a 3.5-inch HDD dummy module

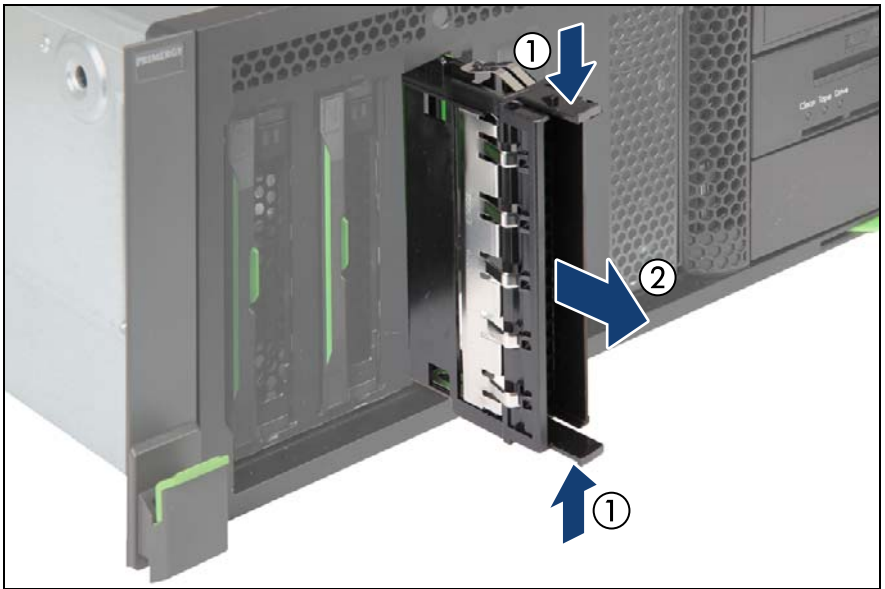


Figure 93: Removing a 3.5-inch dummy module

- ▶ Press in on the locking tabs on both sides of the dummy module to disengage the locking mechanism (1).
- ▶ While keeping the locking tabs pressed, pull the dummy module out of its bay (2).



#### **CAUTION!**

Save the dummy module for future use.

Always replace dummy modules into unused HDD bays to comply with applicable EMC regulations and satisfy cooling requirements.

### 7.3.4.3 Installing a 3.5-inch HDD module

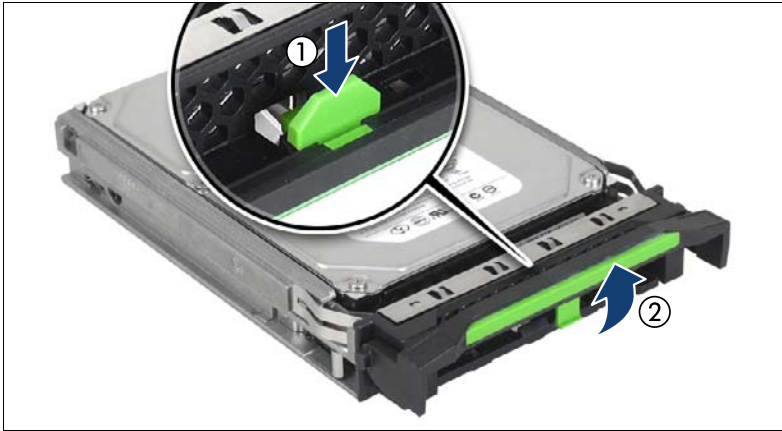


Figure 94: Opening the 3.5-inch HDD module locking lever

- ▶ While pressing down on the locking button (1) fold up the lever (2).

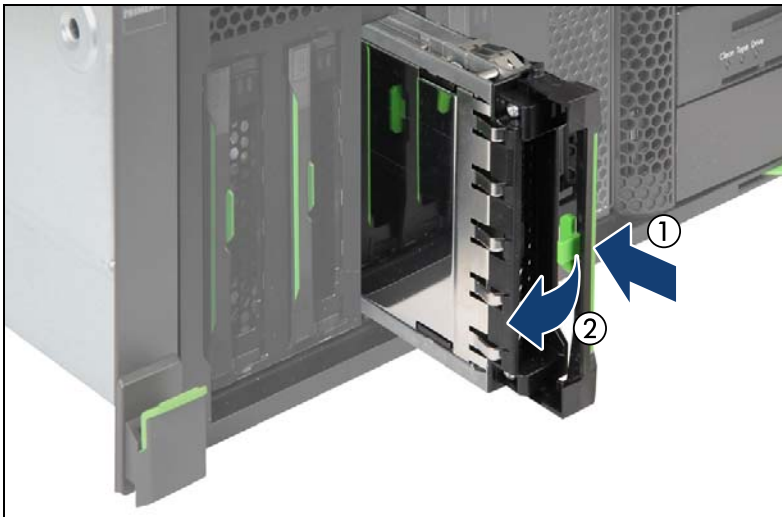


Figure 95: Inserting the 3.5-inch HDD module

- ▶ Insert the HDD module into a drive bay and carefully push back as far as it will go (1).
- ▶ Fold down the lever to lock the HDD module in place (2).

### 7.3.4.4 Concluding steps

- ▶ ["Installing accessible drive and HDD bay covers" on page 69](#)
- ▶ ["Performing a RAID array rebuild" on page 104](#)

## 7.3.5 Removing 3.5-inch HDD modules



**Customer Replaceable Unit (CRU)**





**Hardware: 5 minutes**

**Tools:** tool-less

### 7.3.5.1 Preliminary steps

- ▶ If the HDD / SSD module to be removed is combined into a RAID array, please proceed as follows:

| RAID level       | Procedure   |
|------------------|---|
| RAID 0           | <p>Only remove an HDD module combined in a RAID 0 array if defective.</p> <p> <b>CAUTION!</b><br/>Removing an operational HDD module will result in data loss!</p>   |
| RAID 1<br>RAID 5 | <p>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.</p> <p> After replacing the HDD module, RAID rebuild will be performed as a background process as described in section <a href="#">"Performing a RAID array rebuild" on page 104</a>.</p> |

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 ServerView RAID Manager or BIOS Utility (see "ServerView Suite RAID Management" user guide and manuals of RAID controller).



### CAUTION!

All data on all HDDs / SSDs in the array will be lost! Be sure to back up your data before deleting a RAID array.

- ▶ ["Removing accessible drive and HDD bay covers" on page 58](#)

### 7.3.5.2 Removing a 3.5-inch HDD module

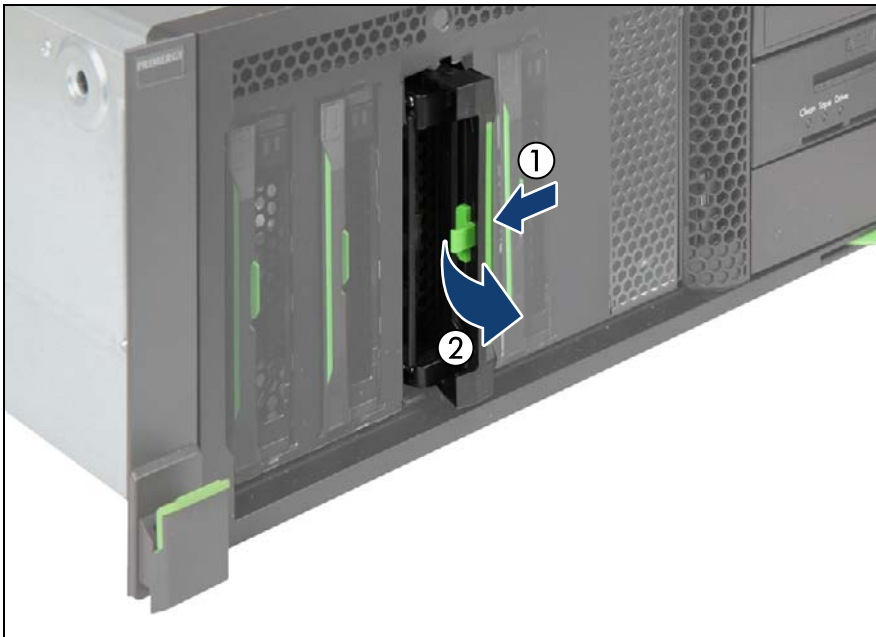


Figure 96: Disconnecting a 3.5-inch HDD module

- ▶ While pressing down on the locking button (1) fold up the lever (2).



Thereby, the HDD module is pushed out of its drive bay by about 1 cm and disconnected from the SAS / SATA backplane.

- ▶ Wait about 30 seconds to allow the hard disk drive to spin down.
- ▶ Pull the HDD module completely out of its bay.

### 7.3.5.3 Installing a 3.5-inch HDD dummy module



#### CAUTION!

If the removed HDD 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.

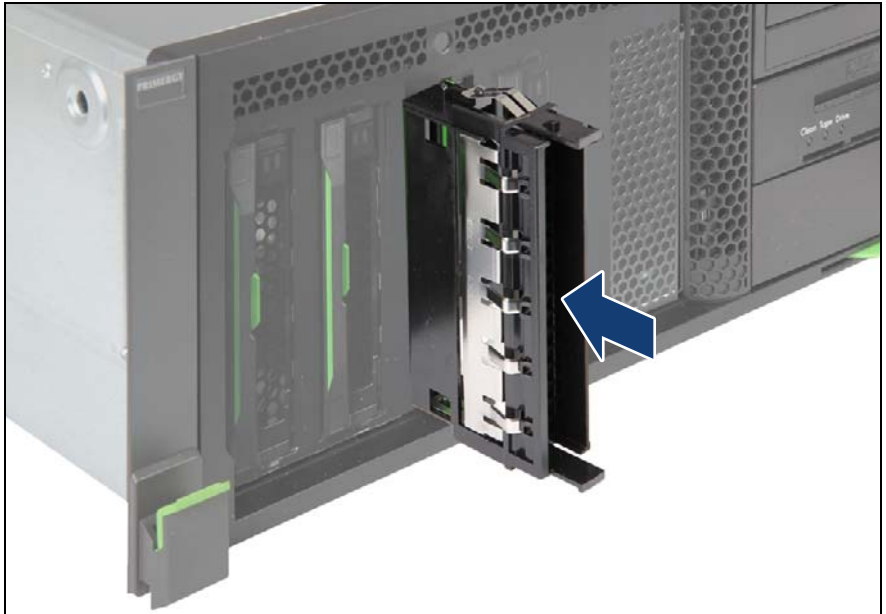


Figure 97: Installing a 3.5-inch HDD dummy module

- ▶ Slide the HDD dummy module into the drive bay until it locks in place.

### 7.3.5.4 Concluding steps

- ▶ ["Installing accessible drive and HDD bay covers" on page 69](#)

## 7.3.6 Replacing a 3.5-inch HDD module



**Customer Replaceable Unit (CRU)**



**Hardware: 5 minutes**

**Tools:** tool-less



### **CAUTION!**

- Only remove an HDD / SSD module during operation if the drive is not currently being accessed. Observe the indicators on the HDD module, as described in the operating manual of your server.
- Under no circumstances should you remove an HDD / SSD module while the system is in operation if you are not sure that the drive is operated by a RAID controller and belongs to a disk array that is operating in RAID level 1, 1E, 10, 5, 50, 6 or 60.

An HDD / SSD module can only be replaced during operation in conjunction with a corresponding RAID configuration.

- All HDD / SSD modules (drives) must be uniquely identified so that they can be reinstalled in their original mounting locations later. If this is not done, existing data can be lost.

### **7.3.6.1 Preliminary steps**

- ▶ ["Locating the defective server" on page 45](#)
- ▶ ["Removing accessible drive and HDD bay covers" on page 58](#)
- ▶ Locate the defective HDD module as described in section ["Local diagnostic indicators on the front" on page 47](#).

#### **Only applicable for removing intact HDD modules:**

- ▶ Before removing a non-defective HDD module, put the drive into "Offline" mode using your RAID configuration software.



For further information, please refer to the "ServerView Suite RAID Management" user guide.

### 7.3.6.2 Removing a 3.5-inch HDD module

- ▶ Remove the HDD module to be replaced from the server as described in section ["Removing a 3.5-inch HDD module" on page 172](#).

### 7.3.6.3 Installing a 3.5-inch HDD module

- ▶ Install the new HDD module into the empty drive bay as described in section ["Installing 3.5-inch HDD modules" on page 168](#).

### 7.3.6.4 Concluding steps

- ▶ ["Installing accessible drive and HDD bay covers" on page 69](#)
- ▶ ["Performing a RAID array rebuild" on page 104](#)

## 7.3.7 Replacing a 3.5-inch HDD SAS backplane



**Upgrade and Repair Unit (URU)**



**Hardware: 15 minutes**

|   |
|---|
| <b>Tools:</b> Phillips PH2 / (+) No. 2 screw driver |
|---|

### 7.3.7.1 Preliminary steps

- ▶ ["Shutting down the server" on page 48](#)
- ▶ ["Disconnecting the server from the mains" on page 48](#)
- ▶ ["Getting access to the component" on page 49](#)
- ▶ ["Removing the system fan holder" on page 74](#)
- ▶ ["Removing 3.5-inch HDD modules" on page 171](#)

### 7.3.7.2 Removing the defective 3.5-inch HDD SAS backplane

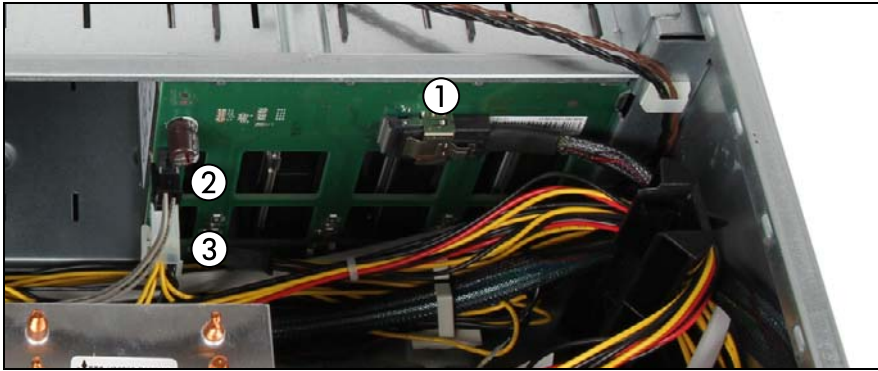


Figure 98: Disconnecting cables

- ▶ Disconnect the cables from the SAS backplane:
  - (1) SAS/SATA data cable from connector "x1"
  - (2) power cable from connector "x9" or "x10" (if applicable)
  - (3) power cable from connector "x7"

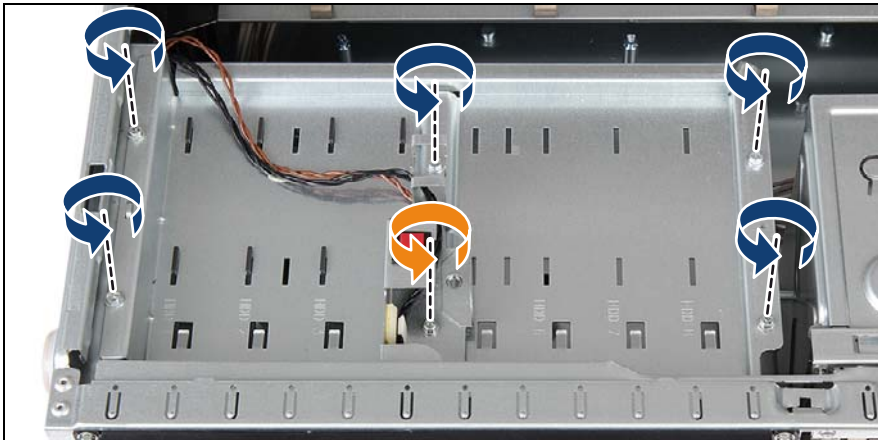


Figure 99: Removing the 3.5-inch HDD bay top cover (A)

- ▶ Remove five screws from the 3.5-inch HDD bay top cover (see blue arrows).
- ▶ Remove one screw from the intrusion switch holder (see orange arrow).

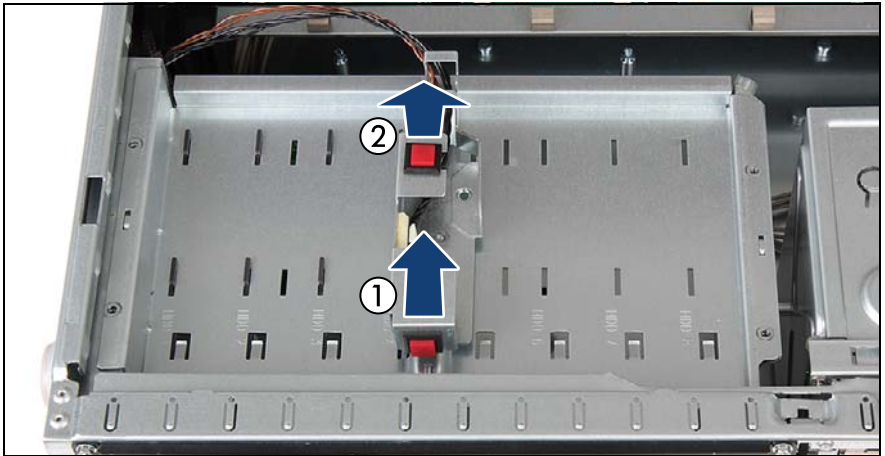


Figure 100: Removing the 3.5-inch HDD bay top cover (B)

- ▶ Slide back the intrusion switch holder until it disengages from the HDD bay top cover (1).
- ▶ Remove the intrusion switch holder (2) and set aside.
- ▶ Leave the intrusion switch cable connected to the system board.

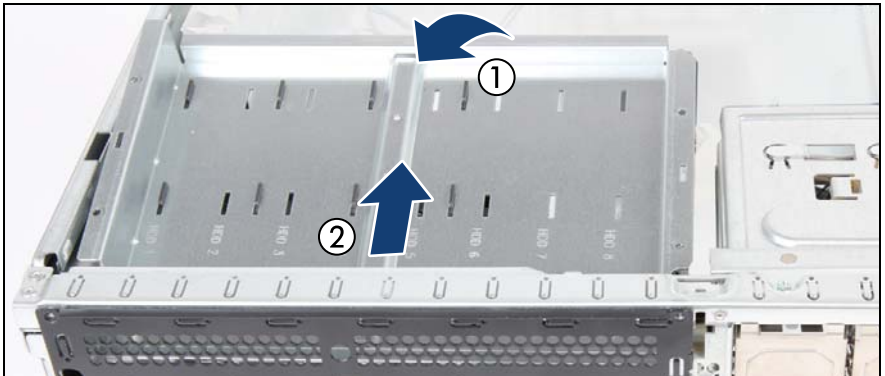


Figure 101: Removing the 3.5-inch HDD bay top cover (C)

- ▶ Carefully fold up the 3.5-inch HDD bay top cover to disengage it from the SAS backplane below (1).
- ▶ Remove the 3.5-inch HDD bay top cover from the chassis (2).

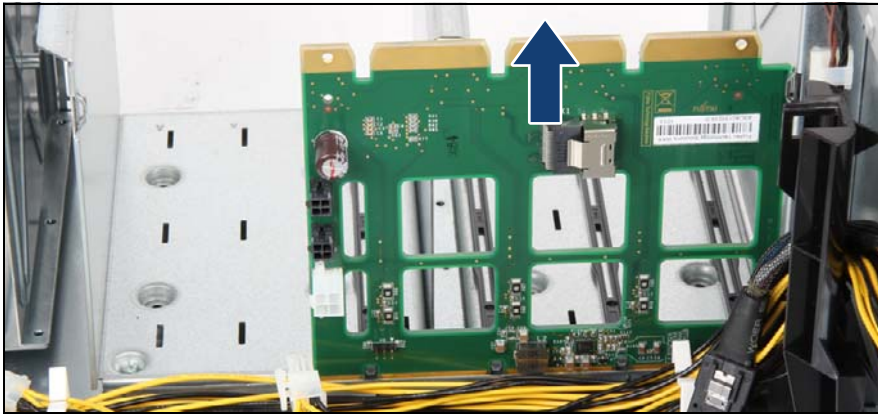


Figure 102: Removing the defective 3.5-inch HDD SAS backplane

- ▶ Pull up on the SAS backplane and remove it from the HDD bay in a vertical motion.

### 7.3.7.3 Installing the new 3.5-inch HDD SAS backplane

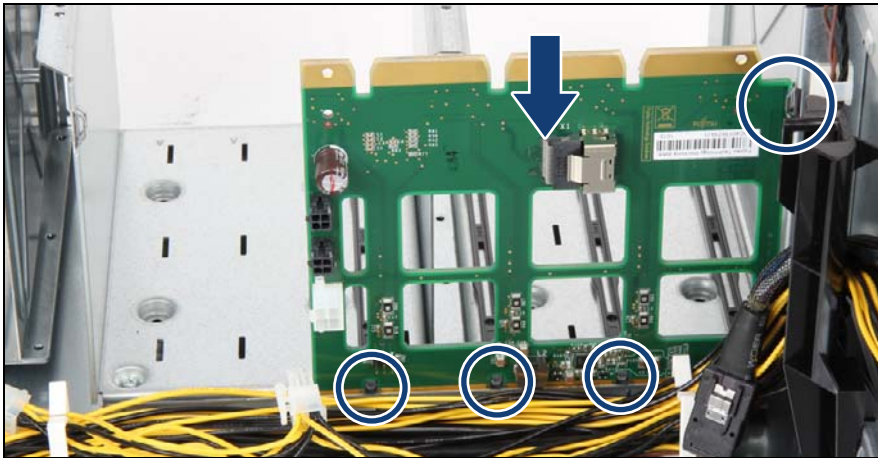


Figure 103: Installing the new 4x 3.5-inch HDD SAS backplane

- ▶ Fit the SAS backplane into the guide on the outer wall of the HDD bay and lower it into the bottom rim.
- ▶ Ensure that the 4x 3.5-inch HDD SAS backplane is properly seated into the bottom rim and side guide (see circles).

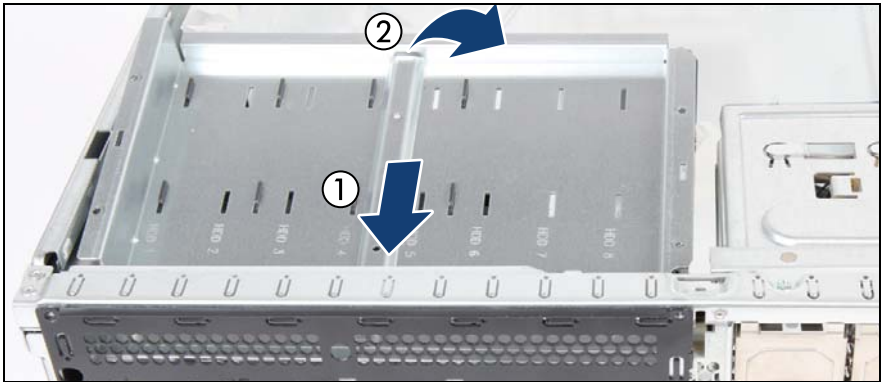


Figure 104: Installing the 3.5-inch HDD bay top cover (A)

- ▶ At a slight angle, fit the HDD bay top cover under the front chassis rim (1).
- ▶ Fold down the HDD bay top cover (2) until it is properly seated on the HDD bays.



**CAUTION!**

Ensure that the 3.5-inch HDD backplanes is properly secured in the upper rim of the HDD bay top cover.

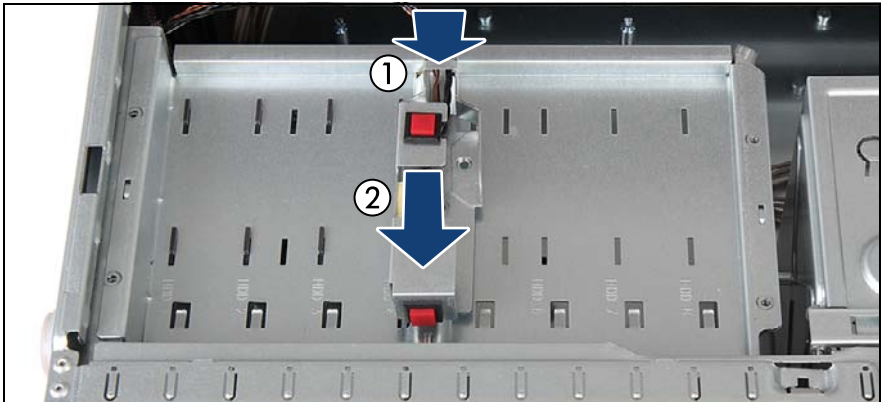


Figure 105: Installing the 3.5-inch HDD bay top cover (B)

- ▶ Place the intrusion switch holder on the HDD bay top cover as shown (1).
- ▶ Slide the intrusion switch holder under the front chassis rim as far as it will go (2).

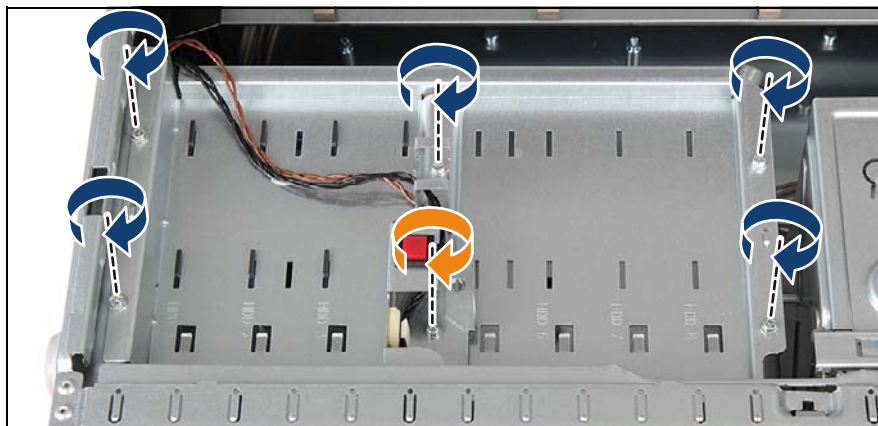


Figure 106: Installing the 3.5-inch HDD bay top cover (C)

- ▶ Secure the HDD bay top cover to the chassis with five screws (see blue arrows).
- ▶ Secure the intrusion switch holder on the HDD bay top cover with one screw (see orange arrow).
- ▶ Connect the cables to the SAS backplane (see figure 98).

### 7.3.7.4 Concluding steps

- ▶ ["Installing the system fan holder" on page 75](#)
- ▶ ["Reassembling" on page 62](#)
- ▶ ["Connecting the server to the mains" on page 72](#)
- ▶ ["Switching on the server" on page 73](#)
- ▶ ["Installing a 3.5-inch HDD module" on page 170](#) and ["Installing a 3.5-inch HDD dummy module" on page 173.](#)



For detailed information on HDD mounting order, refer to section ["3.5-inch HDD configurations" on page 165.](#)

## 7.4 HDD extension boxes

**i** The procedures for the HDD extension boxes are identical except of cabling and required bays.

### 7.4.1 HDD extension box variants

#### 8x 2.5-inch HDD extension box



Figure 107: 8x 2.5-inch HDD extension box - Rack version

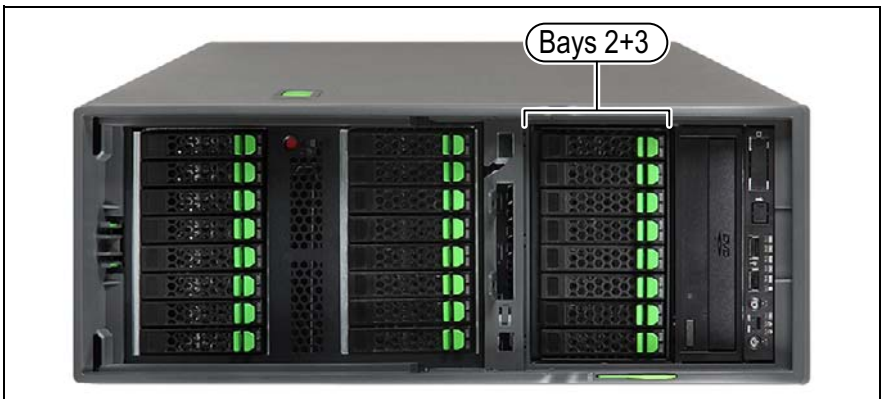


Figure 108: 8x 2.5-inch HDD extension box - Tower version

**i** The 8x 2.5-inch HDD extension box occupies accessible drive bays 2 and 3.

4x 3.5-inch HDD extension box



Figure 109: 4x 3.5-inch HDD extension box - Rack version

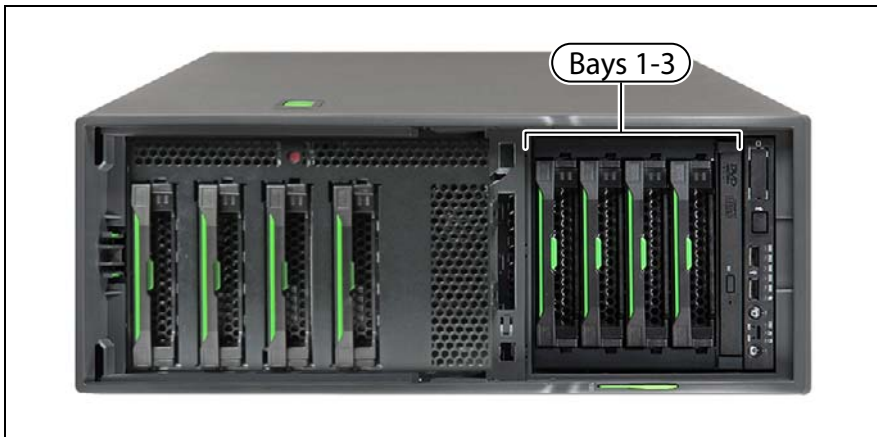


Figure 110: 4x 3.5-inch HDD extension box - Tower version



The 4x 3.5-inch HDD extension box occupies accessible drive bays 1, 2 and 3. This box can also be equipped with a slimline ODD.

## 7.4.2 Installing an HDD extension box



**Upgrade and Repair Unit  
(URU)**



**Hardware: 10 minutes**

|   |
|---|
| <b>Tools:</b> Slotted screw driver (for bending in or out accessible drive mounting brackets) |
|---|

### 7.4.2.1 Preliminary steps

- ▶ ["Suspending BitLocker functionality" on page 77](#)
- ▶ ["Shutting down the server" on page 48](#)
- ▶ ["Disconnecting the server from the mains" on page 48](#)
- ▶ ["Getting access to the component" on page 49](#)



The front cover only needs to be removed in order to remove or install accessible drive dummy covers.

- ▶ ["Removing the system fan holder" on page 74](#)
- ▶ Installing a 4x 3.5-inch HDD extension box: ["Installing the slimline ODD" on page 322](#) (if applicable)

### 7.4.2.2 Removing accessible drive dummy covers

#### Removing accessible drive filler covers



Figure 111: Removing an accessible drive filler cover

- ▶ Hold the accessible drive filler cover by its two handle recesses and pull it out of the desired installation bays.



**CAUTION!**

Always replace filler covers into unused drive bays to comply with applicable EMC regulations and satisfy cooling requirements.

## Removing accessible drive covers

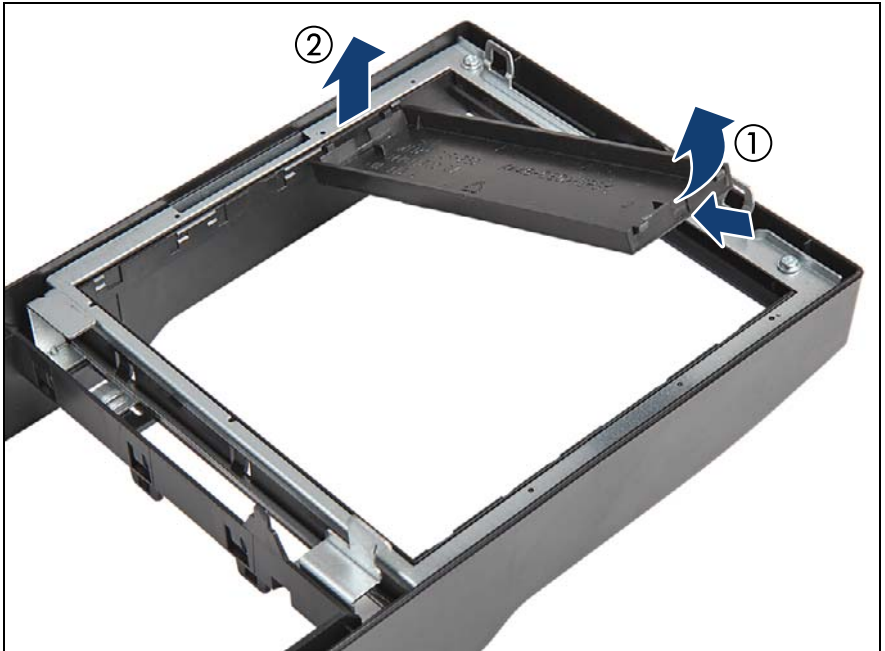


Figure 112: Removing an accessible drive covers

**i** Removing accessible drive covers is illustrated by the example of the tower server. In case of the rack front cover, the procedure is identical.

- ▶ Turn the front cover face down.
- ▶ Press in on the lugs on either side of the drive cover.
- ▶ Fold up (1) and remove the desired accessible drive covers (2).

### 7.4.2.3 Installing the HDD extension box

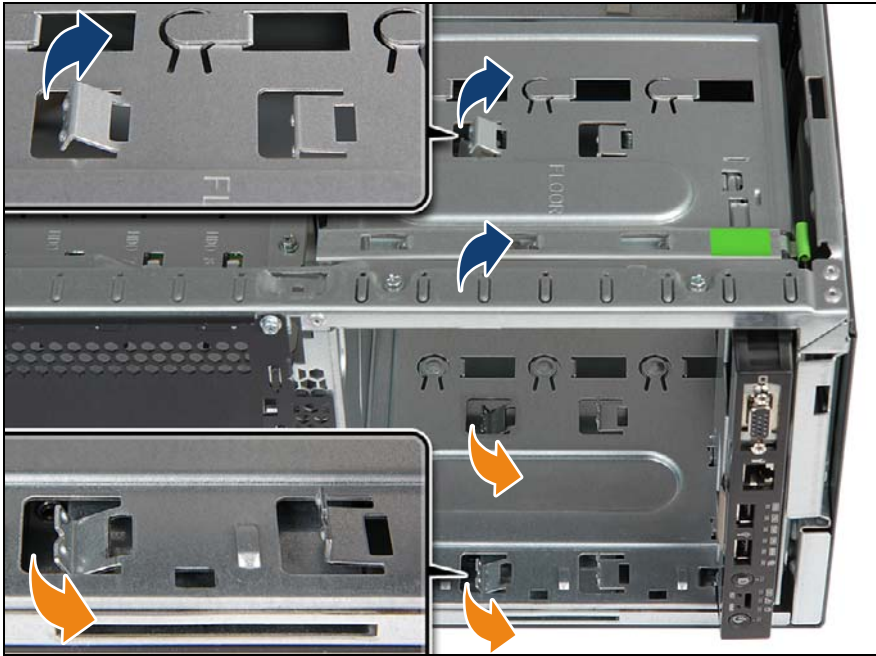


Figure 113: Checking mounting bracket positions

- i** Installing a 4x 3.5-inch HDD extension box: bend all mounting brackets outward.
- ▶ Using a screw driver, bend the mounting brackets of the middle installation bay outwards (see close-up):
    - ▶ Bend up the upper two mounting brackets (see blue arrows).
    - ▶ Bend down the lower two mounting brackets (see orange arrows).

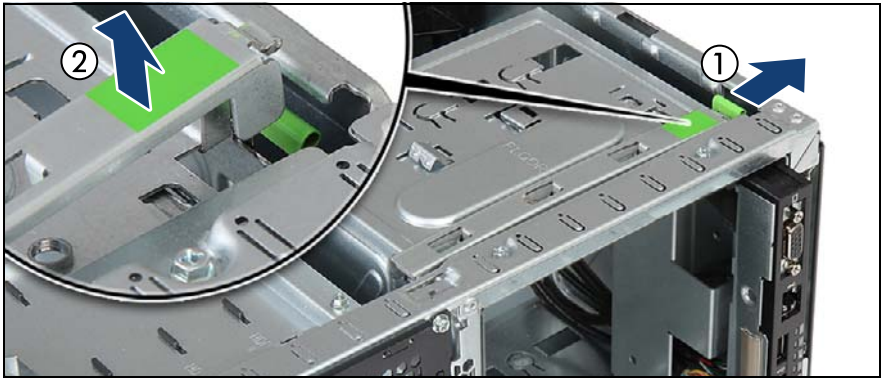


Figure 114: Opening the accessible drive locking bar

- ▶ Press out on the locking latch to disengage the accessible drive locking bar (1).
- ▶ Fold up the accessible drive locking bar (2).

**i** Unlocking and securing the front panel and accessible drives is illustrated by the example of tower servers. In case of rack servers, the accessible drive locking bar is located on the side of the drive bay. In this case, proceed as follows:

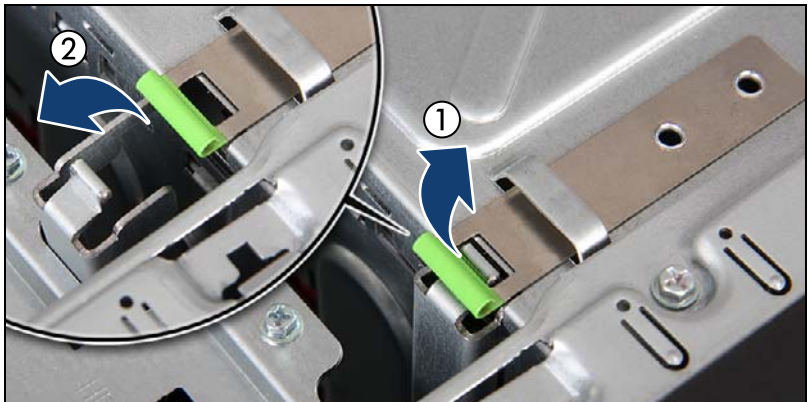


Figure 115: Opening the accessible drive locking bar (rack systems)

- ▶ Pull up on the locking latch to disengage the accessible drive locking bar (1).
- ▶ Fold out the accessible drive locking bar (2).



Figure 116: Inserting the HDD extension box (example 4x 3.5-inch HDD extension box)

- ▶ Insert the HDD extension box into installation bays (1) and carefully push in until the front screw hole on the front panel frame lines up with the centering pin on the locking bar.
- ▶ Close the locking bar (2) until it locks in place (3).

**i** When working on a rack-mounted server, proceed as follows:

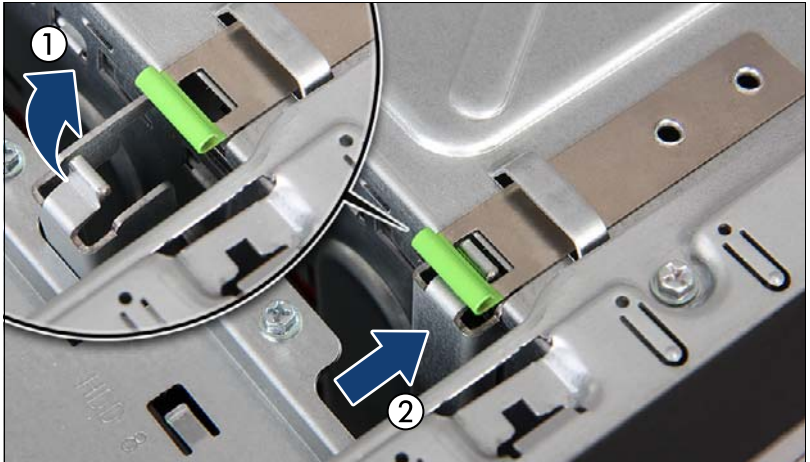


Figure 117: Closing the accessible drive locking bar (rack systems)

- ▶ Fold in the locking bar (1) until it locks in place (2, see close-up).
- ▶ Connect SAS and power cables to the HDD extension box see section ["Cabling plans" on page 399](#).
- ▶ If applicable, connect slimline ODD and LSD module cables see section ["Cabling plans" on page 399](#).
- ▶ Install HDD modules or HDD dummy modules into the additional HDD slots as described in sections ["2.5-inch HDD / SSD configurations" on page 139](#) or ["3.5-inch HDD configurations" on page 165](#).

#### 7.4.2.4 Concluding steps

- ▶ ["Installing the system fan holder" on page 75](#)
- ▶ ["Reassembling" on page 62](#)
- ▶ ["Connecting the server to the mains" on page 72](#)
- ▶ ["Switching on the server" on page 73](#)
- ▶ ["Resuming BitLocker functionality" on page 103](#)

## 7.4.3 Removing an HDD extension box



**Upgrade and Repair Unit (URU)**



**Hardware: 10 minutes**

**Tools:** tool-less

### 7.4.3.1 Preliminary steps

- ▶ ["Suspending BitLocker functionality" on page 77](#)
- ▶ ["Shutting down the server" on page 48](#)
- ▶ ["Disconnecting the server from the mains" on page 48](#)
- ▶ ["Getting access to the component" on page 49](#)



The front cover only needs to be removed in order to remove or install accessible drive dummy covers.

- ▶ ["Removing the system fan holder" on page 74](#)

### 7.4.3.2 Removing the HDD extension box

- ▶ Remove the HDD modules or HDD dummy modules.
- ▶ Remove all cables from the HDD extension box see section ["Cabling plans" on page 399](#).

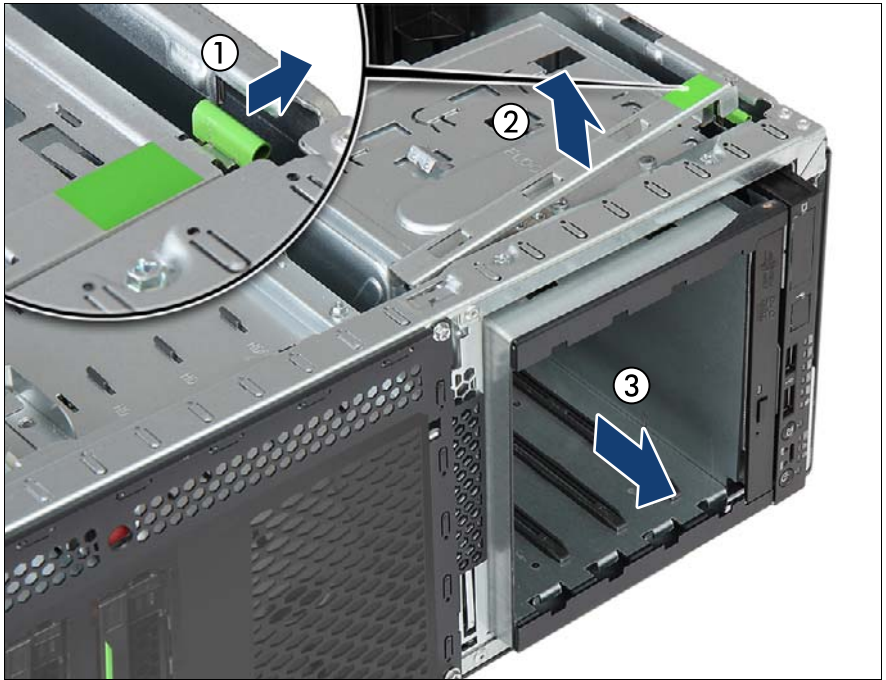


Figure 118: Removing the HDD extension box

- ▶ Press out on the locking latch to disengage the accessible drive locking bar (1).
- ▶ Fold up the accessible drive locking bar (2).
- ▶ Carefully pull the HDD extension box out of its installation bays (3).
- ▶ Close the accessible drive locking bar until it locks in place.

### 7.4.3.3 Installing accessible drive dummy covers

#### Installing accessible drive filler covers

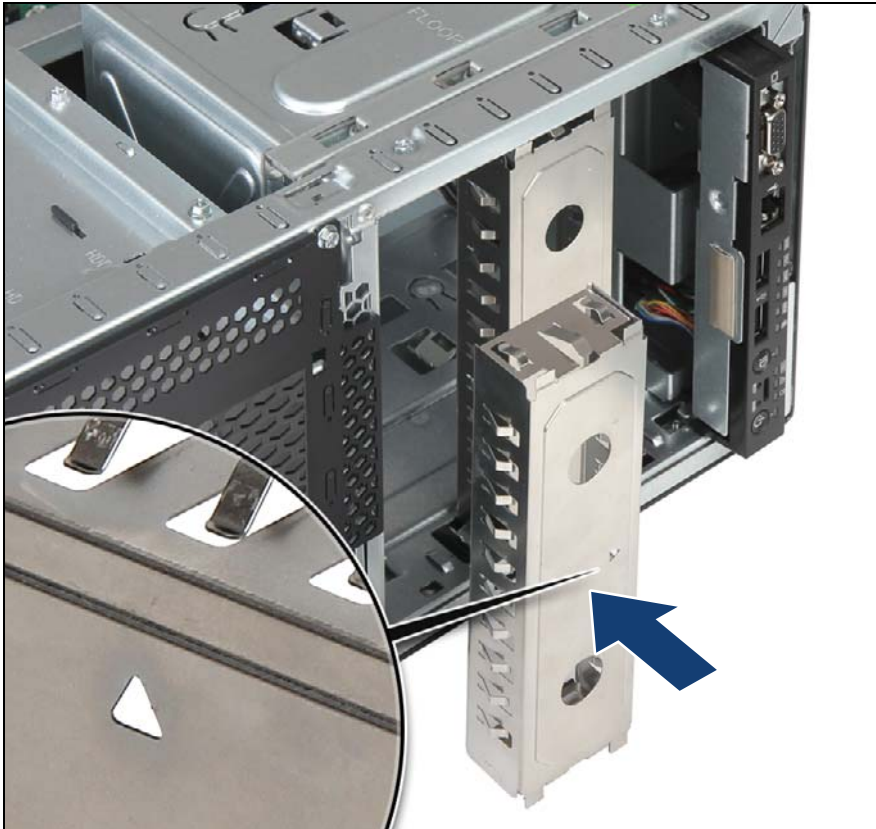


Figure 119: Installing an accessible drive filler cover

- ▶ Hold the accessible drive filler cover by its two handle recesses and insert it into the empty installation bays with the punched-out arrow symbol facing up (see close-up).



**CAUTION!**

Always replace filler covers into unused drive bays to comply with applicable EMC regulations and satisfy cooling requirements.

## Installing accessible drive covers

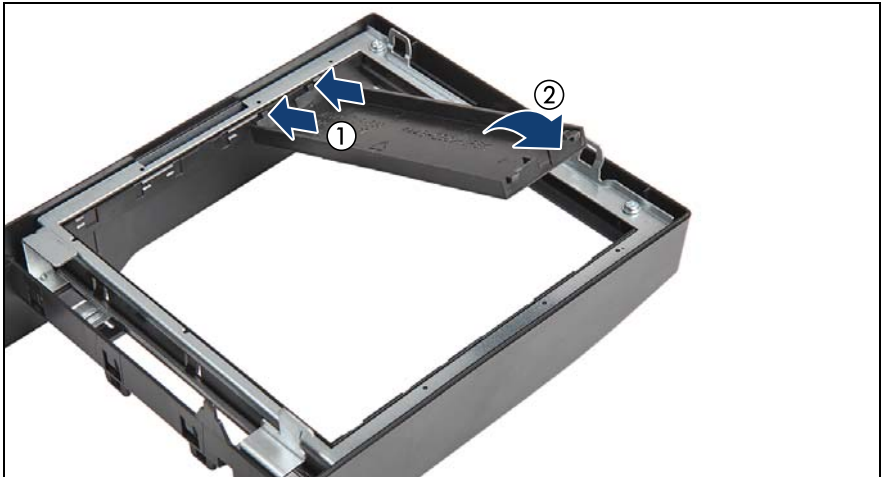


Figure 120: Installing accessible drive covers

**i** Installing accessible drive covers is illustrated by the example of the tower server. In case of the rack front cover, the procedure is identical.

- ▶ Ensure that an accessible drive filler cover has been installed in every empty drive bay.
- ▶ Turn the front cover face down.
- ▶ Join the two lugs on one edge of the accessible drive cover with the right inner edge of the front cover (1).
- ▶ Fold down the accessible drive cover until it snaps in place (2).

### 7.4.3.4 Concluding steps

- ▶ Removing a 4x 3.5-inch HDD extension box: ["Removing the slimline ODD" on page 328](#) (if applicable)
- ▶ ["Installing the system fan holder" on page 75](#)
- ▶ ["Reassembling" on page 62](#)
- ▶ ["Connecting the server to the mains" on page 72](#)
- ▶ ["Switching on the server" on page 73](#)
- ▶ ["Resuming BitLocker functionality" on page 103](#)

## 7.4.4 Replacing an HDD extension box



**Upgrade and Repair Unit (URU)**



**Hardware: 10 minutes**

**Tools:** tool-less

### 7.4.4.1 Preliminary steps

- ▶ ["Shutting down the server" on page 48](#)
- ▶ ["Disconnecting the server from the mains" on page 48](#)
- ▶ ["Getting access to the component" on page 49](#)
- ▶ ["Removing the system fan holder" on page 74](#)

### 7.4.4.2 Removing the defective HDD extension box

- ▶ Remove the HDD extension box as described in section ["Removing an HDD extension box" on page 190](#).

### 7.4.4.3 Installing the new HDD extension box

- ▶ Install the HDD extension box as described in section ["Installing an HDD extension box" on page 183](#).

### 7.4.4.4 Concluding steps

- ▶ ["Installing the system fan holder" on page 75](#)
- ▶ ["Reassembling" on page 62](#)
- ▶ ["Connecting the server to the mains" on page 72](#)
- ▶ ["Switching on the server" on page 73](#)

## 7.5 SAS expander board

### 7.5.1 Installing the SAS expander board



**Field Replaceable Unit (FRU)**



**Hardware: 10 minutes**

**Tools:** Phillips PH1 / (+) No. 1 screw driver (for installing the carrier)

#### 7.5.1.1 Preliminary steps

- ▶ ["Suspending BitLocker functionality" on page 77](#)
- ▶ ["Shutting down the server" on page 48](#)
- ▶ ["Disconnecting the server from the mains" on page 48](#)
- ▶ ["Getting access to the component" on page 49](#)
- ▶ ["Removing the system fan holder" on page 74](#)

#### 7.5.1.2 Installing the carrier

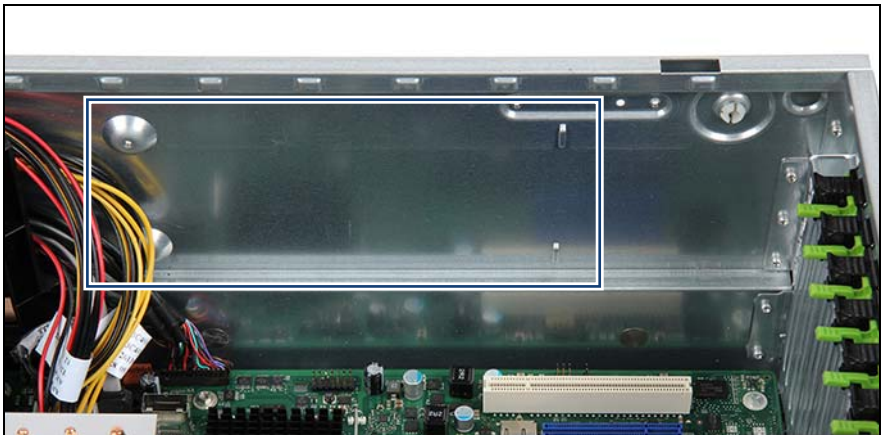


Figure 121: Position for the carrier



Figure 122: Installing the carrier (A)

- ▶ Insert the two noses of the carrier into the hooks of the chassis.



