

PRIMERGY RX200 S5 Server

Options Guide

Edition April 2009

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Certified documentation according to DIN EN ISO 9001:2000

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 9001:2000.

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1 Preface

The PRIMERGY RX200 S5 server is an Intel-based server for mid-size networks and large companies. The server is suitable for use as a file server and also as an application, information or Internet server.

Thanks to its highly developed hardware and software components, the PRIMERGY RX200 S5 server offers a high level of data security and availability. These components include hot-plug hard disk drive modules, redundant system fans and power supply units, the Server Management ServerView Suite, Prefailure Detection and Analysis (PDA) and Automatic Server Reconfiguration and Restart (ASR&R).

Security functions in the BIOS Setup and on the system board protect the data on the server against manipulation. Additional security is provided by the lockable rack door.

The server occupies one height unit in the rack.

1.1 Concept and target groups

This Options Guide shows you how to extend and upgrade your server.



CAUTION!

The activities described in this manual may only be performed by technical specialists.



The installation and removal of the hot-plug components is described in the Operating Manual supplied with the server.

1.2 Documentation overview

More information on your PRIMERGY RX200 S5 can be found in the following documents:

- “Quick Start Hardware - PRIMERGY RX200 S5” leaflet (only included as a printed copy)
- “Quick Start Software - Quick Installation Guide” DVD booklet (only included with the PRIMERGY ServerView Suite as a printed copy)
- “Safety notes and other important information” manual

- “Warranty” manual
- “PRIMERGY ServerView Suite Local Service Concept - LSC” manual
- “Returning used devices” manual
- “Helpdesk” leaflet
- Technical manual for the system board D2786
- “PRIMERGY RX200 S5 Server Operating Manual”
- "D2786 BIOS Setup Utility for RX200 S5" manual



PRIMERGY manuals are available in PDF format on the PRIMERGY ServerView Suite DVD 2. The PRIMERGY ServerView Suite DVD 2 is part of the PRIMERGY ServerView Suite supplied with every server.

If you no longer have the ServerView Suite DVDs, you can obtain the relevant current versions using the order number U15000-C289.

The PDF files of the manuals can also be downloaded free of charge from the Internet. The overview page showing the online documentation available on the Internet can be found using the URL:

<http://manuals.ts.fujitsu.com>. The PRIMERGY server documentation can be accessed using the *Industry standard servers* navigation option.

Further sources of information:

- PRIMERGY Abbreviations and Glossary on the PRIMERGY ServerView Suite DVD 2
- Manual for the monitor
- Documentation for the boards and drives
- Operating system documentation
- Information files in your operating system

1.3 Expansions and conversions

Second processor

The system board can be upgraded with a second processor. Only processors of the same type may be used on the system board. The second processor must have the same clock frequency as the first.

Main memory expansion

The system board supports up to 96 GB of main memory. 6 slots (2 banks with 3 channels each) are provided for each CPU for the main memory.

Accessible drive

In the version with a maximum of six HDD modules, a 5.25 inch bay is available for a DVD drive (SATA interface) with a height of 0.5 inches.

Extending the number of HDD modules

You can add further HDD modules, if required. The server can accommodate a maximum of eight HDD modules. To do this, you may need to exchange the HDD backplane.

Expansion cards in the PCI slots

The system board offers two slots with a PCI Express x8 interface and one slot with a PCI Express x4 interface (exclusively for modular RAID controllers):

Expansion cards can only be installed using three-slot riser cards. The riser cards provide three slots at a right angle to the system board (two slots for PCIe controllers and one slot for a RAID controller).

Intelligent Battery Backup Unit

You can add an iBBU (intelligent Battery Backup Unit) to the optional modular RAID controller to ensure data integrity in the event of a power failure.

uSSD

You can insert a USB solid state disk on the system board at a later time.

TPM

A Trusted Platform Module (TPM) for safer storage of keys can be implemented as an option. This module enables programs from third party manufacturers to store key information (e.g. drive encryption using Windows Bitlocker Drive Encryption).

The TPM is activated via the BIOS system (for more information, refer to the Fujitsu Technology Solutions BIOS manual).





CAUTION!