Figure 123: Installing the carrier (B)

- ▶ Set the carrier in place. Take care that the cables are not damaged!
- ▶ Fasten the carrier with one screw (see circle).

### 7.5.1.3 Installing the SAS expander board

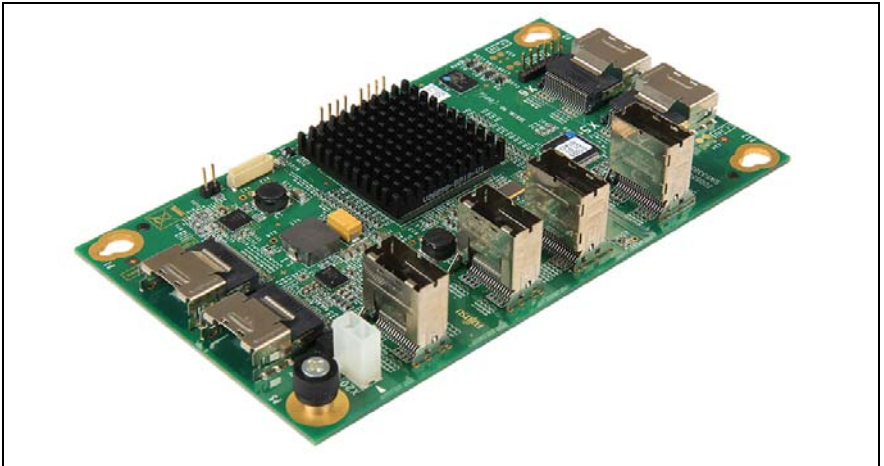


Figure 124: SAS expander board (A3C40125917)

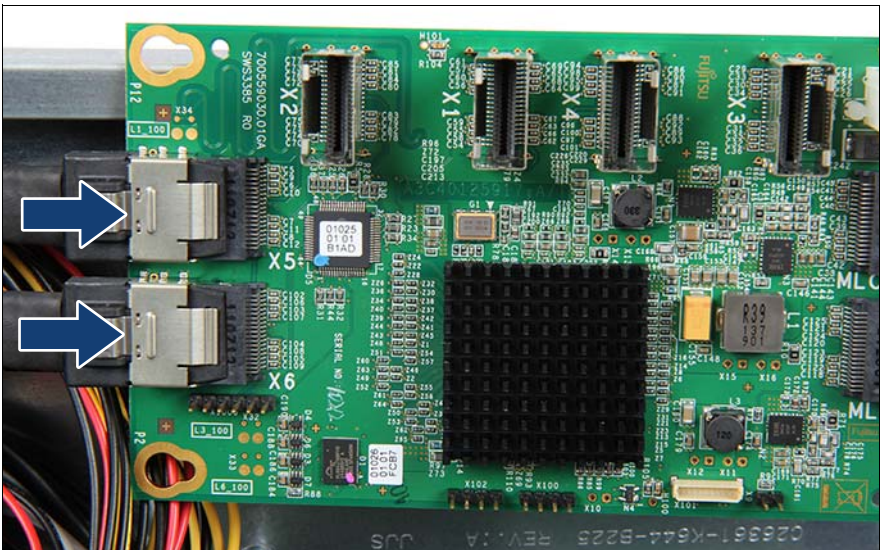


Figure 125: Connecting SAS cables

- ▶ Connect the two SAS cables coming from the bottom and middle 2.5-inch HDD cages to the connectors "X5" and "X6" on the SAS expander board. This is recommended because of the shortness of these cables.

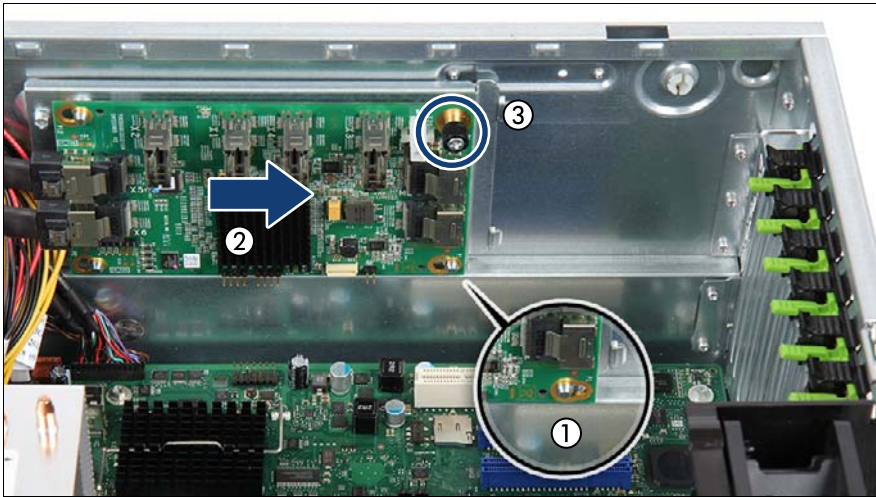


Figure 126: Installing the SAS expander board

- ▶ Insert the SAS expander board into the chassis so that the three shoulder screw caps on the carrier rest in the wide ends of the keyhole slots on the SAS expander board (1).
- ▶ Slide the expander board to the right as far as it will go (2).  
The shoulder screw caps on the carrier will lock in the narrow ends of the keyhole slots on the SAS expander board.
- ▶ Secure the SAS expander board in the chassis with the captive knurled thumb screw on the board (3).
- ▶ Change SAS cabling according to the new server configuration as described in section ["Cabling plans" on page 399](#).

**Example cabling 24x 2.5-inch HDDs with SAS expander board and one SAS controller**

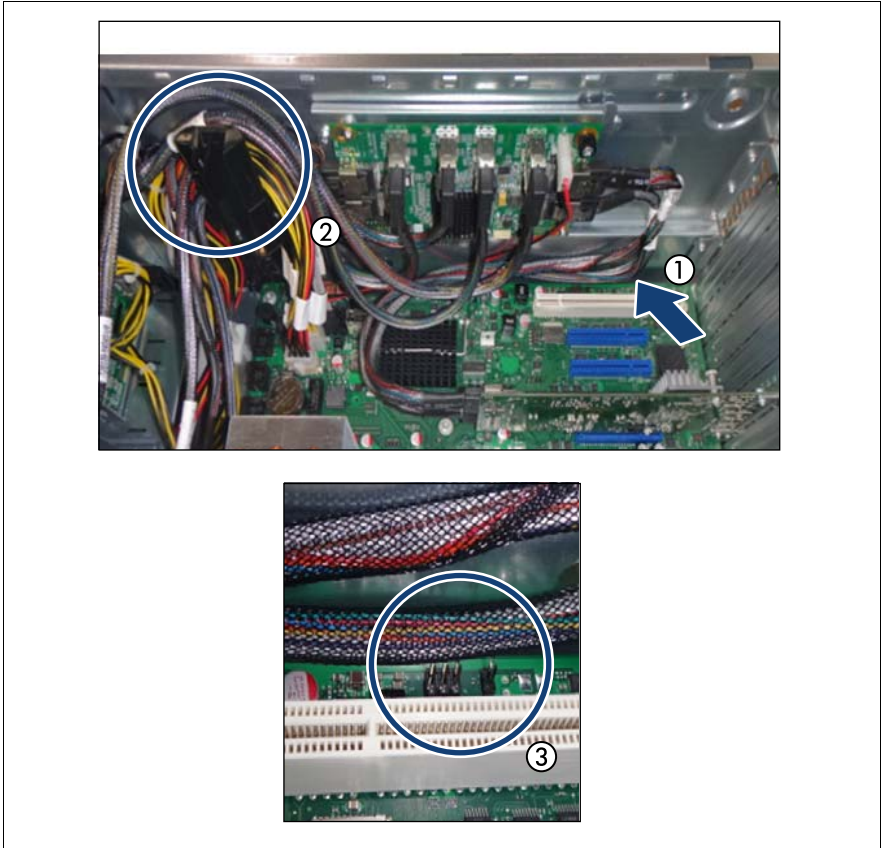


Figure 127: Example cabling 24x 2.5-inch HDDs



**CAUTION!**

- ▶ Press the SAS cables to the chassis to get them away from the PCI slots (1).
- ▶ Make sure that the power supply cables are positioned under the SAS cables (2).
- ▶ Take care that the SAS cables don't damage pins (3).

## Hard disk drives / solid state drives

| Cable                                 | Cabling list no. | from                            | to                                |
|---------------------------------------|------------------|---------------------------------|-----------------------------------|
| SAS cable T26139-Y4040-V4             | C42              | SAS expander board connector X1 | SAS backplane 1 connector X1      |
| SAS cable T26139-Y4040-V4             | C42              | SAS expander board connector X2 | SAS backplane 2 connector X1      |
| SAS cable T26139-Y4040-V6             | C43              | SAS expander board connector X3 | SAS backplane 3 connector X1      |
| SAS cable T26139-Y4040-V6             | C43              | SAS expander board connector X4 | SAS backplane 4 connector X1      |
| SAS cable T26139-Y3963-V102           | C44              | SAS expander board connector X5 | SAS backplane 5 connector X1      |
| SAS cable T26139-Y3963-V102           | C44              | SAS expander board connector X6 | SAS backplane 6 connector X1      |
| SAS cable T26139-Y3963-V103           | C20              | SAS controller connector MLC1   | SAS expander board connector MLC1 |
| SAS cable T26139-Y3963-V103           | C20              | SAS controller connector MLC2   | SAS expander board connector MLC2 |
| HDD power cable T26139-Y4030-V102     | C1               | Power backplane connector X21   | SAS backplane 1 connector X6      |
|                                       |                  |                                 | SAS backplane 2 connector X6      |
|                                       |                  |                                 | SAS backplane 3 connector X6      |
|                                       |                  |                                 | SAS backplane 4 connector X6      |
| HDD box power cable T26139-Y3939-V402 | C6               | System board connector P5       | SAS backplane 5 connector X6      |
|                                       |                  |                                 | SAS backplane 6 connector X6      |
|                                       |                  |                                 | SAS expander board connector X20  |



For numbering SAS backplanes see section ["2.5-inch HDD backplane overview"](#) on page 139.



Figure 128: Preparing system air duct

- ▶ Valid for first installation of the SAS expander board: bend up the latch before installing the system air duct.

#### 7.5.1.4 Concluding steps

- ▶ ["Installing the system fan holder" on page 75](#)
- ▶ ["Reassembling" on page 62](#)
- ▶ ["Connecting the server to the mains" on page 72](#)
- ▶ ["Switching on the server" on page 73](#)
- ▶ ["Resuming BitLocker functionality" on page 103](#)

## 7.5.2 Removing the SAS expander board



Field Replaceable Unit  
(FRU)



Hardware: 10 minutes

|                         |
|-------------------------|
| <b>Tools:</b> tool-less |
|-------------------------|

### 7.5.2.1 Preliminary steps

- ▶ ["Suspending BitLocker functionality" on page 77](#)
- ▶ ["Shutting down the server" on page 48](#)
- ▶ ["Disconnecting the server from the mains" on page 48](#)
- ▶ ["Getting access to the component" on page 49](#)
- ▶ ["Removing the system fan holder" on page 74](#)

### 7.5.2.2 Removing the SAS expander board

- ▶ Remove all cables from the SAS expander board except the two SAS cables connected to connectors "X5" and "X6" on the SAS expander board.

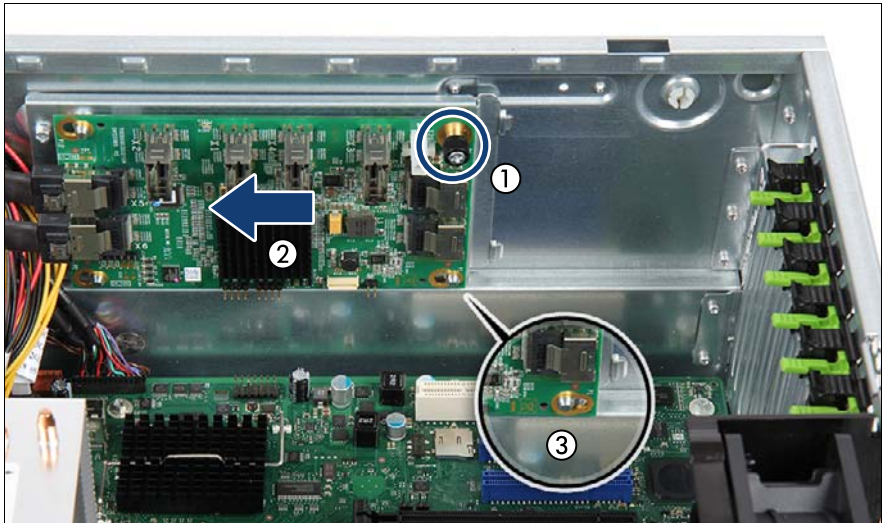


Figure 129: Removing the SAS expander board

- ▶ Loosen the captive knurled thumb screw on the SAS expander board (1).
- ▶ Slide the SAS expander board to the left as far as it will go (2).  
The shoulder screw caps on the carrier will rest in the wide ends of the keyhole slots on the SAS expander board (3).
- ▶ Remove the SAS expander board from the chassis.
- ▶ Disconnect the two SAS cables from connectors "X5" and "X6" on the SAS expander board.
- ▶ If you don't install a new SAS expander board, change SAS cabling according to the new server configuration as described in section ["Cabling plans" on page 399](#).

### 7.5.2.3 Concluding steps

- ▶ ["Installing the system fan holder" on page 75](#)
- ▶ ["Reassembling" on page 62](#)
- ▶ ["Connecting the server to the mains" on page 72](#)
- ▶ ["Switching on the server" on page 73](#)
- ▶ ["Resuming BitLocker functionality" on page 103](#)

## 7.5.3 Replacing the SAS expander board



**Field Replaceable Unit  
(FRU)**



**Hardware: 10 minutes**

|                         |
|-------------------------|
| <b>Tools:</b> tool-less |
|-------------------------|

### 7.5.3.1 Preliminary steps

- ▶ ["Shutting down the server" on page 48](#)
- ▶ ["Disconnecting the server from the mains" on page 48](#)
- ▶ ["Getting access to the component" on page 49](#)
- ▶ ["Removing the system fan holder" on page 74](#)

### 7.5.3.2 Removing the defective SAS expander board

- ▶ Remove the SAS expander board as described in section ["Removing the SAS expander board" on page 202](#).

### 7.5.3.3 Installing the new SAS expander board

- ▶ Install the SAS expander board as described in section ["Installing the SAS expander board" on page 195](#).
- ▶ Reconnect all cables on the SAS expander board to their original positions.

### 7.5.3.4 Concluding steps

- ▶ ["Installing the system fan holder" on page 75](#)
- ▶ ["Reassembling" on page 62](#)
- ▶ ["Connecting the server to the mains" on page 72](#)
- ▶ ["Switching on the server" on page 73](#)

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# 8 Fans

## 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 further information, please refer to chapter "[Important information](#)" on page 33.

## 8.1 Basic information

The following fans are available:

- three system fans included in a system fan holder
- one rear fan (only available in a redundant power supply configuration)



Additional fans in power supply units are integral parts of the power supply units and cannot be replaced separately.

# Fans



Figure 130: System fan holder with three system fans (fan 1-3)



Figure 131: Rear fan (fan 4)

## Fan numbering

Refer to the below figure for the fan numbering scheme in ServerView Operations Manager:

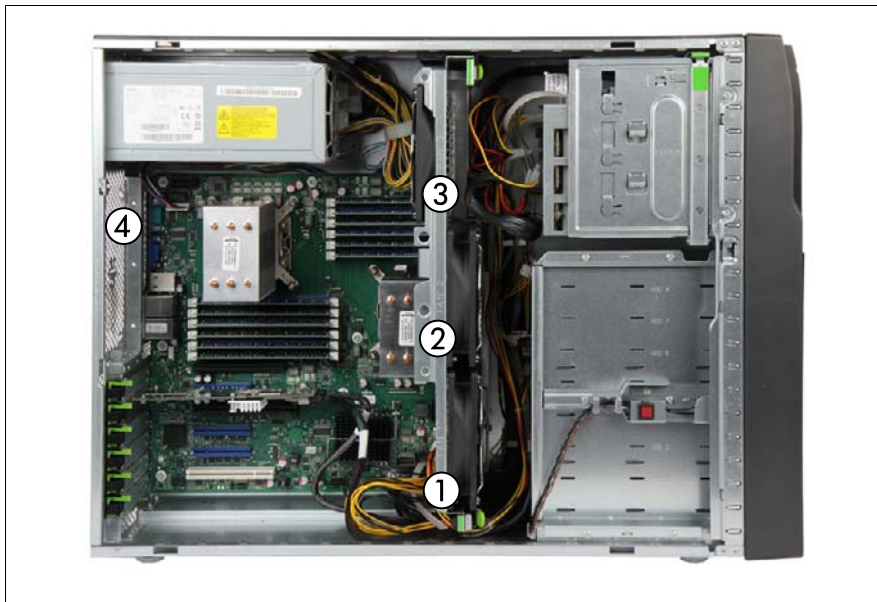


Figure 132: Fan numbering

|   |   |
|---|---|
| 1 | System fans 1 -3 in the system fan holder |
| 2 |   |
| 3 |   |
| 4 | Rear fan                                  |

## 8.2 System fans

### 8.2.1 Replacing the system fans



**Field Replaceable Unit (FRU)**



**Hardware: 5 minutes**

**Tools:** tool-less



The system fans are installed in the system fan holder. Only the complete system fan holder can be replaced as spare part.

#### 8.2.1.1 Preliminary steps

- ▶ ["Shutting down the server" on page 48](#)
- ▶ ["Disconnecting the server from the mains" on page 48](#)
- ▶ ["Getting access to the component" on page 49](#)
- ▶ ["Removing the system air duct" on page 61](#)

#### 8.2.1.2 Removing the defective system fans

- ▶ Remove the system fan holder as described in section ["Removing the system fan holder" on page 74](#).

#### 8.2.1.3 Installing the new system fans

- ▶ Install the system fan holder as described in section ["Installing the system fan holder" on page 75](#).

#### 8.2.1.4 Concluding steps

- ▶ ["Installing the system air duct" on page 62](#)
- ▶ ["Reassembling" on page 62](#)
- ▶ ["Connecting the server to the mains" on page 72](#)
- ▶ ["Switching on the server" on page 73](#)

- ▶ ["Performing a fan test after replacing a defective fan" on page 109](#)

## 8.3 Rear fan

### 8.3.1 Installing the rear fan



**Upgrade and Repair Unit  
(URU)**



**Hardware: 5 minutes**

**Tools:** tool-less

#### 8.3.1.1 Preliminary steps

- ▶ ["Shutting down the server" on page 48](#)
- ▶ ["Disconnecting the server from the mains" on page 48](#)
- ▶ ["Getting access to the component" on page 49](#)

#### 8.3.1.2 Installing the rear fan

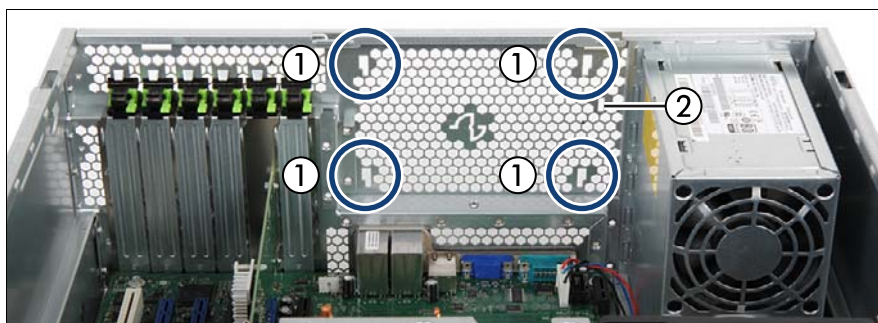


Figure 133: Rear fan - slots in the chassis

- ▶ Note the four slots in the chassis for installing the rear fan (1) and the slot for the latch on the locking lever (2).



Figure 134: Rear fan - hooks

- Note the four hooks on the rear fan (1) and the slot for the latch on the locking lever (2).

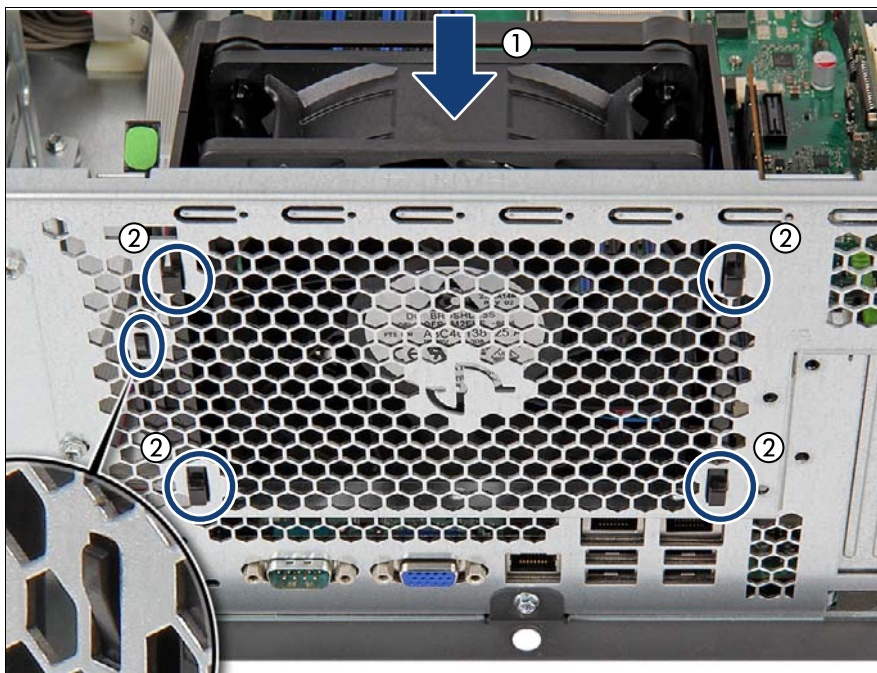


Figure 135: Installing the rear fan

- ▶ Insert the rear fan (1) and fit the four hooks on the fan into the slots (2).
- ▶ Press down the rear fan until the latch on the locking lever properly engages in the slot on the server rear (see close-up).
- ▶ Ensure that the rear fan is properly seated in the chassis.

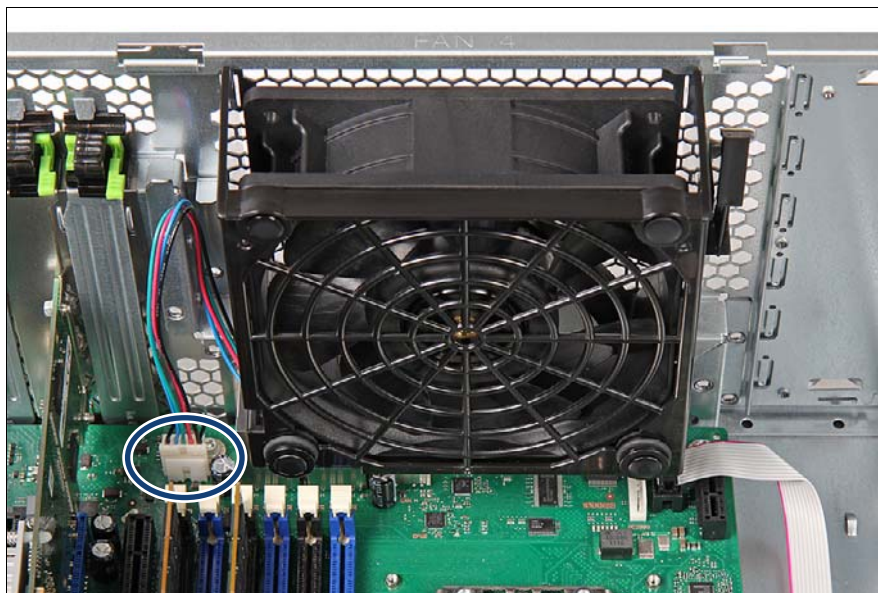


Figure 136: Connecting the rear fan cable

- ▶ Connect the rear fan cable to the connector "FAN 4" on the system board.

### 8.3.1.3 Concluding steps

- ▶ ["Reassembling" on page 62](#)
- ▶ ["Connecting the server to the mains" on page 72](#)
- ▶ ["Switching on the server" on page 73](#)

## 8.3.2 Removing the rear fan



Field Replaceable Unit  
(FRU)



Hardware: 5 minutes

Tools: tool-less

### 8.3.2.1 Preliminary steps

- ▶ ["Shutting down the server" on page 48](#)
- ▶ ["Disconnecting the server from the mains" on page 48](#)
- ▶ ["Getting access to the component" on page 49](#)

### 8.3.2.2 Removing the rear fan

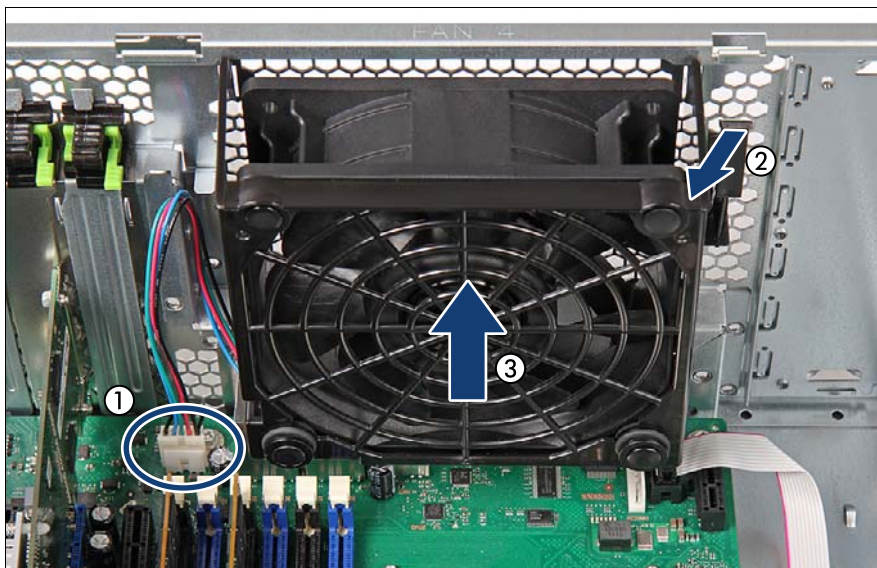


Figure 137: Removing the rear fan (A)

- ▶ Disconnect the fan cable from the connector "FAN 4" on the system board (1).
- ▶ Pull the locking lever (2) while lifting up the rear fan (3).



Figure 138: Removing the rear fan (B)

- ▶ Disengage the four hooks (see circles) from the slots on the rear (1).
- ▶ Remove the rear fan (2).

### 8.3.2.3 Concluding steps

- ▶ ["Reassembling" on page 62](#)
- ▶ ["Connecting the server to the mains" on page 72](#)
- ▶ ["Switching on the server" on page 73](#)

### 8.3.3 Replacing the rear fan



**Field Replaceable Unit (FRU)**



**Hardware: 5 minutes**

**Tools:** tool-less

#### 8.3.3.1 Preliminary steps

- ▶ ["Shutting down the server" on page 48](#)
- ▶ ["Disconnecting the server from the mains" on page 48](#)
- ▶ ["Getting access to the component" on page 49](#)
- ▶ ["Removing the system air duct" on page 61](#)

#### 8.3.3.2 Removing the defective rear fan

- ▶ Remove the rear fan as described in section ["Removing the rear fan" on page 213](#).

#### 8.3.3.3 Installing the new rear fan

- ▶ Install the rear fan as described in section ["Installing the rear fan" on page 209](#).

#### 8.3.3.4 Concluding steps

- ▶ ["Installing the system air duct" on page 62](#)
- ▶ ["Reassembling" on page 62](#)
- ▶ ["Connecting the server to the mains" on page 72](#)
- ▶ ["Switching on the server" on page 73](#)
- ▶ ["Performing a fan test after replacing a defective fan" on page 109](#)



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## 9 Expansion cards and backup units

### 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 further information, please refer to chapter "[Important information](#)" on page 33.

## 9.1 Basic information

The system board is equipped with six PCI slots:

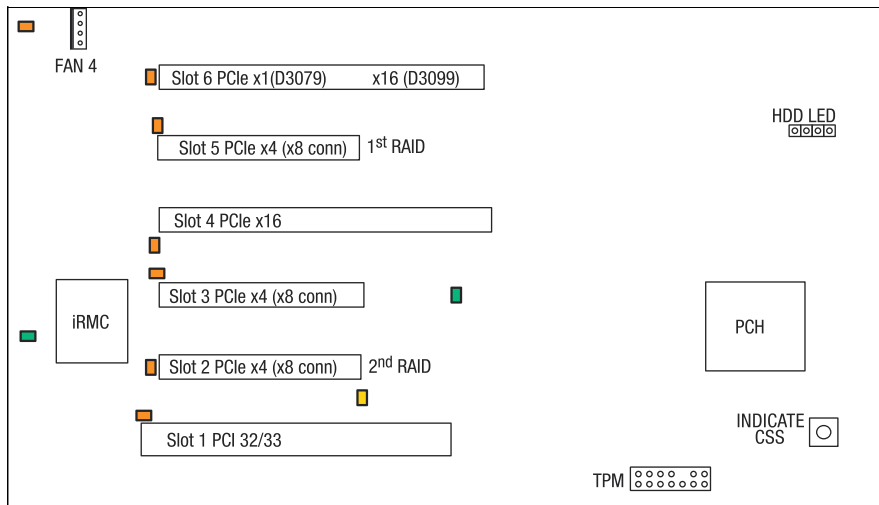


Figure 139: PCI slot overview

| PCI slot | Type            | Mechanical connector | Electrical interface | Notes   |
|----------|-----------------|----------------------|----------------------|---|
| 1        | PCI 32 / 33 MHz |                      |                      | this slot can not be used if the SAS expander board is configured |
| 2        | PCIe Gen 2      | x8                   | x4                   |   |
| 3        | PCIe Gen 3      | x8                   | x4                   |   |
| 4        | PCIe Gen 3      | x16                  | x16                  |   |
| 5        | PCIe Gen 3      | x8                   | x4                   | SAS RAID controller is only released for PCI slot 5               |
| 6        | PCIe Gen 3      | x16                  | x16                  | this slot is only available with two CPUs implemented             |

Expansion card slot sequence

| Rule #                           | PCI controller                     | max. | PCI 32/33 | PCIe x4 | PCIe x4 | PCIe x16 | PCIe x4 | PCIe x16 |
|----------------------------------|------------------------------------|------|-----------|---------|---------|----------|---------|----------|
|                                  |                                    |      | PCH       | PCH     | CPU1    | CPU1     | CPU1    | CPU2     |
|                                  |                                    |      | Slot1     | Slot2   | Slot3   | Slot4    | Slot5   | Slot6    |
| 1                                | RAID Ctrl SAS 6G 0/1 (D2607)       | 1    | -         | -       | -       | -        | 1       | -        |
| 2                                | RAID Ctrl SAS 6G 5/6 512MB (D2616) | 1    | -         | -       | -       | -        | 1       | -        |
| 3                                | RAID Ctrl SAS 6G 1GB (D3116C)      | 1    | -         | -       | -       | -        | 1       | -        |
| 4                                | VGA Card NVIDIA NVS300             | 1    | -         | 1       | 2       | -        | -       | -        |
| 5                                | USB3.0 Sunrich U-720               | 1    | -         | 1       | 2       | -        | -       | -        |
| 6                                | LAN 2x10Gbit Fibre FTS D2755       | 2    | -         | -       | -       | 1        | 3       | 2        |
| 7                                | LAN 2x10Gbit CU Intel X540-T2      | 2    | -         | -       | -       | 1        | 3       | 2        |
| 8                                | LAN 2x1Gbit CU Intel I350-T2       | 4    | -         | 1       | 2       | 4        | 3       | 5        |
| 9                                | LAN 4x1Gbit CU Intel I350-T4       | 4    | -         | 1       | 2       | 4        | 3       | 5        |
| Order of Install Priority (1..n) |                                    |      |           |         |         |          |         |          |



For the latest information on supported expansion cards, refer to your server's hardware configurator available online at the following address:

for the EMEA market:

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

for the Japanese market:

<http://jp.fujitsu.com/platform/server/primergy/system/>

## 9.2 Handling slot brackets

### 9.2.1 Installing a slot bracket



**Upgrade and Repair Unit (URU)**



**Hardware: 5 minutes**

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



Use the full height bracket perforated for the ModularRAID controllers based on LSI MegaRAID.

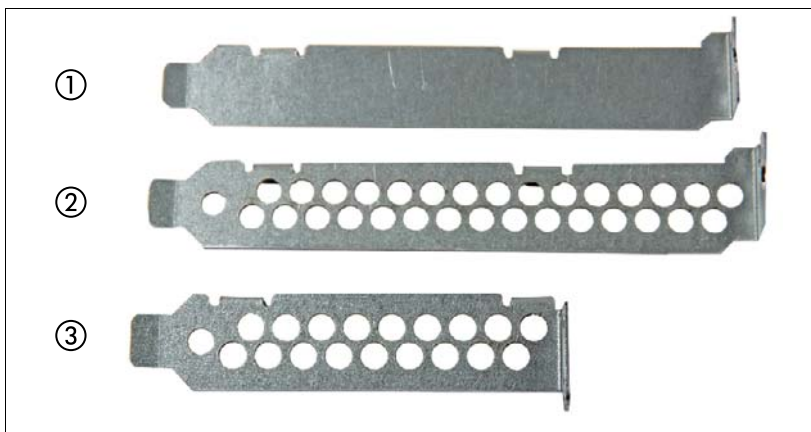


Figure 140: Perforated and non-perforated slot brackets

|   |                                    |
|---|------------------------------------|
| 1 | Full height bracket non-perforated |
| 2 | Full height bracket perforated     |
| 3 | Low profile bracket perforated     |

## Installing the slot bracket

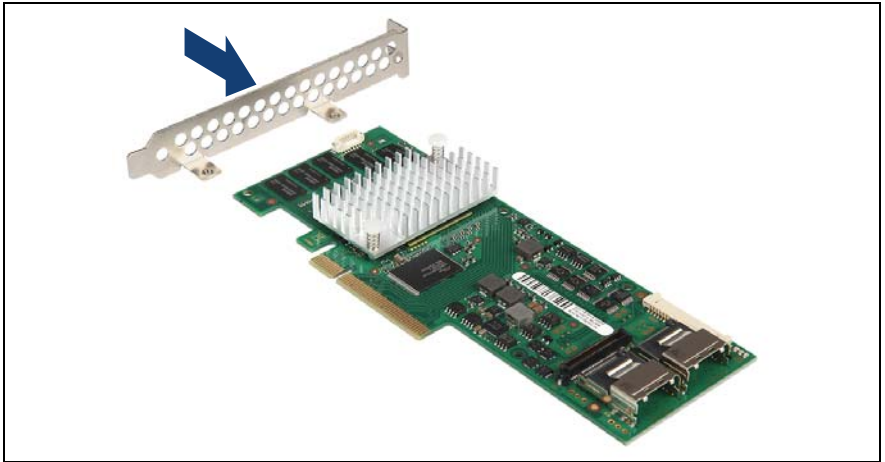


Figure 141: Installing the PCI slot bracket (A)

- ▶ Place the controller on the mounting tabs on the slot bracket.
- ▶ Carefully shift the slot bracket towards the controller until the plug shells engage with the cut-outs in the slot bracket connector panel.

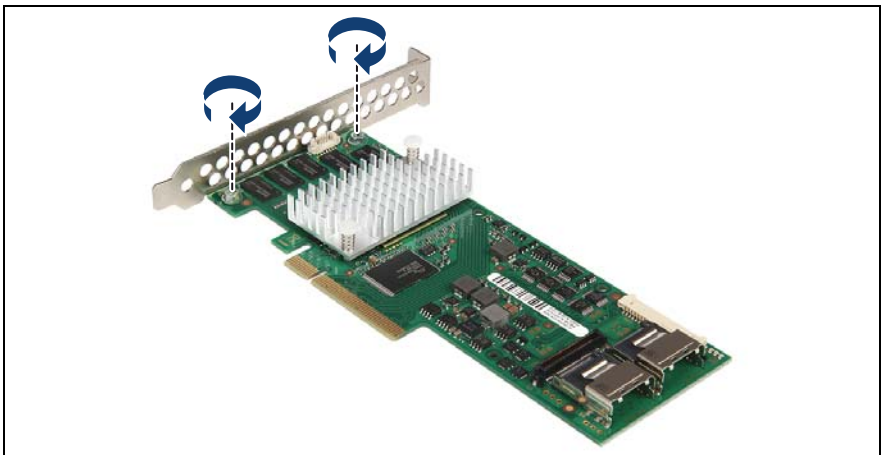


Figure 142: Installing the PCI slot bracket (B)

- ▶ Secure the slot bracket to the controller with two screws.

### Example network adapter D2755

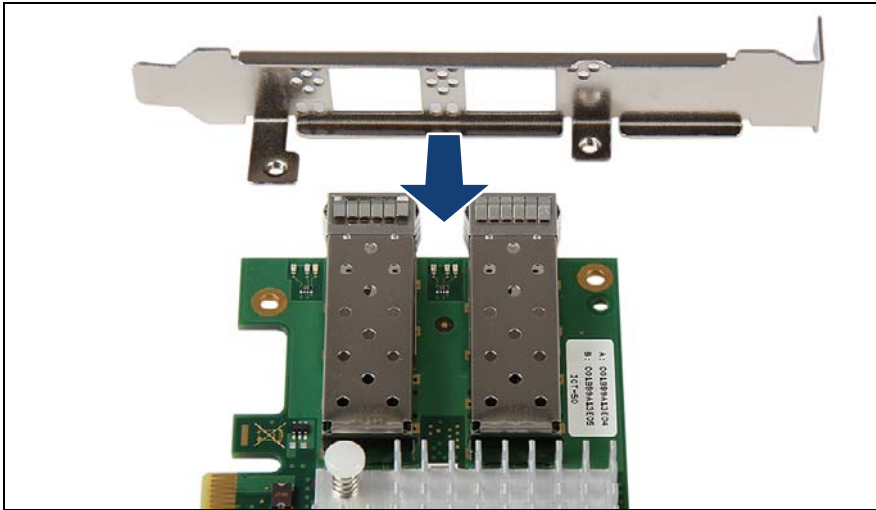


Figure 143: Installing the PCI slot bracket (A)

- ▶ Place the controller on the mounting tabs on the slot bracket.
- ▶ Carefully shift the slot bracket towards the controller until the plug shells engage with the cut-outs in the slot bracket connector panel.

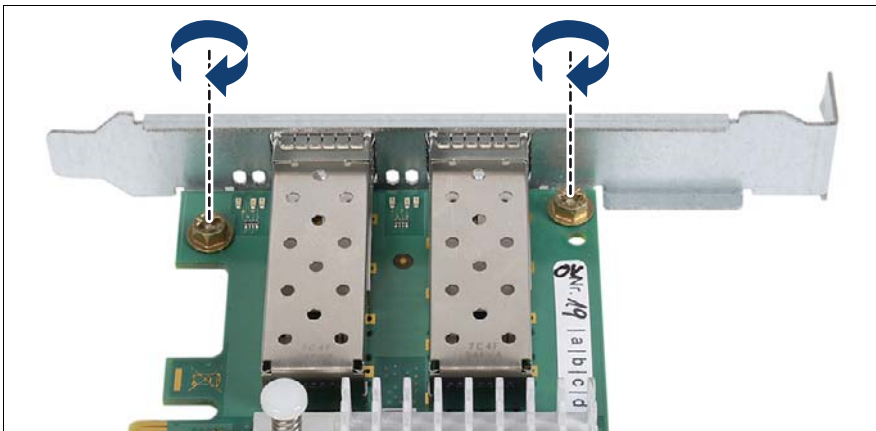


Figure 144: Installing the PCI slot bracket (B)

- ▶ Secure the slot bracket to the controller with two screws.



Figure 145: Assembled LAN controller D2755

### Example USB 3.0 interface card D3305



#### CAUTION!

The USB 3.0 interface card D3305 comes pre-assembled with a full height slot bracket. When replacing the slot bracket, ensure to use the original M3 x 5 mm screws. Standard M3 screws may damage onboard components.

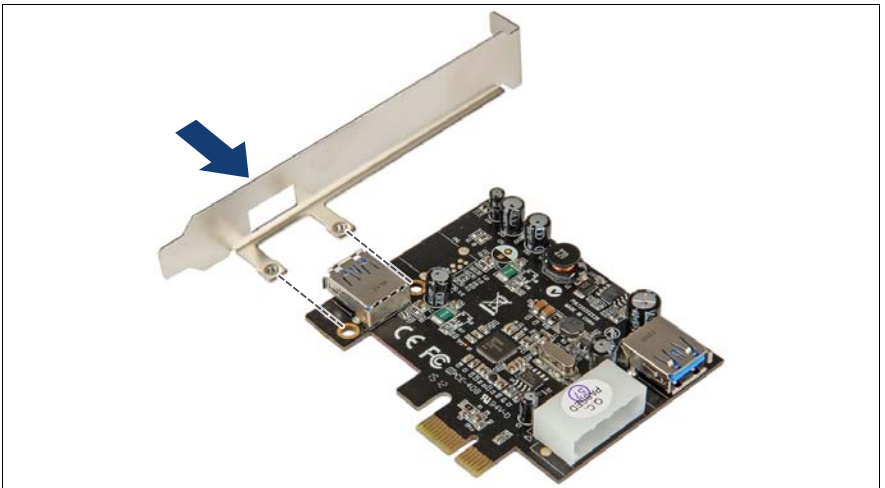


Figure 146: Mounting the PCI slot bracket (A)

- ▶ Place the controller on the mounting tabs on the slot bracket.
- ▶ Carefully shift the slot bracket towards the controller until the plug shells engage with the cut-outs in the slot bracket connector panel.

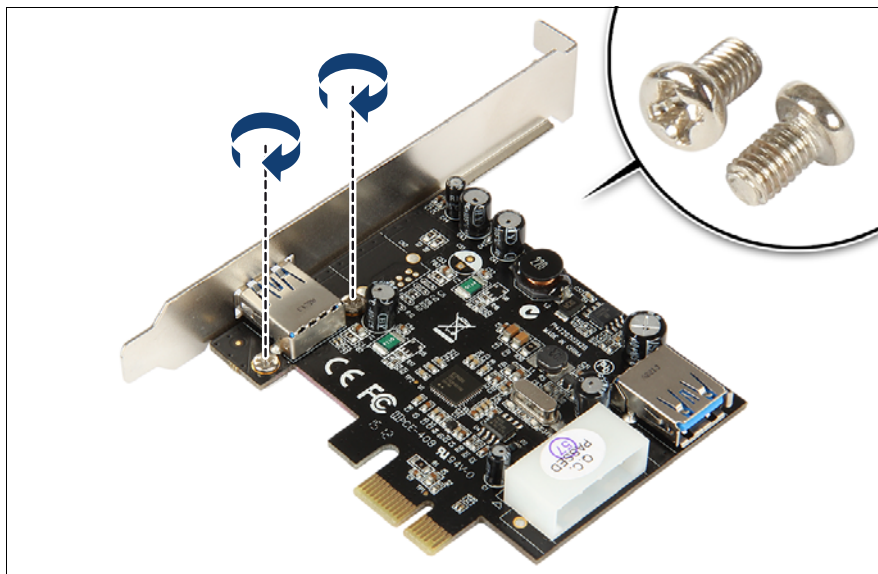


Figure 147: Mounting the PCI slot bracket (B)

- ▶ Secure the slot bracket to the controller with the two M3 x 5 mm screws contained in the expansion card kit.

### 9.2.2 Removing a slot bracket



**Upgrade and Repair Unit (URU)**



**Hardware: 5 minutes**

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

#### Removing the slot bracket

- ▶ Remove the two screws.
- ▶ Remove the controller from the mounting tabs on the slot bracket.

## 9.3 Handling SFP+ transceiver modules

For Fiber Channel over Ethernet (FCoE) configurations, the Ethernet server adapter is equipped with one or two SFP+ (small form-factor pluggable) transceiver modules.

### 9.3.1 Installing SFP+ transceiver modules



**Upgrade and Repair Unit (URU)**



**Hardware: 5 minutes**

**Tools:** tool-less

#### Preparing the SFP+ transceiver module



Figure 148: Removing the protective optical port plug

- ▶ Remove the SFP+ transceiver module from its protective packaging.
- ▶ Remove the optical port plug from the new / additional SFP+ transceiver module.



#### **CAUTION!**

- Always keep the protective port plugs attached to the transceiver optical bores and fiber-optic cable connectors until you are ready to make a connection.
- Save the protective port plug for future use.



Figure 149: Unlatching the locking bail

- ▶ Carefully unlatch and fold down the locking bail on the SFP+ transceiver module.

### Inserting the SFP+ transceiver module



Figure 150: Inserting the SFP+ transceiver module

- ▶ Insert and slide the SFP+ transceiver module into the socket connector as far as it will go.



If only one slot is equipped with a SFP+ transceiver module, use the left connector.

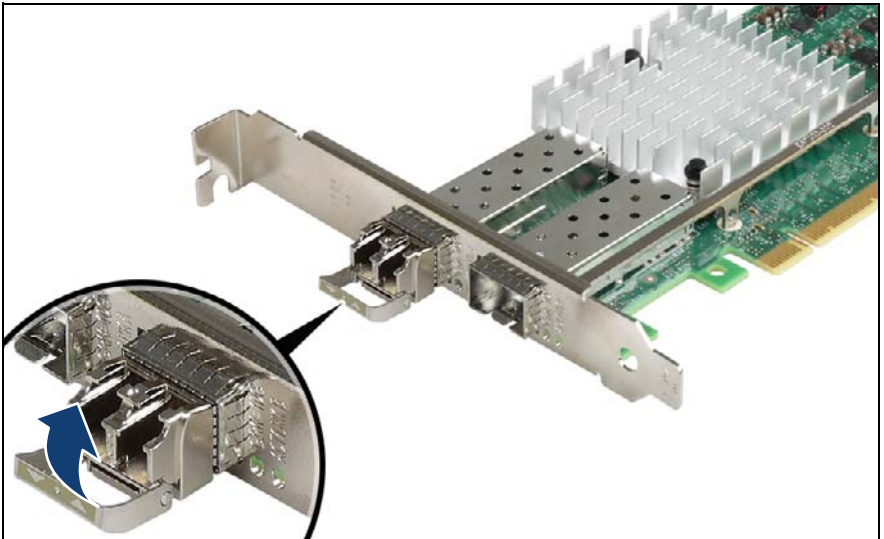


Figure 151: Latching the locking bail

- ▶ Carefully fold up and latch the locking bail.

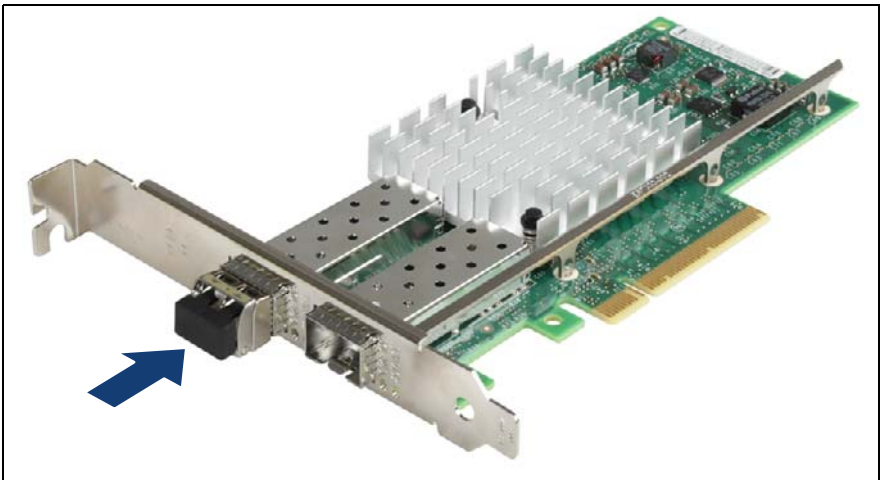


Figure 152: Attaching the protective optical port plug

- ▶ If the SFP+ transceiver module is not immediately connected to an LC connector, attach the protective optical port plug to the transceiver optical bores.

### Installing the secondary SFP+ transceiver module

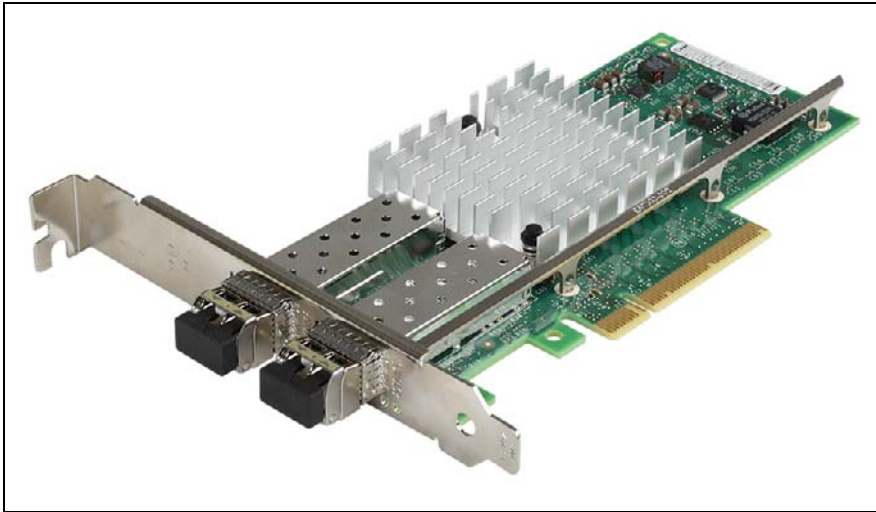


Figure 153: Installing the secondary SFP+ transceiver module

- ▶ If applicable, install the secondary SFP+ transceiver module accordingly.

### 9.3.2 Removing an SFP+ transceiver module



**Upgrade and Repair Unit  
(URU)**



**Hardware: 5 minutes**

**Tools:** tool-less

For Fiber Channel over Ethernet (FCoE) configurations, the ethernet server adapter is equipped with one or two SFP+ (small form-factor pluggable) transceiver modules.



Figure 154: Removing the protective optical port plug

- ▶ If present, remove the protective optical port plug from the SFP+ transceiver module.



**CAUTION!**

Save the protective port plug for future use.

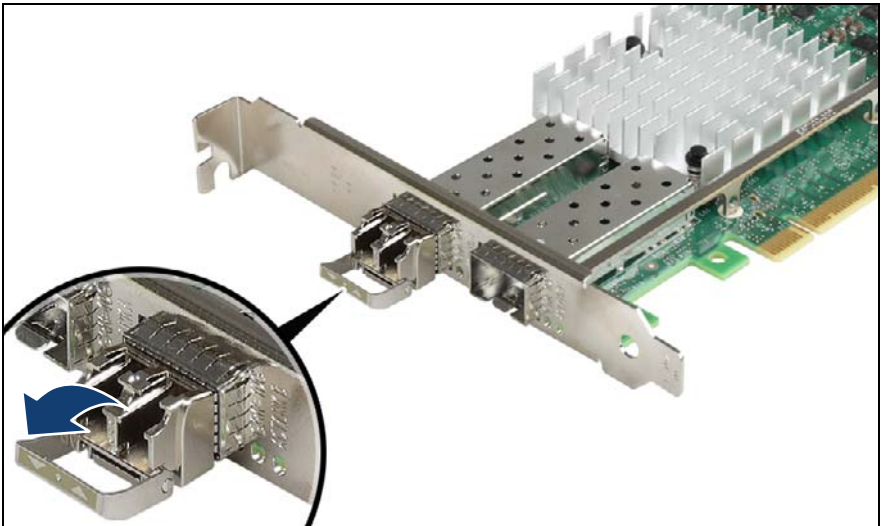


Figure 155: Unlatching the locking bail

- ▶ Carefully unlatch and fold down the locking bail on the SFP+ transceiver module to eject the transceiver from the socket connector.

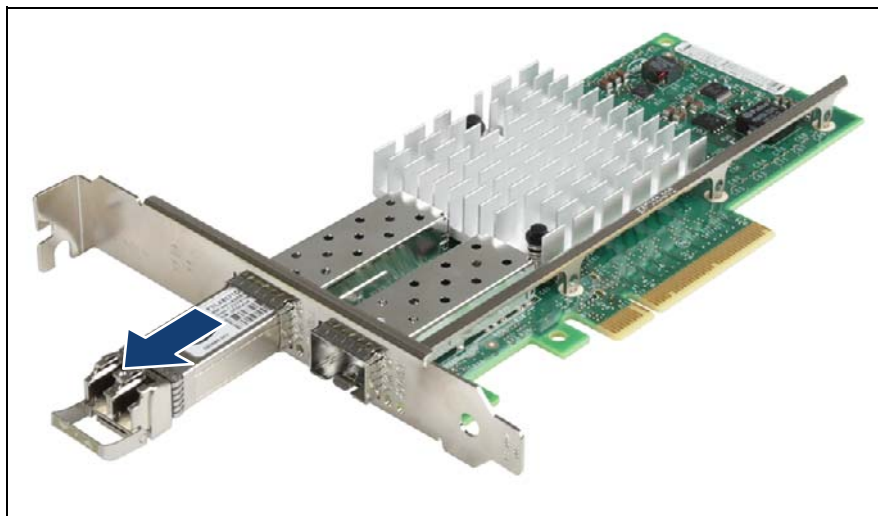


Figure 156: Removing the SFP+ transceiver

- ▶ Pull the SFP+ transceiver module out of its socket connector.
- ▶ Reattach the protective optical port plug to the transceiver optical bores.



Place the removed SFP+ transceiver module in an antistatic bag or other protective environment.

## 9.4 Expansion cards in PCI slots

### 9.4.1 Installing expansion cards



**Upgrade and Repair Unit  
(URU)**



**Hardware: 5 minutes  
Software: 5 minutes**

|   |
|---|
| <b>Tools:</b> Phillips PH2 / (+) No. 2 screw driver |
|---|

#### 9.4.1.1 Preliminary steps

- ▶ ["Suspending BitLocker functionality" on page 77](#)
- ▶ ["Disabling SVOM boot watchdog functionality" on page 78](#)
- ▶ ["Shutting down the server" on page 48](#)
- ▶ ["Disconnecting the server from the mains" on page 48](#)
- ▶ ["Getting access to the component" on page 49](#)

### 9.4.1.2 Removing the PCI slot bracket

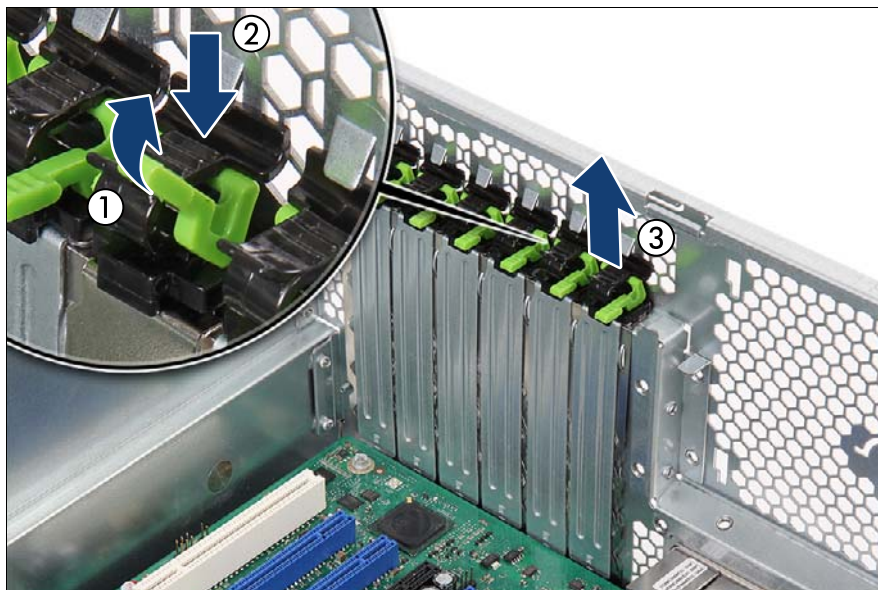


Figure 157: Removing the PCI slot bracket (A)

- ▶ Fold up the locking handle on the slot bracket clamp (1, see close-up).
- ▶ Press down on the slot bracket clamp to disengage it (2, see close-up).
- ▶ Remove the slot bracket clamp (3).
- ▶ If applicable, remove the slot bracket.



#### **CAUTION!**

Keep the slot bracket for further use.

Always replace slot brackets into unused PCI slot openings to comply with applicable EMC regulations and satisfy cooling requirements.

### 9.4.1.3 Installing an expansion card

- ▶ Remove the expansion card from its protective packaging.



For further instructions regarding controller settings, please refer to the accompanying documentation.

- ▶ If applicable, attach the required slot bracket to the expansion card as described in section ["Installing a slot bracket"](#) on page 220.

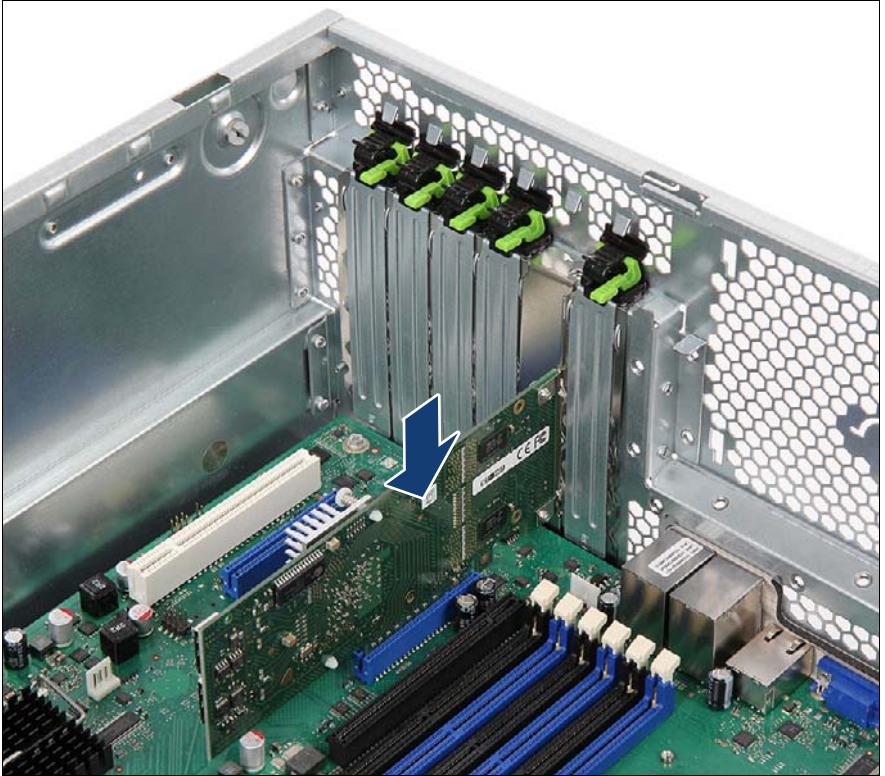


Figure 158: Installing the expansion card (A)

- ▶ Carefully insert the expansion card into the desired PCI slot and press down firmly until it is fully seated in the slot.



For slot preferences, please refer to section ["Basic information"](#) on page 218.

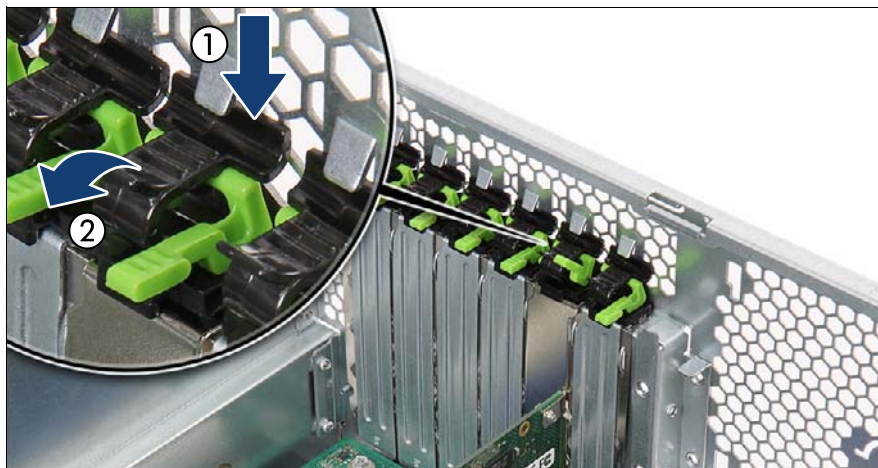


Figure 159: Installing the expansion card (B)

- ▶ Clip on the PCI slot bracket clamp (1).
- ▶ Fold down the locking handle on the PCI slot bracket clamp until it locks in place (2).

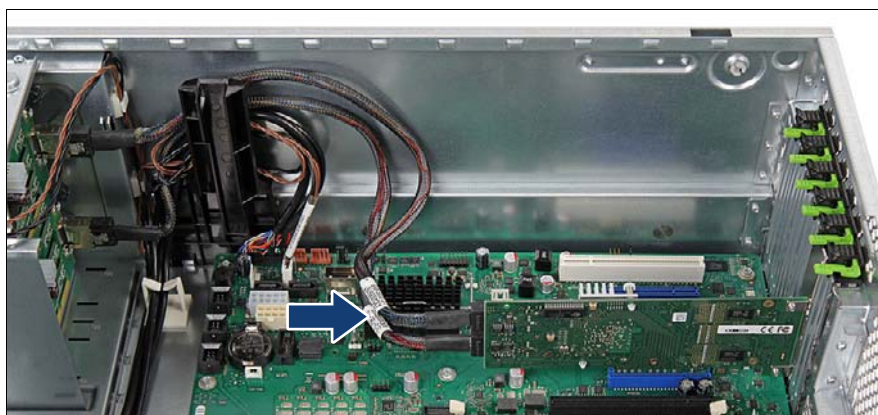


Figure 160: Connecting cables to the expansion card

- ▶ If applicable, connect internal cables to the expansion card (see section "[Cabling plans](#)" on page 399).



### CAUTION!

Ensure that the RAID controller is not deformed.

- ▶ If applicable, install SFP+ transceiver modules to the expansion card as described in sections ["Installing SFP+ transceiver modules" on page 225](#).
- ▶ If applicable, connect a BBU or FBU to the expansion card as described in sections ["Installing a BBU" on page 244](#) or ["Installing an FBU" on page 249](#).

### 9.4.1.4 Concluding steps

- ▶ ["Reassembling" on page 62](#)
- ▶ Reconnect all external cables to the replaced expansion card.
- ▶ ["Connecting the server to the mains" on page 72](#)
- ▶ ["Switching on the server" on page 73](#)
- ▶ ["Updating RAID controller firmware" on page 89](#)
- ▶ If applicable, ["Enabling Option ROM scan" on page 90](#) .
- ▶ ["Enabling SVOM boot watchdog functionality" on page 97](#)
- ▶ ["Resuming BitLocker functionality" on page 103](#)
- ▶ If applicable, ["After replacing / upgrading LAN controllers" on page 107](#)

## 9.4.2 Removing expansion cards



**Upgrade and Repair Unit (URU)**



**Hardware: 5 minutes**

|                         |
|-------------------------|
| <b>Tools:</b> tool-less |
|-------------------------|

### 9.4.2.1 Preliminary steps

- ▶ ["Suspending BitLocker functionality" on page 77](#)
- ▶ ["Shutting down the server" on page 48](#)
- ▶ Remove all external cables from the expansion card to be removed.
- ▶ ["Disconnecting the server from the mains" on page 48](#)
- ▶ ["Getting access to the component" on page 49](#)

### 9.4.2.2 Removing an expansion card

- ▶ If applicable, disconnect internal cables from the expansion card.
- ▶ If applicable, remove SFP+ transceiver modules ["Removing an SFP+ transceiver module"](#) on page 228.

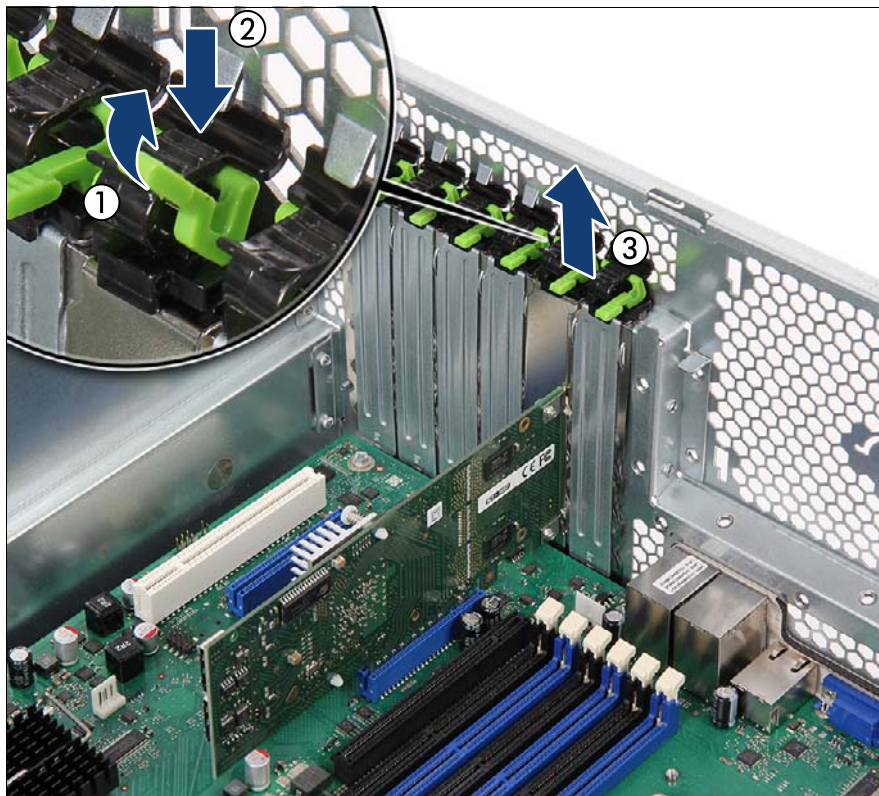


Figure 161: Removing the expansion card (A)

- ▶ Fold up the locking handle on the slot bracket clamp (1, see close-up).
- ▶ Press down on the slot bracket clamp to disengage it (2, see close-up).
- ▶ Remove the slot bracket clamp (3).

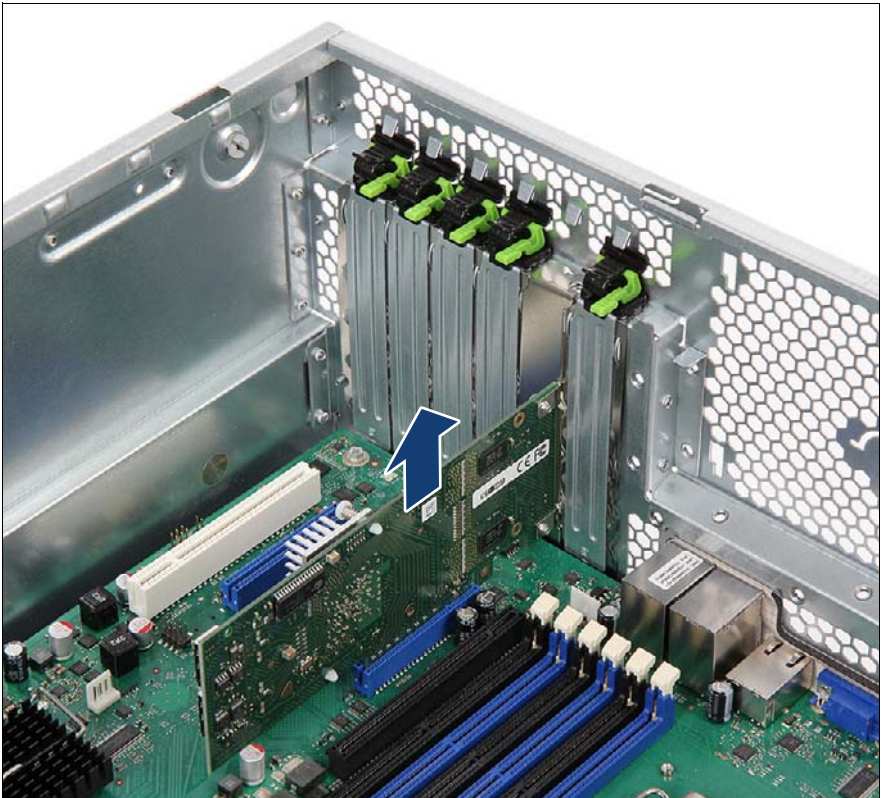


Figure 162: Removing the expansion card (B)

- ▶ Carefully pull up on the expansion card in a vertical motion and remove it from its slot.

### 9.4.2.3 Installing a PCI slot bracket



#### CAUTION!

Always replace slot brackets into unused PCI slot openings to comply with applicable EMC regulations and satisfy cooling requirements.

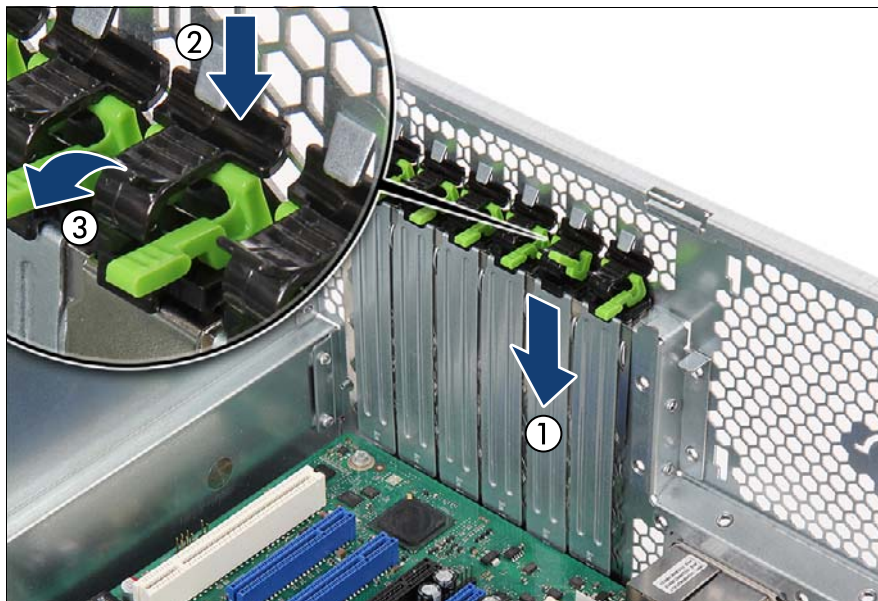


Figure 163: Installing a PCI slot bracket

- ▶ Insert a PCI slot bracket into the unused PCI slot opening (1).
- ▶ Clip on the PCI slot bracket clamp (2).
- ▶ Fold down the locking handle on the PCI slot bracket clamp until it locks in place (3).

### 9.4.2.4 Concluding steps

- ▶ ["Reassembling" on page 62](#)
- ▶ ["Connecting the server to the mains" on page 72](#)
- ▶ ["Switching on the server" on page 73](#)
- ▶ ["Resuming BitLocker functionality" on page 103](#)

### 9.4.3 Replacing expansion cards



**Upgrade and Repair Unit (URU)**



**Hardware: 5 minutes**  
**Software: 5 minutes**

**Tools:** Phillips PH2 / (+) No. 2 screw driver (only for installing slot brackets)

#### Note on network settings recovery



When replacing network controllers or the system board, network configuration settings in the operating system 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 controller or the system board.

#### 9.4.3.1 Preliminary steps

- ▶ If applicable, ["Note on network settings recovery"](#) on page 239.
- ▶ ["Suspending BitLocker functionality"](#) on page 77
- ▶ ["Disabling SVOM boot watchdog functionality"](#) on page 78
- ▶ ["Locating the defective server"](#) on page 45
- ▶ ["Shutting down the server"](#) on page 48
- ▶ ["Disconnecting the server from the mains"](#) on page 48
- ▶ Remove all external cables from the expansion card to be replaced.
- ▶ ["Getting access to the component"](#) on page 49
- ▶ Locate the defective expansion card using the onboard Local Diagnostic LEDs as described in section ["Onboard indicators and controls"](#) on page 414.

#### 9.4.3.2 Removing the defective expansion card

- ▶ Remove the expansion card as described in section ["Removing expansion cards"](#) on page 235.

- ▶ If the slot bracket on the defective expansion card is to be reused, remove it from the board as described in section ["Removing a slot bracket" on page 224](#).

### 9.4.3.3 Installing the new expansion card

- ▶ If applicable, install a slot bracket on the new expansion card as described in section ["Installing a slot bracket" on page 220](#).
- ▶ Install the expansion card as described in section ["Installing expansion cards" on page 231](#).

### 9.4.3.4 Concluding steps

- ▶ ["Reassembling" on page 62](#)
- ▶ Reconnect all external cables to the replaced expansion card.
- ▶ ["Connecting the server to the mains" on page 72](#)
- ▶ ["Enabling replaced components in the system BIOS" on page 98](#)
- ▶ Inform the customer about changed WWN and MAC addresses. For further information, refer to section ["Looking up changed MAC / WWN addresses" on page 104](#).
- ▶ ["Updating the NIC configuration file in a Linux environment" on page 101](#)
- ▶ ["Updating RAID controller firmware" on page 89](#)
- ▶ ["Enabling SVOM boot watchdog functionality" on page 97](#)
- ▶ ["Switching on the server" on page 73](#)
- ▶ ["Resuming BitLocker functionality" on page 103](#)
- ▶ 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 further information, please refer to section ["Note on network settings recovery" on page 239](#).

- ▶ If applicable, ["After replacing / upgrading LAN controllers" on page 107](#).

## 9.4.4 Replacing TFM



**Upgrade and Repair Unit (URU)**



**Hardware: 5 minutes**

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

### 9.4.4.1 Preliminary steps

- ▶ ["Locating the defective server" on page 45](#)
- ▶ ["Shutting down the server" on page 48](#)
- ▶ ["Disconnecting the server from the mains" on page 48](#)
- ▶ Remove all external cables from the expansion card to be replaced.
- ▶ ["Getting access to the component" on page 49](#)
- ▶ Locate the defective expansion card using the onboard Local Diagnostic LEDs as described in section ["Onboard indicators and controls" on page 414](#).

### 9.4.4.2 Removing the defective TFM

- ▶ Remove the depending expansion card as described in section ["Removing an expansion card" on page 236](#).
- ▶ Disconnect the FBU cable from the TFM.

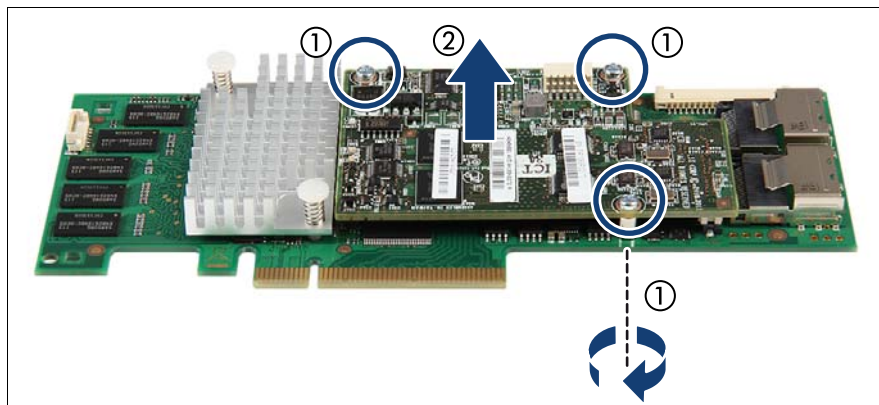


Figure 164: Removing the TFM

- ▶ Remove the three screws (1).
- ▶ Remove the TFM (2).

### 9.4.4.3 Installing the new TFM

- ▶ Install the new TFM as described in section ["Installing TFM to the RAID controller \(if applicable\)"](#) on page 249.
- ▶ Connect the FBU cable to the TFM.
- ▶ Install the expansion card as described in section ["Installing an expansion card"](#) on page 232.

### 9.4.4.4 Concluding steps

- ▶ ["Reassembling"](#) on page 62
- ▶ Reconnect all external cables to the replaced expansion card.
- ▶ ["Connecting the server to the mains"](#) on page 72
- ▶ ["Switching on the server"](#) on page 73

## 9.5 Backup Units

### 9.5.1 Basic information

The Battery Backup Unit (BBU) or Flash Backup Unit (FBU) backs up the memory contents of the connected SAS RAID controller in the event of a power failure. The server can accommodate up to two backup units.

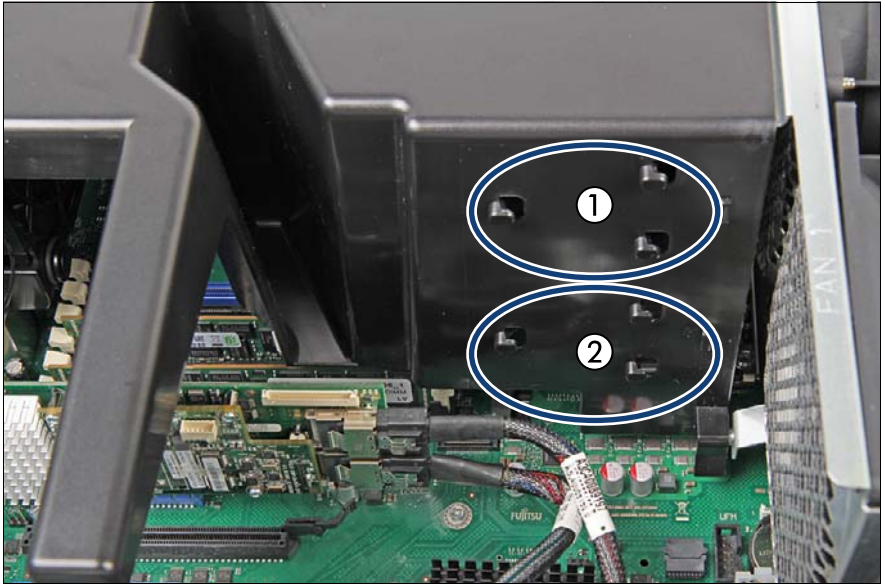


Figure 165: BBU / FBU mounting positions

|   |  |
|---|--|
| 1 | Mounting position for first BBU / FBU  |
| 2 | Mounting position for second BBU / FBU |

### 9.5.2 Installing a BBU



**Upgrade and Repair Unit  
(URU)**



**Hardware: 5 minutes**

**Tools:** tool-less



#### **CAUTION!**

For further safety information, please refer to chapter ["Important information" on page 33](#).

#### 9.5.2.1 Preliminary steps

- ▶ ["Disabling SVOM boot watchdog functionality" on page 78](#)
- ▶ ["Shutting down the server" on page 48](#)
- ▶ ["Disconnecting the server from the mains" on page 48](#)
- ▶ ["Getting access to the component" on page 49](#)

### 9.5.2.2 Installing the BBU

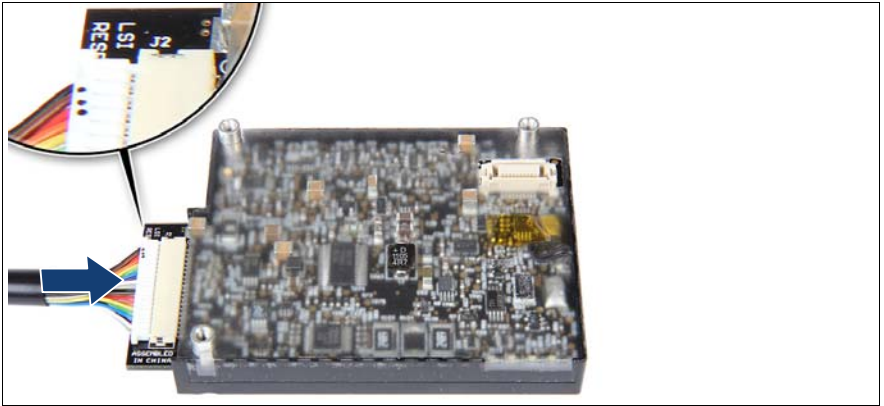


Figure 166: Connecting the BBU cable

- ▶ Connect the BBU cable to the BBU board.



#### CAUTION!

Make sure that the connector side with the three dots points towards you (see close-up). Otherwise, short-circuits may result!

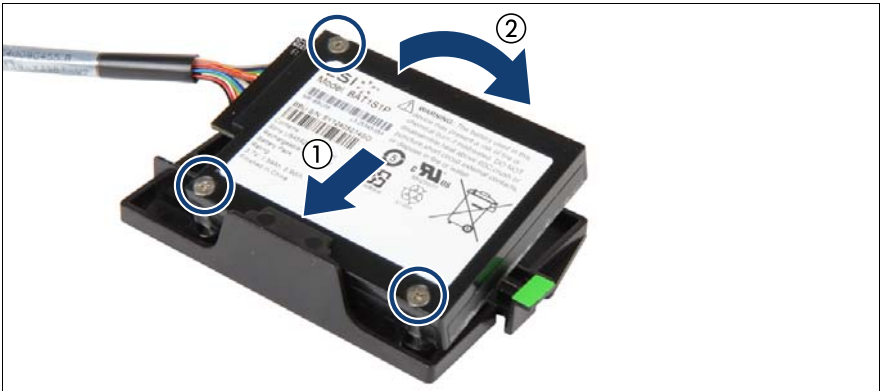


Figure 167: Installing the BBU in the BBU holder

- ▶ At a slight angle, fit the BBU under the right retaining bracket on the BBU holder (1).
- ▶ Fold down the BBU until it locks in place (2).

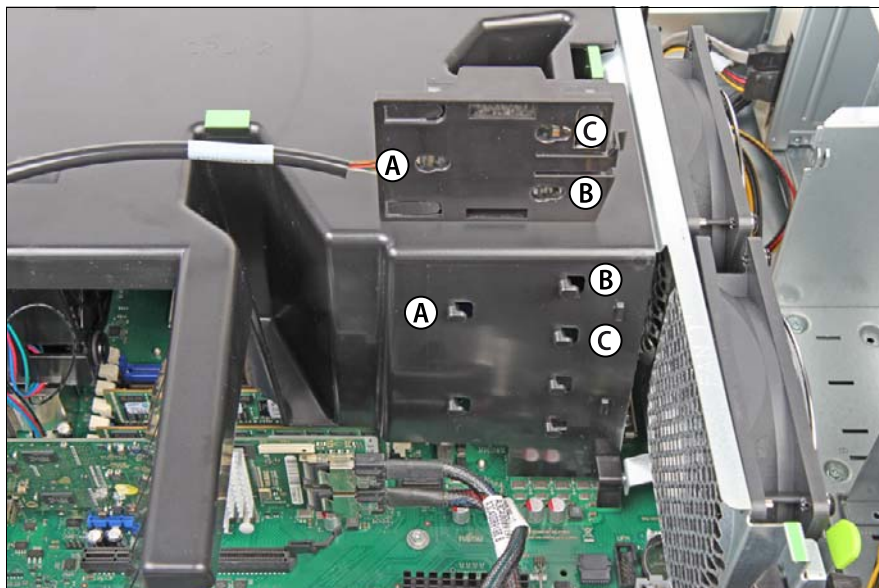


Figure 168: Mounting the BBU holder (A)



Note the positions of the fixation bolts on the side of the system air duct and corresponding keyhole slots on the BBU holder.

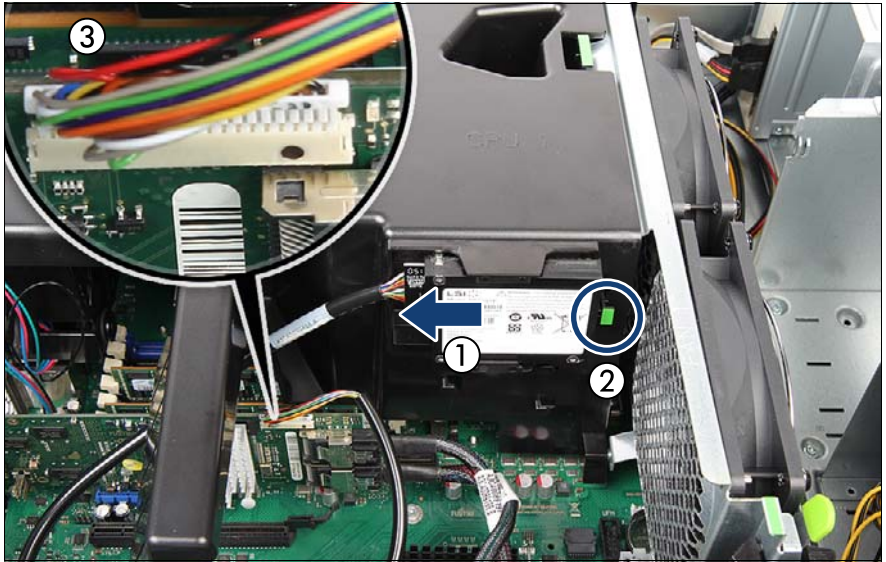


Figure 169: Mounting the BBU holder (B)

- ▶ Insert the BBU holder into the chassis so that the three hooks on the air duct rest in the wide ends of the keyhole slots on the BBU holder.
- ▶ Slide the BBU holder in as far as it will go (1).  
The hooks on the air duct will lock in the narrow ends of the keyhole slots on the BBU holder.
- ▶ Ensure that the locking handle on the BBU holder properly snaps in place (2).
- ▶ If applicable, install a RAID controller as described in section ["Installing expansion cards" on page 231](#).
- ▶ Connect the BBU cable to the RAID controller (3, see close-up).



**CAUTION!**

Make sure that the connector side with the three dots points towards you. Otherwise, short-circuits may result!

### 9.5.2.3 Concluding steps

- ▶ ["Reassembling" on page 62](#)
- ▶ ["Connecting the server to the mains" on page 72](#)
- ▶ ["Switching on the server" on page 73](#)
- ▶ If applicable, ["Updating RAID controller firmware" on page 89](#)
- ▶ ["Enabling SVOM boot watchdog functionality" on page 97](#)

### Note on BBU charging and calibration

The BBU may be deeply discharged due to extended storage time and wrongly show as bad or defective in the ServerView RAID Manager.

In this case, the BBU will automatically enter a trickle charge cycle for recovery. This initial charge may take up to 12 hours before the BBU will initiate a recalibration cycle.

- ▶ Enter the ServerView RAID Manager and check the current BBU status.



For further information, please refer to the "ServerView Suite RAID Management" user guide.

- ▶ If the BBU is shown as bad or defective, do not power off the server for at least 12 hours to allow the charge and calibration cycles to finish.
- ▶ If the BBU status does not change after 12 hours, please try to initiate the recalibration process manually using the ServerView RAID Manager.



If this procedure still does not fix the BBU status, please contact your local Fujitsu customer service partner.

### 9.5.3 Installing an FBU



**Upgrade and Repair Unit (URU)**



**Hardware: 10 minutes**

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



**CAUTION!**

For further safety information, please refer to chapter "[Important information](#)" on page 33.

#### 9.5.3.1 Preliminary steps

- ▶ "[Disabling SVOM boot watchdog functionality](#)" on page 78
- ▶ "[Shutting down the server](#)" on page 48
- ▶ "[Disconnecting the server from the mains](#)" on page 48
- ▶ "[Getting access to the component](#)" on page 49

#### 9.5.3.2 Installing TFM to the RAID controller (if applicable)

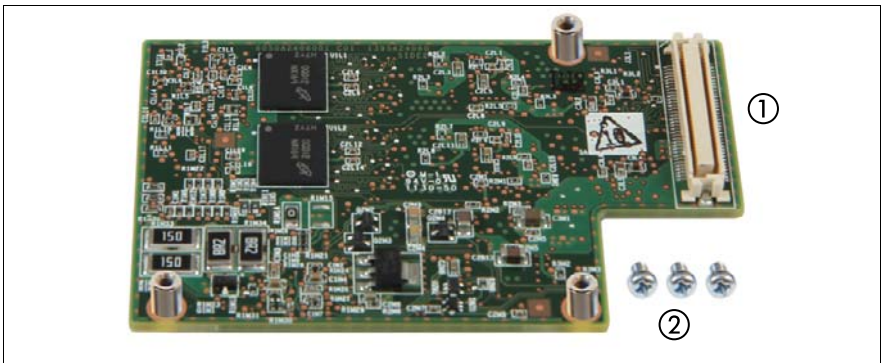


Figure 170: TFM kit

|   |     |   |        |
|---|-----|---|--------|
| 1 | TFM | 2 | Screws |
|---|-----|---|--------|

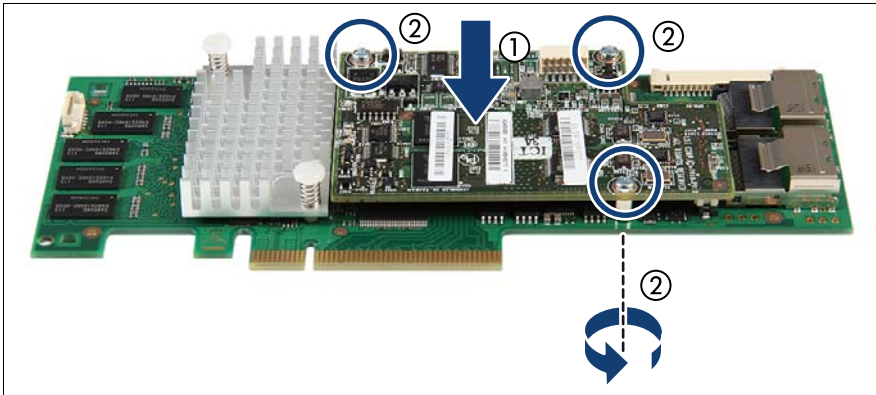


Figure 171: Installing TFM

- ▶ Fit the spacer bolts of the TFM on the RAID controller (1).
- ▶ Secure the TFM on the RAID controller with the three screws (2).

### 9.5.3.3 Installing the FBU

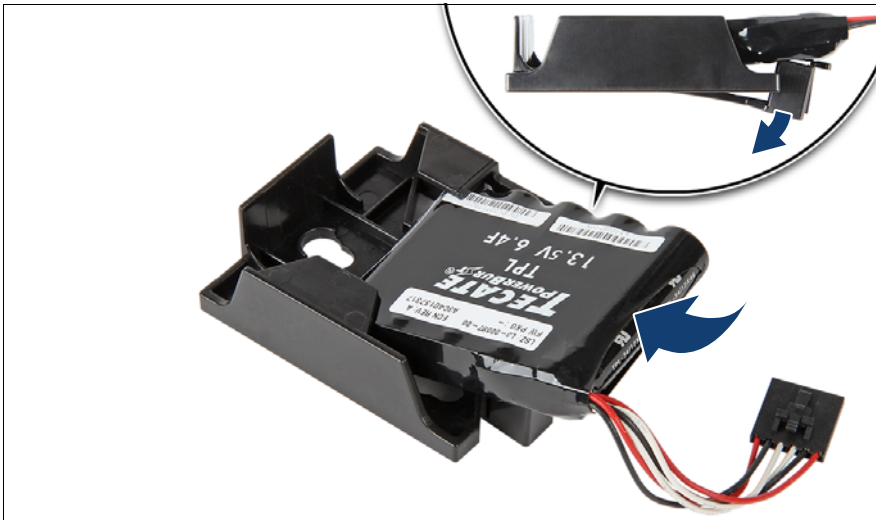


Figure 172: Installing the FBU in the holder (A)

- ▶ At a slight angle, fit the FBU under the right retaining bracket on the holder.
- ▶ Push down the FBU until it locks in place.

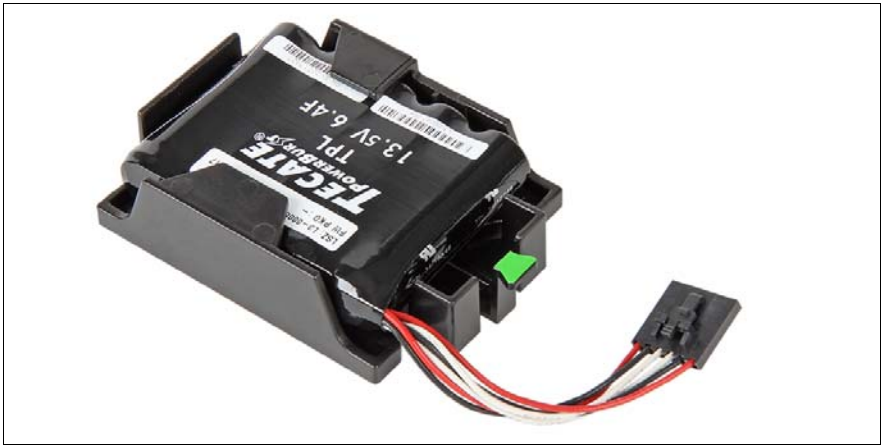


Figure 173: Installing the FBU in the holder (B)

- ▶ Ensure that the FBU is properly seated in the holder.

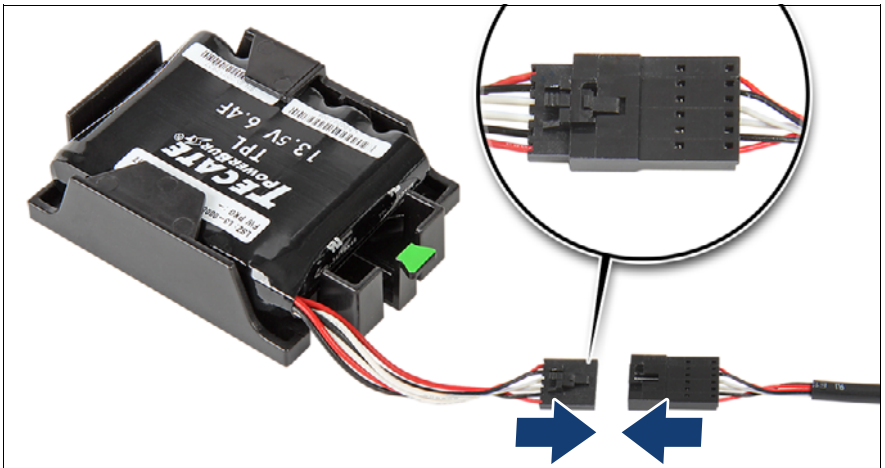


Figure 174: Connecting the FBU cable

- ▶ Connect the FBU cable to the FBU.

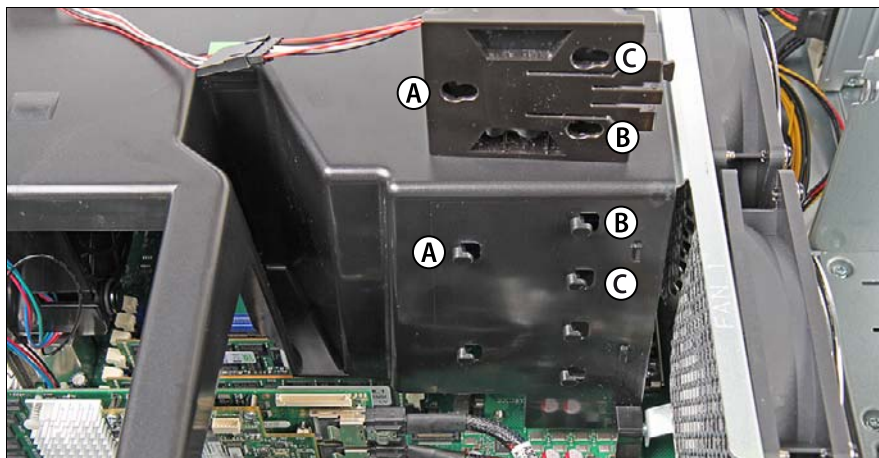


Figure 175: Mounting the FBU holder (A)



Note the positions of the fixation bolts on the side of the system air duct (A-C) and corresponding keyhole slots on the FBU holder.

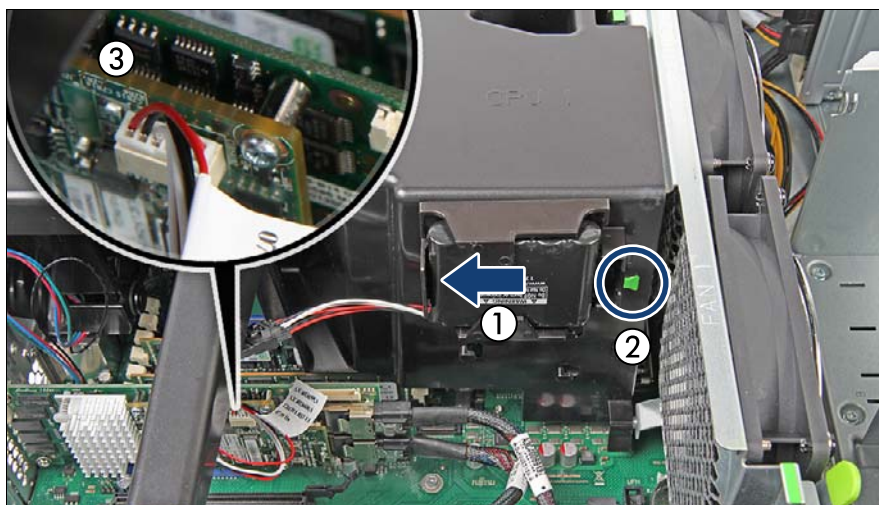


Figure 176: Mounting the FBU holder (B)

- ▶ Insert the FBU holder into the chassis so that the three hooks on the air duct rest in the wide ends of the keyhole slots on the FBU holder.
- ▶ Slide the FBU holder in as far as it will go (1).

The hooks on the air duct will lock in the narrow ends of the keyhole slots on the FBU holder.

- ▶ Ensure that the locking handle on the FBU holder properly snaps in place (2).
- ▶ If applicable, install a RAID controller as described in section "[Installing expansion cards](#)" on page 231.
- ▶ Connect the FBU cable to the TFM (3, see close-up).

### 9.5.3.4 Concluding steps

- ▶ "[Reassembling](#)" on page 62
- ▶ "[Connecting the server to the mains](#)" on page 72
- ▶ "[Switching on the server](#)" on page 73
- ▶ If applicable, "[Updating RAID controller firmware](#)" on page 89
- ▶ "[Enabling SVOM boot watchdog functionality](#)" on page 97

## 9.5.4 Removing a BBU



**Upgrade and Repair Unit (URU)**



**Hardware: 5 minutes**

|                         |
|-------------------------|
| <b>Tools:</b> tool-less |
|-------------------------|



### **CAUTION!**

Do not throw battery backup units into the trash can. Batteries must be disposed of in accordance with local regulations concerning special waste.

For further safety information, please refer to section "[Environmental protection](#)" on page 42.

### 9.5.4.1 Preliminary steps

- ▶ ["Disabling SVOM boot watchdog functionality" on page 78](#)
- ▶ ["Shutting down the server" on page 48](#)
- ▶ ["Disconnecting the server from the mains" on page 48](#)
- ▶ ["Getting access to the component" on page 49](#)

### 9.5.4.2 Removing the BBU

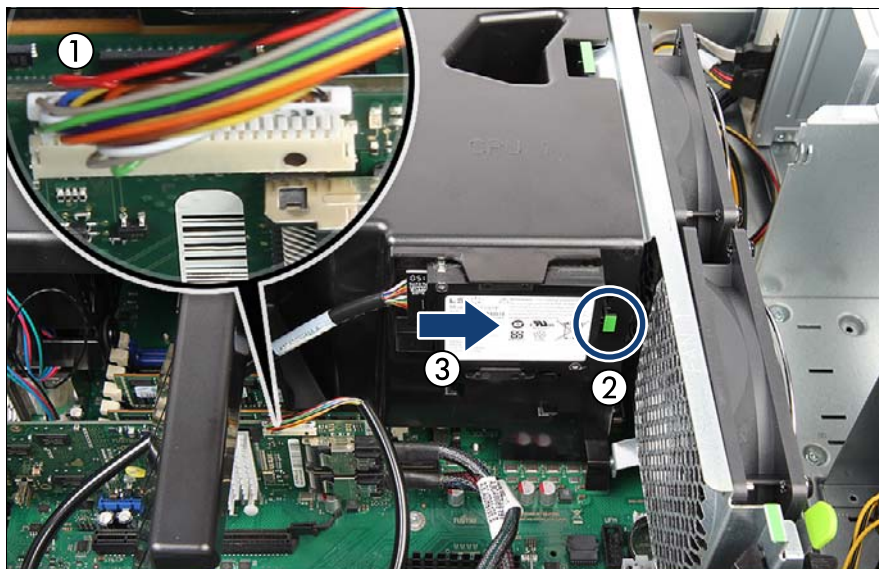


Figure 177: Removing the BBU holder from the chassis

- ▶ Carefully disconnect the BBU cable from the RAID controller (1).
- ▶ Lift up the green locking handle on the BBU holder (2, see close-up) while sliding the BBU holder in the direction of the arrow as far as it will go (3).



After that, the hooks on the air duct will rest in the wide ends of the keyhole slots on the holder.

- ▶ Lift the BBU holder out of the chassis.



Figure 178: Removing the BBU from the holder

- ▶ Press out on the retaining bracket on the holder (1), lift the battery at the bottom side and remove the BBU at a slight angle out of the holder (2).

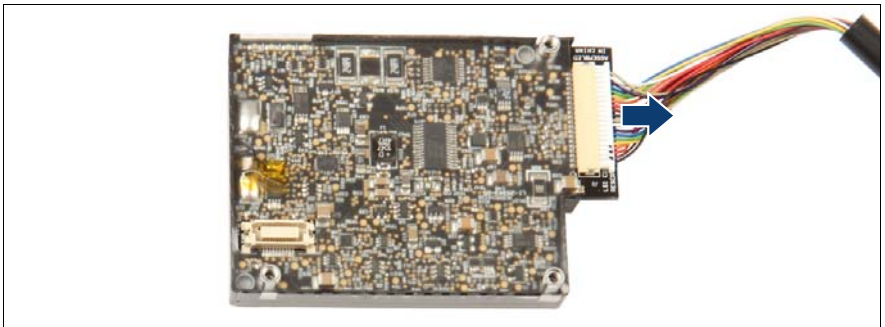


Figure 179: Disconnecting the BBU cable from the BBU

- ▶ Disconnect the BBU cable from the BBU.