- When using the TPM, note the program descriptions provided by the third party manufacturers.
- You must also create a backup of the TPM content. To do this, follow the third party manufacturer's instructions. Without this backup, if the TPM or the system board is faulty you will not be able to access your data.
- If a failure occurs, please inform your service about the TPM activation before it takes any action, and be prepared to provide them with your backup copies of the TPM content.

1.4 Notational conventions


The following notational conventions are used in this manual:

<i>Text in italics</i>	indicates commands or menu items.
“Quotation marks”	indicate names of chapters and terms that are being emphasized.
▶	describes activities that must be performed in the order shown.
 CAUTION!	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.

2 Procedure



CAUTION!

- The actions described in this manual should only be performed by technical specialists.
 - Repairs to the device that do not relate to CSS failures must only be carried out 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.
- ▶ First of all, carefully read the safety instructions in the [chapter “Safety instructions” on page 13](#) et seq..
- ▶ Make sure that all necessary manuals (see the [section “Documentation overview” on page 5](#)) are available; print the PDF files if required. Most importantly, you will need the operating manual for the server and the technical manual for the system board.
- ▶ Shut the server down correctly, switch it off, disconnect the power plugs and open the server as described in the [chapter “Preparation” on page 19](#) et seq..
- ▶ Carry out the expansion or upgrade of your server as described in the pertinent chapter.
-  Installation and removal of the hot-plug components are described in the operating manual.
- ▶ Close the server, connect it to the power outlet, and switch it on as described in the [chapter “Completion” on page 61](#) et seq..
- ▶ Start the operating system and make the appropriate configuration if necessary (see the operating manual).

3 Safety instructions



The following safety instructions are also provided in the manual “Safety notes and other important information”.

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.



CAUTION!

- The actions described in this manual should only be performed by technical specialists.
- Repairs to the device that do not relate to CSS failures must only be carried out 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 starting up



CAUTION!

- 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.

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.

Installation and operation



CAUTION!

- This unit should not be operated in ambient temperatures above 35 °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 V - 127 V oder 200 V - 240 V. Ensure that the local mains voltage lies within these limits.
- This device must only be connected to properly grounded shock-proof sockets or insulated sockets of the rack's internal power supply with tested and approved power cables.
- Ensure that the device is connected to a grounded shockproof socket close to the device.



CAUTION!

- Ensure that the power sockets on the device and the grounded shock-proof sockets are freely accessible.
- The On/Off button or the main power switch (if present) does not isolate the device from the mains power supply. To disconnect it completely from the mains power supply, unplug all network power plugs from the grounded shockproof sockets.
- 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.
- The EN 50173 and EN 50174-1/2 standards apply for LAN cabling. The minimum requirement is the use of a category 5 screened LAN cable for 10/100 Mbit/s Ethernet, or a category 5e cable for Gigabit Ethernet. The requirements from the ISO/IEC 11801 specification must also be met.
- 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 strike).
- 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), switch off the server immediately, remove all power plugs and contact your sales outlet or customer service team.

**CAUTION!**

- Proper operation of the system (in accordance with IEC 60950-1/ 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: CCS 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.

Batteries**CAUTION!**

- Incorrect replacement of batteries may result in a risk of explosion. The batteries may only be replaced with identical batteries or with a type recommended by the manufacturer (see the technical manual for the system board).
- Replace the lithium-battery on the system board in accordance with the instructions in the technical manual for the system board.

Working with CDs/DVDs and CD/DVD drives

When working with devices with CD/DVD drives, these instructions must be followed.



CAUTION!

- Only use CDs/DVDs that are in perfect condition in your server's CD/DVD drive, in order to prevent data loss, equipment damage and injury.
- Check each CD/DVD 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 and cause imbalance.

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

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



You can prevent mechanical damage and damage to the CD/DVD drive, as well as premature CD/DVD wear, by observing the following suggestions:

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

Laser information

The CD/DVD drive complies with IEC 60825-1 laser class 1.



CAUTION!

The CD/DVD 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 CD/DVD drive casing!