### 9.5.4.3 Concluding steps

- ▶ ["Reassembling" on page 62](#)
- ▶ ["Connecting the server to the mains" on page 72](#)
- ▶ ["Switching on the server" on page 73](#)
- ▶ If applicable, ["Updating RAID controller firmware" on page 89](#)
- ▶ ["Enabling SVOM boot watchdog functionality" on page 97](#)

### 9.5.5 Removing an FBU



**Upgrade and Repair Unit (URU)**



**Hardware: 5 minutes**

**Tools:** tool-less



#### **CAUTION!**

Do not throw FBUs into the trash can. Batteries must be disposed of in accordance with local regulations concerning special waste.

For further safety information, please refer to section "[Environmental protection](#)" on page 42.

#### **9.5.5.1 Preliminary steps**

- ▶ "[Disabling SVOM boot watchdog functionality](#)" on page 78
- ▶ "[Shutting down the server](#)" on page 48
- ▶ "[Disconnecting the server from the mains](#)" on page 48
- ▶ "[Getting access to the component](#)" on page 49

### 9.5.5.2 Removing the FBU

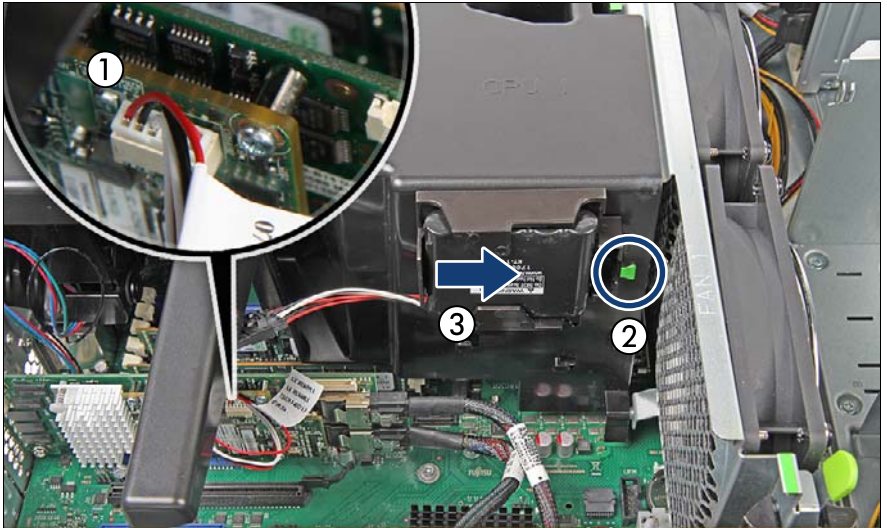


Figure 180: Removing the FBU holder from the chassis

- ▶ Carefully disconnect the FBU cable from the RAID controller (1).
- ▶ Lift up the green locking handle on the FBU holder (2) while sliding the FBU holder in the direction of the arrow as far as it will go (3).

**i** After that, the hooks on the air duct will rest in the wide ends of the keyhole slots on the holder.

- ▶ Lift the FBU holder out of the chassis.

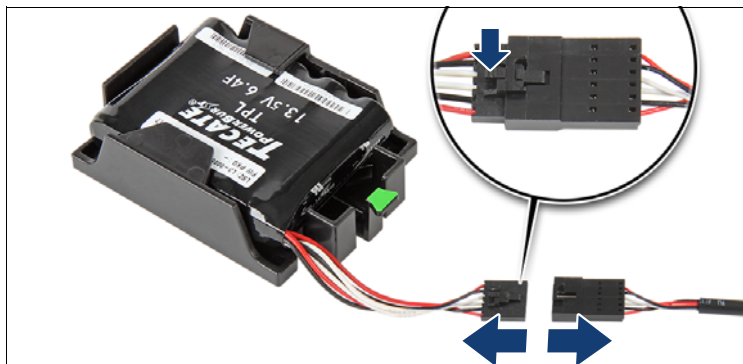


Figure 181: Disconnecting the FBU cable from the FBU

- ▶ Disconnect the FBU cable from the FBU.

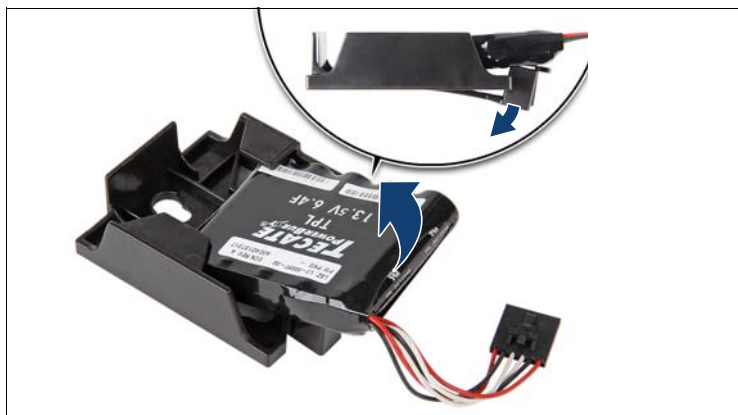


Figure 182: Removing the FBU from the holder

- ▶ Pull the FBU at a slight angle out of the holder.

### 9.5.5.3 Concluding steps

- ▶ ["Reassembling" on page 62](#)
- ▶ ["Connecting the server to the mains" on page 72](#)
- ▶ ["Switching on the server" on page 73](#)
- ▶ If applicable, ["Updating RAID controller firmware" on page 89](#)
- ▶ ["Enabling SVOM boot watchdog functionality" on page 97](#)

## 9.5.6 Replacing a BBU



**Upgrade and Repair Unit  
(URU)**



**Hardware: 10 minutes**

**Tools:** tool-less



### **CAUTION!**

Do not throw battery backup units into the trash can. Batteries must be disposed of in accordance with local regulations concerning special waste.

For further safety information, please refer to section ["Environmental protection"](#) on page 42.

### **9.5.6.1 Preliminary steps**

- ▶ ["Locating the defective server"](#) on page 45
- ▶ ["Disabling SVOM boot watchdog functionality"](#) on page 78
- ▶ ["Shutting down the server"](#) on page 48
- ▶ ["Disconnecting the server from the mains"](#) on page 48
- ▶ ["Getting access to the component"](#) on page 49

### **9.5.6.2 Removing the defective BBU**

- ▶ Remove the BBU as described in section ["Removing the BBU"](#) on page 254.

### **9.5.6.3 Installing the new BBU**

- ▶ Install the BBU as described in section ["Installing the BBU"](#) on page 245.

### **9.5.6.4 Concluding steps**

- ▶ ["Reassembling"](#) on page 62
- ▶ ["Connecting the server to the mains"](#) on page 72
- ▶ ["Switching on the server"](#) on page 73

## Expansion cards and backup units

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- ▶ If applicable, ["Updating RAID controller firmware" on page 89](#)
- ▶ ["Enabling SVOM boot watchdog functionality" on page 97](#)

### Note on BBU charging and calibration

The BBU may be deeply discharged due to extended storage time and wrongly show as bad or defective in the ServerView RAID Manager.

In this case, the BBU will automatically enter a trickle charge cycle for recovery. This initial charge may take up to 12 hours before the BBU will initiate a recalibration cycle.

- ▶ Enter the ServerView RAID Manager and check the current BBU status.



For further information, please refer to the "ServerView Suite RAID Management" user guide.

- ▶ If the BBU is shown as bad or defective, do not power off the server for at least 12 hours to allow the charge and calibration cycles to finish.
- ▶ If the BBU status does not change after 12 hours, please try to initiate the recalibration process manually using the ServerView RAID Manager.



If this procedure still does not fix the BBU status, please contact your local Fujitsu customer service partner.

## 9.5.7 Replacing an FBU



**Upgrade and Repair Unit (URU)**



**Hardware: 10 minutes**

**Tools:** tool-less



### CAUTION!

Do not throw battery FBUs into the trash can. Batteries must be disposed of in accordance with local regulations concerning special waste.

For further safety information, please refer to section ["Environmental protection" on page 42](#).

### 9.5.7.1 Preliminary steps

- ▶ ["Locating the defective server" on page 45](#)
- ▶ ["Disabling SVOM boot watchdog functionality" on page 78](#)
- ▶ ["Shutting down the server" on page 48](#)
- ▶ ["Disconnecting the server from the mains" on page 48](#)
- ▶ ["Getting access to the component" on page 49](#)

### 9.5.7.2 Removing the defective FBU

- ▶ Remove the FBU as described in section ["Removing the FBU" on page 257](#).

### 9.5.7.3 Installing the new FBU

- ▶ Install the FBU as described in section ["Installing the FBU" on page 250](#).

### 9.5.7.4 Concluding steps

- ▶ ["Reassembling" on page 62](#)
- ▶ ["Connecting the server to the mains" on page 72](#)
- ▶ ["Switching on the server" on page 73](#)
- ▶ If applicable, ["Updating RAID controller firmware" on page 89](#)
- ▶ ["Enabling SVOM boot watchdog functionality" on page 97](#)



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# 10 Main memory

## Safety notes



### CAUTION!

- Do not install unsupported third party memory modules. For further information on supported memory modules, refer to section "[Basic information](#)" on page 264.
- Memory modules remain hot after shutdown. Wait for components to cool down before installing or removing memory modules to prevent burns.
- Do not insert and remove memory modules repeatedly. Doing so may cause failures.
- Pressing out the securing clips on the memory slot will eject the installed memory module. To prevent damage and injuries eject memory modules carefully without applying excessive force.
- For further information, please refer to chapter "[Important information](#)" on page 33.

## 10.1 Basic information

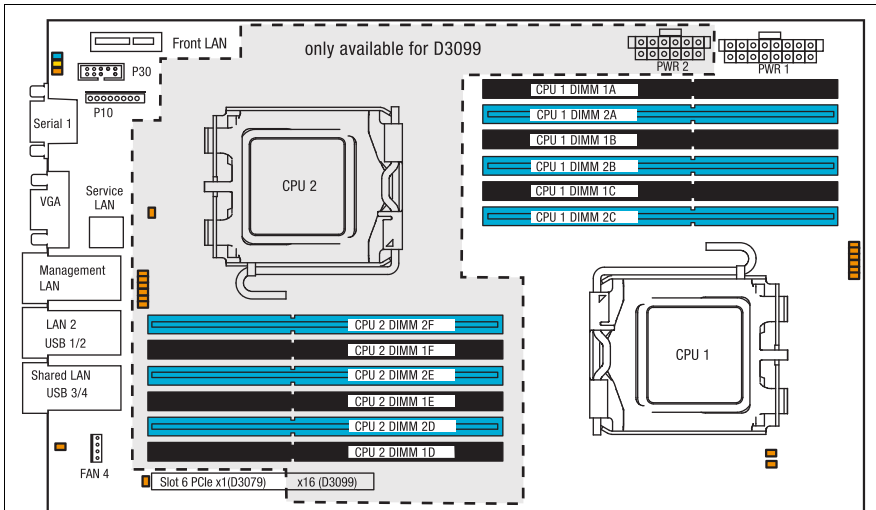


Figure 183: Memory overview

- The system board is equipped with 12 memory slots (6 memory slots per CPU)
- The system has to be equipped with at least one memory module per CPU.
- Supported capacities: 4 GB, 8 GB, or 16 GB
- Maximum amount of RAM: 192 GB
- Supported memory modules:  
DDR3-1600 PC3-12800

| Type                           | Ranking |    | Error Correction |
|--------------------------------|---------|----|------------------|
|                                | SR      | DR |                  |
| SR: Single-Rank, DR: Dual-Rank |         |    |                  |
| RDIMMs (Registered DIMMs)      | o       | o  | ECC or non-ECC   |

**Population rules**

- Populate memory slot 1 / channel A (DIMM 1A) first.
- In case of dual processor configurations, populate memory slot 1 / channel D (DIMM 1D) second.
- Within all channels, memory slot 1 must be populated prior to slot 2.
- If memory modules with different capacities are used:
  - Populate modules with higher capacities first.
  - Within a channel, populate modules in descending order of capacity.
- If memory modules with different speeds are used, the lowest clock rate applies for all DIMMs.  
Regardless of the mode, all DIMMs will run at the highest common frequency that is allowed by the SPD Data of the DIMMs and the maximum speed of the selected configuration.
- Mixing UDIMMs or RDIMMs is not allowed.
- Mixing ECC and non-ECC DIMMs is not allowed.

# Main memory

## Independent Channel mode

| CPU     | CPU 1                  |    |    |    |    |    | CPU 2 |    |    |    |    |    |
|---------|------------------------|----|----|----|----|----|-------|----|----|----|----|----|
| Channel | A                      |    | B  |    | C  |    | D     |    | E  |    | F  |    |
| DIMM    | 1A                     | 2A | 1B | 2B | 1C | 2C | 1D    | 2D | 1E | 2E | 1F | 2F |
| # DIMMs | Mono CPU configuration |    |    |    |    |    |       |    |    |    |    |    |
| 1       | 1                      |    |    |    |    |    |       |    |    |    |    |    |
| 2       | 1                      |    | 2  |    |    |    |       |    |    |    |    |    |
| 3       | 1                      |    | 2  |    | 3  |    |       |    |    |    |    |    |
| 4       | 1                      | 4  | 2  |    | 3  |    |       |    |    |    |    |    |
| 5       | 1                      | 4  | 2  | 5  | 3  |    |       |    |    |    |    |    |
| 6       | 1                      | 4  | 2  | 5  | 3  | 6  |       |    |    |    |    |    |
| # DIMMs | Dual CPU configuration |    |    |    |    |    |       |    |    |    |    |    |
| 1       | 1                      |    |    |    |    |    | 2     |    |    |    |    |    |
| 2       | 1                      |    | 3  |    |    |    | 2     |    | 4  |    |    |    |
| 3       | 1                      |    | 3  |    | 5  |    | 2     |    | 4  |    | 6  |    |
| 4       | 1                      | 7  | 3  |    | 5  |    | 2     | 8  | 4  |    | 6  |    |
| 5       | 1                      | 7  | 3  | 9  | 5  |    | 2     | 8  | 4  | 10 | 6  |    |
| 6       | 1                      | 7  | 3  | 9  | 5  | 11 | 2     | 8  | 4  | 10 | 6  | 12 |

## Performance mode

| CPU     | CPU 1                  |    |    |    |    |    | CPU 2 |    |    |    |    |    |
|---------|------------------------|----|----|----|----|----|-------|----|----|----|----|----|
| Channel | A                      |    | B  |    | C  |    | D     |    | E  |    | F  |    |
| DIMM    | 1A                     | 2A | 1B | 2B | 1C | 2C | 1D    | 2D | 1E | 2E | 1F | 2F |
| # DIMMs | Mono CPU configuration |    |    |    |    |    |       |    |    |    |    |    |
| 6       | 1                      | 2  | 1  | 2  | 1  | 2  |       |    |    |    |    |    |
| # DIMMs | Dual CPU configuration |    |    |    |    |    |       |    |    |    |    |    |
| 12      | 1                      | 3  | 1  | 3  | 1  | 3  | 2     | 4  | 2  | 4  | 2  | 4  |



Notes on Performance mode:

- Always populate memory modules in multiples of 3.
- Same numbers mean identical modules (capacity, rank).

## 10.2 Installing memory modules



Upgrade and Repair Unit  
(URU)



Hardware: 5 minutes

**Tools:** tool-less

### 10.2.1 Preliminary steps

- ▶ ["Suspending BitLocker functionality" on page 77](#)
- ▶ ["Disabling SVOM boot watchdog functionality" on page 78](#)
- ▶ ["Shutting down the server" on page 48](#)
- ▶ ["Disconnecting the server from the mains" on page 48](#)
- ▶ ["Getting access to the component" on page 49](#)

### 10.2.2 Installing a memory module

- ▶ Identify the correct memory slot see section ["Basic information" on page 264](#).

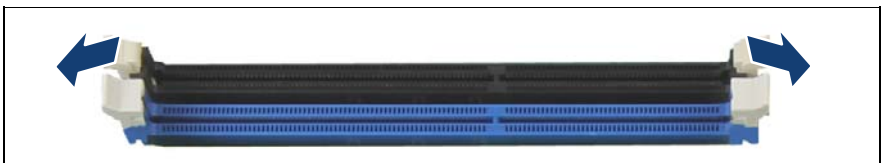


Figure 184: Installing memory modules (A)

- ▶ Press out the securing clip at each end of the memory slot.

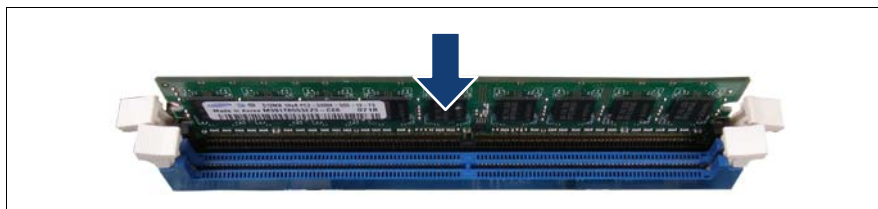


Figure 185: Installing memory modules (B)

- ▶ Align the notch on the bottom of the module with the crossbar in the slot.
- ▶ Press down on the memory module until the securing clips snap into the cutouts at each end of the module.

### 10.2.3 Concluding steps

- ▶ ["Reassembling" on page 62](#)
- ▶ ["Connecting the server to the mains" on page 72](#)
- ▶ ["Updating or recovering the system board BIOS and iRMC" on page 86](#) (if applicable)
- ▶ ["Switching on the server" on page 73](#)
- ▶ ["Enabling SVOM boot watchdog functionality" on page 97](#)
- ▶ ["Verifying the memory mode" on page 98](#) (if applicable)
- ▶ ["Resuming BitLocker functionality" on page 103](#)

## 10.3 Removing memory modules



Upgrade and Repair Unit  
(URU)



Hardware: 5 minutes

**Tools:** tool-less

### 10.3.1 Preliminary steps

- ▶ ["Suspending BitLocker functionality" on page 77](#)
- ▶ ["Disabling SVOM boot watchdog functionality" on page 78](#)
- ▶ ["Locating the defective server" on page 45](#)
- ▶ ["Shutting down the server" on page 48](#)
- ▶ ["Disconnecting the server from the mains" on page 48](#)
- ▶ ["Getting access to the component" on page 49](#)

### 10.3.2 Removing a memory module

- ▶ Identify the desired memory slot see section ["Basic information" on page 264](#).



#### CAUTION!

Ensure to maintain an operational configuration when removing memory modules. For additional information, please refer to section ["Basic information" on page 264](#).

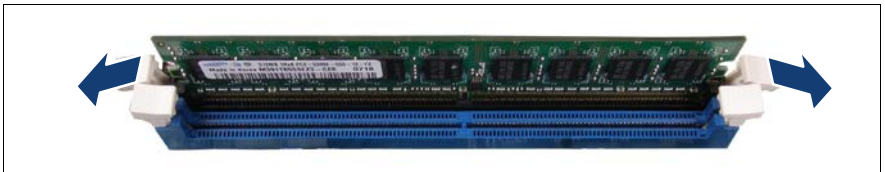


Figure 186: Removing memory modules (A)

- ▶ Eject the desired memory module by pressing out the securing clips at each end of the memory slot.

## Main memory

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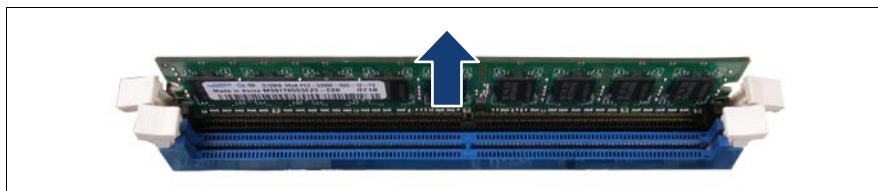


Figure 187: Removing memory modules (B)

- ▶ Remove the ejected memory module.

### 10.3.3 Concluding steps

- ▶ ["Reassembling" on page 62](#)
- ▶ ["Connecting the server to the mains" on page 72](#)
- ▶ ["Updating or recovering the system board BIOS and iRMC" on page 86](#) (if applicable)
- ▶ ["Switching on the server" on page 73](#)
- ▶ ["Enabling SVOM boot watchdog functionality" on page 97](#)
- ▶ ["Resuming BitLocker functionality" on page 103](#)

## 10.4 Replacing memory modules



**Upgrade and Repair Unit (URU)**



**Hardware: 5 minutes**  
**Software: 5 minutes**

**Tools:** tool-less

### 10.4.1 Preliminary steps

- ▶ Identify the defective memory slot using the server management software.
- ▶ ["Suspending BitLocker functionality" on page 77](#)
- ▶ ["Disabling SVOM boot watchdog functionality" on page 78](#)
- ▶ ["Locating the defective server" on page 45](#)

- ▶ ["Shutting down the server" on page 48](#)
- ▶ ["Disconnecting the server from the mains" on page 48](#)
- ▶ ["Getting access to the component" on page 49](#)
- ▶ Locate the defective memory module using the onboard Local Diagnostic LEDs as described in section ["Onboard indicators and controls" on page 414](#).

## **10.4.2 Removing the defective memory module**

- ▶ Remove the memory module as described in section ["Removing a memory module" on page 269](#).

## **10.4.3 Installing the new memory module**

- ▶ Install the memory module as described in section ["Installing a memory module" on page 267](#).

## **10.4.4 Concluding steps**

- ▶ ["Reassembling" on page 62](#)
- ▶ ["Connecting the server to the mains" on page 72](#)
- ▶ ["Updating or recovering the system board BIOS and iRMC" on page 86 \(if applicable\)](#)
- ▶ ["Switching on the server" on page 73](#)
- ▶ ["Enabling SVOM boot watchdog functionality" on page 97](#)
- ▶ ["Enabling replaced components in the system BIOS" on page 98](#)
- ▶ ["Verifying the memory mode" on page 98](#)
- ▶ ["Resuming BitLocker functionality" on page 103](#)
- ▶ ["Resetting the error status after replacing memory modules or processors" on page 94](#)



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# 11 Processors

## Safety notes



### CAUTION!

- Do not install unsupported processors. For further information on supported processors, refer to section "[Basic information](#)" on [page 274](#).
- 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 processors, be careful not to touch or bend the spring contacts on the processor sockets.
- Never touch the underside of the processors. Even minor soiling such as grease from the skin can impair the processor's operation or destroy the processors.
- For further information, please refer to chapter "[Important information](#)" on [page 33](#).

## 11.1 Basic information

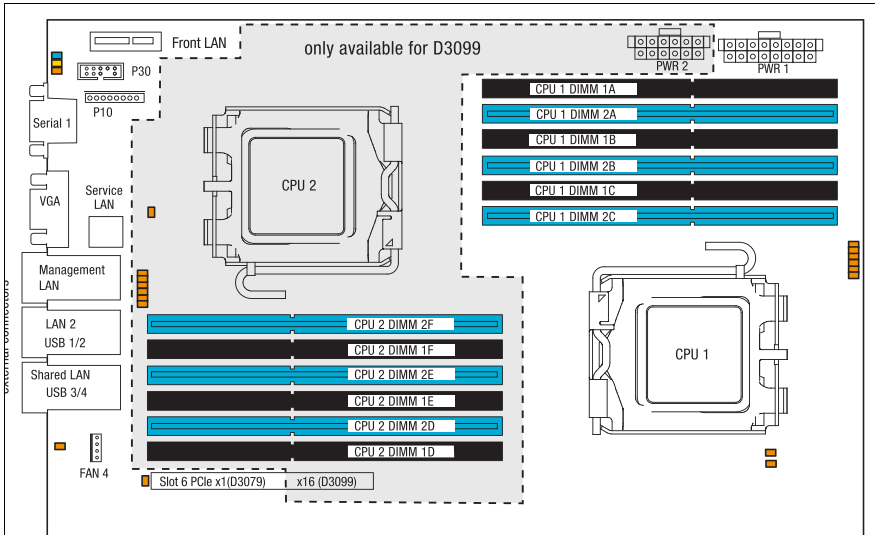


Figure 188: Processor locations on system board

- The system board can be equipped with two processors (CPU 1 and CPU 2)
- Two processors with different clock frequencies are not possible.

### Supported processors

- Intel Xeon E5-24xxv2 processor series CPUs
- Socket type: LGA 2011 package
- Thermal Design Power (TDP) class: up to 135 W

## 11.2 Installing processors



**Upgrade and Repair Unit (URU)**



**Hardware: 15 minutes**  
**Software: 5 minutes**

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



### **CAUTION!**

Processors are extremely sensitive to electrostatic discharge and must be handled with care. After a processor has been removed from its protective sleeve or from its socket, place it upside down on a nonconducting, antistatic surface. Never push a processor over a surface.

### 11.2.1 Preliminary steps

- ▶ ["Suspending BitLocker functionality" on page 77](#)
- ▶ ["Disabling SVOM boot watchdog functionality" on page 78](#)
- ▶ ["Shutting down the server" on page 48](#)
- ▶ ["Disconnecting the server from the mains" on page 48](#)
- ▶ ["Getting access to the component" on page 49](#)

### 11.2.2 Installing a processor



This description applies to the following procedures:

- Installing the second processor in a single-processor configuration
- Transferring a processor after replacing the system board (see section ["Replacing the system board" on page 371](#))

11.2.2.1 Removing the protective cover

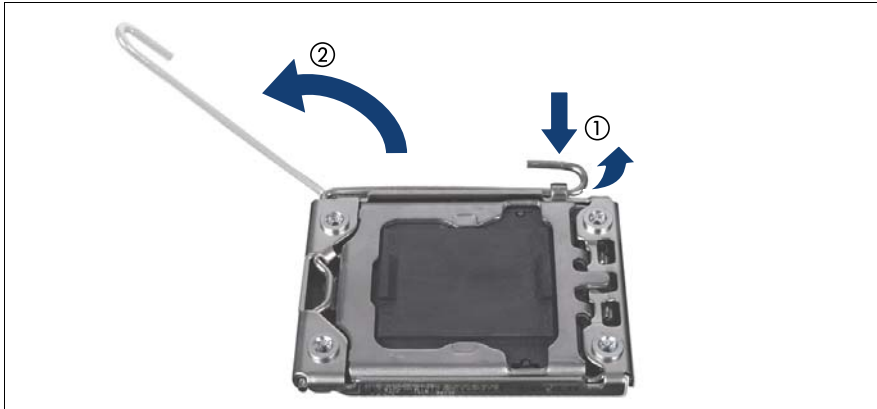


Figure 189: Opening socket release lever

- ▶ Unlatch the socket release lever by pushing it down and away from the socket (1), and then swivel it up (2).

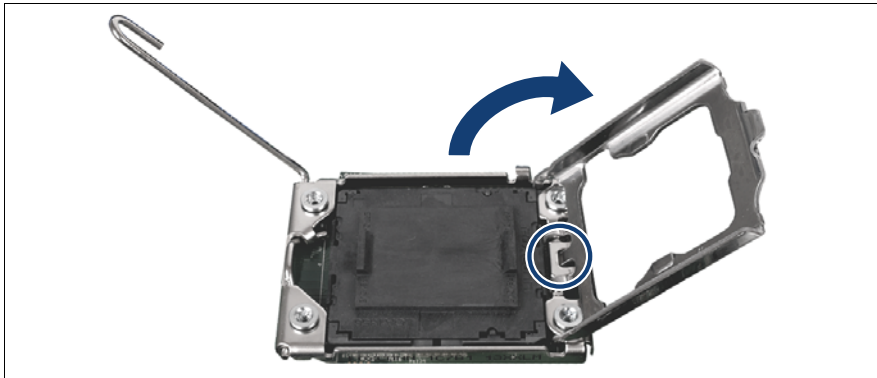


Figure 190: Opening the load plate

- ▶ Open the load plate of the processor socket.



**CAUTION!**

**Handle the locking frame carefully.**

In a vertical position, the small clip (see circle) can scratch the system board.

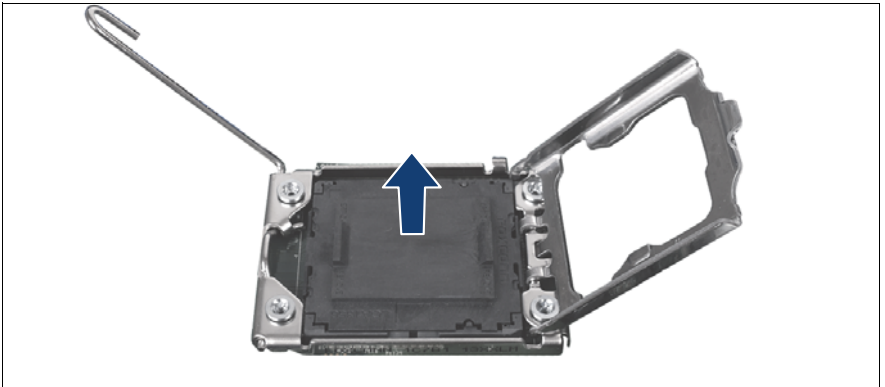


Figure 191: Removing the protective cover

- ▶ Remove the black protective cover from the processor socket.

#### 11.2.2.2 Installing the new processor

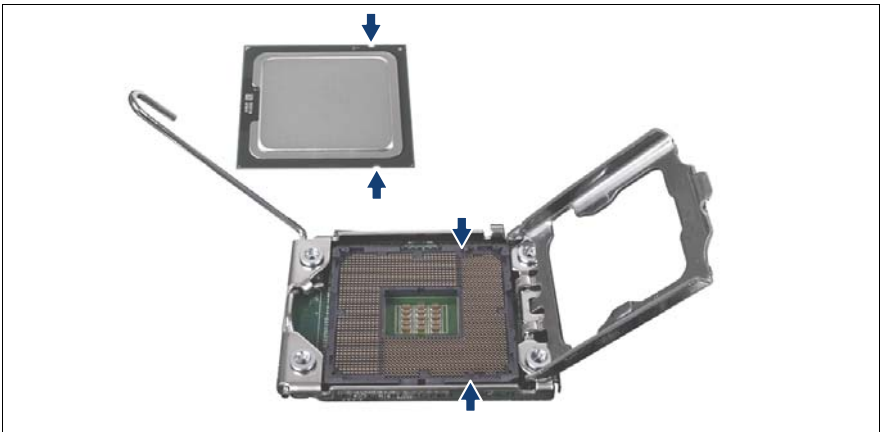


Figure 192: Installing the processor

- ▶ Hold the processor with your thumb and index finger.
- ▶ Place the new processor on the socket.



Make sure that the recesses on the processor are aligned with the corresponding markings on the socket.



### CAUTION!

- Ensure that the processor is level in the socket.
- Be careful not to touch or bend the pins on the processor socket.
- Never touch the underside of the processor. Even minor soiling such as grease from the skin can impair the processor's operation or destroy the processor.
- Ensure not to scrape or dent the processor edges.

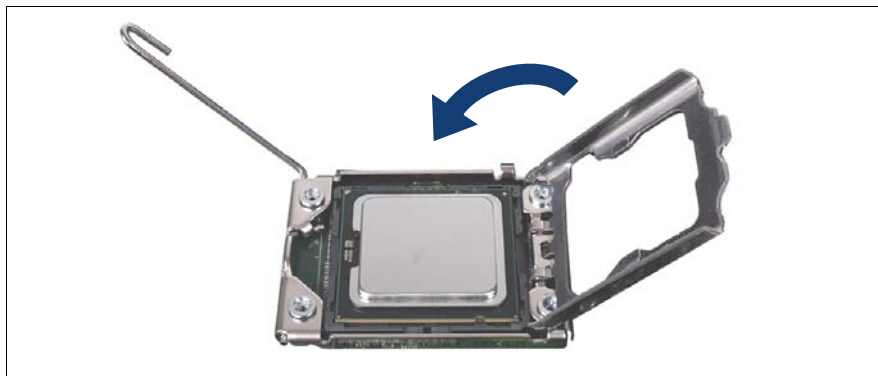


Figure 193: Closing the load plate

- ▶ Close the load plate of the processor.

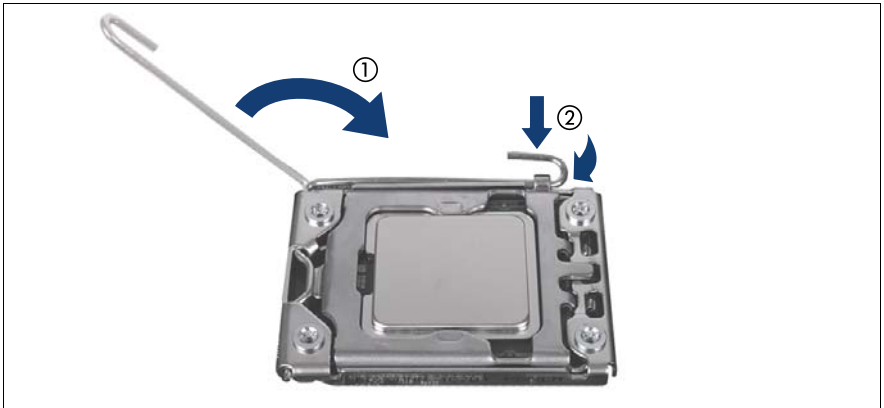


Figure 194: Closing the socket release lever

- ▶ Close the socket release lever (1) and latch it under the load plate retention tab (2) to lock down the load plate.
- ▶ If applicable, install the second processor accordingly.

### 11.2.3 Concluding steps

- ▶ ["Installing processor heat sinks" on page 288](#)
- ▶ ["Reassembling" on page 62](#)
- ▶ ["Connecting the server to the mains" on page 72](#)
- ▶ ["Switching on the server" on page 73](#)
- ▶ ["Updating or recovering the system board BIOS and iRMC" on page 86 \(if applicable\)](#)
- ▶ ["Enabling SVOM boot watchdog functionality" on page 97](#)
- ▶ ["Resuming BitLocker functionality" on page 103](#)

### 11.3 Removing processors



**Upgrade and Repair Unit (URU)**



**Hardware: 15 minutes**  
**Software: 5 minutes**

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



#### **CAUTION!**

Processors are extremely sensitive to electrostatic discharge and must be handled with care. After a processor has been removed from its protective sleeve or from its socket, place it upside down on a nonconducting, antistatic surface. Never push a processor over a surface.

#### 11.3.1 Preliminary steps

- ▶ ["Suspending BitLocker functionality" on page 77](#)
- ▶ ["Disabling SVOM boot watchdog functionality" on page 78](#)
- ▶ ["Shutting down the server" on page 48](#)
- ▶ ["Disconnecting the server from the mains" on page 48](#)
- ▶ ["Getting access to the component" on page 49](#)
- ▶ ["Removing processor heat sinks" on page 290](#)

#### 11.3.2 Removing a processor



This description applies to the following procedures:

- Removing the second processor (CPU 2) from a dual-processor configuration
- Removing processors from a defective system board (see section ["Replacing the system board" on page 371](#))
- ▶ Remove the desired processor heat sink as described in section ["Removing processor heat sinks" on page 290](#).

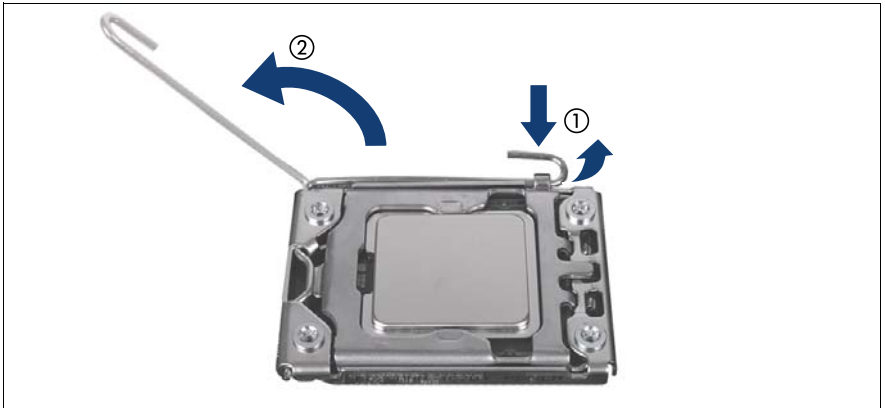


Figure 195: Opening socket release lever

- Unlatch the socket release lever by pushing it down and away from the socket (1), and then swivel it up (2).

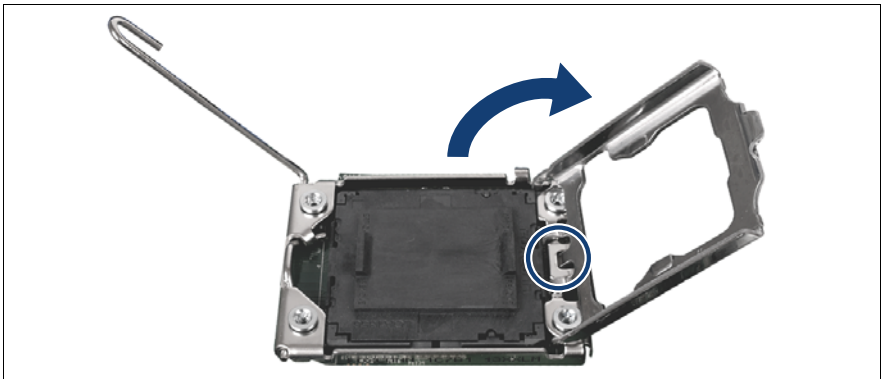


Figure 196: Opening the load plate

- Open the load plate of the processor socket.



**CAUTION!**

**Handle the locking frame carefully.**

In a vertical position, the small clip (see circle) can scratch the system board.

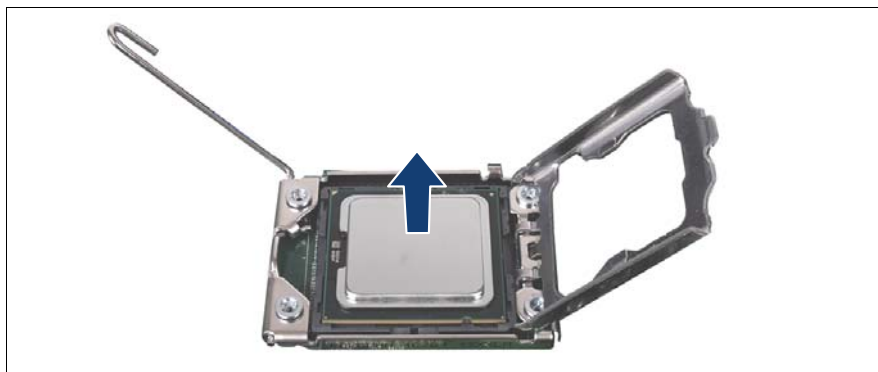


Figure 197: Removing the processor

- ▶ Carefully remove the defective processor from its socket in a vertical motion.



**CAUTION!**

Be careful not to touch or bend the spring contacts on the processor socket.

- ▶ Thoroughly clean residual thermal paste from the processor surface using a lint-free cloth.
- ▶ Store the processor in a safe place for later reuse.



**CAUTION!**

Processors are extremely sensitive to electrostatic discharge and must be handled with care. After a processor has been removed from its protective sleeve or from its socket, place it upside down on a nonconducting, antistatic surface. Never push a processor over a surface.

Be careful not to touch or bend the spring contacts on the processor socket.

### 11.3.2.1 Installing the protective cover

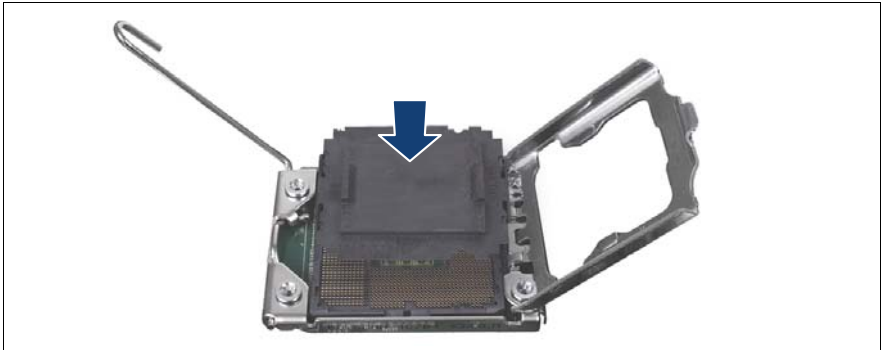


Figure 198: Attaching the protective socket cover

- ▶ Carefully lower the protective socket cover onto the processor socket in a vertical motion until it snaps in place.

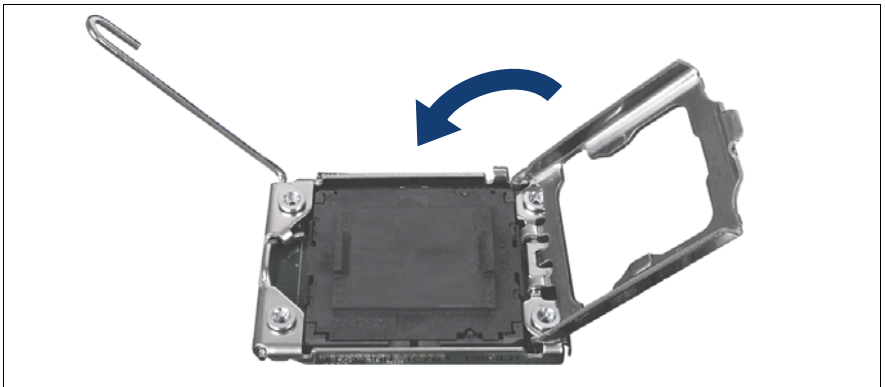


Figure 199: Closing the load plate

- ▶ Close the load plate of the processor.

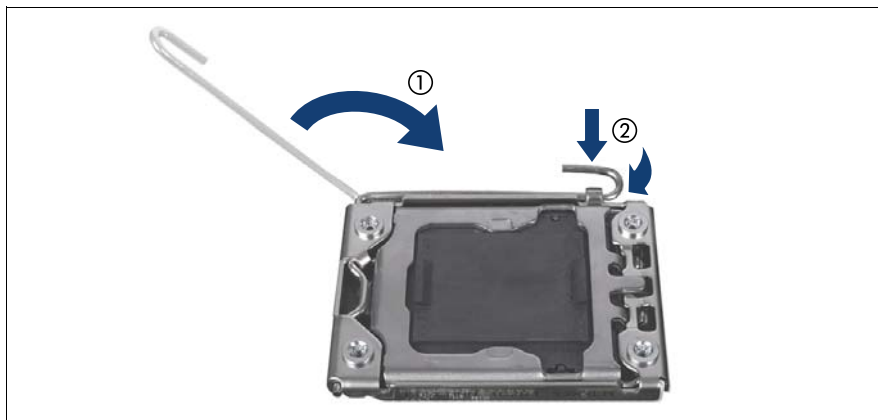


Figure 200: Close the socket release lever

- ▶ Close the socket release (1) lever and latch it under the load plate retention tab to lock down the load plate (2).

### 11.3.3 Concluding steps

- ▶ ["Reassembling" on page 62](#)
- ▶ ["Connecting the server to the mains" on page 72](#)
- ▶ If applicable, ["Updating or recovering the system board BIOS and iRMC" on page 86](#)
- ▶ ["Switching on the server" on page 73](#)
- ▶ ["Enabling SVOM boot watchdog functionality" on page 97](#)
- ▶ ["Resuming BitLocker functionality" on page 103](#)

## 11.4 Upgrading or replacing processors



**Field Replaceable Unit (FRU)**



**Hardware: 15 minutes**  
**Software: 5 minutes**

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



### **CAUTION!**

Processors are extremely sensitive to electrostatic discharge and must be handled with care. After a processor has been removed from its protective sleeve or from its socket, place it upside down on a nonconducting, antistatic surface. Never push a processor over a surface.

### 11.4.1 Preliminary steps

- ▶ ["Suspending BitLocker functionality" on page 77](#)
- ▶ ["Disabling SVOM boot watchdog functionality" on page 78](#)
- ▶ If applicable, ["Locating the defective server" on page 45](#)
- ▶ ["Shutting down the server" on page 48](#)
- ▶ ["Disconnecting the server from the mains" on page 48](#)
- ▶ ["Getting access to the component" on page 49](#)
- ▶ ["Removing processor heat sinks" on page 290](#)

### 11.4.2 Upgrading or replacing a processor



This description applies to the following procedures:

- Installing the second processor in a single-processor configuration
  - Transferring a processor after replacing the system board (see section ["Replacing the system board" on page 371](#))
- ▶ In case of installing a second processor remove the protective cover as described in section ["Removing the protective cover" on page 276](#).

- ▶ Remove the desired processor as described in section ["Removing a processor" on page 280](#).
- ▶ Install the new processor as described in section ["Installing a processor" on page 275](#).
- ▶ In case of transferring a processor install the protective cover to the defective system board as described in section ["Installing the protective cover" on page 283](#).

### 11.4.3 Concluding steps

- ▶ ["Installing processor heat sinks" on page 288](#)
- ▶ ["Reassembling" on page 62](#)
- ▶ ["Connecting the server to the mains" on page 72](#)



If the Global Error LED is flashing with the error message "CPU has been changed" on the display after the system is powered on, please follow the steps below.

- ▶ Restart the system and wait until the screen output appears.
  - ▶ Press **F2**.
  - ▶ If a password is assigned, enter this password and confirm with **Enter**.  
The BIOS setup main menu will be displayed on the screen.
  - ▶ Select "Save Changes and Exit" or "Save Changes and Reset" on the Save & Exit menu.
  - ▶ Confirm that the Global Error LED is off.
- This is only information regarding to the change of the CPU configuration. There is no technical problem.
- ▶ ["Updating or recovering the system board BIOS and iRMC" on page 86](#) (if applicable)
  - ▶ ["Switching on the server" on page 73](#)
  - ▶ ["Enabling SVOM boot watchdog functionality" on page 97](#)
  - ▶ ["Resuming BitLocker functionality" on page 103](#)

- ▶ ["Resetting the error status after replacing memory modules or processors"](#) on page 94

## 11.5 Handling processor heat sinks



**Field Replaceable Unit (FRU)**  
if thermal paste is involved



**Hardware: 15 minutes**



**Upgrade and Repair Unit (URU)**

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

### 11.5.1 Preliminary steps

- ▶ ["Shutting down the server"](#) on page 48
- ▶ ["Disconnecting the server from the mains"](#) on page 48
- ▶ ["Getting access to the component"](#) on page 49

## 11.5.2 Installing processor heat sinks

### 11.5.2.1 Preparing the heat sink and processor

#### When installing a new heat sink

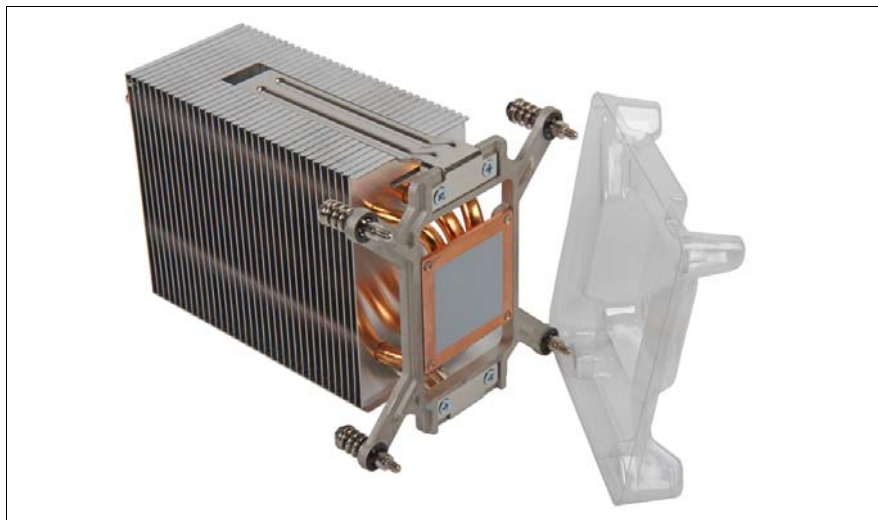


Figure 201: Removing the protective heat sink cover

- ▶ Remove the protective cover from the heat sink.



#### **CAUTION!**

Ensure not to touch the thermal paste on the bottom of the heat sink.

#### When reusing a heat sink

- ▶ Ensure that all residual thermal paste has been thoroughly cleaned off the copper surface of the heat sink.
- ▶ Apply thermal paste to the processor surface as described in section ["Applying thermal paste" on page 292](#).

### 11.5.2.2 Installing the heat sink

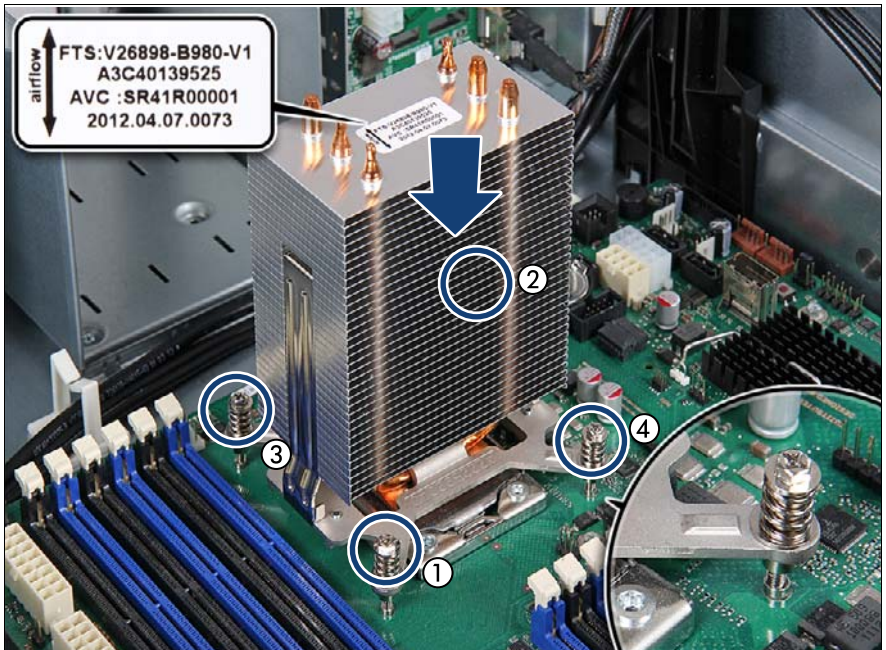


Figure 202: Installing the heat sink

- ▶ Align the heat sink as shown with the cooling fins matching the direction of the airflow (see airflow label).
- ▶ Carefully seat the heat sink on the four threaded holes as shown (see close-up).
- ▶ Fasten the four captive screws on the heat sink in a crossover pattern (screw torque: 1.0 Nm, not applicable for the Japanese market) (1-4).

### 11.5.3 Removing processor heat sinks

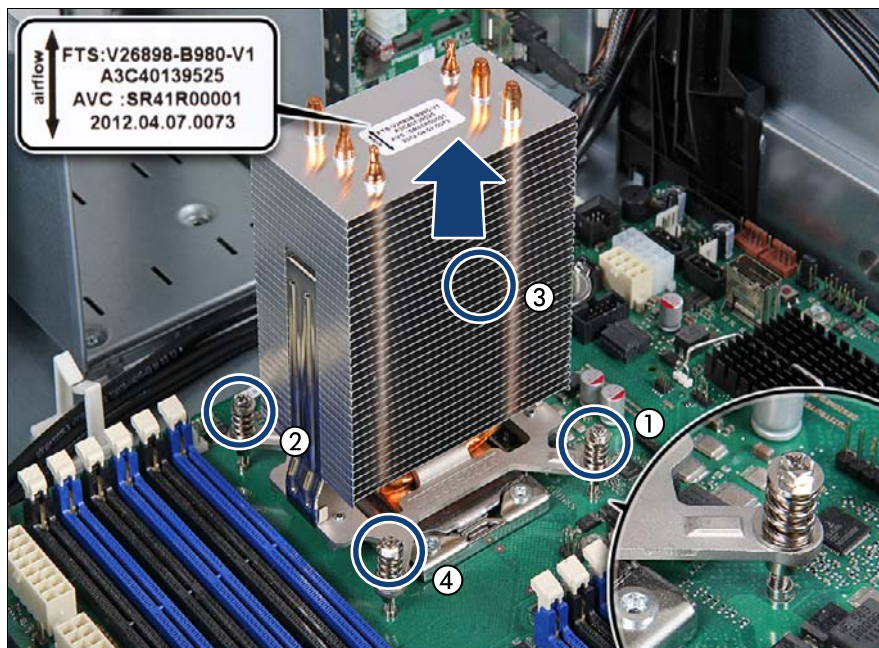


Figure 203: Removing the processor heat sink

- ▶ Loosen the four captive screws on the heat sink in a crossover pattern (1-4).
- ▶ Carefully turn the heat sink back and forth to detach it from the processor.



This may be necessary due to the adhesive quality of the thermal paste located between the heat sink and processor.



**CAUTION!**

Pay special attention not to damage any system board components surrounding the processor socket.

- ▶ Lift the heat sink out of the chassis.
- ▶ Thoroughly clean residual thermal paste from the surface of the heat sink and the processor using a lint-free cloth.

## 11.5.4 Replacing processor heat sinks

### 11.5.4.1 Removing the processor heat sink

- ▶ Remove the processor heat sink as described in section ["Removing processor heat sinks" on page 290](#).

### 11.5.4.2 Applying thermal paste

- ▶ Apply thermal paste to the processor surface as described in section ["Applying thermal paste" on page 292](#).



If the processor upgrade or replacement kit contains a new processor heat sink, a thin layer of thermal compound has already been pre-applied to its lower surface. In this case, please proceed with section ["Installing the processor heat sink" on page 291](#).

### 11.5.4.3 Installing the processor heat sink

- ▶ Install the processor heat sink as described in sections ["Preparing the heat sink and processor" on page 288](#) and ["Installing the heat sink" on page 289](#).

## 11.5.5 Concluding steps

- ▶ ["Reassembling" on page 62](#)
- ▶ ["Connecting the server to the mains" on page 72](#)
- ▶ ["Switching on the server" on page 73](#)

## 11.6 Applying thermal paste



Field Replaceable Unit (FRU)



Hardware: 5 minutes

Tools: tool-less



- For the Japanese market, the service engineer must follow the instruction provided separately.
- If the processor upgrade or replacement kit contains a new processor heat sink, a thin layer of thermal compound has already been pre-applied to its lower surface. In this case, please proceed with section ["Installing processor heat sinks" on page 288](#).

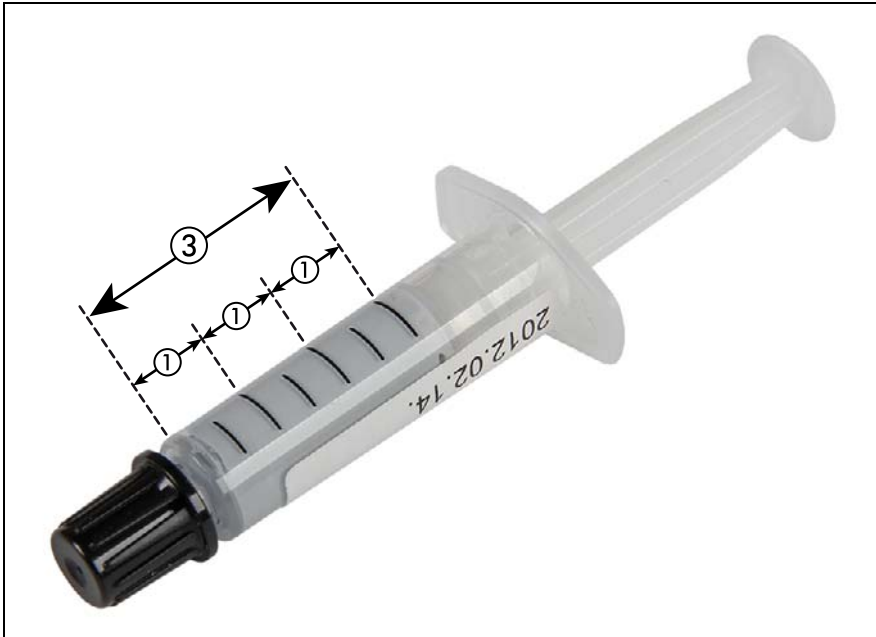


Figure 204: Thermal paste syringe

One thermal compound syringe (A3C40142460 / 34035576) contains thermal paste for three processors.

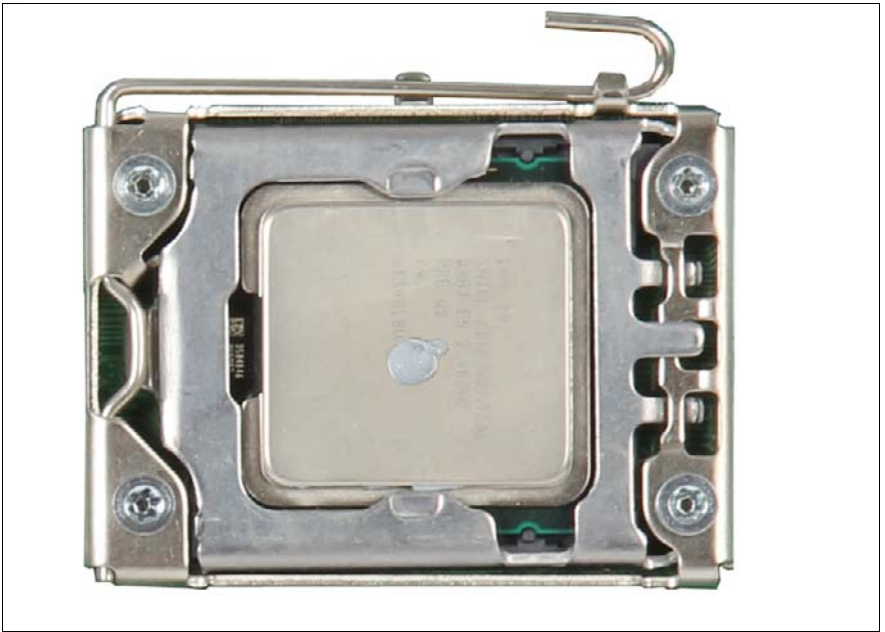


Figure 205: Applying thermal paste

- ▶ Apply a dot of thermal paste to the center of the processor surface as shown.



Two graduation marks on the syringe equal the correct amount of thermal paste for one processor.



**CAUTION!**

Do not mix different types of thermal paste.



---

## 12 Accessible drives and LSD

### 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.
- Do not touch the circuitry on boards or soldered parts. Hold circuit boards by their metallic areas or edges.
- 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).
- For further safety information, please refer to chapter "[Important information](#)" on page 33.

## 12.1 Basic information

### Accessible drive bays

The server offers three 5.25-inch accessible drive bays for optical disk drives and backup drives:

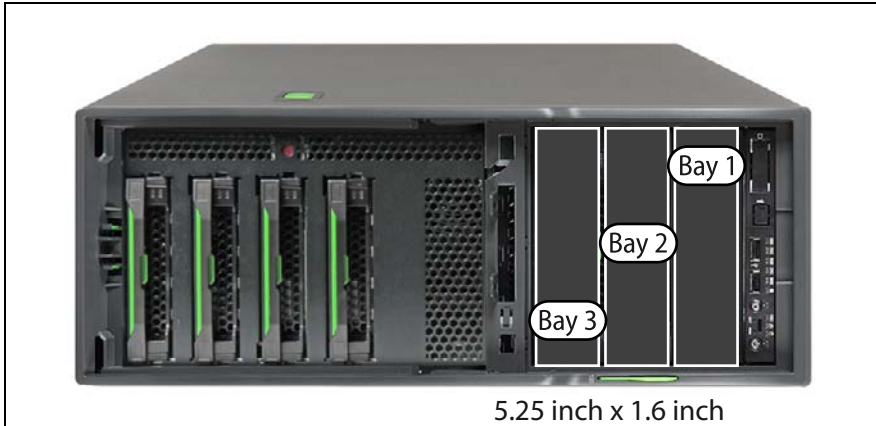


Figure 206: Accessible drives mounting order (tower server)

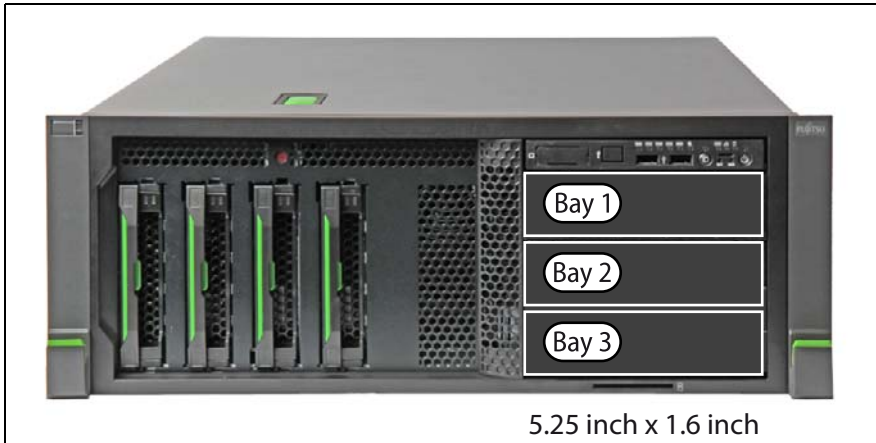


Figure 207: Accessible drives mounting order (rack server)

Mounting order for accessible drives

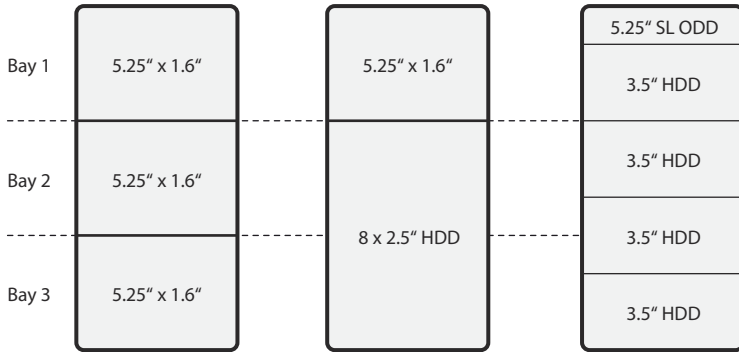


Figure 208: Accessible drive configurations

| Order | Accessible drive                             | Drive bay     | Max. | Occupied     | Interface            |
|-------|--|---------------|------|--------------|----------------------|
| 1     | 4x 3.5-inch HDD extension box                | Bays 1+2+3    | 1    | 4.8" x 5.25" | SAS                  |
|       | Slimline ODD in 4x3.5-inch HDD extension box |               |      |              | SATA                 |
| 1     | 8x 2.5-inch HDD extension box                | Bays 2+3      | 1    | 3.2" x 5.25" | SAS                  |
| 2     | LSD in Multibay box                          | Bay 1         | 1    | 1.6" x 5.25" | I <sup>2</sup> C bus |
|       | Slimline ODD in Multibay box                 |               |      |              | SATA                 |
| 3     | Optical disk drive (full height)             | Bay 1, 2 or 3 | 1    | 1.6" x 5.25" | SATA                 |
| 3     | Backup drive LTO3 HH Ultrium                 | Bay 1, 2 or 3 | 1    | 1.6" x 5.25" | SAS                  |
| 3     | Backup drive LTO4 HH IBM                     | Bay 1, 2 or 3 | 1    | 1.6" x 5.25" | SAS                  |
| 3     | Backup drive LTO5 HH Ultrium                 | Bay 1, 2 or 3 | 1    | 1.6" x 5.25" | SAS                  |

Table 4: Accessible drive mounting sequence

## Accessible drives and LSD

| Order | Accessible drive                                     | Drive bay     | Max. | Occupied     | Interface |
|-------|--|---------------|------|--------------|-----------|
| 3     | Backup drive<br>DDS Gen 5 (DAT72)/<br>Gen 6 (DAT160) | Bay 1, 2 or 3 | 2    | 1.6" x 5.25" | USB 2.0   |
| 3     | Backup drive<br>DDS Gen 6 (DAT160)                   | Bay 1, 2 or 3 | 2    | 1.6" x 5.25" | USB 2.0   |
| 3     | RDX backup drive                                     | Bay 1, 2 or 3 | 2    | 1.6" x 5.25" | USB 2.0   |
|       |  |               | 1    | 1.6" x 5.25" | USB 3.0   |

Table 4: Accessible drive mounting sequence

## 12.2 Installing accessible drives



**Upgrade and Repair Unit (URU)**



**Hardware: 10 minutes**

**Tools:** Slotted screw driver (for bending in or out accessible drive mounting brackets)

### 12.2.1 Preliminary steps

- ▶ ["Shutting down the server" on page 48](#)
- ▶ ["Disconnecting the server from the mains" on page 48](#)
- ▶ ["Getting access to the component" on page 49](#)



The front cover only needs to be removed in order to remove or install accessible drive dummy covers.

- ▶ ["Removing the system fan holder" on page 74](#)

### 12.2.2 Removing accessible drive dummy covers

- ▶ If applicable, remove the accessible dummy covers for the desired accessible drive bay as described in section ["Removing accessible drive dummy covers" on page 184](#).

## 12.2.3 Installing mounting brackets to RDX and DAT72 backup drives

This section is not applied for Japanese market.

Backup drive mounting brackets are contained in mounting kit S26361-F3753-E1 (to be ordered separately with the backup drive).

**i** No new mounting brackets are available when replacing a backup drive during service.

- ▶ If applicable, remove existing mounting brackets from the backup drive.

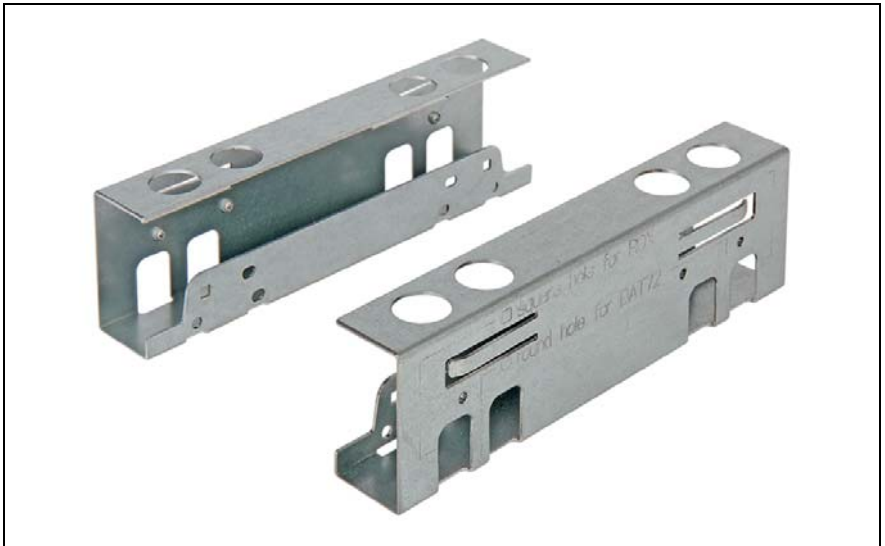


Figure 209: Backup drive mounting brackets

## Accessible drives and LSD

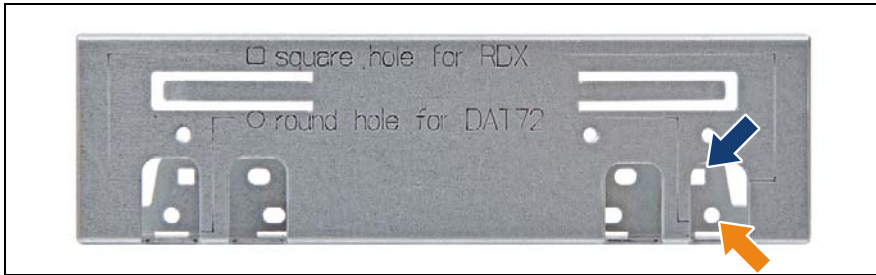


Figure 210: Screw holes on backup drive mounting brackets

- ▶ Note the screw hole description stamped onto the mounting bracket:
  - ▶ Use the square screw hole for RDX backup drives (see blue arrow).
  - ▶ Use the round screw holes for DAT72 backup drives (see orange arrow).

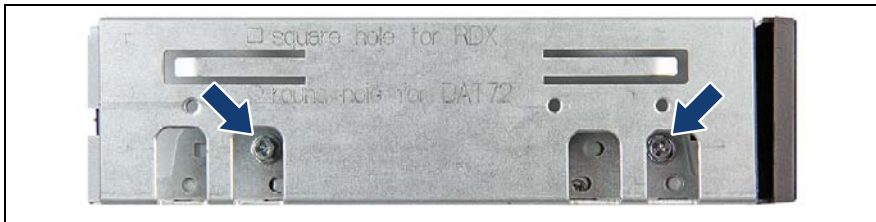


Figure 211: Securing mounting brackets to an RDX backup drive

- ▶ Secure the backup drive mounting brackets to the RDX backup drive with two screws per bracket as shown.



Figure 212: Securing mounting brackets to a DAT72 backup drive

- ▶ Secure the backup drive mounting brackets to the DAT72 backup drive with two screws per bracket as shown.

## 12.2.4 Installing an accessible drive

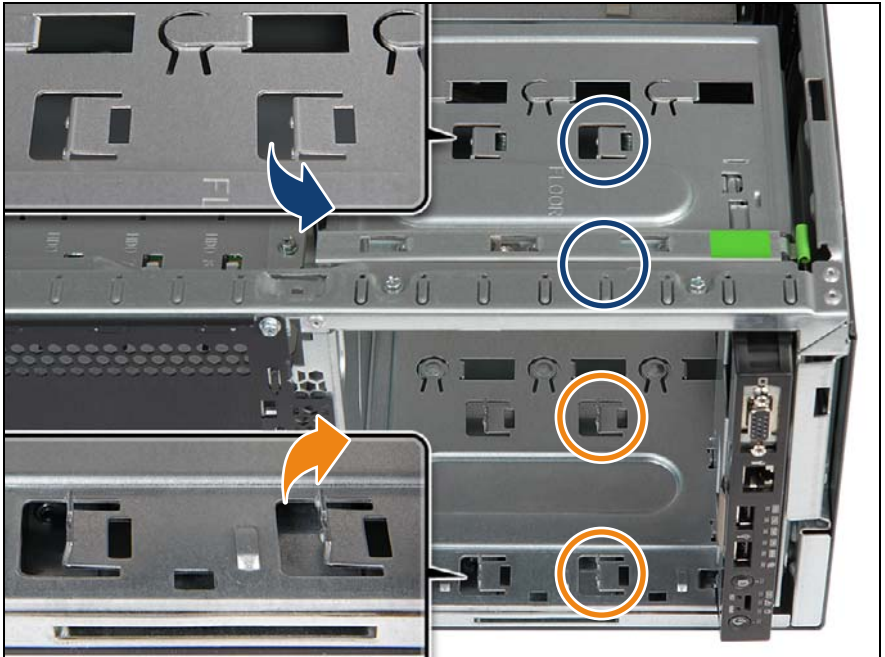


Figure 213: Checking mounting bracket positions (Example: ODD installation, bay 1)

- ▶ Ensure that the four mounting brackets in the desired accessible drive bay have not been bent out. If necessary, proceed as follows:
  - ▶ Using a screw driver, bend the mounting brackets of the upper installation bay inwards, so that their sides are flush with the bay walls (see close-up).
  - ▶ Bend down the upper two mounting brackets (see blue circles).
  - ▶ Bend up the lower two mounting brackets (see orange circles).

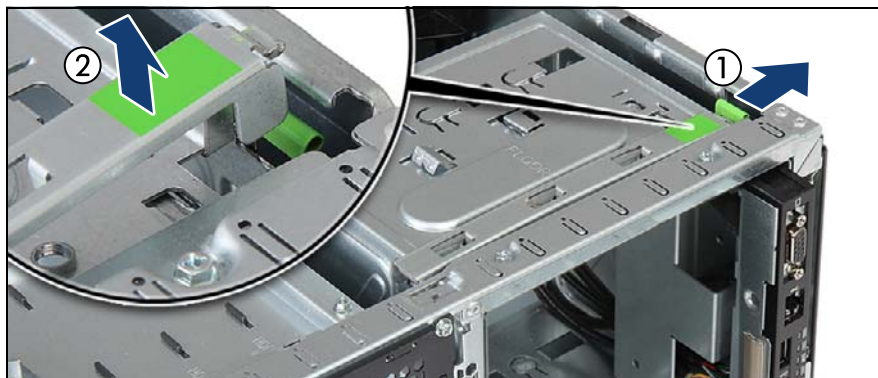


Figure 214: Opening the accessible drive locking bar

- ▶ Press out on the locking latch to disengage the accessible drive locking bar (1).
- ▶ Fold up the accessible drive locking bar (2).

**i** Unlocking and securing the front panel and accessible drives is illustrated by the example of tower servers. In case of rack servers, the accessible drive locking bar is located on the side of the drive bay. In this case, proceed as follows:

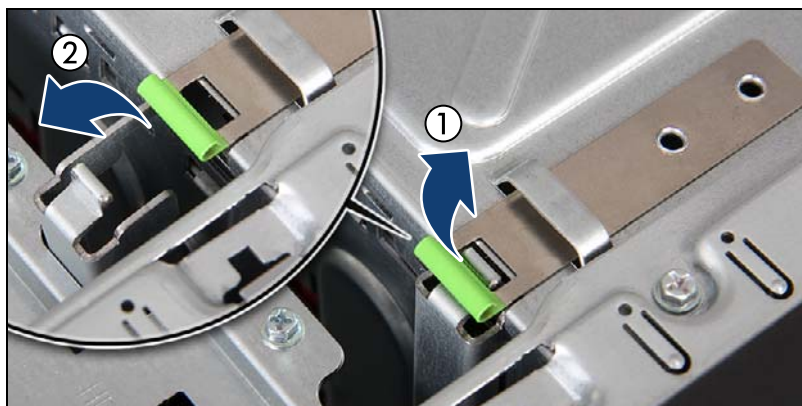


Figure 215: Opening the accessible drive locking bar (rack systems)

- ▶ Pull up on the locking latch to disengage the accessible drive locking bar (1).
- ▶ Fold out the accessible drive locking bar (2).



Figure 216: Inserting the accessible drive

- ▶ Insert the accessible drive into its installation bay and carefully push in until the front screw hole on the front panel frame lines up with the centering pin on the locking bar (1).



**CAUTION!**

For installing a LTO drive: ensure that the power cables routed behind the accessible drive cage are not trapped when pushing the LTO drive in its bay.

- ▶ Close the locking bar (2) until it locks in place (3).

## Accessible drives and LSD

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- ▶ Connect the cables according to your configuration see section "Cabling plans" (figure 303 or figure 304).



### CAUTION!

#### Applies to LTO3 drive cabling:

For connection to the power supply, do **not** use the short end of cable C34. Use the separate cable C35!

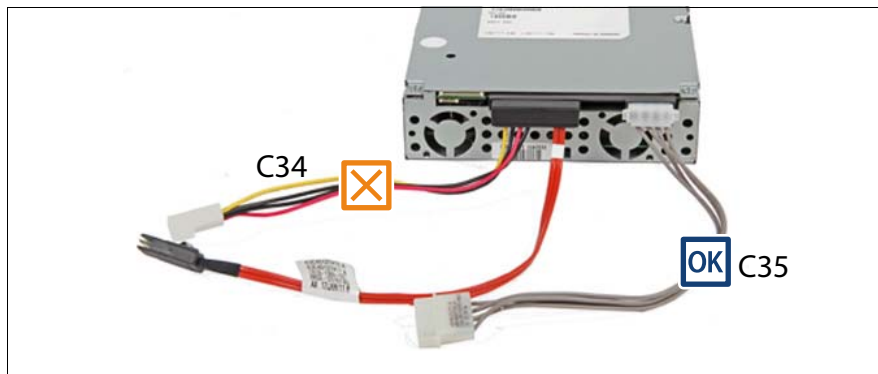


Figure 217: Connecting the cables to the LTO3



#### Notes on RDX drive USB cabling:

- A USB 2.0 RDX drive may be replaced by a USB 3.0 RDX drive with previous cabling.
- A USB 3.0 RDX drive may be connected with a USB 2.0 cable to an onboard USB 2.0 connector with limited performance.
- For full performance, connect the USB 3.0 RDX drive to a USB 3.0 interface card by USB 3.0 cable.
- The USB 3.0 cable cannot be connected to a USB 2.0 RDX drive.

## 12.2.5 Concluding steps

- ▶ "Installing the system fan holder" on page 75
- ▶ "Reassembling" on page 62
- ▶ "Connecting the server to the mains" on page 72
- ▶ "Switching on the server" on page 73
- ▶ If applicable, "Verifying and configuring the backup software solution" on page 91

## 12.3 Removing accessible drives



**Upgrade and Repair Unit (URU)**



**Hardware: 10 minutes**

**Tools:** tool-less

### 12.3.1 Preliminary steps

- ▶ "Locating the defective server" on page 45
- ▶ "Removing backup and optical disk media" on page 80
- ▶ "Verifying and configuring the backup software solution" on page 82
- ▶ "Shutting down the server" on page 48
- ▶ "Disconnecting the server from the mains" on page 48
- ▶ "Getting access to the component" on page 49



The front cover only needs to be removed in order to remove or install accessible drive dummy covers.

- ▶ "Removing the system fan holder" on page 74

### 12.3.2 Removing an accessible drive

- ▶ Remove all cables from the accessible drive see section ["Cabling plans" on page 399](#).
- ▶ Press out on the locking latch to disengage the accessible drive locking bar (see figure 214).
- ▶ Fold up the accessible drive locking bar.

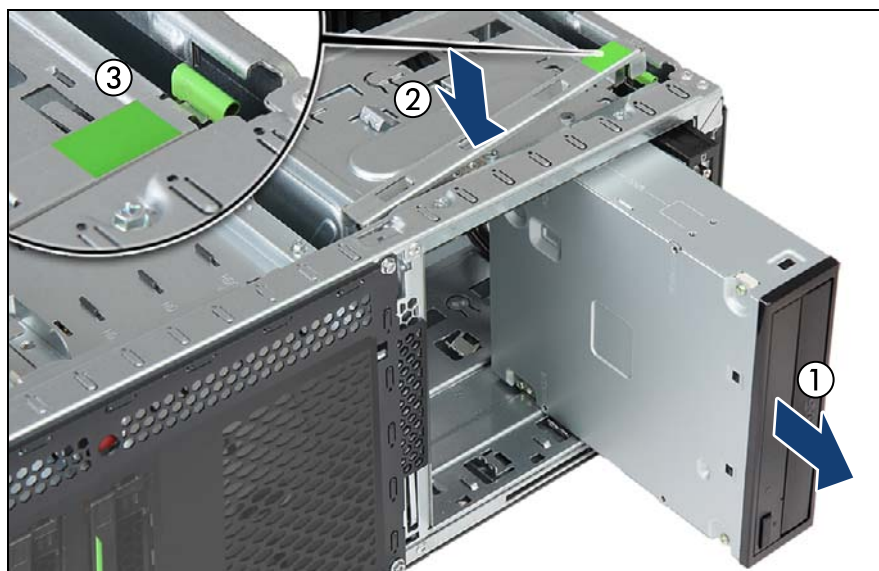


Figure 218: Removing the accessible drive

- ▶ Carefully pull the accessible drive out of its installation bay (1).
- ▶ Close the locking bar (2) until it locks in place (3).

### 12.3.3 Installing accessible drive dummy covers

- ▶ If applicable, install the accessible dummy covers for the desired accessible drive bay as described in section ["Installing accessible drive dummy covers" on page 192](#).

### 12.3.4 Concluding steps

- ▶ "Installing the system fan holder" on page 75
- ▶ "Reassembling" on page 62
- ▶ "Connecting the server to the mains" on page 72
- ▶ "Switching on the server" on page 73
- ▶ If applicable, "Verifying and configuring the backup software solution" on page 91

## 12.4 Replacing accessible drives



**Upgrade and Repair Unit (URU)**



**Hardware: 15 minutes**

**Tools:** Slotted screw driver (for bending in or out accessible drive mounting brackets)

### 12.4.1 Preliminary steps

- ▶ "Locating the defective server" on page 45
- ▶ "Removing backup and optical disk media" on page 80
- ▶ "Verifying and configuring the backup software solution" on page 82
- ▶ "Shutting down the server" on page 48
- ▶ "Disconnecting the server from the mains" on page 48
- ▶ "Getting access to the component" on page 49



Removing the front cover is not required in order to replace an accessible drive.

- ▶ "Removing the system fan holder" on page 74

### 12.4.2 Removing the defective accessible drive

- ▶ Remove all cables from the accessible drive.
- ▶ Remove the accessible drive as described in section ["Removing an accessible drive" on page 306](#).

### 12.4.3 Installing the new accessible drive

- ▶ Install the accessible drive as described in section ["Installing an accessible drive" on page 301](#).
- ▶ Reconnect all cables to their original accessible drive connectors as described in section ["Cabling plans" on page 399](#).

### 12.4.4 Concluding steps

- ▶ ["Installing the system fan holder" on page 75](#)
- ▶ ["Reassembling" on page 62](#)
- ▶ ["Connecting the server to the mains" on page 72](#)
- ▶ ["Switching on the server" on page 73](#)
- ▶ ["Verifying and configuring the backup software solution" on page 91](#) (if applicable)

## 12.5 Slimline ODD and LSD in Multibay box

### 12.5.1 Installing the slimline ODD or LSD



**Upgrade and Repair Unit (URU)**



**Hardware: 10 minutes**

**Tools:**

- Phillips PH2 / (+) No. 2 screw driver
- Slotted screw driver (for bending in or out accessible drive mounting brackets)

#### 12.5.1.1 Preliminary steps

- ▶ ["Shutting down the server" on page 48](#)
- ▶ ["Disconnecting the server from the mains" on page 48](#)
- ▶ ["Getting access to the component" on page 49](#)



The front cover only needs to be removed in order to remove or install accessible drive dummy covers. If the Multibay box is already installed in the server and will be removed in order to install a slimline ODD or LSD module, the front cover can remain installed.

- ▶ ["Removing the system fan holder" on page 74](#)
- ▶ ["Removing the Multibay box" on page 316](#) (if applicable)

#### 12.5.1.2 Installing the slimline ODD

- ▶ Press up on the locking tab to disengage the slimline ODD dummy module as shown in [figure 229 on page 317](#).
- ▶ From inside the Multibay box, press out on the ODD dummy module and pull it out of its bay.

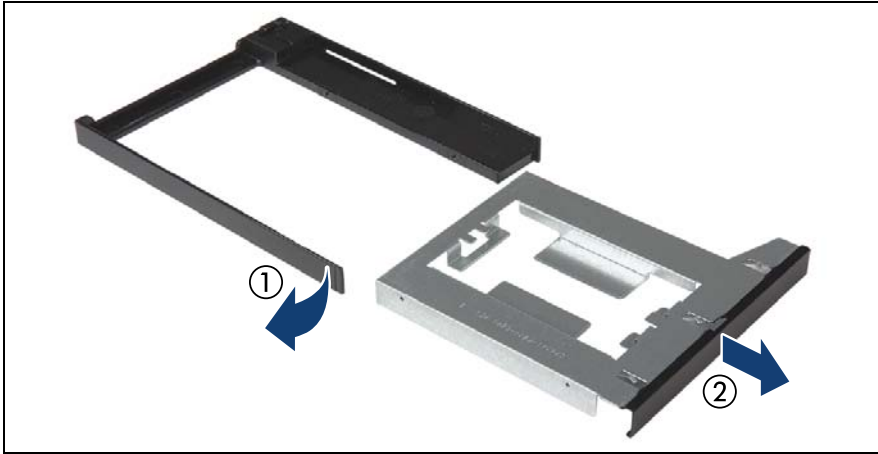


Figure 219: Disassembling the slimline ODD dummy module

- ▶ Disengage (1) and remove (2) the slimline ODD dummy from the slimline ODD installation frame.

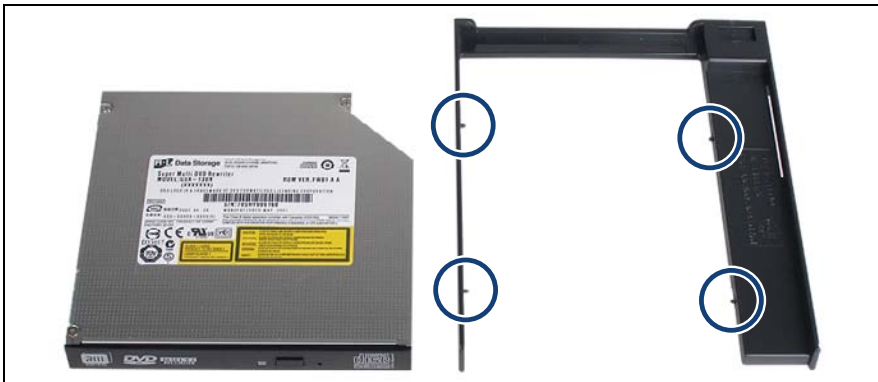


Figure 220: Mounting the slimline ODD in the installation frame

- ▶ Fit the slimline ODD into the slimline ODD installation frame.
- ▶ Ensure that the four pins on the frame (see circles) engage with the screw holes on the drive.
- ▶ Ensure that the ODD is properly seated in the installation frame as shown above.



Figure 221: Mounting the slimline ODD module in the Multibay box

- ▶ Insert the slimline ODD module into the Multibay box (1) and push back until the locking tab (2) engages.



Figure 222: Mounting the slimline ODD in the installation frame (B)

- ▶ Connect the SATA power cable (1) and the SATA cable (2) to the slimline ODD.

### 12.5.1.3 Installing the LSD module

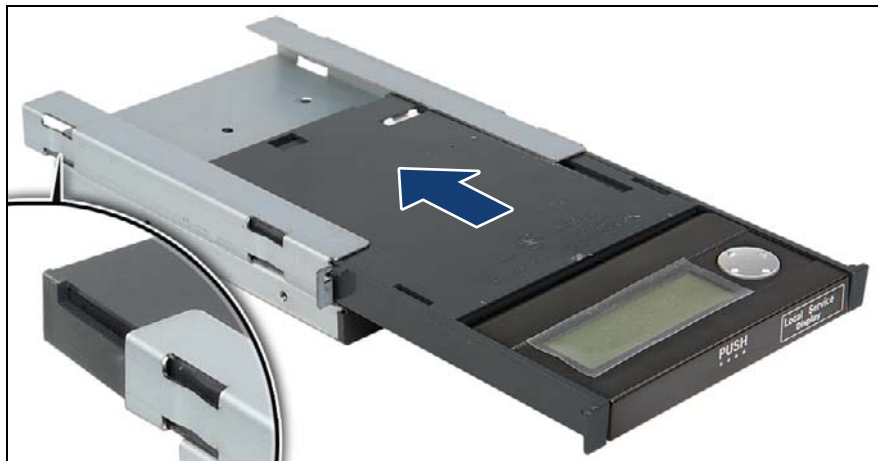


Figure 223: Inserting the LSD module into the 3.5-inch installation frame

- ▶ From the front, slide the LSD module into the 3.5-inch installation frame until the locking latch (see close-up) engages.

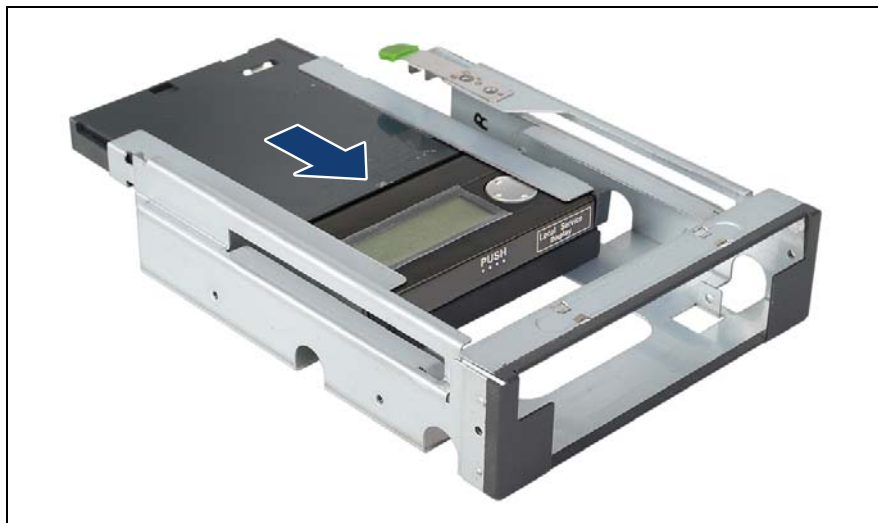


Figure 224: Installing the 3.5-inch installation frame in the Multibay box (A)

- ▶ From the rear, slide the 3.5-inch installation frame into the Multibay box.

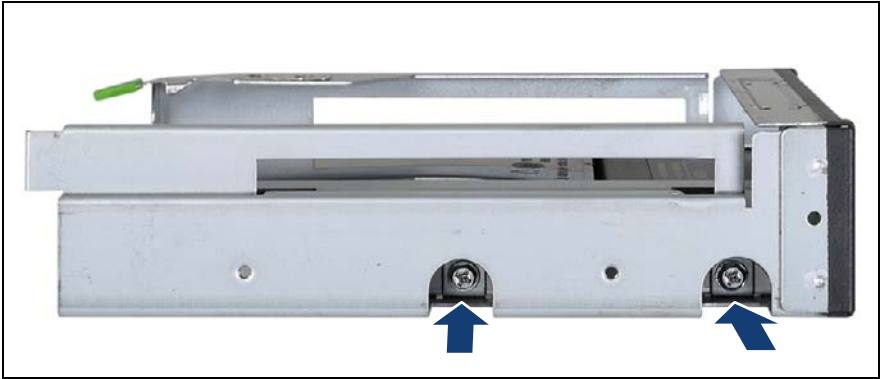


Figure 225: Installing the 3.5-inch installation frame in the Multibay box (B)

- ▶ Secure the installation frame in the Multibay box with two screws (M3 x 6 mm) on either side.
- ▶ Before inserting the Multibay box into the chassis, connect the LSD cable to the LSD module.

### 12.5.1.4 Removing accessible drive dummy covers

- ▶ If applicable, remove the accessible dummy covers for installation bay 1 as described in section ["Removing accessible drive dummy covers"](#) on [page 184](#).

### 12.5.1.5 Installing the Multibay box

- ▶ Ensure that the four mounting brackets in installation bay 1 have not been bent out (see [figure 213](#)).
- ▶ Press out on the locking latch to disengage the accessible drive locking bar (see [figure 214](#)).
- ▶ Fold up the accessible drive locking bar.



Figure 226: Inserting the Multibay box

- ▶ Insert the Multibay box into installation bay 1 and carefully push in until the front screw hole on the front panel frame lines up with the centering pin on the locking bar (1).
- ▶ Close the locking bar (2) until it locks in place (3).

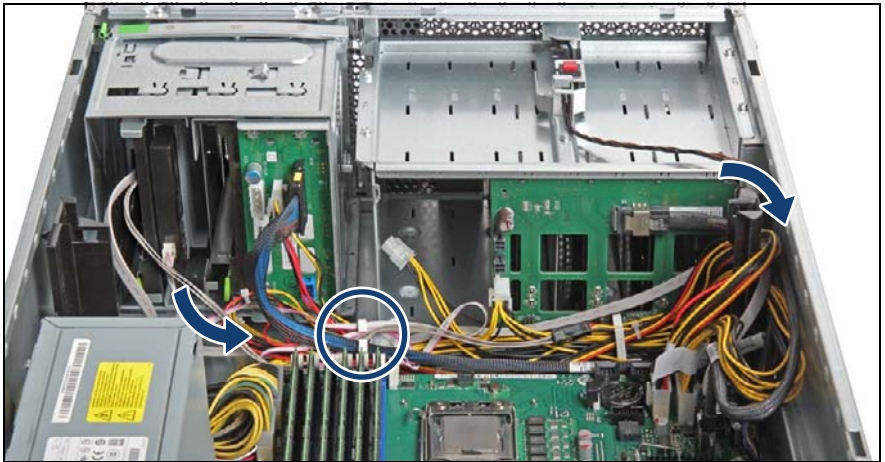


Figure 227: Routing cables

- ▶ Connect the LSD, SATA and power cables (see section ["Cabling" on page 397](#)).
- ▶ Run the SATA cable along the drive bays and through the cable clamp on the server floor as shown.
- ▶ Run the SATA cable through the cable guide.

#### 12.5.1.6 Concluding steps

- ▶ ["Installing the system fan holder" on page 75](#)
- ▶ ["Reassembling" on page 62](#)
- ▶ ["Connecting the server to the mains" on page 72](#)
- ▶ ["Switching on the server" on page 73](#)

### 12.5.2 Removing a slimline ODD or LSD



**Upgrade and Repair Unit (URU)**



**Hardware: 10 minutes**

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

#### 12.5.2.1 Preliminary steps

- ▶ ["Removing backup and optical disk media" on page 80](#)
- ▶ ["Shutting down the server" on page 48](#)
- ▶ ["Disconnecting the server from the mains" on page 48](#)
- ▶ ["Getting access to the component" on page 49](#)



The front cover only needs to be removed in order to remove or install accessible drive dummy covers. If the Multibay will be reinstalled after removing the slimline ODD or LSD module, the front cover can remain installed.

- ▶ ["Removing the system fan holder" on page 74](#)

#### 12.5.2.2 Removing the Multibay box

- ▶ Remove all cables from the slimline ODD.
- ▶ Remove the LSD cable from system board connector SMB 1.
- ▶ Press out on the locking latch to disengage the accessible drive locking bar (see figure 214).
- ▶ Fold up the accessible drive locking bar.

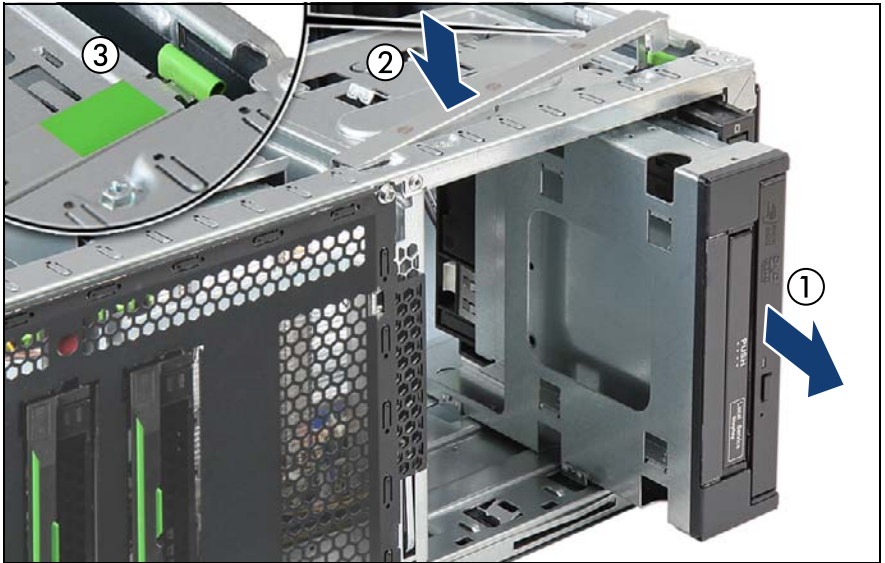


Figure 228: Removing the Multibay box

- ▶ Carefully pull the Multibay box out of its installation bay (1).
- ▶ Close the locking bar (2) until it locks in place (3).

### 12.5.2.3 Removing the slimline ODD

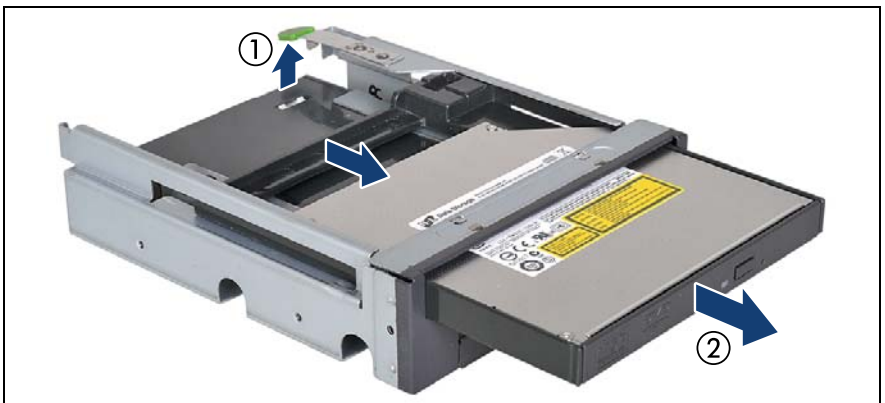


Figure 229: Removing the slimline ODD from the Multibay box

- ▶ Press up on the locking tab to disengage the slimline ODD module (1).

## Accessible drives and LSD

- ▶ From inside the Multibay box, press out on the slimline ODD module and pull it out of its bay (2).

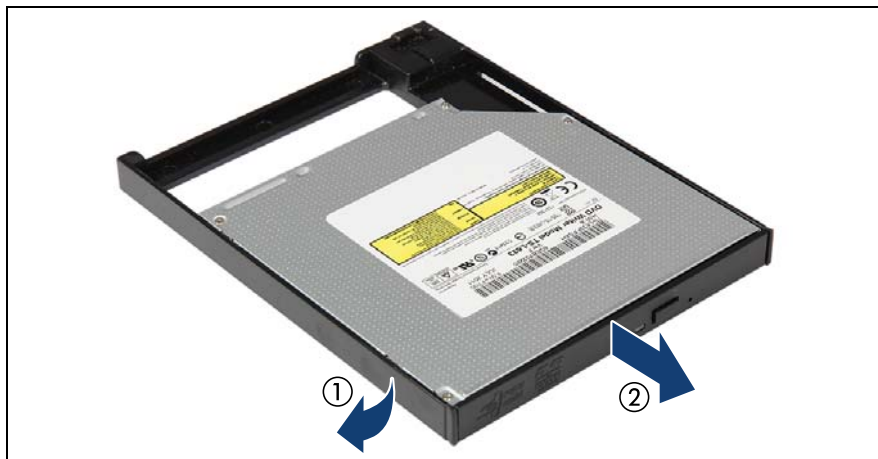


Figure 230: Removing the slimline ODD from its installation frame

- ▶ Disengage (1) and remove (2) the slimline ODD from its installation frame.

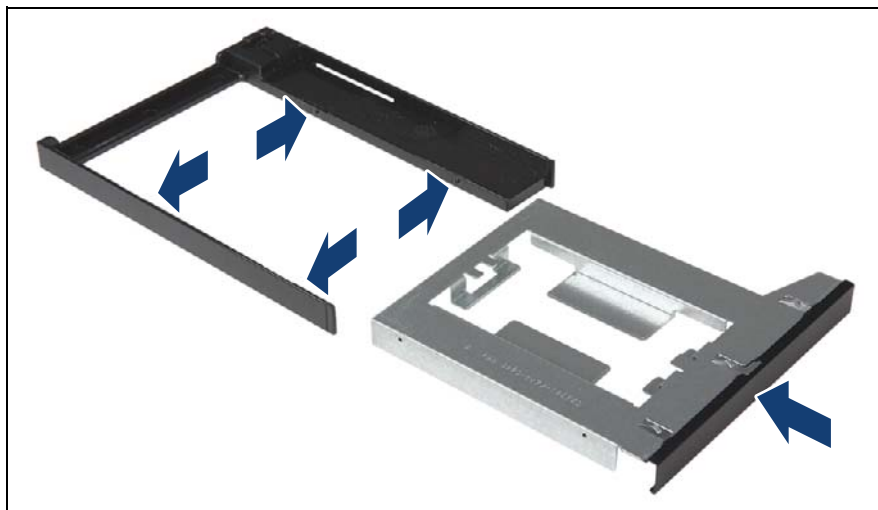


Figure 231: Mounting the slimline ODD dummy insert in the installation frame

- ▶ Fit the slimline ODD dummy insert into the slimline ODD installation frame.

- ▶ Ensure that the four pins on the frame (see arrows) engage with the side holes on the dummy insert.
- ▶ Insert the slimline ODD dummy module into the Multibay box and push back until the locking tab engages as shown in [figure 221](#) on [page 311](#).

#### 12.5.2.4 Removing the LSD module

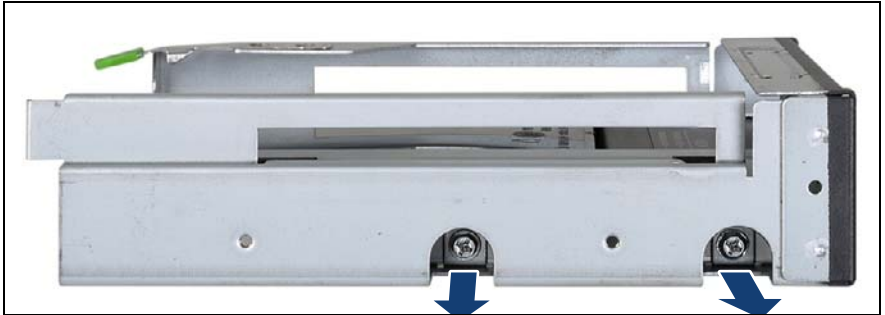


Figure 232: Removing the 3.5-inch installation frame from the Multibay box (A)

- ▶ Remove two screws on either side of the Multibay box to disengage the 3.5-inch installation bay.