Modules with electrostatic-sensitive components

Systems and components that might be damaged by electrostatic discharge (ESD) are marked with the following label:



Figure 1: ESD label

When you handle components fitted with ESDs, you must observe the following points under all circumstances:

- Remove the power plug before installing or removing components containing ESDs.
- You must always discharge yourself of static charges (e.g. by touching a grounded object) before working.
- The equipment and tools you use must be free of static charges.
- Only touch the components at the positions highlighted in green (touch points).
- Do not touch any exposed pins or conductors on a component.
- Use a grounding cable designed for this purpose to connect yourself to the system unit as you install components.
- Place all components on a static-safe base.



You will find a detailed description for handling ESD components in the relevant European or international standards (DIN EN 61340-5-1, ANSI/ESD S20.20).

4 Preparation



CAUTION!

Follow the safety instructions in the chapter [“Safety instructions” on page 13](#).

4.1 Pulling out/removing the server

- ▶ Terminate all applications and shut down the server correctly.
- ▶ If your operating system has not switched off the server, press the on/off button.
- ▶ Pull all power connectors out of the power outlets.
- ▶ Loosen the knurled screws on the sides and pull the server carefully out of the rack as far as it will go.



If the server is not easily accessible once it has been pulled out, remove it from the rack completely. See the operating manual for details on how to remove the server from the rack.



CAUTION!

At least two people are needed to remove the server from the rack.

4.2 Opening the server

You must remove the fan cover before removing the housing cover.

Removing the fan cover

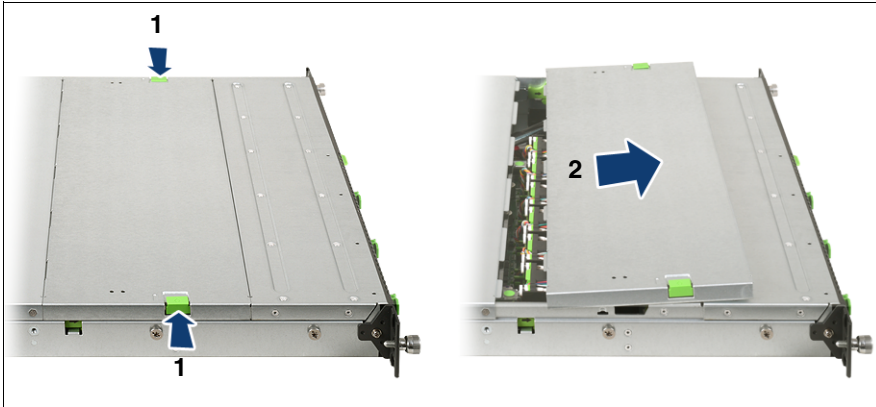


Figure 2: Opening the fan cover

- ▶ Push the two green buttons (1) in the direction of the arrow and lift the fan cover upwards to remove it (2).

Removing the housing cover



Figure 3: Removing the housing cover

- ▶ Use the two green locking levers (see circles) to unlock the housing cover.

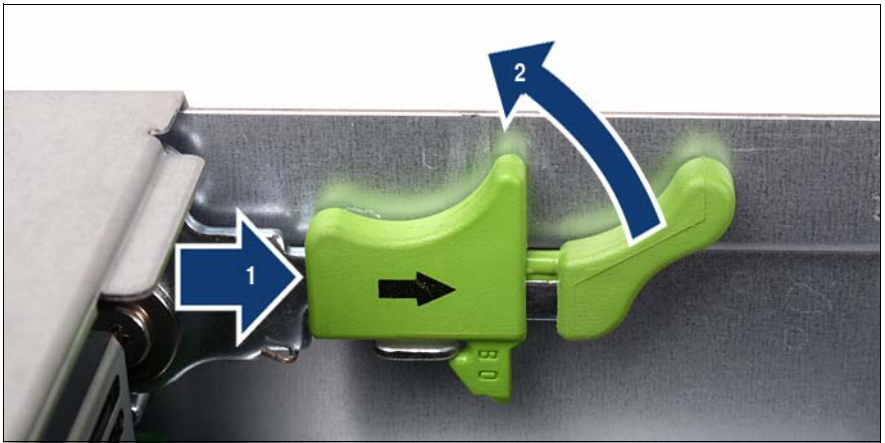


Figure 4: Using the locking levers

- ▶ Push the green locking levers together as shown (1) and then move them up (2) so that the housing cover is pushed backward slightly.
- ▶ Lift off the housing cover upwards.

4.3 Removing the air cowl

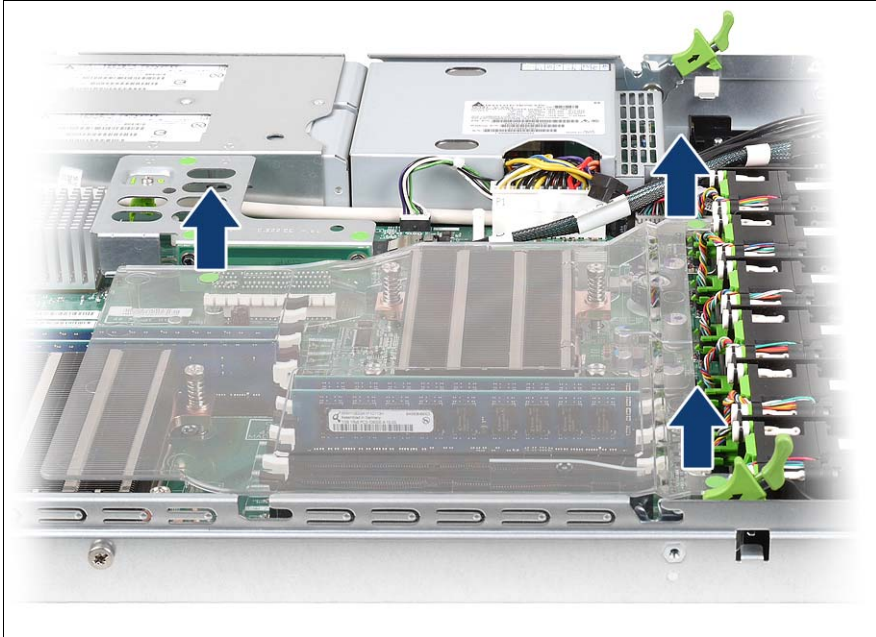


Figure 5: Taking off the air cowl

- ▶ Lift the air cowl upwards to remove it.

5 Processors



CAUTION!

Follow the safety instructions in the chapter [“Safety instructions” on page 13](#).



CAUTION!

Processors are modules which can react extremely sensitively to electrostatic discharges and which must therefore always be handled with care.

After a processor has been removed from its protective sleeve or from its socket, place it with its smooth side down on a non-conducting, antistatic surface.

Never push a processor over a surface.

5.1 Installing a second processor

The system board can be upgraded with a second processor.



CAUTION!

Only processors of the same type may be used on the system board. The second processor must have the same clock frequency as the first. For dual operation, use a suitable multiprocessor operating system.

- ▶ Open the server as described in [chapter “Preparation” on page 19](#).
- ▶ Lift the air cowl upwards to remove it as described in [section “Removing the air cowl” on page 22](#).

Inserting the processor

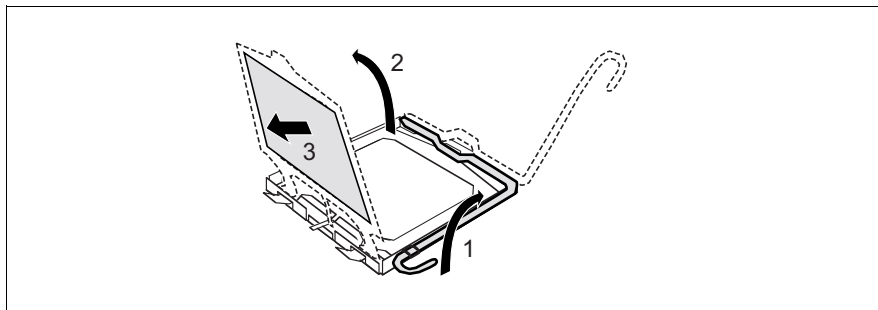


Figure 6: Releasing the lever

- ▶ Release the socket lever by pressing it sideways and pushing it upwards as far as it will go (1).
- ▶ Open the cover (2).
- ▶ Remove the plastic cover (3).