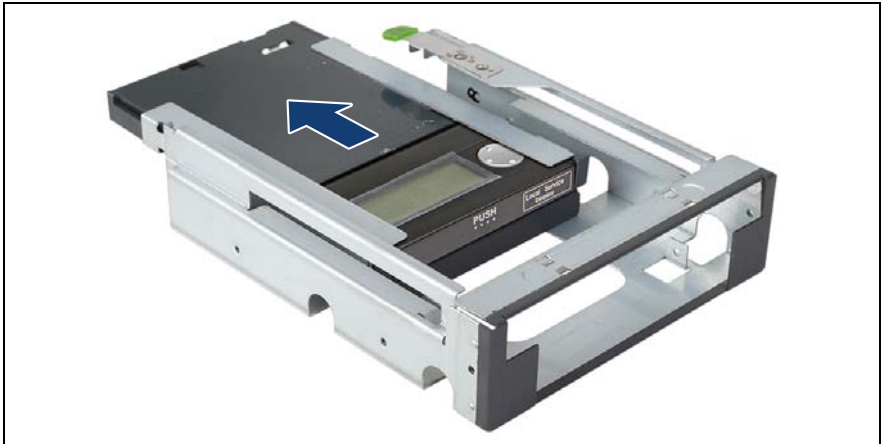


Figure 233: Removing the 3.5-inch installation frame from the Multibay box (B)

- ▶ Slide the 3.5-inch installation frame out of the Multibay box as shown.

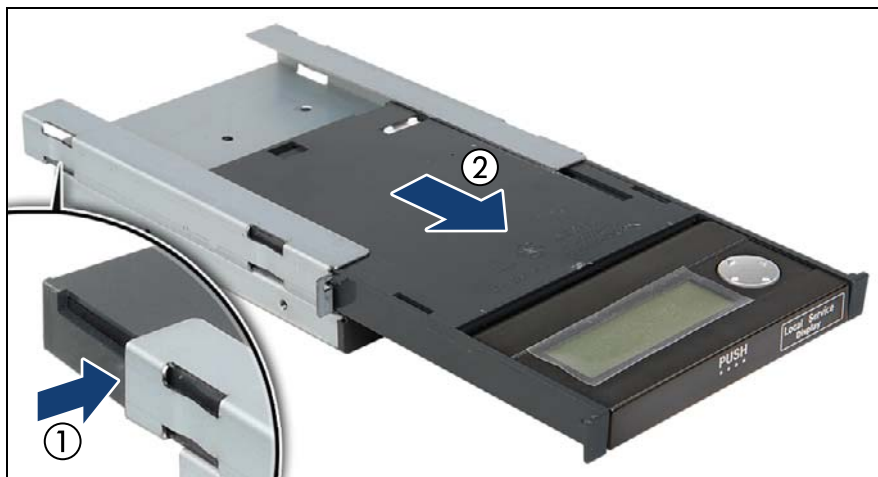


Figure 234: Removing the LSD module from the 3.5-inch installation frame

- ▶ Press in on the locking latch (see close-up) to disengage the LSD module (1).
- ▶ Pull the LSD module out of the 3.5-inch installation frame (2).
- ▶ If the removed LSD module is not to be replaced by a new module, reinstall the LSD dummy cover.

### 12.5.2.5 Installing the Multibay box

- ▶ Install the Multibay box as described in section ["Installing the Multibay box" on page 313](#).

### 12.5.2.6 Concluding steps

- ▶ ["Installing the system fan holder" on page 75](#)
- ▶ ["Reassembling" on page 62](#)
- ▶ ["Connecting the server to the mains" on page 72](#)
- ▶ ["Switching on the server" on page 73](#)

## 12.5.3 Replacing a slimline ODD or LSD



**Upgrade and Repair Unit (URU)**



**Hardware: 10 minutes**

**Tools:** – Phillips PH2 / (+) No. 2 screw driver  
 – Slotted screw driver (for bending in or out accessible drive mounting brackets)

### 12.5.3.1 Preliminary steps

- ▶ ["Locating the defective server" on page 45](#)
- ▶ ["Removing backup and optical disk media" on page 80](#)
- ▶ ["Shutting down the server" on page 48](#)
- ▶ ["Disconnecting the server from the mains" on page 48](#)
- ▶ ["Getting access to the component" on page 49](#)



Removing the front cover is not required in order to replace the slimline ODD or LSD module in the Multibay box.

- ▶ ["Removing the system fan holder" on page 74](#)
- ▶ ["Removing the Multibay box" on page 316](#)

### 12.5.3.2 Removing the defective slimline ODD

- ▶ Remove the slimline ODD from the Multibay box as described in section ["Removing the slimline ODD" on page 317](#).

### 12.5.3.3 Removing the defective LSD module

- ▶ Remove the LSD module from the Multibay box as described in section ["Removing the LSD module" on page 319](#).

### 12.5.3.4 Installing the new slimline ODD

- ▶ Install the slimline ODD into the Multibay box as described in section ["Installing the slimline ODD" on page 309](#).

### 12.5.3.5 Installing the new LSD module

- ▶ Install the LSD module into the Multibay box as described in section ["Installing the LSD module" on page 312](#).

### 12.5.3.6 Concluding steps

- ▶ ["Installing the Multibay box" on page 313](#)
- ▶ ["Installing the system fan holder" on page 75](#)
- ▶ ["Reassembling" on page 62](#)
- ▶ ["Connecting the server to the mains" on page 72](#)
- ▶ ["Switching on the server" on page 73](#)
- ▶ If applicable, ["Verifying and configuring the backup software solution" on page 91](#)

## 12.6 Slimline ODD in 4x 3.5-inch HDD extension box

### 12.6.1 Installing the slimline ODD



**Upgrade and Repair Unit (URU)**



**Hardware: 10 minutes**

**Tools:**

- Phillips PH2 / (+) No. 2 screw driver
- Slotted screw driver (for bending in or out accessible drive mounting brackets)

#### 12.6.1.1 Preliminary steps

- ▶ ["Shutting down the server" on page 48](#)
- ▶ ["Disconnecting the server from the mains" on page 48](#)
- ▶ ["Getting access to the component" on page 49](#)

**i** The front cover only needs to be removed in order to remove or install accessible drive dummy covers. If the HDD extension box is already installed in the server and will be removed in order to install a slimline ODD or LSD module, the front cover can remain installed.

- ▶ ["Removing the system fan holder" on page 74](#)
- ▶ ["Removing an HDD extension box" on page 190](#) (if applicable)

### 12.6.1.2 Installing the slimline ODD



Figure 235: Removing the slimline ODD mounting bracket

- ▶ Remove two screws from the slimline ODD mounting bracket.
- ▶ Remove the slimline ODD mounting bracket.

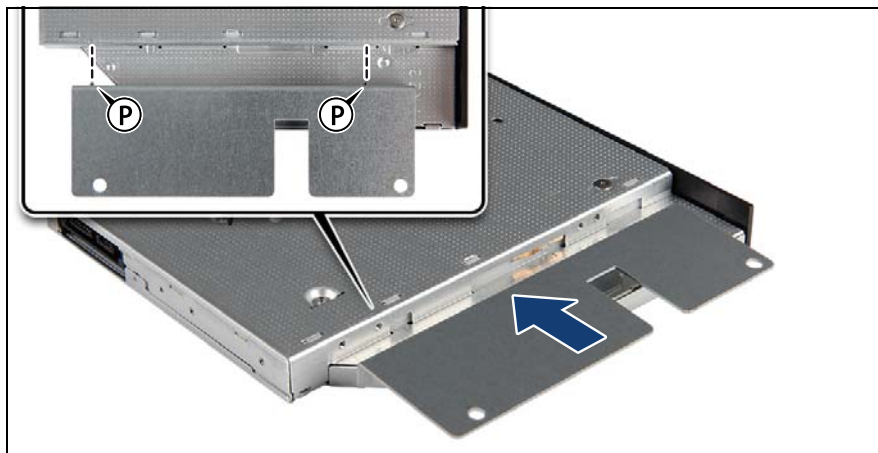


Figure 236: Installing the slimline ODD mounting bracket on the ODD (A)

- ▶ Turn the slimline ODD upside down.
- ▶ Fit the mounting bracket on the slimline ODD as shown.
- ▶ Ensure that the two pins (P) on the mounting bracket properly engage with the screw holes in the drive.



Figure 237: Installing the slimline ODD mounting bracket on the ODD (B)

- ▶ Ensure that the slimline ODD mounting bracket is properly seated on the drive as shown.



Figure 238: Installing the slimline ODD on the HDD extension box

- ▶ Hook the two latches on the left edge of the slimline ODD into the metal guides on the 4x 3.5-inch HDD extension box as shown (see close-up).
- ▶ Fold down the slimline ODD.



Figure 239: Installing the slimline ODD on the HDD extension box (B)

- ▶ Secure the slimline ODD mounting bracket on the 4x 3.5-inch HDD extension box with two screws.



Figure 240: Connecting cables

- ▶ Connect the power cable (1) and the SATA cable (2) to the slimline ODD.

### 12.6.1.3 Installing the 4x 3.5-inch HDD extension box

- ▶ Install the 4x 3.5-inch HDD extension box into installation bays 1, 2 and 3 as described in section ["Installing an HDD extension box" on page 183](#).

### 12.6.1.4 Cabling the slimline ODD

- ▶ Connect the SATA and power cables (see section ["Cabling" on page 397](#)).

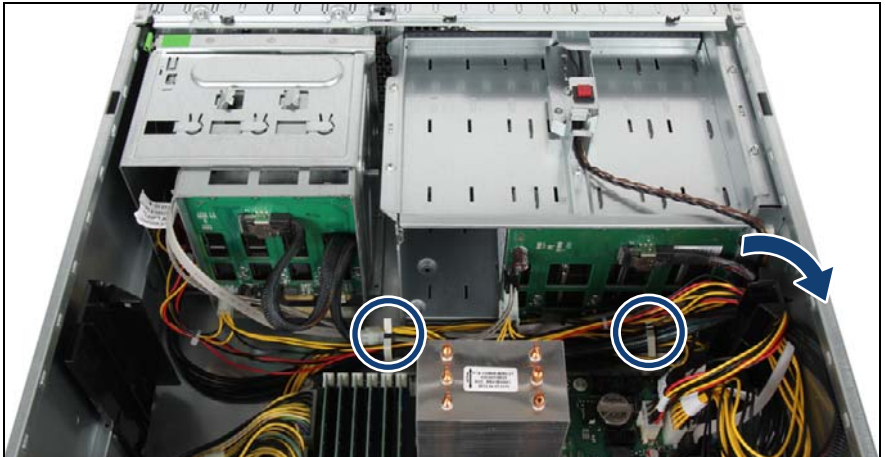


Figure 241: Routing cables

- ▶ Run the SATA cable along the drive bays and through the cable clamps on the server floor as shown.
- ▶ Run the SATA cable through the cable guide.

### 12.6.1.5 Concluding steps

- ▶ ["Installing the system fan holder" on page 75](#)
- ▶ ["Reassembling" on page 62](#)
- ▶ ["Connecting the server to the mains" on page 72](#)
- ▶ ["Switching on the server" on page 73](#)

### 12.6.2 Removing the slimline ODD



**Upgrade and Repair Unit (URU)**



**Hardware: 10 minutes**

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

#### 12.6.2.1 Preliminary steps

- ▶ ["Removing backup and optical disk media" on page 80](#)
- ▶ ["Shutting down the server" on page 48](#)
- ▶ ["Disconnecting the server from the mains" on page 48](#)
- ▶ ["Getting access to the component" on page 49](#)



The front cover only needs to be removed in order to remove or install accessible drive dummy covers. If the HDD extension box will be reinstalled after removing the slimline ODD, the front cover can remain installed.

- ▶ ["Removing the system fan holder" on page 74](#)
- ▶ ["Removing an HDD extension box" on page 190](#)

### 12.6.2.2 Removing the slimline ODD



Figure 242: Removing the slimline ODD from the extension box (A)

- ▶ Remove two screws from the slimline ODD mounting bracket.



Figure 243: Removing the slimline ODD from the extension box (B)

- ▶ Fold up (1) and remove (2) the slimline ODD as shown.

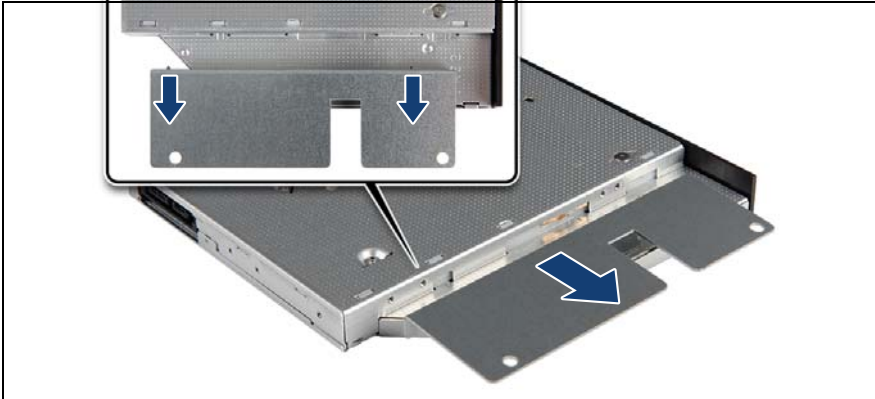


Figure 244: Removing the mounting frame from the slimline ODD

- ▶ Remove the slimline ODD mounting bracket from the slimline ODD.



Figure 245: Reinstalling the slimline ODD mounting frame on the HDD expansion box

- ▶ If the removed slimline ODD is not to be replaced by a new drive, reinstall the slimline ODD mounting bracket on the 4x 3.5-inch HDD extension box. Secure the slimline ODD mounting bracket on the HDD extension box with two screws.

### 12.6.2.3 Concluding steps

- ▶ ["Installing an HDD extension box" on page 183](#)
- ▶ ["Installing the system fan holder" on page 75](#)
- ▶ ["Reassembling" on page 62](#)
- ▶ ["Connecting the server to the mains" on page 72](#)
- ▶ ["Switching on the server" on page 73](#)

## 12.6.3 Replacing the slimline ODD



**Upgrade and Repair Unit (URU)**



**Hardware: 10 minutes**

**Tools:**

- Phillips PH2 / (+) No. 2 screw driver
- Slotted screw driver (for bending in or out accessible drive mounting brackets)

### 12.6.3.1 Preliminary steps

- ▶ ["Locating the defective server" on page 45](#)
- ▶ ["Removing backup and optical disk media" on page 80](#)
- ▶ ["Shutting down the server" on page 48](#)
- ▶ ["Disconnecting the server from the mains" on page 48](#)
- ▶ ["Getting access to the component" on page 49](#)



Removing the front cover is not required in order to replace the slimline ODD or LSD module in the 2x 3.5-inch HDD extension box.

- ▶ ["Removing the system fan holder" on page 74](#)
- ▶ ["Removing an HDD extension box" on page 190](#)

### 12.6.3.2 Removing the defective slimline ODD

- ▶ Remove the slimline ODD from the 4x 3.5-inch HDD extension box as described in section ["Removing the slimline ODD" on page 329](#).

### 12.6.3.3 Installing the new slimline ODD

- ▶ Install the slimline ODD onto the 4x 3.5-inch HDD extension box as described in section ["Installing the new slimline ODD" on page 332](#).

### 12.6.3.4 Concluding steps

- ▶ ["Installing an HDD extension box" on page 183](#)
- ▶ ["Installing the system fan holder" on page 75](#)
- ▶ ["Reassembling" on page 62](#)
- ▶ ["Switching on the server" on page 73](#)

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# 13 Front panel module

## Safety notes



### CAUTION!

- When inserting the front panel module 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 further information, please refer to chapter "[Important information](#)" on page 33.

# 13.1 Replacing the front panel module



**Field Replaceable Unit (FRU)**



**Hardware: 10 minutes**  
**Software: 5 minutes**

**Tools:** tool-less

### Note on system information backup / restore



The front panel module 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. After replacing the system board the backup data is restored from the Chassis ID board to the new system board.



### CAUTION!

For that reason the front panel module and system board must not be replaced simultaneously! In this case, restoring the system configuration data on the system board would fail.

## 13.1.1 Preliminary steps

- ▶ ["Suspending BitLocker functionality" on page 77](#)
- ▶ ["Disabling SVOM boot watchdog functionality" on page 78](#)
- ▶ ["Locating the defective server" on page 45](#)
- ▶ ["Shutting down the server" on page 48](#)
- ▶ ["Disconnecting the server from the mains" on page 48](#)
- ▶ ["Getting access to the component" on page 49](#)
- ▶ ["Removing the system fan holder" on page 74](#)

### 13.1.2 Removing the defective front panel module

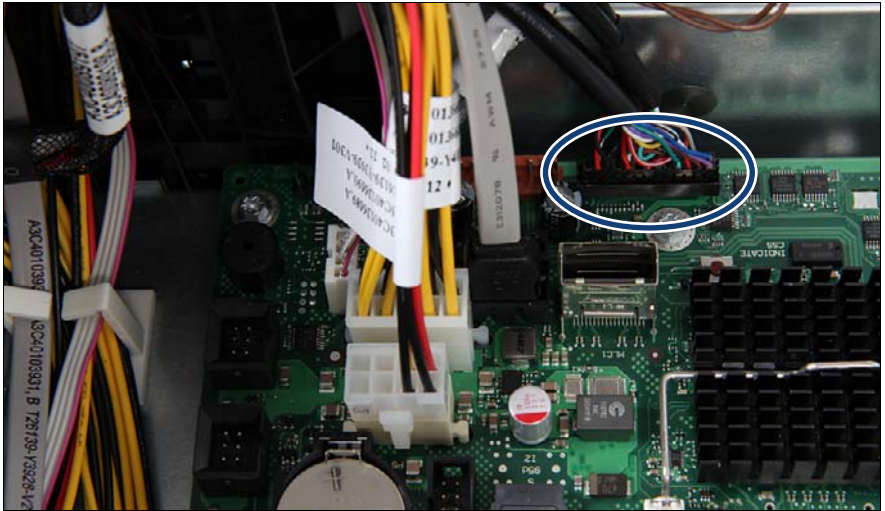


Figure 246: Disconnecting front panel cables

- ▶ Disconnect the front panel cable from the system board (see circle).
- ▶ Remove all front panel cables from the cable guides.

## Front panel module

---



Figure 247: Removing the front panel module

**i** The front cover (tower server) / rack mounting frame (rack server) does not need to be removed in order to replace the front panel module. In the figures, the front cover / rack mounting frame has been removed for illustration purposes only.

- ▶ Press out on the locking latch to disengage the accessible drive locking bar (1).
- ▶ Fold up the accessible drive locking bar (2).
- ▶ Remove the front panel module (3).

- i** Unlocking and securing the front panel and accessible drives is illustrated by the example of tower servers. In case of rack servers, the accessible drive locking bar is located on the side of the drive bay. In this case, proceed as follows:

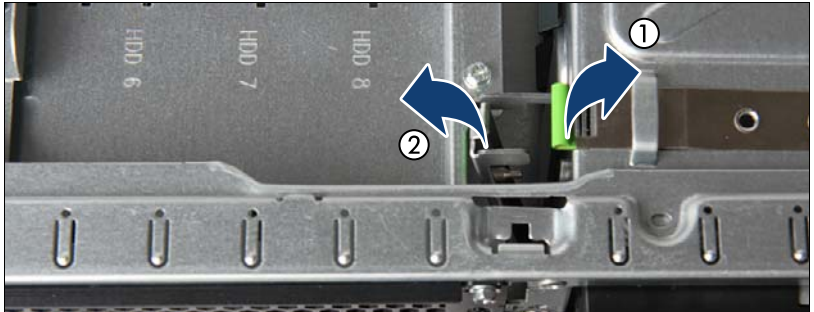


Figure 248: Removing the front panel module (rack systems)

- ▶ Pull up on the locking latch to disengage the accessible drive locking bar (1).
- ▶ Fold out the accessible drive locking bar (2).
- ▶ Remove the front panel module.



Figure 249: Front panel module - cable tie

- ▶ If necessary, cut the cable tie and remove it. The cable tie must not be replaced.

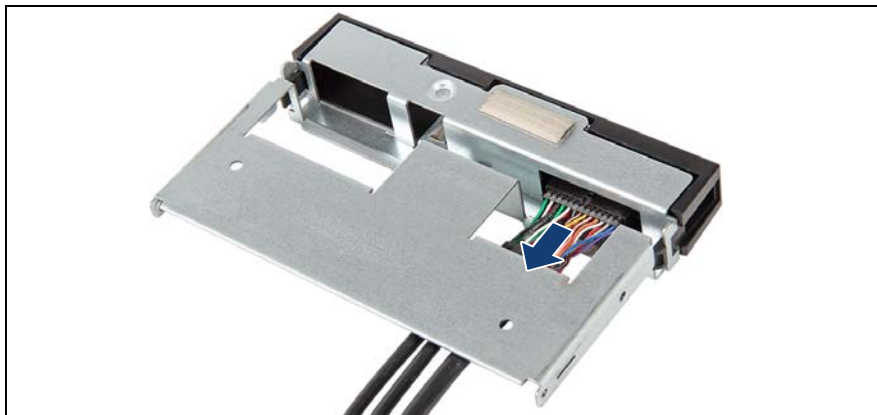


Figure 250: Removing the front panel cable

- ▶ Remove the front panel cable from the defective front panel module as shown.

### 13.1.3 Installing the new front panel module

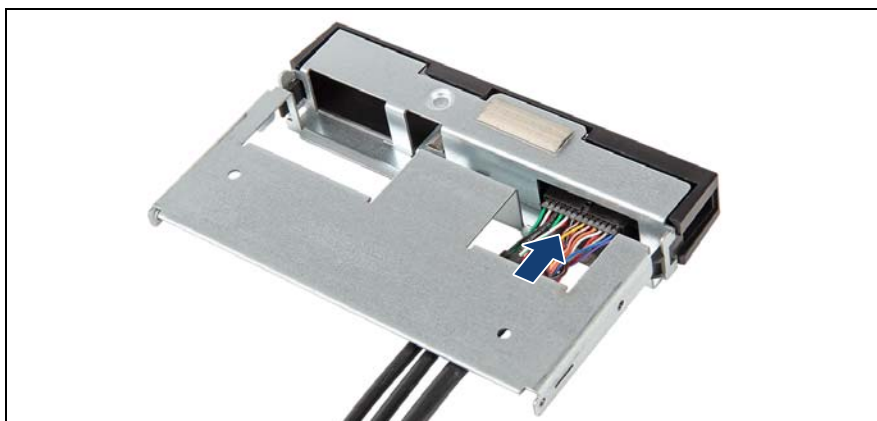


Figure 251: Connecting the front panel cable

- ▶ Connect the front panel cable to the new front panel module as shown.

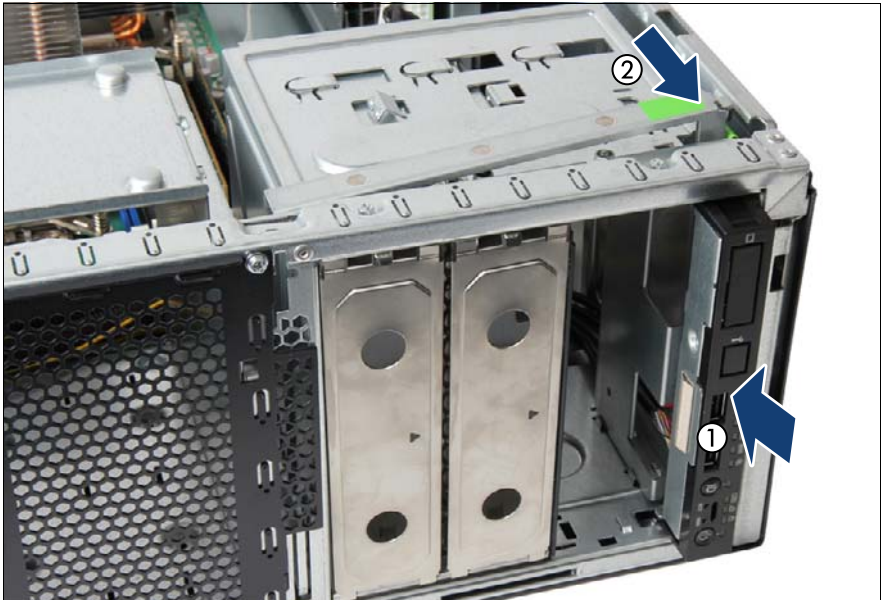


Figure 252: Installing the front panel module

- ▶ Insert the front panel module into its installation bay and carefully push in until the front screw hole on the front panel frame lines up with the centering pin on the locking bar (1).
- ▶ Close the locking bar until it locks in place (2).

**i** Unlocking and securing the front panel and accessible drives is illustrated by the example of tower servers. In case of rack servers, the accessible drive locking bar is located on the side of the drive bay (see figure 248).

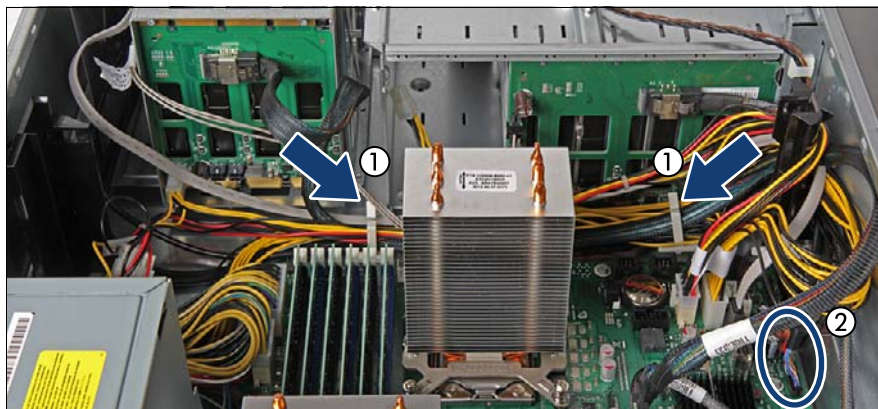


Figure 253: Securing front panel cables

- ▶ Run the front panel cables through the cable guides (1).
- ▶ Connect the front panel cable to the connector "Front Panel" on the system board (2).

### 13.1.4 Concluding steps

- ▶ ["Installing the system fan holder" on page 75](#)
- ▶ ["Reassembling" on page 62](#)
- ▶ ["Connecting the server to the mains" on page 72](#)
- ▶ ["Switching on the server" on page 73](#)
- ▶ ["Verifying system information backup / restore" on page 88](#)
- ▶ Store your server's system information on the Chassis ID EPROM integrated into the front panel board. For further information on how to obtain and use the *ChassisId\_Prom* Tool, refer to section ["Using the Chassis ID Prom Tool" on page 106](#).
- ▶ ["Enabling SVOM boot watchdog functionality" on page 97](#)
- ▶ ["Resuming BitLocker functionality" on page 103](#)

---

# 14 System board and components

## 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 further information, please refer to chapter "[Important information](#)" on page 33.

## 14.1 Basic information

This section provides instructions for the system board and the following components:

- **CMOS battery**  
CMOS memory (volatile BIOS memory) and the real-time clock are powered by a lithium coin cell (CMOS battery). This cell lasts up to ten 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.
- **UFM (USB Flash Module)**  
The server can be equipped with a USB Flash Module (UFM).
- **TPM (Trusted Platform Module)**  
The system board is optionally equipped with a Trusted Platform Module (TPM). This module enables programs from third party manufacturers to store key information, for example drive encryption using Windows Bitlocker Drive Encryption.
- **Onboard SAS enabling key**  
The onboard SAS enabling key enables the SAS functionality of the Onboard controller.

# 14.2 Replacing the CMOS battery



Upgrade and Repair Unit  
(URU)



Hardware: 5 minutes

**Tools:** tool-less; recommended: tooth pick

### Safety notes



#### 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 further safety information, please refer to section "Environmental protection" in the operating manual of your server.
- **Ensure to insert the CMOS battery with the positive pole facing up!**

### 14.2.1 Preliminary steps

- ▶ ["Locating the defective server" on page 45](#)
- ▶ ["Shutting down the server" on page 48](#)
- ▶ ["Disconnecting the server from the mains" on page 48](#)
- ▶ ["Getting access to the component" on page 49](#)

## 14.2.2 Removing the CMOS battery

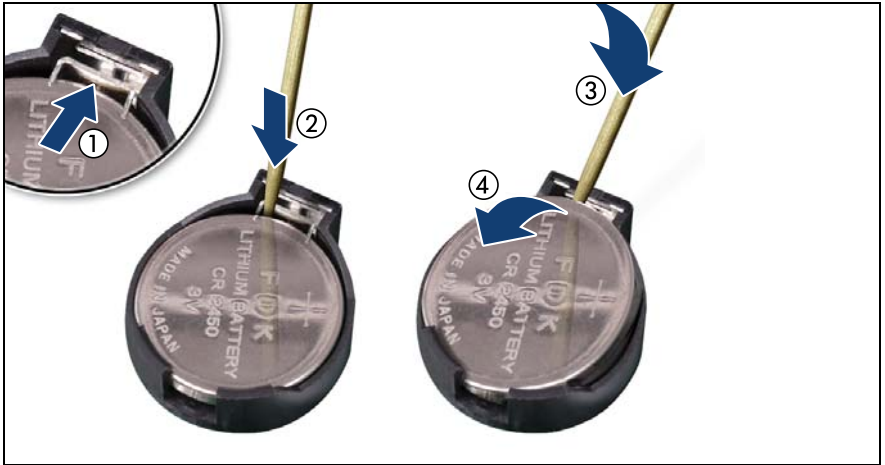


Figure 254: Replacing the CMOS battery

- ▶ Press out on the locking spring to eject the depleted CMOS battery (1).
- ▶ If the CMOS battery cannot be ejected this way, use a toothpick (recommended) or similar tool as a lever: Insert the toothpick between the battery and locking spring as shown (2).



### CAUTION!

Do not use sharp-edged tools like screw drivers as they may damage system board components when slipping.

- ▶ Carefully pry the depleted CMOS battery out of its socket as shown (3).
- ▶ Remove the CMOS battery (4).



Do not throw the CMOS battery into the trash can. Lithium batteries must be disposed of in accordance with local regulations concerning special waste.

### 14.2.3 Installing the CMOS battery

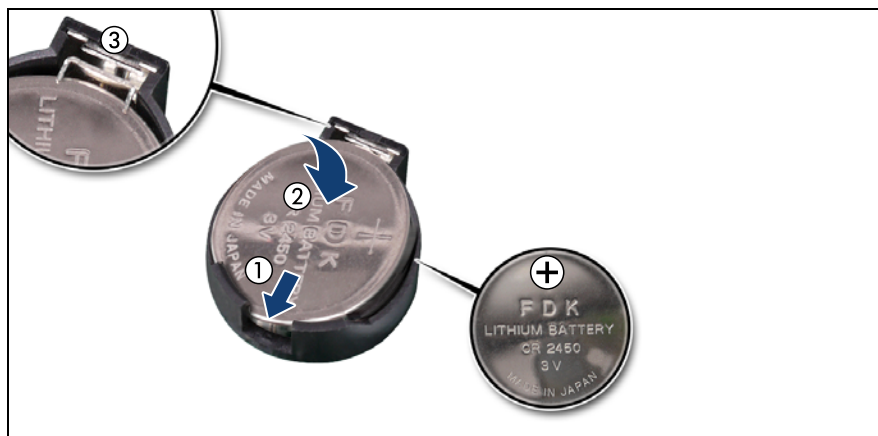


Figure 255: Installing the CMOS battery

- ▶ At a slight angle, fit the new CMOS battery into its socket as shown (1).



#### **CAUTION!**

Ensure to insert the CMOS battery with the positive pole (label side) facing up as shown (see close-up).

- ▶ Fold down the CMOS battery (2) until it locks in place.
- ▶ Ensure that the locking spring (3) is properly engaged.

### 14.2.4 Concluding steps

- ▶ Dispose of the CMOS battery in accordance with local regulations concerning special waste.
- ▶ ["Reassembling" on page 62](#)
- ▶ ["Connecting the server to the mains" on page 72](#)
- ▶ ["Switching on the server" on page 73](#)
- ▶ Verify whether the backup data on the Chassis ID EPROM has been restored to the system board as described in section ["Verifying system information backup / restore" on page 88](#).
- ▶ ["Verifying the system time settings" on page 99](#)

## 14.3 USB Flash Module (UFM)

### 14.3.1 Installing the UFM



**Upgrade and Repair Unit (URU)**



**Hardware: 5 minutes**  
**Software: 5 minutes**

**Tools:** tool-less

#### 14.3.1.1 Preliminary steps

- ▶ ["Suspending BitLocker functionality" on page 77](#)
- ▶ ["Disabling SVOM boot watchdog functionality" on page 78](#)
- ▶ ["Locating the defective server" on page 45](#)
- ▶ ["Shutting down the server" on page 48](#)
- ▶ ["Disconnecting the server from the mains" on page 48](#)
- ▶ ["Getting access to the component" on page 49](#)

#### 14.3.1.2 Installing the UFM

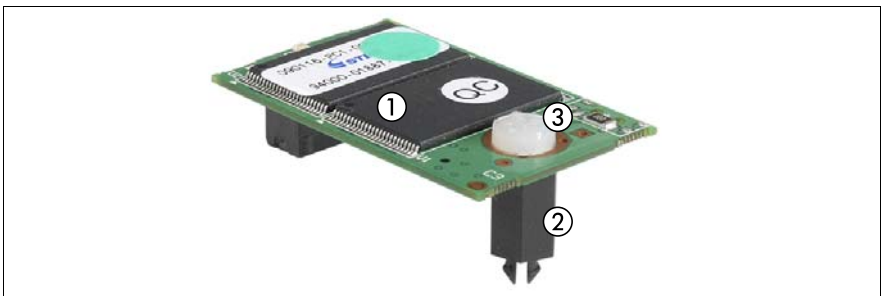


Figure 256: UFM kit

|   |                        |   |            |
|---|------------------------|---|------------|
| 1 | USB Flash Module (UFM) | 2 | UFM spacer |
| 3 | UFM nylon screw        |   |            |

## System board and components



Figure 257: UFM mounting location

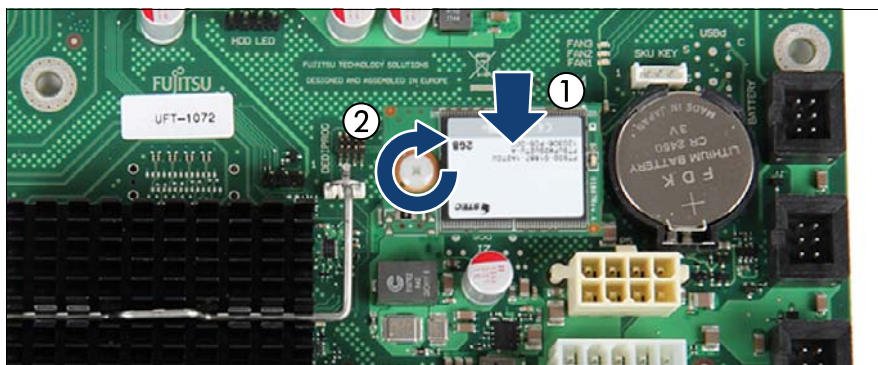


Figure 258: Installing the UFM

- ▶ Connect the UFM to the system board (1), snapping in the UFM spacer.
- ▶ Fasten the nylon screw (2).

### 14.3.1.3 Concluding steps

- ▶ ["Reassembling" on page 62](#)
- ▶ ["Connecting the server to the mains" on page 72](#)
- ▶ ["Switching on the server" on page 73](#)
- ▶ ["Enabling SVOM boot watchdog functionality" on page 97](#)
- ▶ ["Resuming BitLocker functionality" on page 103](#)

### 14.3.1.4 Software configuration

The UFM delivery set includes the "Recovery Tool CD" to setup the ESXi configuration. Proceed as follows:

- ▶ Switch on the server.
- ▶ Right after switching on the server, insert the "Recovery Tool CD" into the DVD drive and close the drive tray.
- ▶ The server should now boot from the "Recovery Tool CD".
- ▶ Follow the on-screen instructions.

### 14.3.2 Removing the UFM



**Upgrade and Repair Unit (URU)**



**Hardware: 5 minutes**

|   |
|---|
| <b>Tools:</b> Phillips PH1 / (+) No. 1 screw driver |
|---|

#### 14.3.2.1 Preliminary steps

- ▶ ["Suspending BitLocker functionality" on page 77](#)
- ▶ ["Locating the defective server" on page 45](#)
- ▶ ["Shutting down the server" on page 48](#)
- ▶ ["Disconnecting the server from the mains" on page 48.](#)
- ▶ ["Getting access to the component" on page 49.](#)

### 14.3.2.2 Removing the UFM

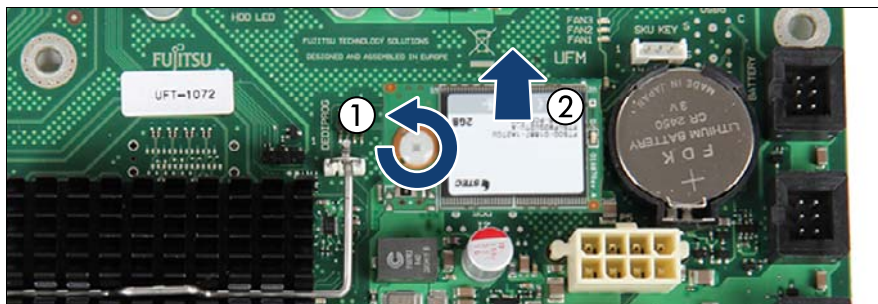


Figure 259: Removing the UFM (A)

- ▶ Remove the nylon screw (1).
- ▶ Disconnect and remove the UFM (2).



Figure 260: Removing the UFM (B)

- ▶ The UFM spacer remains on the system board.

### 14.3.2.3 Concluding steps

- ▶ ["Reassembling" on page 62](#)
- ▶ ["Connecting the server to the mains" on page 72](#)
- ▶ ["Switching on the server" on page 73](#)
- ▶ ["Resuming BitLocker functionality" on page 103](#)

### 14.3.3 Replacing the UFM



**Upgrade and Repair Unit (URU)**



**Hardware: 10 minutes**  
**Software: 5 minutes**

**Tools:** – Phillips PH1 / (+) No. 1 screw driver  
– combination pliers and flat nose pliers

#### 14.3.3.1 Preliminary steps

- ▶ ["Suspending BitLocker functionality" on page 77](#)
- ▶ ["Disabling SVOM boot watchdog functionality" on page 78](#)
- ▶ ["Locating the defective server" on page 45](#)
- ▶ ["Shutting down the server" on page 48](#)
- ▶ ["Disconnecting the server from the mains" on page 48](#)
- ▶ ["Getting access to the component" on page 49](#)

#### 14.3.3.2 Removing the defective UFM

- ▶ Remove the UFM from the system board as described in section ["Removing the UFM" on page 347](#).
- ▶ The UFM spacer remains on the system board.

### 14.3.3.3 Installing the new UFM

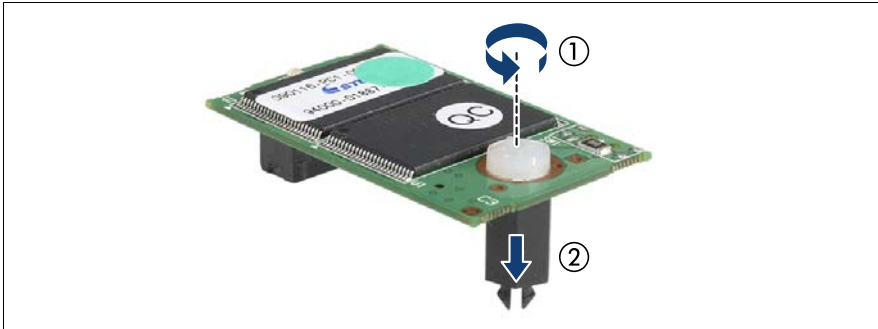


Figure 261: Preparing the new UFM

- ▶ Remove the nylon screw from the new UFM (1).
- ▶ Remove the UFM spacer (2).



Figure 262: Installing the UFM (A)

- ▶ Fit the UFM on the UFM connector and the remaining UFM spacer.



Figure 263: Installing the UFM (B)

- ▶ Secure the UFM to the UFM spacer with the nylon screw.

### Destroying the defective UFM



#### CAUTION!

The UFM contains customer information (e.g. IP address, license numbers). After replacing the UFM, hand the defective UFM over to the customer. If the customer requests disposal of the defective UFM, proceed as follows:

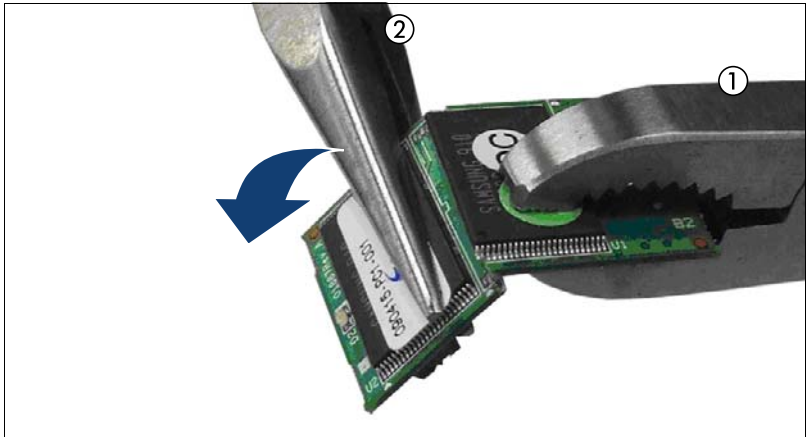


Figure 264: Destroying the defective UFM

- ▶ Use a pair of combination pliers (1) and flat nose pliers (2) to break the UFM in half as shown.

#### 14.3.3.4 Concluding steps

- ▶ ["Reassembling" on page 62](#)
- ▶ ["Connecting the server to the mains" on page 72](#)
- ▶ ["Switching on the server" on page 73](#)
- ▶ ["Enabling SVOM boot watchdog functionality" on page 97](#)
- ▶ ["Resuming BitLocker functionality" on page 103](#)

#### 14.3.3.5 Software configuration

The UFM delivery set includes the "Recovery Tool CD" to setup the ESXi configuration. Proceed as follows:

## System board and components

---

- ▶ Switch on the server.
- ▶ Right after switching on the server, insert the "Recovery Tool CD" into the DVD drive and close the drive tray.
- ▶ The server should now boot from the "Recovery Tool CD".
- ▶ Follow the on-screen instructions.

## 14.4 Trusted Platform Module (TPM)

### 14.4.1 Installing the TPM



**Upgrade and Repair Unit (URU)**



**Hardware: 5 minutes  
Software: 5 minutes**

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

Installing the TPM:

- Bit screw driver
- TPM bit insert (\*)

(\*) For the Japanese market:

- TPM module fixing tool (S26361-F3552-L909)

#### 14.4.1.1 Preliminary steps

- ▶ ["Suspending BitLocker functionality" on page 77](#)
- ▶ ["Locating the defective server" on page 45](#)
- ▶ ["Shutting down the server" on page 48](#)
- ▶ ["Disconnecting the server from the mains" on page 48](#)
- ▶ ["Getting access to the component" on page 49](#)

14.4.1.2 Installing the TPM

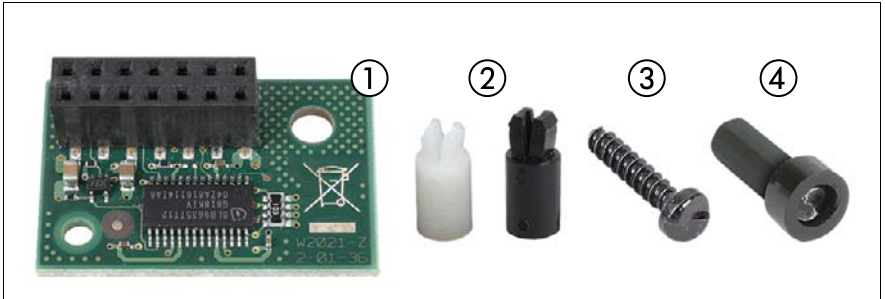


Figure 265: TPM kit

|   |   |   |                                      |
|---|---|---|--------------------------------------|
| 1 | TPM (Trusted Platform Module)   | 3 | Special screw for TPM                |
| 2 | TPM spacer<br><div style="border: 1px solid black; padding: 2px; display: inline-block;"> <p><b>i</b> The black TPM spacer is not used in this server.</p> </div> | 4 | TPM bit insert for TPM special screw |

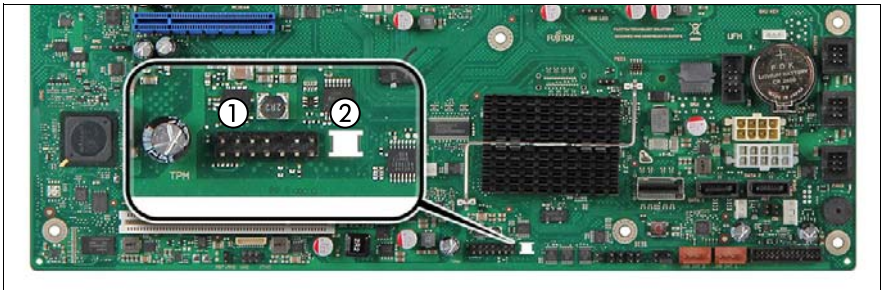


Figure 266: TPM mounting location

- 1: TPM connector
- 2: Cut-out for TPM spacer

## System board and components



Figure 267: Installing the TPM spacer

- ▶ Snap the TPM spacer into the cut-out in the system board.

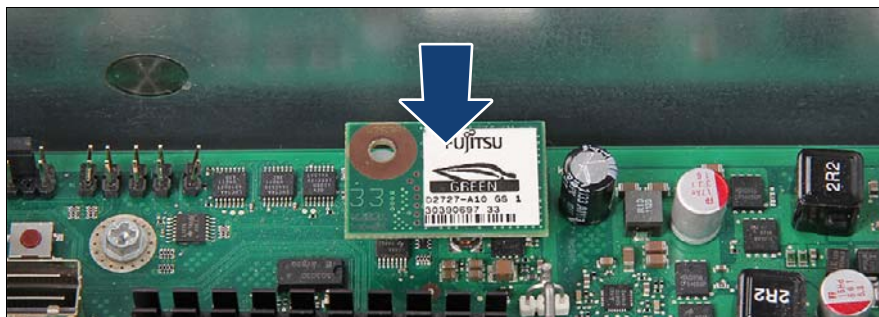


Figure 268: Installing the TPM

- ▶ Connect the TPM to the system board.



Figure 269: TPM bit insert

- ▶ Attach the TPM bit insert or TPM module fixing tool (Japanese market) to a bit screw driver.

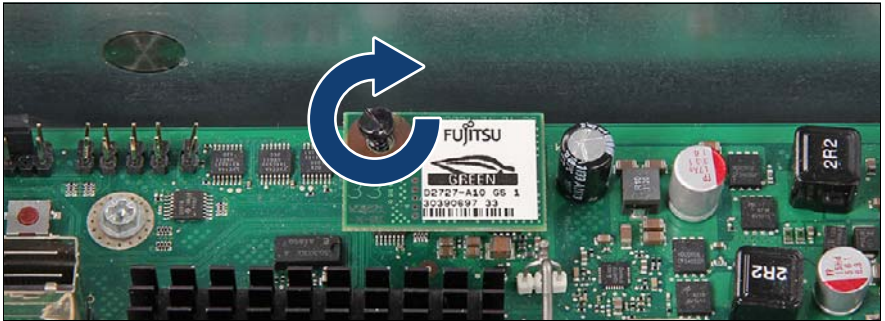


Figure 270: Securing the TPM

- ▶ Secure the TPM with the TPM screw using the TPM bit insert.



Do not fasten the screw too firmly. Stop as soon as the head of the screw lightly touches the TPM.

#### 14.4.1.3 Concluding steps

- ▶ ["Reassembling" on page 62](#)
- ▶ ["Connecting the server to the mains" on page 72](#)
- ▶ Enable TPM in the system board BIOS. Proceed as follows:
  - ▶ Switch on or restart your server.
  - ▶ As soon as the startup screen appears, press the **[F2]** function key to enter the BIOS.
  - ▶ Select the *Advanced* menu.
  - ▶ Select the *Trusted Computing* submenu.
  - ▶ Set the *TPM Support* and *TPM State* settings to *Enabled*.
  - ▶ Under *Pending TPM operation*, select the desired TPM operation mode.
  - ▶ Save your changes and exit the BIOS.



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

- ▶ ["Switching on the server" on page 73](#)
- ▶ ["Resuming BitLocker functionality" on page 103.](#)

### 14.4.2 Removing the TPM



**Field Replaceable Unit (FRU)**



**Hardware: 30 minutes**

**Tools:** Removing the system board:

- Phillips PH2 / (+) No. 2 screw driver

Installing the TPM:

- Bit screw driver
- flat nose pliers
- TPM bit insert (\*)

(\*) For the Japanese market:

- TPM module fixing tool (S26361-F3552-L909)



#### **CAUTION!**

Advise your contact persons that they must provide you with TPM backup copies. For security reasons, the TPM must be restored/re-saved by the customer. After installing a new system board, the TPM must be enabled. You may not clear the TPM data.

If the contact persons **DO NOT** have a backup copy available, inform them that replacing the TPM will cause to lose all data.

#### 14.4.2.1 Preliminary steps

Before removing the TPM, perform the following steps:

- ▶ Before removing the TPM, 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 further information on how to disable BitLocker drive encryption, please refer to the Microsoft Knowledge Base.

Fujitsu service partners will find additional information (also available in Japanese) on the Fujitsu Extranet web pages.

- ▶ Disable TPM in the system board BIOS. Proceed as follows:
  - ▶ Switch on or restart your server.
  - ▶ As soon as the startup screen appears, press the **F2** function key to enter the BIOS.
  - ▶ Select the *Advanced* menu.
  - ▶ Select the *Trusted Computing* submenu.
  - ▶ Set the *TPM Support* and *TPM State* settings to *Disabled*.
  - ▶ Save your changes and exit the BIOS.



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

- ▶ ["Locating the defective server" on page 45](#)
- ▶ ["Shutting down the server" on page 48](#)
- ▶ ["Disconnecting the server from the mains" on page 48](#)
- ▶ ["Getting access to the component" on page 49](#)
- ▶ ["Removing the system fan holder" on page 74](#)

### 14.4.2.2 Removing the TPM

- ▶ ["Removing the defective system board" on page 373](#)
- ▶ Lay the system board on a soft, antistatic surface with its component side facing down.

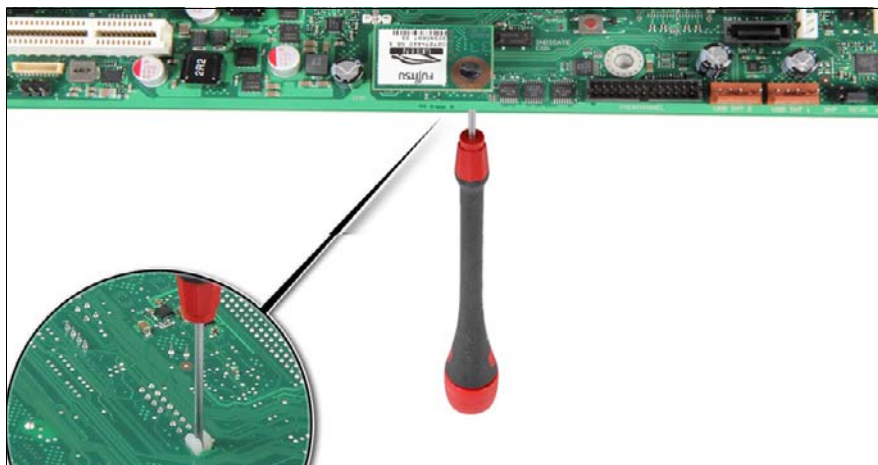


Figure 271: Removing the TPM screw

- ▶ Locate the slotted lower end of the TPM screw (1).
- ▶ Carefully loosen the TPM screw using a thin slotted screw driver (e.g. watchmaker's screw driver) or the dedicated TPM screw driver (Japanese market) (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.
- ▶ Remove the defective TPM on the upper side of the system board.