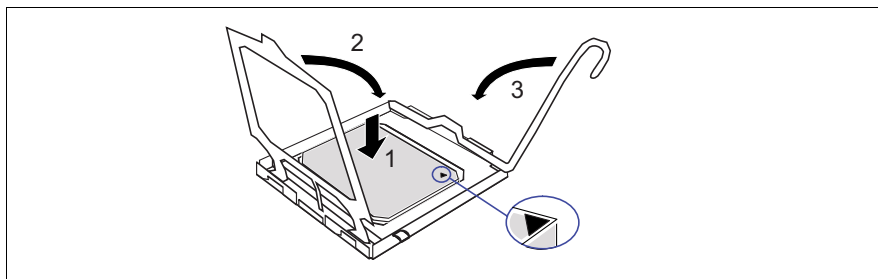


Figure 7: Inserting the processor

- ▶ Position the new processor over the socket and then place it carefully into the socket (1).

**CAUTION!**

The processor can only be installed in one particular direction. Note the marking on one of the corners. To avoid damaging the processor, do not force it into the socket.

- ▶ Close the cover (2).
- ▶ Lock the processor in place in the socket by returning the socket lever to its original position (3).

Installing the heat sink

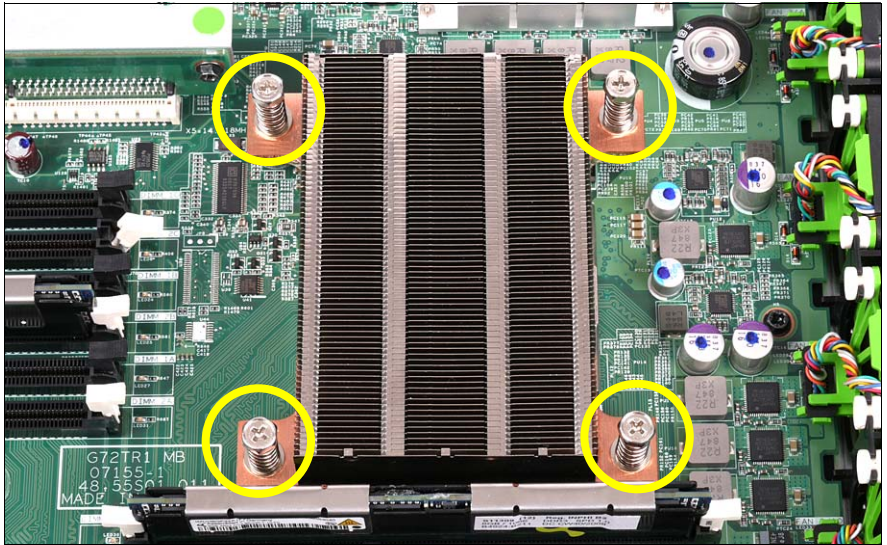


Figure 8: Installing the heat sink

- ▶ Place the heat sink on the processor as shown.
- ▶ Fasten the heat sink by tightening the four screws in a crossover pattern (see circles).



CAUTION!

Never install a processor without a heat sink as otherwise the processor may overheat, causing the possible failure of the processor and system board.

- ▶ Fit the air cowl as described in [chapter "Completion" on page 61](#).
- ▶ Close the server, connect all power plugs to the power outlets, and switch on the server as described in [chapter "Completion" on page 61](#).

5.2 Replacing the processor



CAUTION!

Only processors of the same type may be used on the system board.

- ▶ Open the server as described in [chapter “Preparation” on page 19](#).
- ▶ Lift the air cowl upwards to remove it as described in [section “Removing the air cowl” on page 22](#).