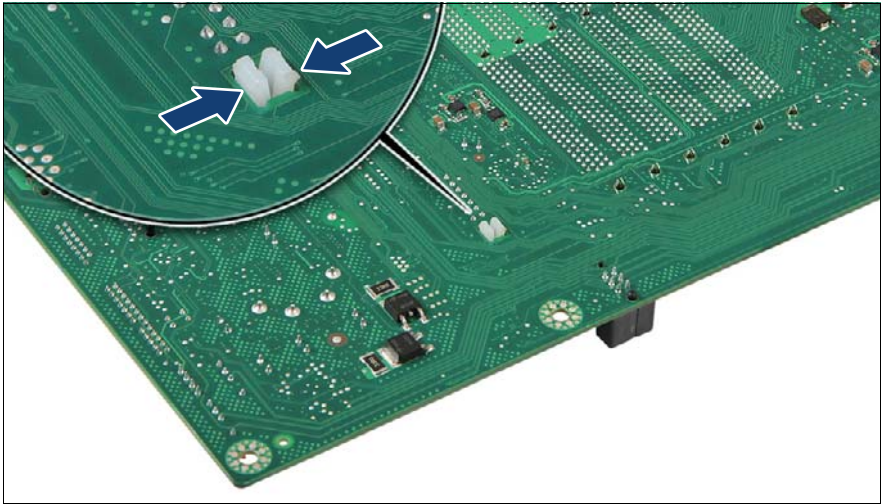


Figure 272: Removing the TPM spacer

- ▶ Using a flat nose pliers, press together the hooks on the TPM spacer (see close-up) and remove it from the system board.



If the TPM is to be replaced, the TPM spacer may remain on the system board.

### 14.4.2.3 Concluding steps

- ▶ ["Installing the new system board" on page 377](#)
- ▶ ["Installing the system fan holder" on page 75](#)
- ▶ ["Reassembling" on page 62](#)
- ▶ ["Connecting the server to the mains" on page 72](#)
- ▶ ["Switching on the server" on page 73](#)

### 14.4.3 Replacing the TPM



**Field Replaceable Unit (FRU)**



**Hardware: 40 minutes**

**Tools:** Removing the system board:

- Phillips PH2 / (+) No. 2 screw driver

Replacing the TPM:

- Bit screw driver
- TPM bit insert<sup>(\*)</sup>
- thin slotted screw driver (2 x 0.4 mm)<sup>(\*)</sup>

<sup>(\*)</sup> For the Japanese market:

- Dedicated TPM screw driver (CWZ8291A)
- TPM module fixing tool (S26361-F3552-L909)



#### **CAUTION!**

Advise your contact persons that they must provide you with TPM backup copies. For security reasons, the TPM must be restored/re-saved by the customer. After installing a new system board, the TPM must be enabled. You may not clear the TPM data.

If the contact persons **DO NOT** have a backup copy available, inform them that replacing the TPM will cause to lose all data.

#### **14.4.3.1 Preliminary steps**

- ▶ ["Suspending BitLocker functionality" on page 77](#)
- ▶ ["Locating the defective server" on page 45](#)
- ▶ ["Shutting down the server" on page 48](#)
- ▶ ["Disconnecting the server from the mains" on page 48](#)
- ▶ ["Getting access to the component" on page 49](#)
- ▶ ["Removing the system fan holder" on page 74](#)

### 14.4.3.2 Removing the defective TPM

- ▶ Remove the TPM as described in section ["Removing the TPM" on page 356](#).
- ▶ Leave the TPM spacer on the system board when removing the TPM.

### 14.4.3.3 Installing the new TPM

- ▶ Install the TPM as described in section ["Installing the TPM" on page 352](#).

### 14.4.3.4 Concluding steps

- ▶ ["Installing the system fan holder" on page 75](#)
- ▶ ["Reassembling" on page 62](#)
- ▶ ["Connecting the server to the mains" on page 72](#)
- ▶ ["Switching on the server" on page 73](#)
- ▶ ["Resuming BitLocker functionality" on page 103](#)

### 14.5 iRMC microSD card

**i** The iRMC microSD card is necessary for using the Embedded Lifecycle Management (eLCM) functionality of the iRMC. It requires a valid eLCM license key, which is always purchased together with the iRMC microSD card and activated through the iRMC web frontend.

For further information, please refer to the “ServerView embedded Lifecycle Management (eLCM)” user guide.

#### 14.5.1 Installing the iRMC microSD card



**Upgrade and Repair Unit (URU)**



**Average task duration: 5 minutes**

**Tools:** tool-less

##### 14.5.1.1 Preliminary steps

- ▶ ["Shutting down the server" on page 48](#)
- ▶ ["Disconnecting the server from the mains" on page 48](#)
- ▶ ["Getting access to the component" on page 49](#)

##### 14.5.1.2 Installing the iRMC microSD card



Figure 273: iRMC microSD card

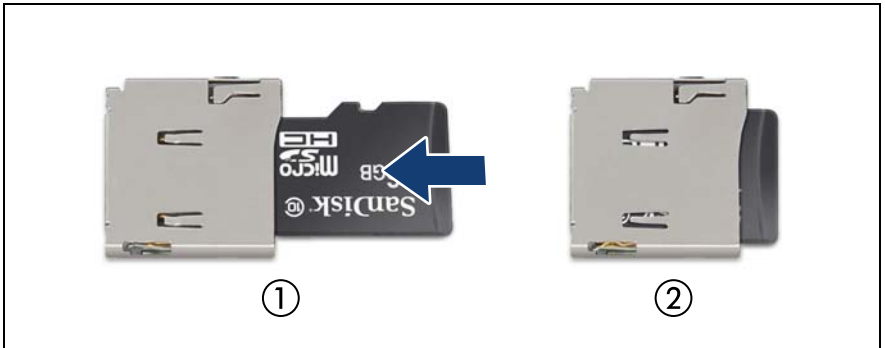


Figure 274: Installing the iRMC microSD card

- ▶ 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 section ["Connectors and indicators on the system board"](#) on page 412.

### 14.5.1.3 Concluding steps

- ▶ ["Reassembling"](#) on page 62
- ▶ ["Connecting the server to the mains"](#) on page 72

### 14.5.2 Removing the iRMC microSD card



**Upgrade and Repair Unit (URU)**



**Average task duration:  
5 minutes**

**Tools:** Side-cutting pliers

#### 14.5.2.1 Preliminary steps

- ▶ ["Shutting down the server" on page 48](#)
- ▶ ["Disconnecting the server from the mains" on page 48](#)
- ▶ ["Getting access to the component" on page 49](#)

#### 14.5.2.2 Removing the iRMC microSD card

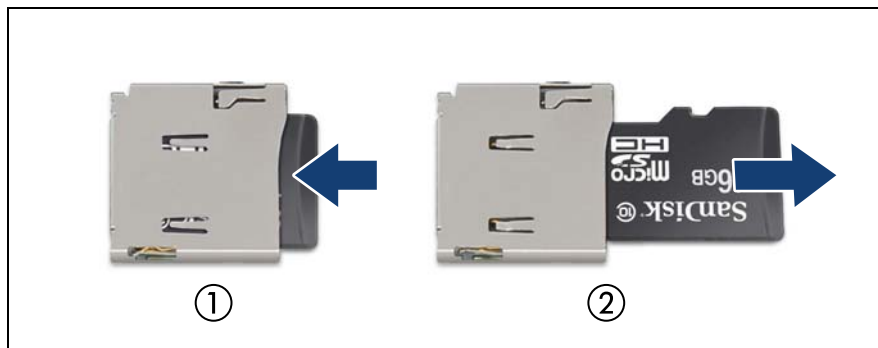


Figure 275: Removing the iRMC microSD card

- ▶ 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).

### Destroying the defective iRMC microSD card



#### **CAUTION!**

The iRMC microSD card contains customer information. After replacing the iRMC microSD card, hand the defective card over to the customer. If the customer requests disposal of the defective iRMC microSD card, proceed as follows:

- ▶ Using a pair of side-cutting pliers, cut the iRMC microSD card in half.

#### **14.5.2.3 Concluding steps**

- ▶ ["Reassembling" on page 62](#)
- ▶ ["Connecting the server to the mains" on page 72](#)

### 14.5.3 Replacing the iRMC microSD card



**Upgrade and Repair Unit  
(URU)**



**Average task duration:  
5 minutes**

**Tools:** Side-cutting pliers

#### 14.5.3.1 Preliminary steps

- ▶ ["Shutting down the server" on page 48](#)
- ▶ ["Disconnecting the server from the mains" on page 48](#)
- ▶ ["Getting access to the component" on page 49](#)

#### 14.5.3.2 Replacing the iRMC microSD card

- ▶ Remove the defective iRMC microSD card as described in section ["Removing the iRMC microSD card" on page 364](#).
- ▶ Install the new iRMC microSD card as described in section ["Installing the iRMC microSD card" on page 362](#).

#### 14.5.3.3 Concluding steps

- ▶ ["Reassembling" on page 62](#)
- ▶ ["Connecting the server to the mains" on page 72](#)

## 14.6 Onboard SAS enabling key

### 14.6.1 Installing the onboard SAS enabling key



Upgrade and Repair Unit  
(URU)



Hardware: 5 minutes

**Tools:** tool-less

#### 14.6.1.1 Preliminary steps

- ▶ ["Suspending BitLocker functionality" on page 77](#)
- ▶ ["Locating the defective server" on page 45](#)
- ▶ ["Shutting down the server" on page 48](#)
- ▶ ["Disconnecting the server from the mains" on page 48](#)
- ▶ ["Getting access to the component" on page 49](#)

#### 14.6.1.2 Installing the onboard SAS enabling key

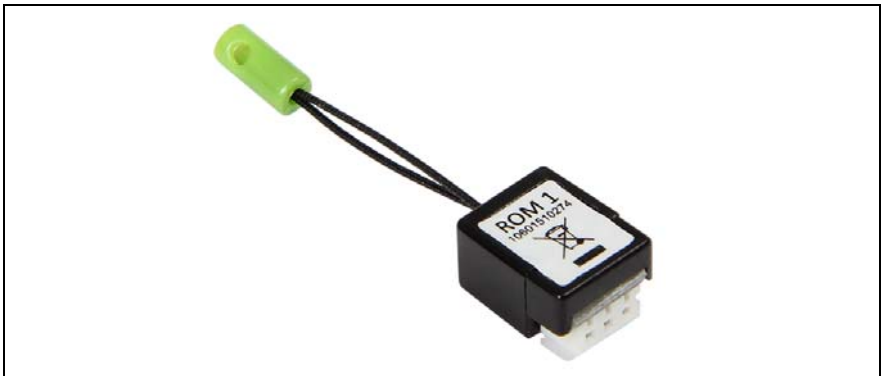


Figure 276: Onboard SAS enabling key

## System board and components



Figure 277: Onboard SAS enabling key mounting location

- ▶ Locate the onboard SAS enabling key mounting location on the system board.

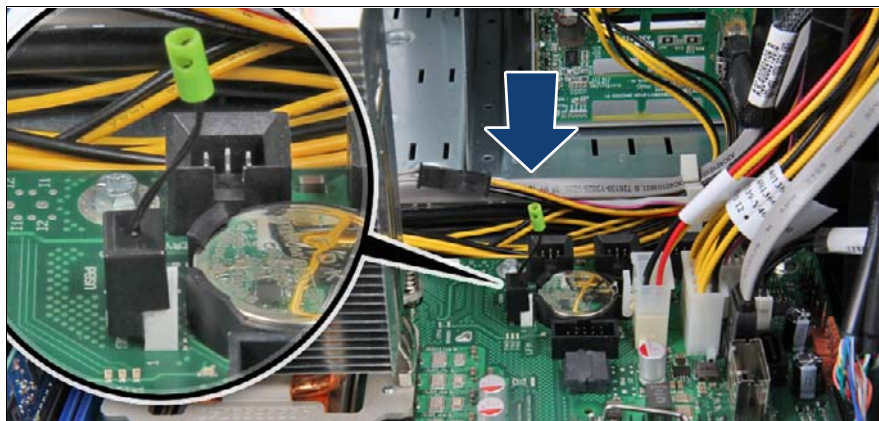


Figure 278: Installing the onboard SAS enabling key

- ▶ Connect the onboard SAS enabling key to connector "SKU Key".

### 14.6.1.3 Concluding steps

- ▶ ["Reassembling" on page 62](#)
- ▶ ["Connecting the server to the mains" on page 72](#)
- ▶ ["Switching on the server" on page 73](#)
- ▶ ["Resuming BitLocker functionality" on page 103](#)

## 14.6.2 Removing the onboard SAS enabling key



Upgrade and Repair Unit  
(URU)



Hardware: 5 minutes

**Tools:** tool-less

### 14.6.2.1 Preliminary steps

- ▶ ["Suspending BitLocker functionality" on page 77](#)
- ▶ ["Shutting down the server" on page 48](#)
- ▶ ["Disconnecting the server from the mains" on page 48](#)
- ▶ ["Getting access to the component" on page 49](#)

### 14.6.2.2 Removing the onboard SAS enabling key

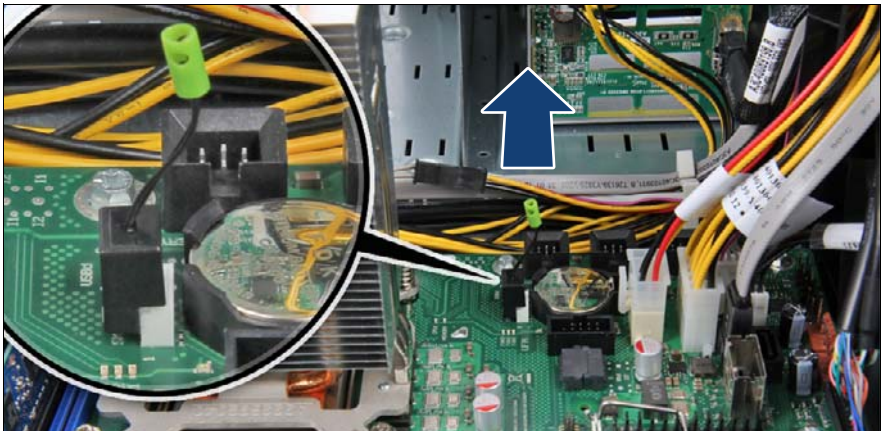


Figure 279: Removing the onboard SAS enabling key

- ▶ Firmly pull up on the release lash until the onboard SAS enabling key pops out of its connector.

### 14.6.2.3 Concluding steps

- ▶ ["Reassembling" on page 62](#)
- ▶ ["Connecting the server to the mains" on page 72](#)
- ▶ ["Switching on the server" on page 73](#)
- ▶ ["Resuming BitLocker functionality" on page 103](#)

### 14.6.3 Replacing the onboard SAS enabling key



**Upgrade and Repair Unit (URU)**



**Hardware: 5 minutes**

|                         |
|-------------------------|
| <b>Tools:</b> tool-less |
|-------------------------|

#### 14.6.3.1 Preliminary steps

- ▶ ["Suspending BitLocker functionality" on page 77](#)
- ▶ ["Locating the defective server" on page 45](#)
- ▶ ["Shutting down the server" on page 48](#)
- ▶ ["Disconnecting the server from the mains" on page 48](#)
- ▶ ["Getting access to the component" on page 49](#)

#### 14.6.3.2 Replacing the onboard SAS enabling key

- ▶ ["Removing the onboard SAS enabling key" on page 369](#)
- ▶ ["Installing the onboard SAS enabling key" on page 367](#)

#### 14.6.3.3 Concluding steps

- ▶ ["Reassembling" on page 62](#)
- ▶ ["Connecting the server to the mains" on page 72](#)
- ▶ ["Switching on the server" on page 73](#)
- ▶ ["Resuming BitLocker functionality" on page 103](#)

## 14.7 Replacing the system board



**Field Replaceable Unit (FRU)**



**Hardware: 50 minutes**  
**Software: 10 minutes**

**Tools:** Replacing the system board:

- Phillips PH2 / (+) No. 2 screw driver
- Magnifying glass for inspecting processor socket springs (recommended)

Replacing the TPM:

- Bit screw driver
- flat nose pliers
- TPM bit insert (\*)
- thin slotted screw driver (2 x 0.4 mm) (\*)

(\*) For the Japanese market:

- Dedicated TPM screw driver (CWZ8291A)
- TPM module fixing tool (S26361-F3552-L909)

If a UFM is installed:

- Phillips PH1 / (+) No. 1 screw driver

### Note on TPM



The system board can be equipped with an optional TPM (Trusted Platform Module). 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 a detailed description, please refer to section "[Replacing the TPM](#)" on page 360.

The TPM is activated in the system BIOS.



### CAUTION!

- Before replacing the system board, ask the customer whether TPM functionality is used.

## System board and components

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- 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 TPM backup copies. For security reasons, the TPM must be restored / re-saved by the customer. After installing a new system board the TPM must be enabled. You may not clear the TPM data.

If the contact persons **DO NOT** have a backup copy available, inform them that replacing the TPM will cause to lose all data.

### Note on system information backup / restore



The front panel module 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. After replacing the system board the backup data is restored from the Chassis ID board to the new system board.



#### **CAUTION!**

For that reason the front panel module and system board must not be replaced simultaneously! In this case, restoring the system configuration data on the system board would fail.

### Note on network settings recovery



When replacing network controllers or the system board, network configuration settings in the operating system 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 controller or the system board.

### 14.7.1 Preliminary steps

- ▶ ["Note on network settings recovery" on page 372](#)
- ▶ ["Suspending BitLocker functionality" on page 77](#)
- ▶ ["Disabling SVOM boot watchdog functionality" on page 78](#)
- ▶ ["Locating the defective server" on page 45](#)
- ▶ ["Shutting down the server" on page 48](#)
- ▶ ["Disconnecting the server from the mains" on page 48](#)
- ▶ Disconnect all external cables.
- ▶ ["Getting access to the component" on page 49](#)
- ▶ ["Removing the system fan holder" on page 74](#)
- ▶ ["Removing the rear fan" on page 213 \(if applicable\)](#)

### 14.7.2 Removing the defective system board

- ▶ Remove all cables from the system board.
- ▶ Remove the following components from the system board as shown in the related sections:

- Heat sink: see [section "Removing processor heat sinks" on page 290](#)



Leave the processor on the defective board for now.

- Memory modules: refer to section ["Removing memory modules" on page 269](#)




Ensure to take note of the memory modules' mounting positions for reassembly.

- Expansion cards: refer to the section ["Removing expansion cards" on page 235](#)



Ensure to take note of the controllers' mounting positions and cable connections for reassembly.

## System board and components

- UFM: refer to section ["Removing the UFM" on page 347](#)
  -  Remove the UFM spacer from the defective system board and fasten it to the UFM with the UFM screw.
- Onboard SAS enabling key: refer to section ["Removing the onboard SAS enabling key" on page 369](#)
- iRMC microSD card: refer to section ["Removing the iRMC microSD card" on page 364](#)

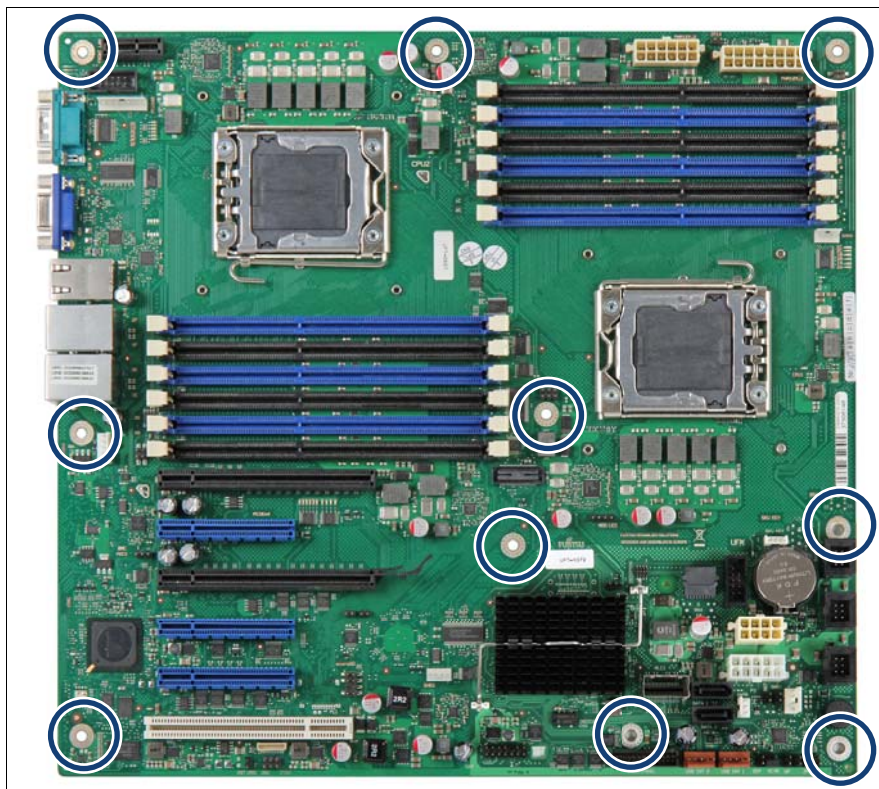


Figure 280: Removing the system board (A)

- ▶ Remove the ten screws (see circles).



Figure 281: Removing the system board (B)

- ▶ Slightly lift up the system board by the memory module ejectors and a PCI slot in order to detach it from the centering bolts (see circles).
- ▶ Carefully shift the system board towards the server front until the plug shells disengage from the cut-outs in the connector panel.

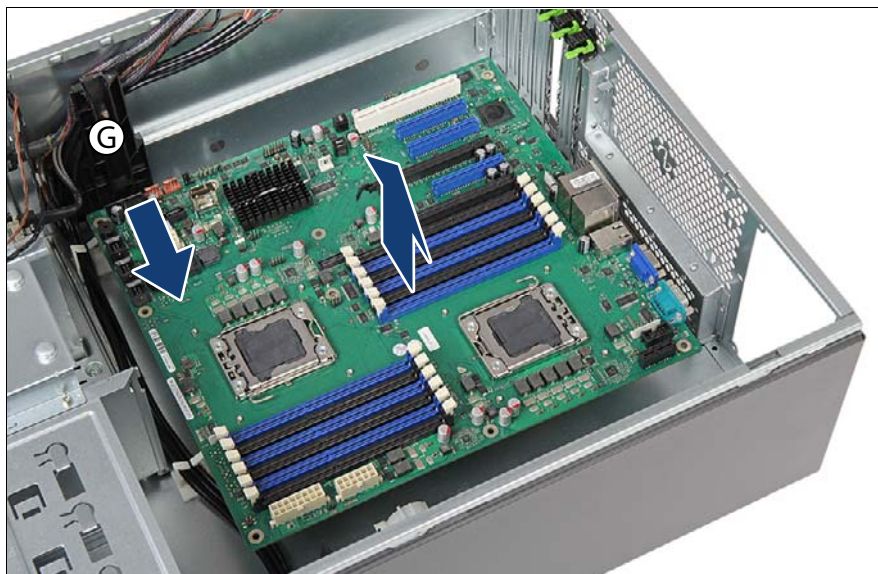


Figure 282: Removing the system board (C)

- ▶ Hold the defective system board by the memory module ejectors and a PCI slot and at a slight angle lift it out of the chassis. Make sure that the system board is shifted from the cable guide (G) before you lift it out.
- ▶ If applicable, remove the TPM as described in section ["Removing the TPM" on page 357](#).

### 14.7.3 Installing the new system board



Figure 283: Installing the system board (A)

- ▶ Hold the system board by the memory module ejectors and a PCI slot.



#### **CAUTION!**

- Do not lift or handle the system board by any of its heat sinks!
  - Ensure not to damage the EMI springs to comply with applicable EMC regulations and satisfy cooling requirements and fire protection measures.
- ▶ At a slight angle, lower the system board into the chassis. Make sure that the system board is shifted under the cable guide (G) before you lower it down.

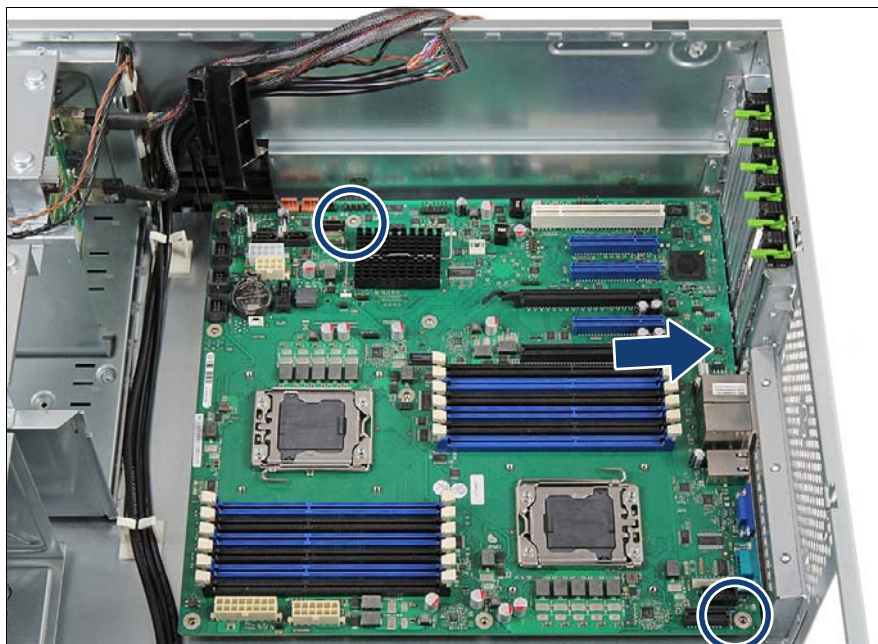


Figure 284: Installing the system board (B)

- ▶ Carefully shift the system board towards the server rear until the plug shells engage with the cut-outs in the connector panel.
- ▶ Lower the system board onto the centering bolts (see circles). Ensure that the system board is properly seated on both centering bolts.

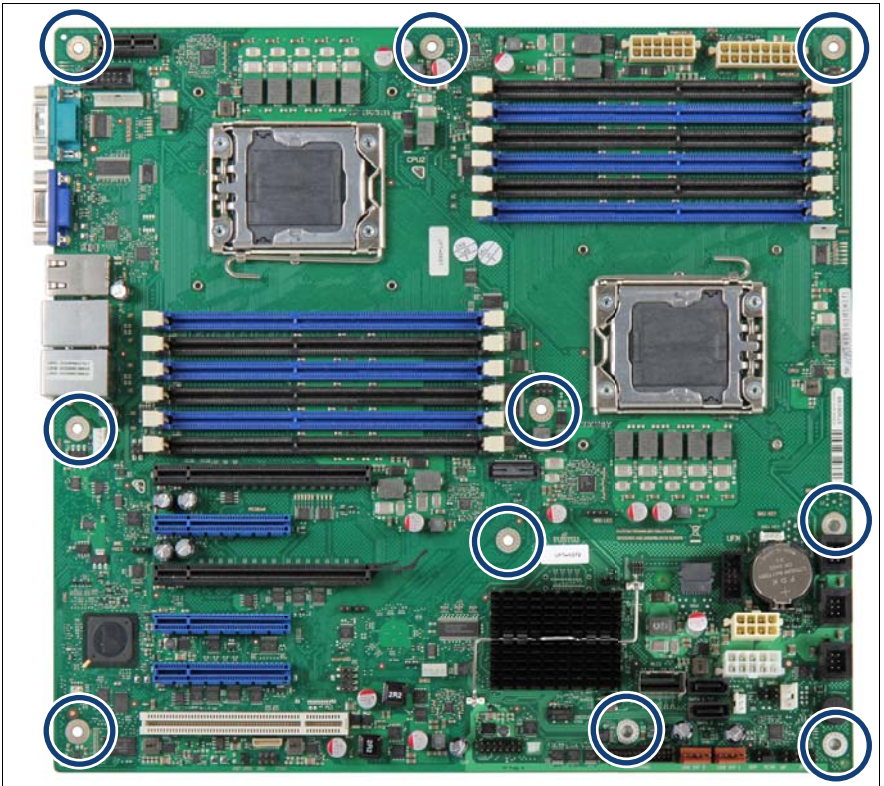


Figure 285: Installing the system board (C)

- ▶ Secure the system board with the ten screws (see circles).



Screw torque: 0.6 Nm (not applicable for the Japanese market)  
Tighten the screws in a cross diagonal pattern.

- ▶ Verify the settings on the new system board (see figure ["Onboard settings" on page 423](#)).

### Preparing the processor socket load plates on the new system board

- ▶ Remove the protective cover on the new system board as described in section ["Removing the protective cover" on page 276](#).

## System board and components

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### Removing processors from the defective system board

- ▶ Carefully remove the processors from their sockets on the defective system board as described in section ["Removing processors" on page 280](#).



Remove and reinstall one processor at a time. Do not remove the second processor from the defective system board until the first processor has been installed on the new system board.

### Installing processors on the new system board

- ▶ Install the processors on the new system board as described in section ["Installing processors" on page 275](#).

### Installing protective socket covers on the defective system board



Since the defective system board is sent back for repair, protect the delicate processor socket springs with a socket cover.

- ▶ Install the protective cover on the new system board as described in section ["Installing the protective cover" on page 283](#).

### Connecting cables to the new system board

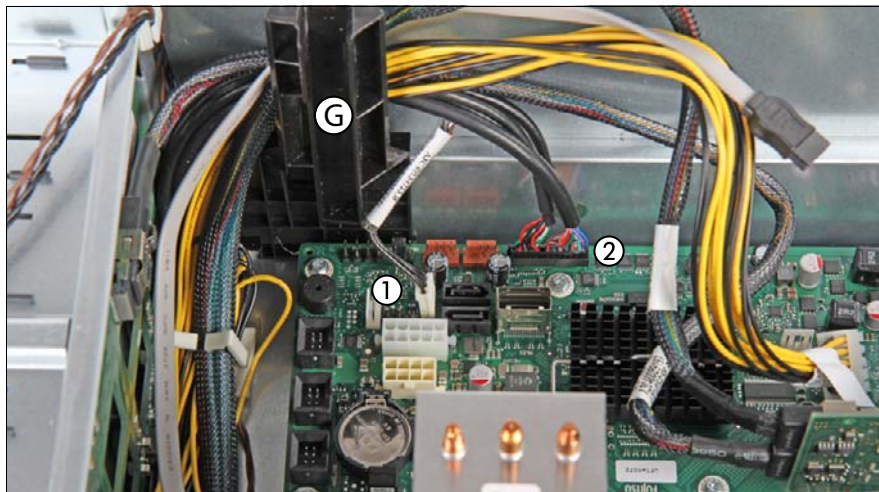




Figure 286: Connecting cables to the system board

- ▶ Run the cables through the cable guide (G) as shown.


- ▶ Connect the intrusion switch cable to the system board connector "INTRUSION" (1) (see section ["Cabling plans" on page 399](#)).
- ▶ Connect the front panel cable to the system board connector "FRONTANEL" (2) (see section ["Cabling plans" on page 399](#)).

### 14.7.4 Concluding steps

- ▶ Reconnect all remaining cables to the system board. For a complete cabling overview, please refer to section ["Cabling plans" on page 399](#).
- ▶ Reinstall all remaining system board components as shown in the related sections:
  - Heat sinks: refer to section ["Installing processor heat sinks" on page 288](#)
  - Memory modules: refer to section ["Installing a memory module" on page 267](#)
    -  Install all memory modules into their original slots.
  - Expansion cards: refer to section ["Installing a memory module" on page 267](#)
    -  Install all expansion cards into their original slots.
  - UFM (if applicable): refer to section ["Installing the UFM" on page 345](#)
  - TPM (if applicable): refer to section ["Installing the TPM" on page 352](#)
  - iRMC (if applicable): refer to section ["Installing the iRMC microSD card" on page 362](#)
- ▶ If applicable, reinstall the rear fan as described in section ["Installing the rear fan" on page 209](#).
- ▶ ["Installing the system fan holder" on page 75](#)
- ▶ ["Reassembling" on page 62](#)
- ▶ If applicable, activate TPM functionality in the system BIOS under *Security > TPM (Security Chip) Setting > Security Chip*. For more information, refer to the corresponding BIOS Setup Utility reference manual.
- ▶ ["Connecting the server to the mains" on page 72](#)

## System board and components

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- ▶ ["Updating or recovering the system board BIOS and iRMC" on page 86](#)
  - ▶ Reconnect all external cables.
  - ▶ ["Switching on the server" on page 73](#)
  - ▶ Verify whether the backup data on the Chassis ID EPROM has been restored to the system board as described in section ["Verifying system information backup / restore" on page 88](#).
  - ▶ ["Verifying the system time settings" on page 99](#)
  - ▶ Inform the customer about changed WWN and MAC addresses. For further information, refer to section ["Looking up changed MAC / WWN addresses" on page 104](#).
  - ▶ After replacing the system board in a server running Linux OS, update the MAC address of the onboard network controller in the related NIC definition file as described in section ["Updating the NIC configuration file in a Linux environment" on page 101](#).
  - ▶ ["Enabling SVOM boot watchdog functionality" on page 97](#)
  - ▶ ["Resuming BitLocker functionality" on page 103](#)
  - ▶ 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 further information, please refer to section ["Note on network settings recovery" on page 372](#).
- ▶ If applicable, ["After replacing the system board" on page 107](#)

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# 15 Converting a tower model to a rack model



**Upgrade and Repair Unit (URU)**



**Hardware: 20 minutes**

|   |
|---|
| <b>Tools:</b> – Phillips PH2 / (+) No. 2 screw driver<br>– Slotted screw driver |
|---|

## Safety notes

For further information, please refer to chapter ["Important information"](#) on page 33.

## 15.1 Preliminary steps

- ▶ ["Shutting down the server"](#) on page 48
- ▶ ["Disconnecting the server from the mains"](#) on page 48
- ▶ Remove all external cables.
- ▶ ["Getting access to the component"](#) on page 49 including ["Removing the front cover"](#) on page 59



The front cover is no longer required.

- ▶ ["Removing the anti-tilt bracket"](#) on page 75

## 15.2 Converting a tower model to a rack model

### Removing the right side cover



Figure 287: Removing the right side cover (A)

- ▶ Remove two screws on the server rear (see circles).



Figure 288: Removing the right side cover (B)

- ▶ Slide the right side cover towards the server rear as far as it will go (1).
- ▶ Remove the three hooks on the right side cover from the slots on the upper chassis edge:
  - ▶ Using a slotted screw driver, slightly pry up on the middle hook until it disengages (2).
  - ▶ Pull up on both ends of the right side cover to remove the left and right hooks from the slots on the upper chassis edge.
- ▶ Ensure that all cables and components are properly secured inside the server and that there are no loose pieces.
- ▶ Carefully turn the server upside down.
  - i** At least two people are needed to turn over a fully equipped server. Remove hard disk drives and power supply modules in order to facilitate the task.



### Removing the accessible drive cage

- ▶ Remove the front panel module as described in section ["Removing the defective front panel module" on page 335](#).
- ▶ If applicable, remove all accessible drives as described in section ["Removing an accessible drive" on page 306](#).
- ▶ If applicable, remove an HDD extension box as described in section ["Removing an HDD extension box" on page 190](#).



Figure 290: Detaching the accessible drive cage (A)

- ▶ Remove two screws from the bottom side of the server as shown.
  - ▶ Bring the server back to its horizontal position.
- i** At least two people are needed to turn over a fully equipped server. Remove hard disk drives and power supply modules in order to facilitate the task.

## Converting a tower model to a rack model

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Figure 291: Detaching the accessible drive cage (B)

- ▶ Remove two screws from the right chassis edge (1).
- ▶ Remove two screws from the top edge of the chassis (2).

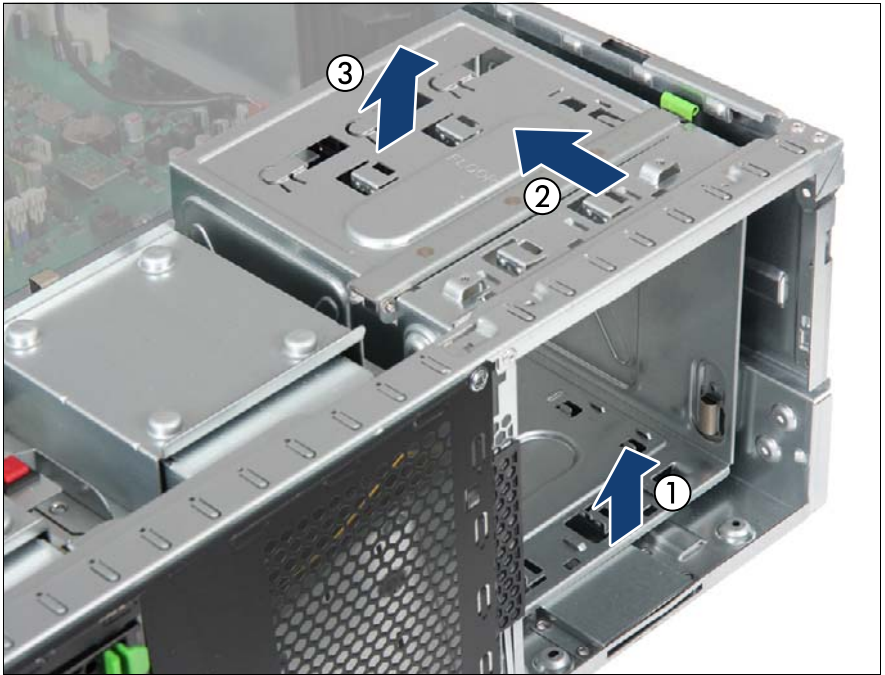


Figure 292: Removing the accessible drive cage

- ▶ Slightly lift up the accessible drive cage to disengage its front bottom edge from the slot on the chassis floor (1).
- ▶ Slide the accessible drive cover from under the chassis frame as shown (2).
- ▶ Lift the accessible drive cage out of the chassis (3).

## Converting a tower model to a rack model

### Converting the accessible drive cage

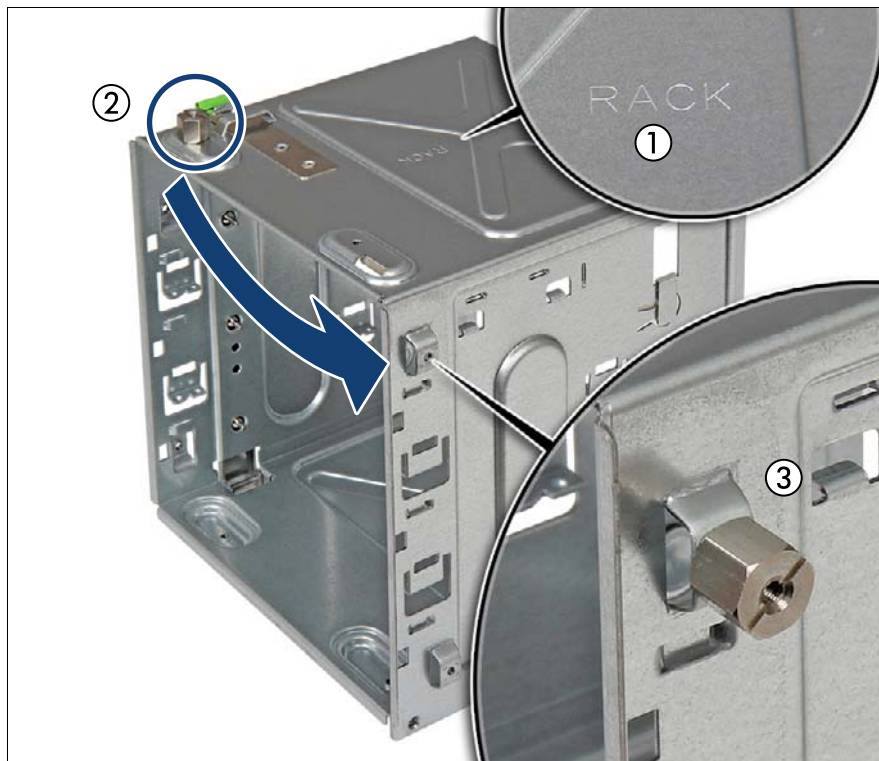


Figure 293: Converting the accessible drive cage

- ▶ Turn the accessible drive cover with its "RACK" stamping facing up (1, see close-up).
- ▶ Remove the threaded bolt from the upper edge of the accessible drive cage (2).
- ▶ Reinstall the threaded bolt on the side of the accessible drive cage as shown (3, see close-up).

### Reinstalling the accessible drive cage

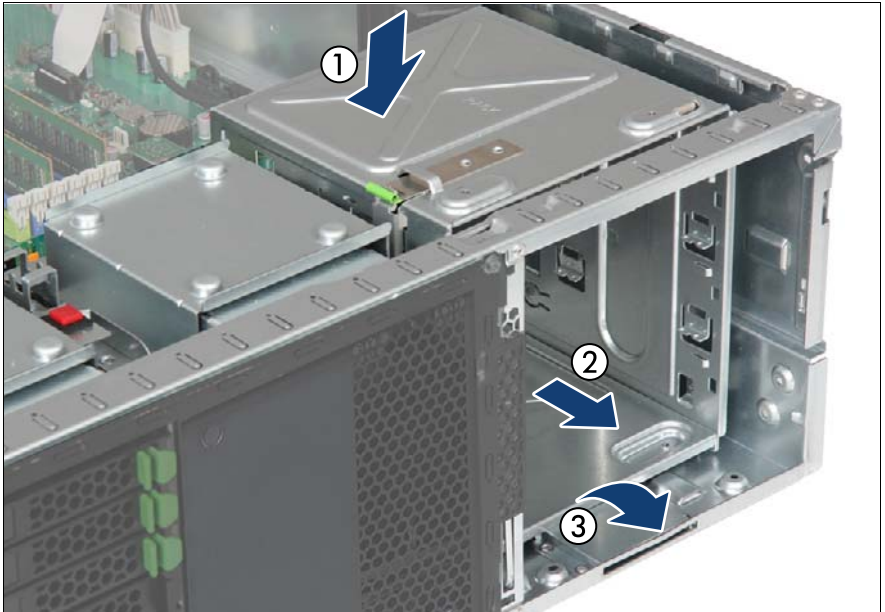


Figure 294: Mounting the accessible drive cage

- ▶ With its "RACK" stamping facing up, lower the accessible drive cage into the chassis (1).
- ▶ Slide the accessible drive cage towards the server front as far as it will go (2).
- ▶ Ensure that the front bottom edge on the accessible drive cover properly engages in the slot in the chassis floor (3).

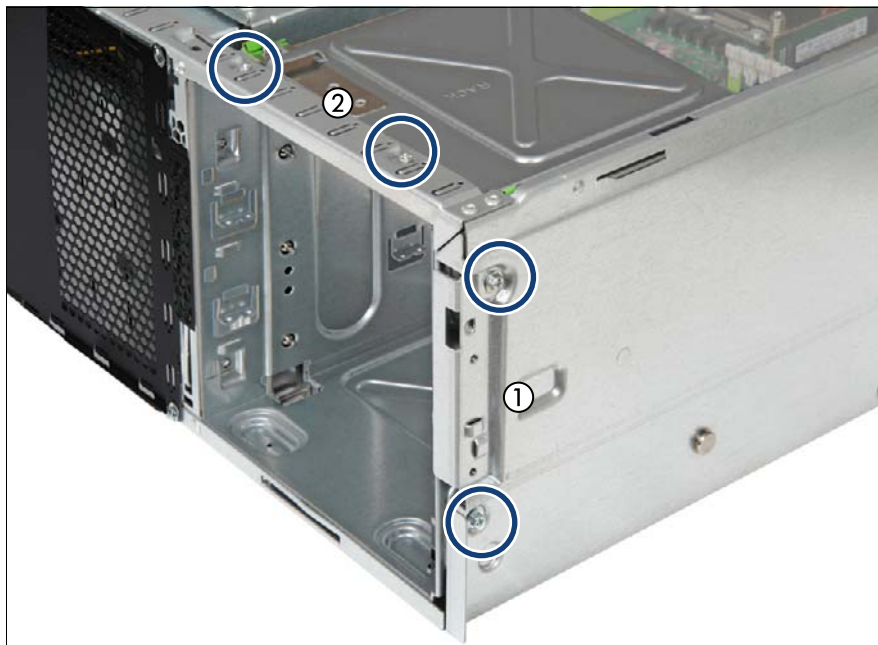


Figure 295: Securing the accessible drive cage (A)

- ▶ Secure the accessible drive cage with two screws (1).
- ▶ Secure the accessible drive cage with two screws (2).
- ▶ Ensure that all cables and components are properly secured inside the server and that there are no loose pieces.



Figure 296: Securing the accessible drive cage (B)

- ▶ Carefully turn the server upside down.



At least two people are needed to turn over a fully equipped server. Remove hard disk drives and power supply modules in order to facilitate the task.

- ▶ Secure the accessible drive cage with two screws.



Note the correct screw positions: The screw hole on the right that has been used in the tower configuration remains empty.

- ▶ Install the front panel module as described in section ["Installing the new front panel module" on page 338](#).
- ▶ If applicable, install all accessible drives as described in section ["Installing an accessible drive" on page 301](#).
- ▶ If applicable, install an HDD extension box as described in section ["Installing an HDD extension box" on page 183](#).

### Preparing the intrusion switch

- ▶ Remove the intrusion switch module as described in section ["Removing the defective intrusion switch cable" on page 403](#).



It is not necessary to disconnect the intrusion switch cable from the system board.

- ▶ Attach a rubber bumper to the front intrusion switch and reinstall the intrusion switch module as described in section ["Installing the new intrusion switch cable" on page 405](#).

## Converting a tower model to a rack model

### Reinstalling accessible drives

- ▶ Reinstall the front panel (rotated by 90 degrees) as described in section ["Installing the new front panel module" on page 338](#).
- ▶ Reinstall all accessible drives into their original bays (rotated by 90 degrees). Reconnect the cables (see section ["Cabling plans" on page 399](#)).
- ▶ Reinstall all accessible drive filler covers and front covers as described in section ["Installing accessible drive dummy covers" on page 306](#).

### Assembling the rack front cover



Figure 297: Rack mounting brackets with quick release levers



The rack front cover consists of a plastic frame and two rack mounting brackets with quick release levers.

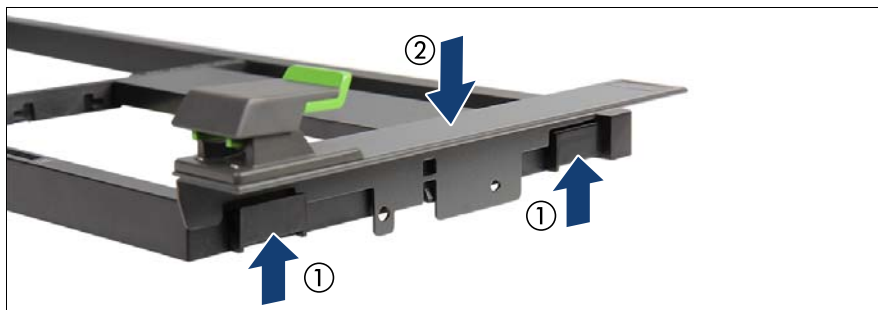



Figure 298: Installing rack mounting brackets

- ▶ Fit the rack mounting bracket on the two hooks on the rack front bezel (1).
- ▶ Firmly press down on the rack mounting bracket until it is fully seated in the rack front bezel (2).

- ▶ Mount the second rack mounting bracket accordingly.



Figure 299: Installing accessible drive dummy covers

- ▶ If available, reinstall all accessible drive dummy covers into their original locations (rotated by 90 degrees):
  - ▶ Ensure that an accessible drive filler cover has been installed in every empty drive bay.
  - ▶ Turn the front cover face down.
  - ▶ Join the two lugs on one edge of the accessible drive cover with the right inner edge of the front cover (1).
  - ▶ Fold down the accessible drive cover until it snaps in place (2).
-  Use the dummy covers that have been removed from the front cover during the preliminary steps.
- ▶ Install the rack front cover as described in section ["Installing the rack front cover"](#) on page 63.
- ▶ If applicable, remove all accessible drives or dummy covers as described in section ["Removing an accessible drive"](#) on page 306.

### 15.3 Concluding steps

- ▶ ["Installing the top cover" on page 64](#)



Figure 300: Attaching the caution label

- ▶ Attach the caution label on the left front edge of the top cover as shown.
- ▶ Mount the support bracket and rack mounting rails in the rack as described in the "Rack Mounting Kit - RMK-F2 Drop-In" Mounting Instructions.



The document is available online.

- ▶ Mount the server in the rack as described in section ["Mounting the server in the rack" on page 65](#).
- ▶ Reconnect all external cables.
- ▶ ["Connecting the server to the mains" on page 72](#)
- ▶ ["Switching on the server" on page 73](#)
- ▶ Update your server's chassis information on the Chassis ID EPROM integrated into the front panel board. For further information on how to obtain and use the *ChassisId\_Prom* Tool, refer to section ["Using the Chassis ID Prom Tool" on page 106](#).
- ▶ Change the chassis model setting to "rack server" as described in section ["Specifying the chassis model" on page 108](#)".

---

# 16 Cabling

## Safety notes



### CAUTION!

- Always hold cables by their connectors when disconnecting them. Never pull on the cable to disconnect cables.
- Ensure that none of the cables are scraped, strained or otherwise damaged while replacing system components.
- Immediately replace cables with damaged shielding.
- Always use shielded network cables.

## 16.1 List of used cables



The numbers in the cable list correspond to those shown in the cabling plans.

| No. | Name                          | Part number (T26139-) | Routing  |
|-----|-------------------------------|-----------------------|--|
| C1  | HDD Power cable               | Y4030-V102            | Power backplane to system board and SAS backplane        |
| C2  | CBL_PDB_MoBo_Pow14            | Y3952-V511            | Power backplane to system board                          |
| C3  | CBL_PDB_MoBo_Pow12            | Y4030-V2              | Power backplane to system board                          |
| C4  | CBL_PDB_MoBo_Sig10            | Y3956-V2              | Power backplane to system board                          |
| C5  | CBL_MoBo_DVD                  | Y3939-V301            | ODD to system board or SAS backplane                     |
| C6  | HDD extension box power cable | Y3939-V402            | System board to HDD extension box                        |
| C7  | HDD extension box power cable | Y3939-V401            | System board to HDD extension box                        |
| C10 | CBL_FRONTANEL 650             | Y4015-V2              | Front panel module to system board                       |
| C12 | CBL_INTRUSION_SW_New          | Y3922-V121            | Server side and front to system board                    |
| C17 | CBL_LSD 700                   | Y3718-V301            | LSD to system board                                      |
| C20 | CBL_SAS470x1                  | Y3963-V103            | SAS backplane to SAS controller                          |
| C21 | CBL_SAS36TO36                 | Y3963-V117            | SAS backplane to SAS controller                          |
| C22 | CBL_BBU08 160                 | Y3987-V3              | BBU to SAS controller                                    |
| C22 | CBL_FBU 170                   | Y4032-V3              | FBU to TFM   |
| C23 | CBL_DVD                       | Y3928-V205            | System board to DVD                                      |
| C32 | CBL_SATA_Full_Pow410          | Y3930-V601            | SATA power cable (standard)                              |
| C33 | CBL_SATA_Slim_Pow400          | Y3986-V302            | SATA power cable (slim)                                  |
| C34 | CBL_SAS_Dev_PowSig700         | Y3969-V401            | SAS power cable; for LTO3 power must be connected to C35 |
| C35 | CBL_PATA_Dev_Pow410           | Y4029-V1              | PATA power cable   |
| C37 | USB 3.0 cable                 | Y4039-A80             | USB backup drive to USB3.0 interface card                |
| C42 | CBL_SASEXP_HDD cage bottom    | V4040-V4              | SAS expander board to SAS backplane                      |

Table 5: List of used cables

| No. | Name                       | Part number (T26139-) | Routing                             |
|-----|----------------------------|-----------------------|-------------------------------------|
| C43 | CBL_SASEXP_HDD cage middle | V4040-V6              | SAS expander board to SAS backplane |
| C44 | CBL_SASEXP_HDD cage top    | Y3963-V102            | SAS expander board to SAS backplane |
|     | CBL_LTO                    | Y3969-V202            | LTO drive to system board           |

Table 5: List of used cables

## 16.2 Cabling plans

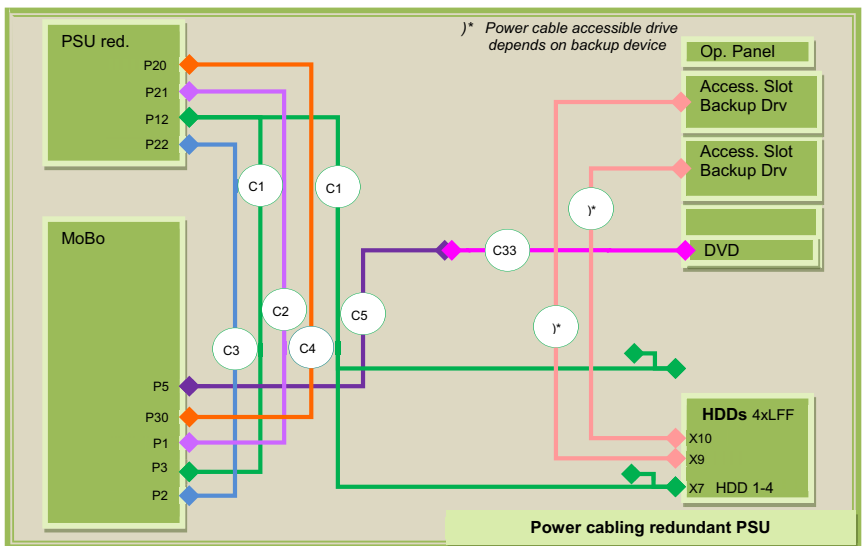


Figure 301: Power cabling redundant PSU

# Cabling

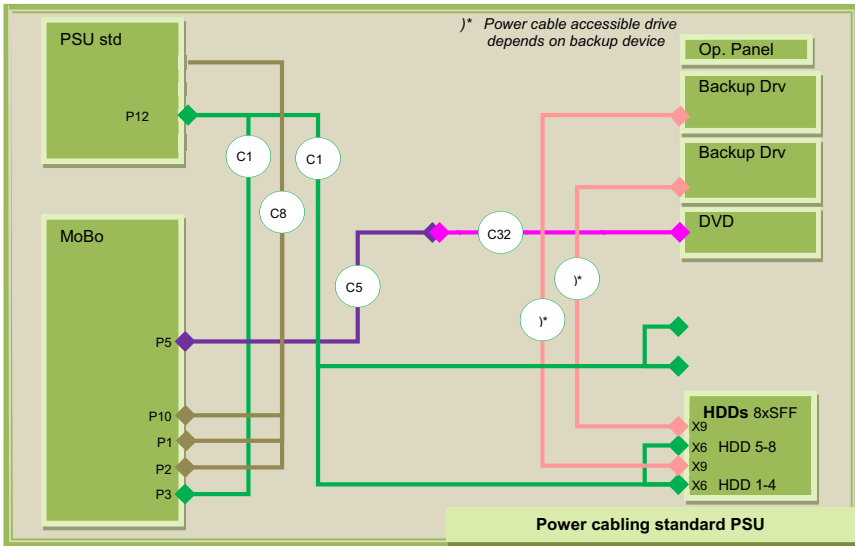


Figure 302: Power cabling standard PSU

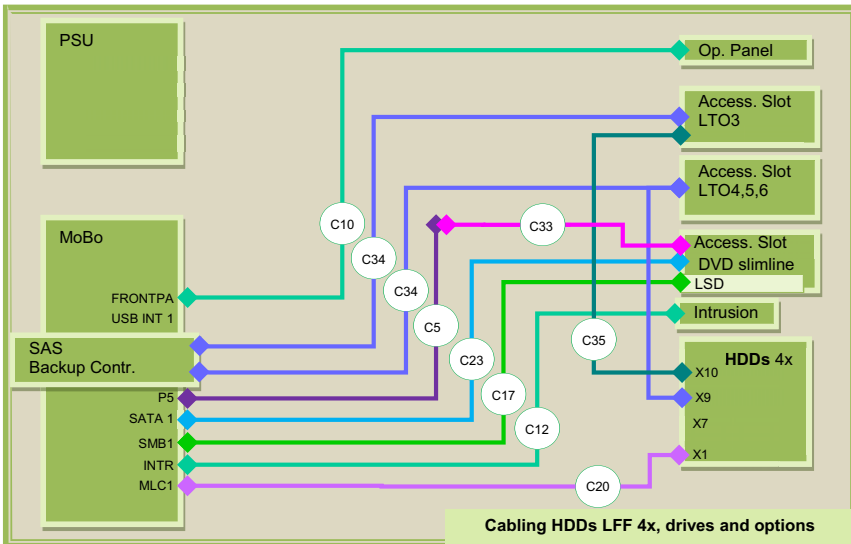


Figure 303: Cabling onboard controller 3.5-inch HDDs and Multibay box

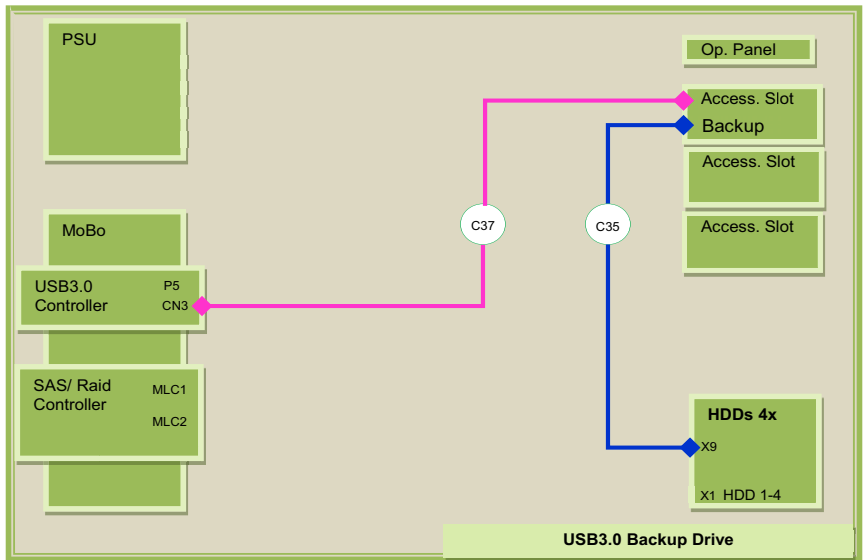


Figure 304: Cabling 4x 3.5-inch HDDs and USB3.0 backup drive

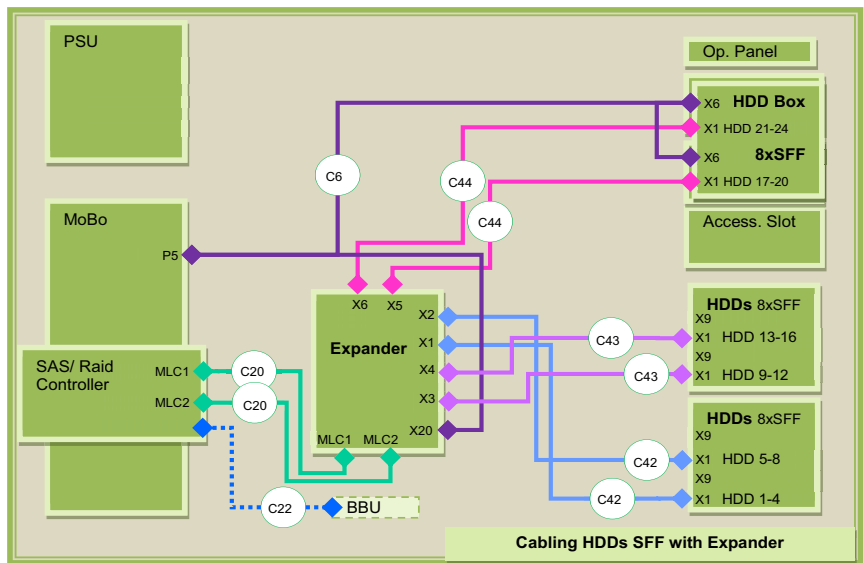


Figure 305: Cabling 2.5-inch HDDs and 8x 2.5-inch HDD extension box

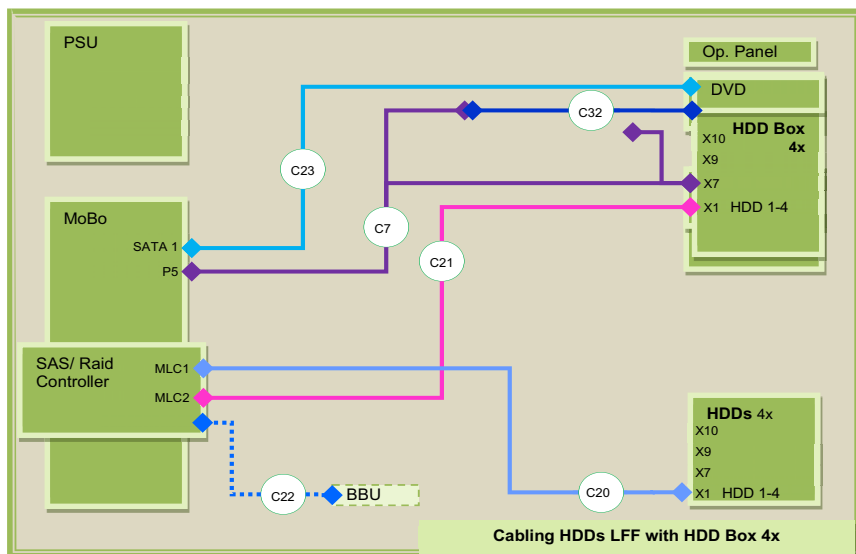


Figure 306: Cabling 3.5-inch HDDs and 4x 3.5-inch HDD extension box

## 16.3 Replacing the intrusion switch cable



**Field Replaceable Unit (FRU)**



**Hardware: 10 minutes**

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

### 16.3.1 Preliminary steps

- ▶ ["Locating the defective server" on page 45](#)
- ▶ ["Shutting down the server" on page 48](#)
- ▶ ["Disconnecting the server from the mains" on page 48](#)
- ▶ ["Getting access to the component" on page 49](#)
- ▶ ["Removing the system fan holder" on page 74](#)

### 16.3.2 Removing the defective intrusion switch cable

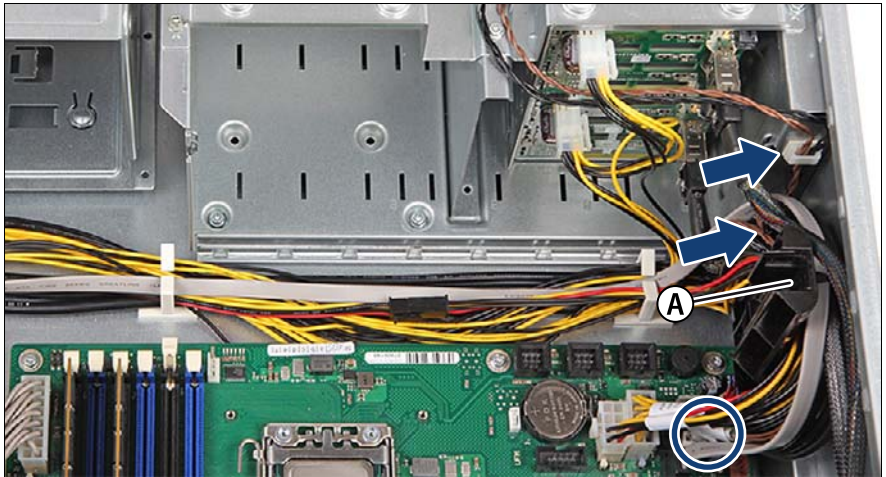


Figure 307: Disconnecting the intrusion switch cable

- ▶ Disconnect the intrusion switch cable from the system board (see circle).
- ▶ Remove the intrusion switch cable from the cable guide (A) and the cable clamps (see arrows) on the HDD cage.

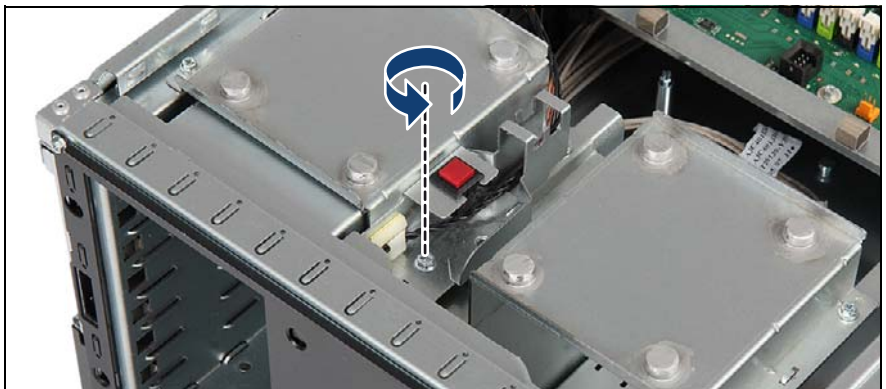


Figure 308: Removing the intrusion switch holder (A)

- ▶ Remove one screw from the intrusion switch holder as shown.

- i** Replacing the intrusion switch cable is illustrated by the example of the 2.5-inch HDD model. In case of the 3.5-inch HDD model, the procedure is identical, although the HDD bay top cover looks slightly different.

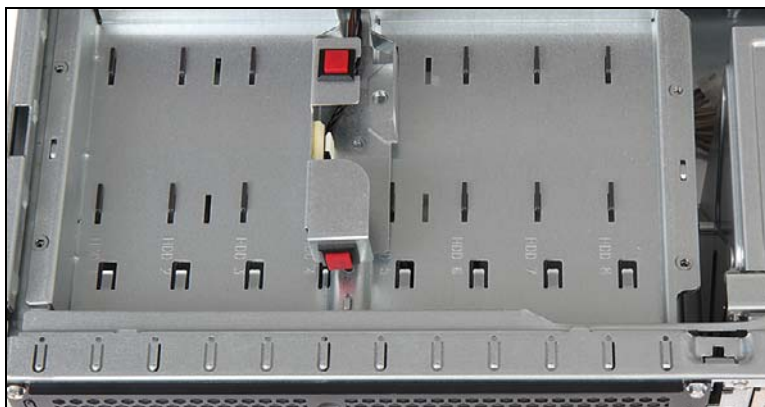


Figure 309: Intrusion switch holder in 3.5-inch HDD configurations

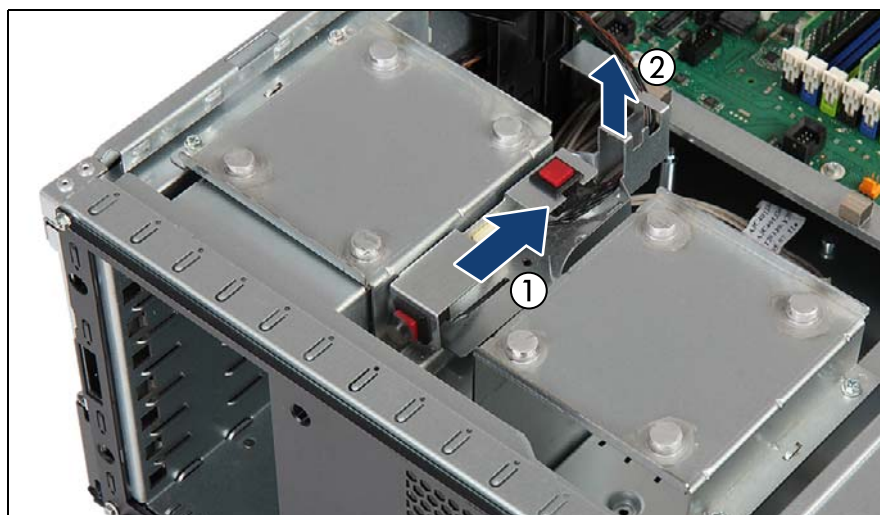


Figure 310: Removing the intrusion switch cable (B)

- ▶ Slide back the intrusion switch holder until it disengages from the HDD bay top cover (1).
- ▶ Remove the defective intrusion switch holder (2).

### 16.3.3 Installing the new intrusion switch cable

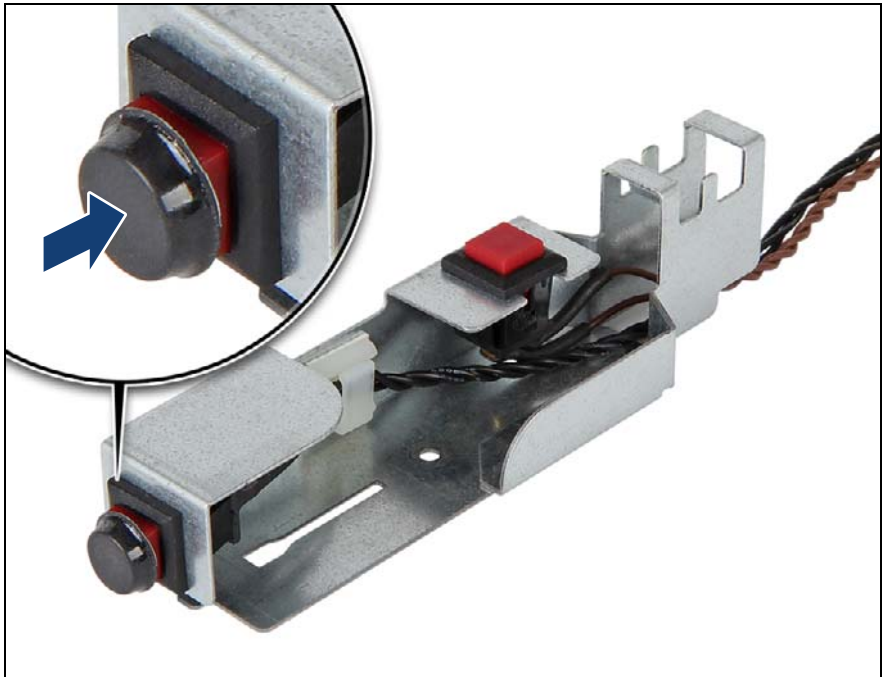


Figure 311: Attaching a rubber bumper to the front intrusion switch

**i** In case of rack server configurations, a rubber bumper needs to be attached to the front intrusion switch as described below. When working on a tower server, please skip this step.

- ▶ Attach a rubber bumper (C26192-Y26-C43) to the front intrusion switch as shown.

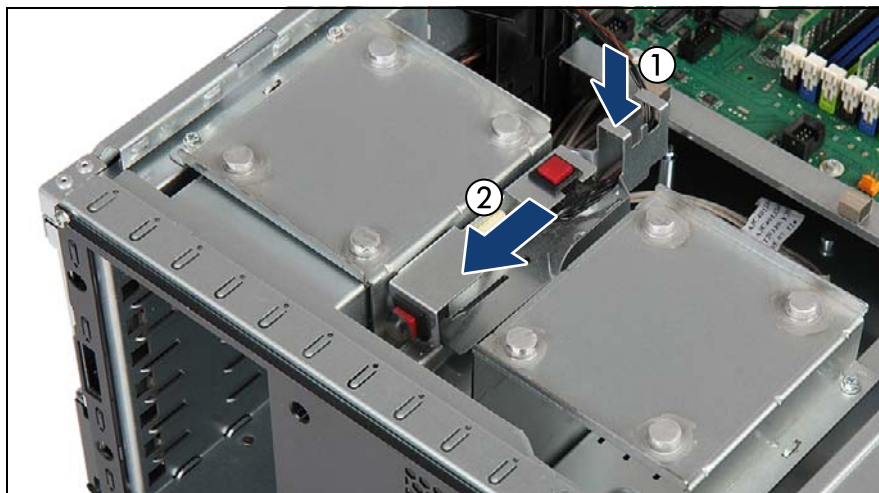


Figure 312: Installing the intrusion switch cable (A)

- ▶ Place the new intrusion switch holder on the HDD bay top cover as shown (1).
- ▶ Slide the intrusion switch holder under the front chassis rim as far as it will go (2).

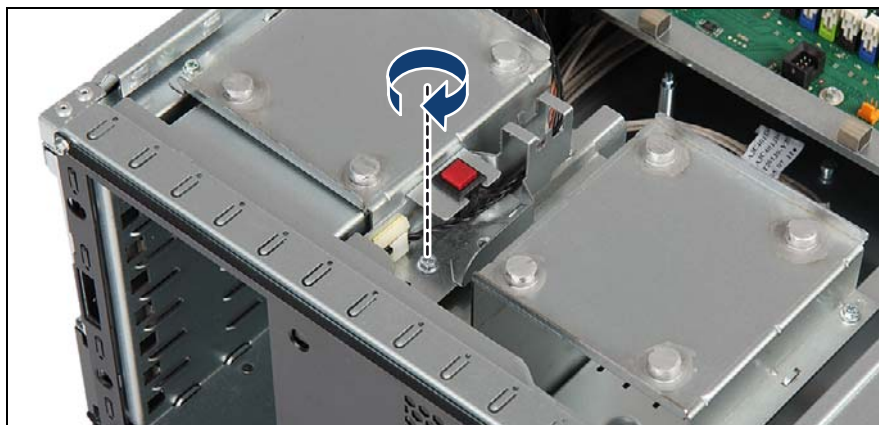


Figure 313: Installing the intrusion switch cable (B)

- ▶ Secure the intrusion switch holder on the HDD bay top cover with one screw.

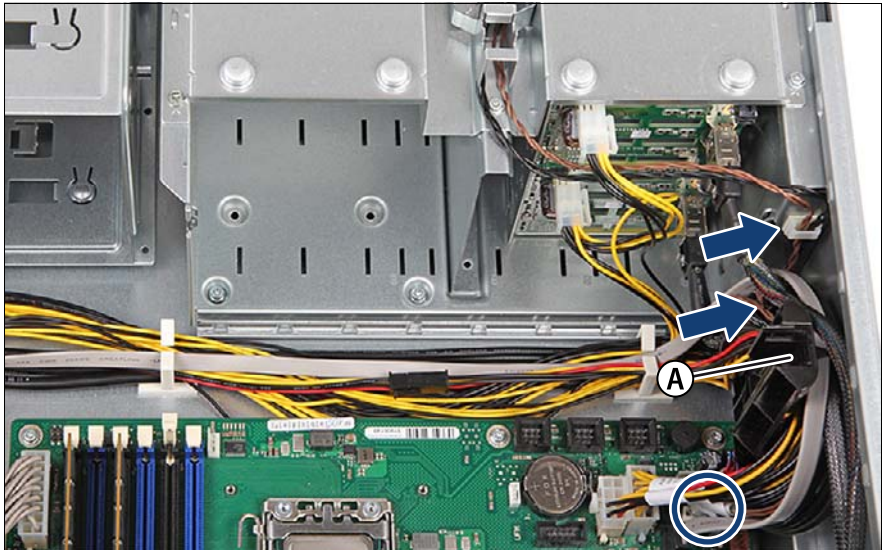


Figure 314: Connecting the intrusion switch cable

- ▶ Run the intrusion switch cable through the cable clamps (see arrows) on the HDD cage and the cable guide (A).
- ▶ Connect the intrusion switch cable to the system board connector "INTRUSION" (see circle).

### 16.3.4 Concluding steps

- ▶ ["Installing the system fan holder" on page 75](#)
- ▶ ["Reassembling" on page 62](#)
- ▶ ["Connecting the server to the mains" on page 72](#)
- ▶ ["Switching on the server" on page 73](#)



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# 17 Appendix

## 17.1 Mechanical overview

### 17.1.1 Server front

#### 2.5-inch HDD / SSD model

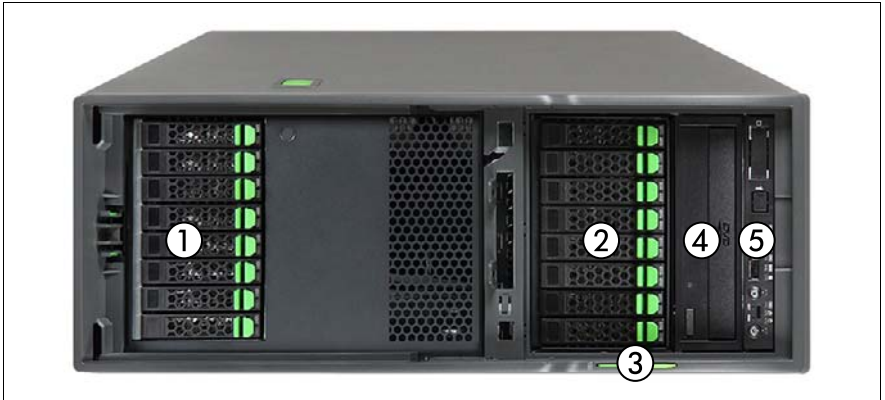


Figure 315: Front side - 2.5-inch HDD / SSD model

|   |  |   |   |
|---|--|---|---|
| 1 | 2.5-inch hard disk drives / solid state drives / dummy modules | 4 | Optical disk drive / 5.25-inch dummy module |
| 2 | 8x 2.5-inch HDD extension box                                  | 5 | Front panel module                          |
| 3 | ID card  |   |   |

3.5-inch HDD model



Figure 316: Front side - 3.5-inch HDD model

|   |   |   |  |
|---|---|---|--|
| 1 | 3.5-inch hard disk drives / dummy modules | 3 | 4x 3.5-inch HDD extension box with LSD or slimline ODD bay |
| 2 | ID card                                   | 4 | Front panel module   |

17.1.2 Server rear



Figure 317: Rear side

|   |  |
|---|--|
| 1 | Power supply unit (photo shows the standard power supply unit) |
| 2 | I/O panel  |
| 3 | Optional expansion cards                                       |

### 17.1.3 Server interior

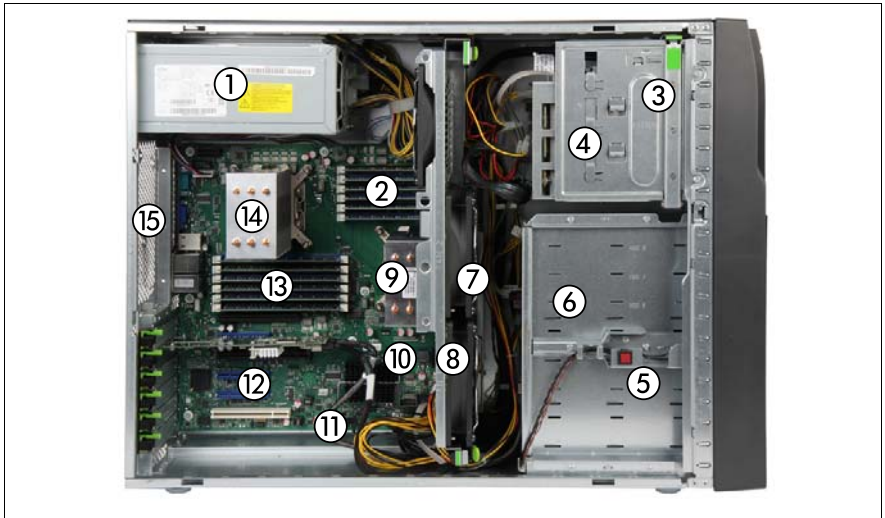


Figure 318: Interior (example: 2.5-inch HDD tower model)

|    |  |
|----|--|
| 1  | Power supply unit (photo shows the standard power supply unit) |
| 2  | Memory modules (for CPU 1)                                     |
| 3  | Front panel module bay   |
| 4  | Accessible drive bay   |
| 5  | Intrusion switches   |
| 6  | HDD / SSD drive bays   |
| 7  | System fans (fans 1-3)   |
| 8  | CMOS battery (not visible, located under the system fan 1)     |
| 9  | CPU 1 / CPU heat sink  |
| 10 | UFM board (if installed)                                       |
| 11 | TPM board (if installed)                                       |
| 12 | Expansion card slots 1-6                                       |
| 13 | Memory modules (for CPU 2)                                     |
| 14 | CPU 2 / CPU heat sink  |
| 15 | Optional system redundant fan (if installed)                   |

## 17.2 Connectors and indicators

### 17.2.1 Connectors and indicators on the system board

#### 17.2.1.1 Onboard connectors

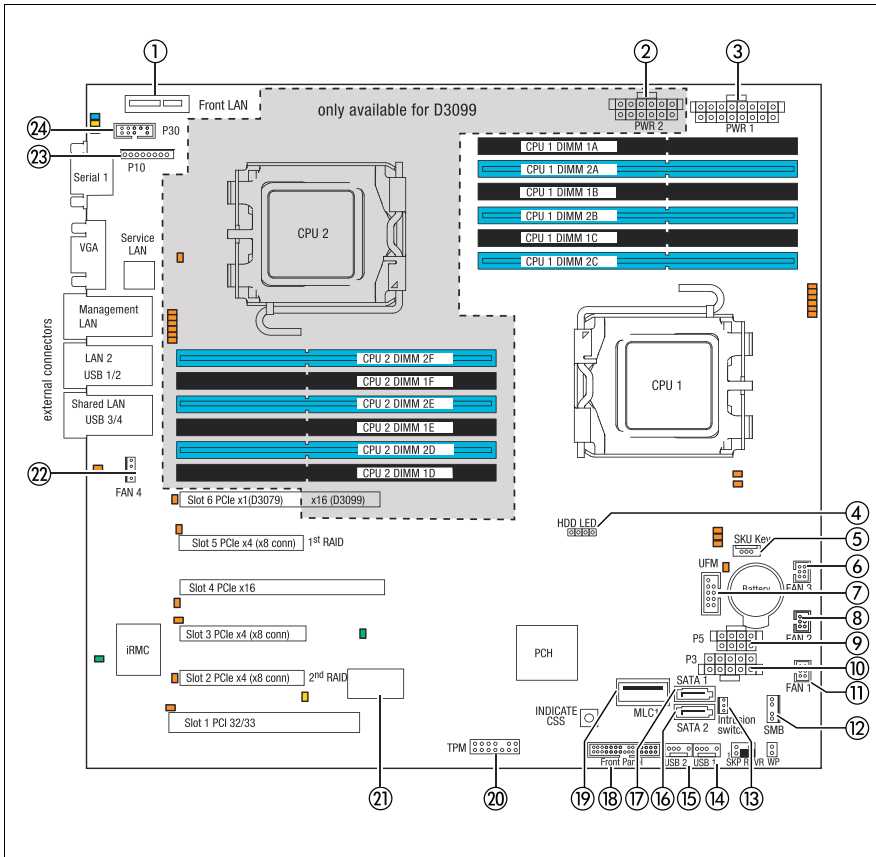


Figure 319: Internal connectors of system board D3099

|    |                  |  |
|----|------------------|--|
| 1  | Front LAN        | not used   |
| 2  | PWR 2            | System power connector 2                           |
| 3  | PWR 1            | System power connector 1                           |
| 4  | HDD LED          | HDD activity (internal)                            |
| 5  | SKU Key          | Connector for SCU (SKU) key                        |
| 6  | FAN 3            | Connector for system fan 3                         |
| 7  | UFM              | Connector for USB Flash Module (UFM)               |
| 8  | FAN 2            | Connector for system fan 2                         |
| 9  | P5 (PWR DRV)     | ODD power connector                                |
| 10 | P3 (PWR 3)       | Main power connector                               |
| 11 | FAN 1            | Connector for system fan 1                         |
| 12 | SMB              | Connector for Local Service Display (LSD)          |
| 13 | Intrusion switch | Intrusion switch cable connector                   |
| 14 | USB INT 1        | USB 2.0 connectors for USB backup drives           |
| 15 | USB INT 2        |  |
| 16 | SATA 2           | SATA connector for accessible SATA drives          |
| 17 | SATA 1           | SATA connector for accessible SATA drives          |
| 18 | Front panel      | Connector for front panel and front USB connectors |
| 19 | MLC1             | SATA connector                                     |
| 20 | TPM              | Connector for Trusted Platform Module (TPM)        |
| 21 | iRMC microSD     | iRMC microSD card                                  |
| 22 | FAN 4            | Connector for system redundant fan (optional)      |
| 23 | P10              | PC2009 connector                                   |
| 24 | P30 (PWR SB)     | Connector for sideband power backplane             |

17.2.1.2 Onboard indicators and controls

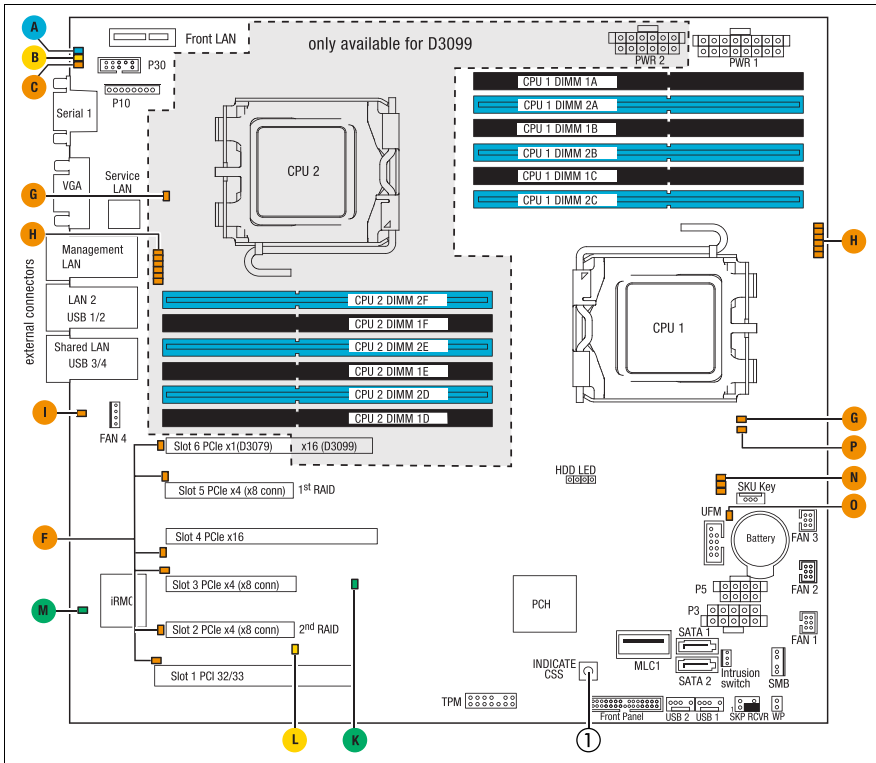


Figure 320: Onboard indicators and Indicate CSS button

|   |                     |
|---|---------------------|
| 1 | Indicate CSS button |
|---|---------------------|

Component LEDs

**i** LEDs A, B and C are visible from the outside on the server rear. All other LEDs are only visible if the server cover has been opened.

| Indicator             | Status  | Description   |
|-----------------------|---------|---|
| <b>A</b> ID indicator | blue on | server has been highlighted using ServerView Operations Manager, iRMC web frontend, or the ID button on the front panel for easy identification |

| Indicator |                                | Status          | Description   |
|-----------|--------------------------------|-----------------|---|
| <b>B</b>  | CSS<br>(Customer Self Service) | off             | no critical event (CSS component)   |
|           |                                | yellow on       | prefailure detected (CSS component)   |
|           |                                | yellow flashing | CSS component failure   |
| <b>C</b>  | GEL<br>(Global Error LED)      | off             | no critical event (non CSS component)   |
|           |                                | orange on       | prefailure detected (non CSS component)   |
|           |                                | orange flashing | non CSS component failure<br>Possible reasons:<br>– sensors report overheating<br>– sensor is defective<br>– CPU error<br>– software reports an error |
| <b>D</b>  | LAN link/transfer              | green on        | LAN link  |
|           |                                | green flashing  | LAN transfer  |
|           |                                | off             | No LAN link   |
| <b>E</b>  | LAN speed                      | off             | 10 Mbit/s   |
|           |                                | green on        | 100 Mbit/s  |
|           |                                | yellow on       | 1000 Mbit/s   |
| <b>F</b>  | Controller                     | off             | PCI card okay   |
|           |                                | orange on       | PCI card failure  |
| <b>G</b>  | CPU                            | off             | CPU okay  |
|           |                                | orange on       | CPU failure   |
| <b>H</b>  | Memory module                  | off             | memory module running   |
|           |                                | orange on       | memory module failure   |
| <b>I</b>  | Fan 4                          | off             | system redundant fan running  |
|           |                                | orange on       | system redundant fan failure  |
| <b>K</b>  | Main power                     | green on        | main voltages are within range  |
| <b>L</b>  | Standby power                  | yellow on       | standby voltages are within range   |
| <b>M</b>  | iRMC                           | off             | iRMC S4 is inactive   |
|           |                                | green flashing  | iRMC S4 okay  |

## Appendix

| Indicator |               | Status    | Description                       |
|-----------|---------------|-----------|-----------------------------------|
| N         | Fans          | off       | fan running                       |
|           |               | orange on | fan failure                       |
| O         | Battery       | off       | battery running                   |
|           |               | orange on | battery failure                   |
| P         | Memory module | orange on | at least one memory module faulty |

### 17.2.1.3 I/O panel connectors

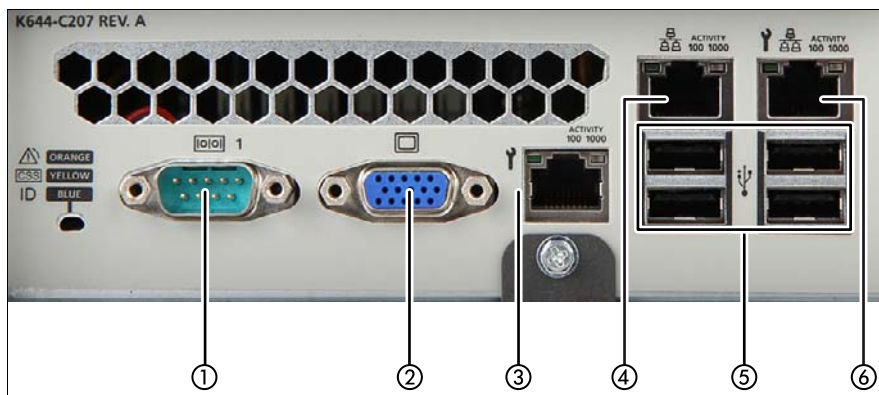


Figure 321: I/O panel connectors

|   |                          |   |                               |
|---|--------------------------|---|-------------------------------|
| 1 | Serial connector COM1    | 4 | Standard LAN connector (LAN1) |
| 2 | Video connector (VGA)    | 5 | 4 USB connectors              |
| 3 | Management LAN connector | 6 | Shared LAN connector (LAN2)   |

Depending on BIOS settings, the shared LAN connector may also be used as a management LAN connector. For further information, please refer to the corresponding BIOS Setup Utility reference manual.

The serial connector COM1 can be used as default interface or to communicate with the iRMC S4.

**i** The chipset offers two integrated USB 2.0 Rate Matching Hubs (RMHs) that enable lower power requirements and manages the transition of the communication data rate from the high speed of the host controller to the lower speed of USB full speed / low speed devices.

**17.2.1.4 I/O panel indicators**

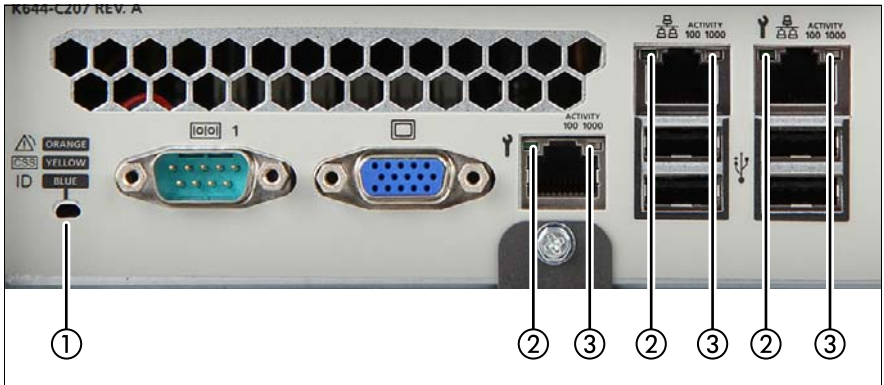


Figure 322: I/O panel indicators

| Indicator    | Status                        | Description   |   |
|--------------|-------------------------------|---|---|
| 1            | Global error indicator        | off   | no critical event (non-CSS component)   |
|              |                               | orange on   | prefailure detected (non-CSS component) |
|              |                               | orange flashing   | non CSS component failure               |
|              | CSS indicator                 | off   | no critical event (CSS component)       |
|              |                               | yellow on   | prefailure detected (CSS component)     |
|              |                               | yellow flashing   | CSS component failure                   |
| ID indicator | blue on                       | server has been highlighted using ServerView Operations Manager, iRMC web frontend, or the ID button on the front panel for easy identification |   |
| 2            | LAN link / transfer indicator | green on  | LAN connection established              |
|              |                               | off   | no LAN connection                       |
|              |                               | green flashing  | data transfer in progress               |

| Indicator |                     | Status    | Description                           |
|-----------|---------------------|-----------|---------------------------------------|
| 3         | LAN speed indicator | yellow on | traffic a transfer rate of 1 Gbit/s   |
|           |                     | green on  | traffic a transfer rate of 100 Mbit/s |
|           |                     | off       | traffic a transfer rate of 10 Mbit/s  |



**Note on the onboard LAN controller**

The separate management LAN connector is used as a management interface (iRMC S4) and is prepared for operation with the Remote Management. Optionally LAN connector 1 can also be used for iRMC S4 server management.

**iRMC-related status signals**

| ID indicator  | Global error indicator | Description   |
|---------------|------------------------|---|
| blue flashing | off                    | A remote connection has been established. Local VGA output has been disabled during the remote session. |
| blue flashing | orange flashing        | An emergency flash of the iRMC firmware is in progress.   |

### 17.2.1.5 PSU indicator (only hot-plug PSUs)

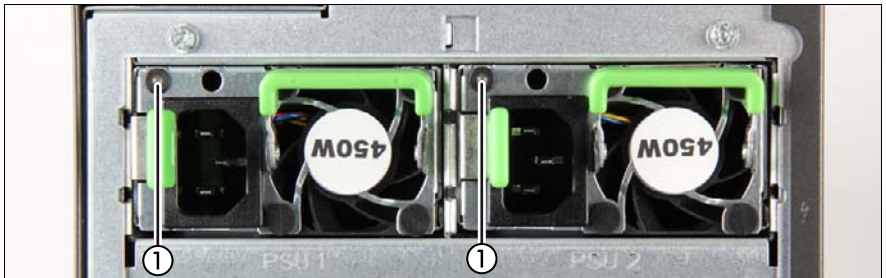


Figure 323: PSU indicator

| Indicator |                      | Status          | Description   |
|-----------|----------------------|-----------------|---|
| 1         | PSU operating status | green on        | Server is switched on and functioning properly                      |
|           |                      | green flashing  | Server is switched off, main voltage is present (Standby mode)      |
|           |                      | orange on       | PSU failure (over / under voltage, over temperature or fan failure) |
|           |                      | orange flashing | Overload warning  |

## 17.2.2 Connectors and indicators on the front panel

### 17.2.2.1 Front panel connectors

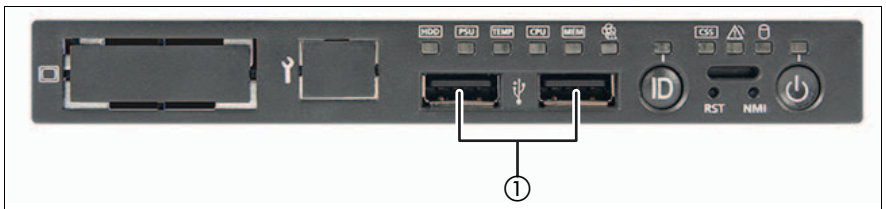


Figure 324: Front panel connectors

| Pos. | Component         |
|------|-------------------|
| 1    | 2x USB connectors |

17.2.2.2 Front panel controls and indicators

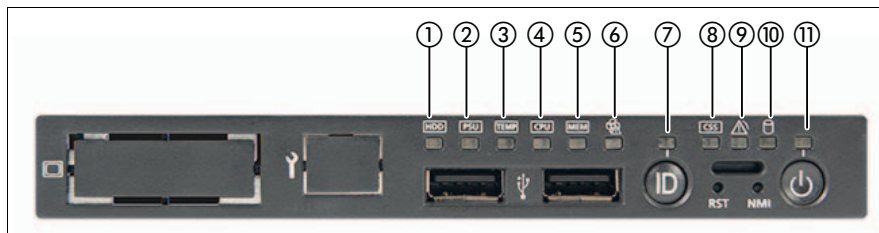



Figure 325: Front panel controls and indicators

Local diagnostic indicators

| Pos. | Indicator                   | Status    | Description  |
|------|-----------------------------|-----------|--|
| 1    | HDD / SSD error indicator   | orange on | HDD / SSD, SAS / SATA backplane or RAID controller failure detected  |
| 2    | PSU error indicator         | orange on | Hot-plug PSU failure detected<br> Only available in redundant PSU configurations. |
| 3    | Temperature error indicator | orange on | Operating temperature levels above permitted limits  |
| 4    | CPU error indicator         | orange on | CPU prefailure event detected  |
| 5    | Memory error indicator      | orange on | Memory module failure detected   |
| 6    | Fan error indicator         | orange on | Fan prefailure or failure event detected   |





In addition to local diagnostic indicators, CSS or Global Error LEDs indicate, if the defective component is a customer replaceable unit or if a service technician needs to be dispatched to replace the part.

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**Status indicators**

| Pos. | Indicator                    | Status          | Description   |
|------|------------------------------|-----------------|---|
| 7    | ID indicator                 | blue on         | server has been highlighted using ServerView Operations Manager, iRMC web frontend, or the ID button on the front panel for easy identification |
| 8    | CSS indicator                | off             | no critical event (CSS component)   |
|      |                              | yellow on       | prefailure detected (CSS component)   |
|      |                              | yellow flashing | CSS component failure   |
| 9    | Global error indicator       | off             | no critical event (non CSS component)   |
|      |                              | orange on       | prefailure detected (non CSS component)   |
|      |                              | orange flashing | non CSS component failure   |
| 10   | HDD / SSD activity indicator | green flashing  | data access in progress   |

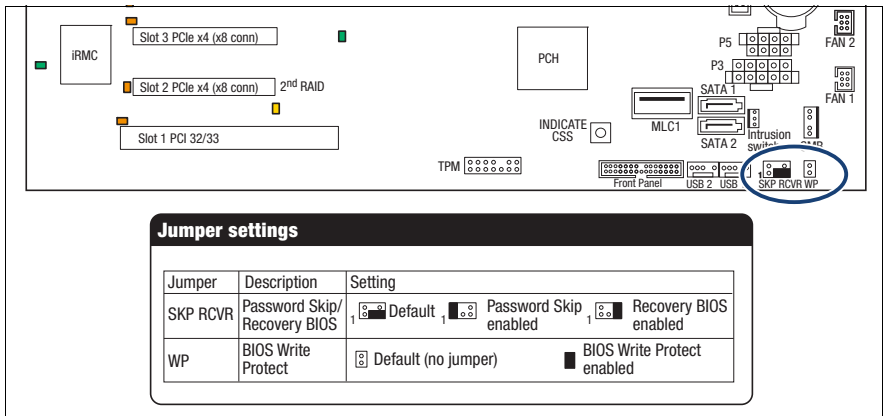
| Pos. | Indicator          | Status  | Description   |
|------|--------------------|---|---|
| 11   | Power-on indicator | green on  | server is switched on and running   |
|      |                    | orange on   | server is switched off, but mains voltage is present (standby mode)   |
|      |                    | With firmware version 7.3.x, two new operating conditions are indicated: iRMC booting and power-on delay. |   |
|      |                    | yellow / orange flashing  | <p>iRMC booting</p>  After connecting the server to the mains (power cord plugged in / after mains failure) the iRMC will boot. The system cannot be switched on, until the iRMC boot sequence is complete. During this time, the power-on indicator will flash yellow / orange. |
|      |                    | yellow on   | <p>Power-on delay</p>  After shutting down, the server cannot be switched on again right away. If the On / Off button is pressed right after shutting down the server, the power-on indicator will light up yellow until the delay period ends and the server will boot.         |

**iRMC-related status signals**

| ID indicator  | Global error indicator | Description   |
|---------------|------------------------|---|
| blue flashing | off                    | A remote connection has been established. Local VGA output has been disabled during the remote session. |
| blue flashing | orange flashing        | An emergency flash of the iRMC firmware is in progress.   |

 The meaning of further buttons is described in the operating manual of your server.

## 17.3 Onboard settings



| Jumper   | Setting                    | Description  |
|----------|----------------------------|--|
| SKP RCVR | Default                    | Password delete and Recovery BIOS options disabled   |
|          | Password Skip enabled      | This jumper setting will permanently delete the current BIOS password and apply default BIOS settings. |
|          | Recovery BIOS enabled      | Recovery BIOS enabled  |
| WP       | Default (no jumper)        | BIOS Write Protect disabled  |
|          | BIOS Write Protect enabled | BIOS Write Protect enabled   |

## 17.4 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 and reference                      |
|--------------------------|--|
| System board             | no TPM, UFM or expansion cards installed |
| 1 CPU with CPU heat sink | installed in socket CPU 1                |
| 1 memory module          | installed in DIMM slot 1A                |
| Front panel module       |  |
| 1 Power supply module    | installed in PSU bay 1                   |

Table 6: Minimum startup configuration - components

| Cable             | Notes and reference |
|-------------------|---------------------|
| Front panel cable |                     |
| Power cable       |                     |

Table 7: Minimum startup configuration - cables

- ▶ ["Shutting down the server" on page 48](#)
- ▶ ["Disconnecting the server from the mains" on page 48](#)
- ▶ Take the system down to its minimum startup configuration.
- ▶ ["Connecting the server to the mains" on page 72](#)
- ▶ Connect a keyboard, mouse and display to the server.
- ▶ Switch on the server as described in section ["Switching on the server" on page 73](#).



**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!