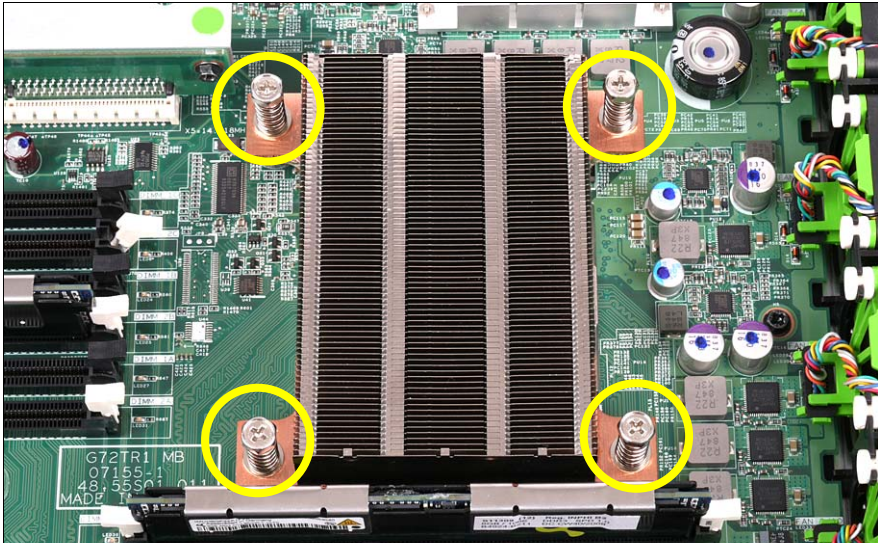


Figure 9: Removing the heat sink

- ▶ Loosen the four screws of the heat sink in a crossover pattern.
- ▶ Loosen the heat sink carefully by turning it back and forth. Then lift it up and off.
- ▶ Remove the residual thermal paste from the underside of the heat sink.
- ▶ Clean the underside of the heat sink using a lint-free cloth.

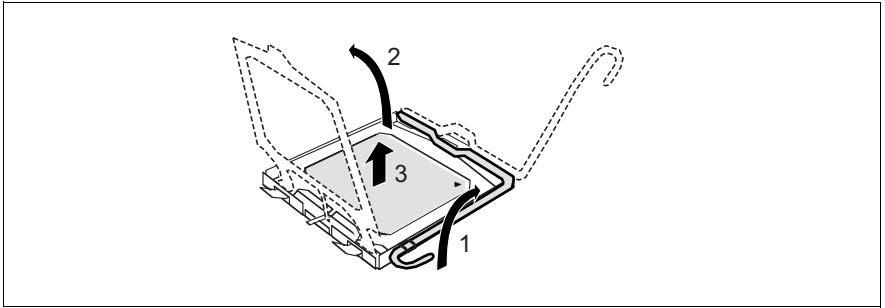


Figure 10: Removing an old processor

- ▶ Release the socket lever by pressing it sideways and pull it upward as far as it will go (1).
- ▶ Open the cover (2).
- ▶ Lift the installed processor carefully out of the socket (3).

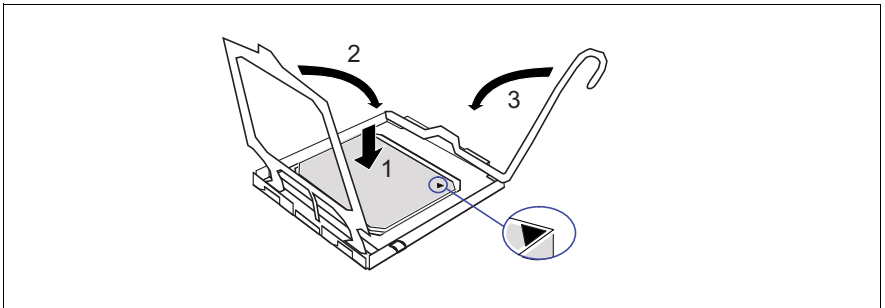


Figure 11: Inserting a new processor

- ▶ Position the new processor over the socket and then place it carefully into the socket (1).

**CAUTION!**

The processor can only be installed in one particular direction. Note the marking on one of the corners. To avoid damaging the processor, do not force it into the socket.

- ▶ Close the cover (2).
- ▶ Lock the processor in place in the socket by returning the socket lever to its original position (3).

- ▶ Apply a small amount of thermal paste to the upper side of the new processor.
- ▶ Ensure a thin and even distribution of the thermal paste.
- ▶ Place the heat sink on the processor (see [figure 8 on page 25](#)).
- ▶ Fasten the heat sink by tightening the four screws in a crossover pattern.
- ▶ Fit the air cowl as described in [chapter “Completion” on page 61](#).
- ▶ Close the server, connect all power plugs to the power outlets, and switch on the server as described in [chapter “Completion” on page 61](#).

5.3 Replacing the heat sink

- ▶ Open the server as described in [chapter “Preparation” on page 19](#).
- ▶ Lift the air cowl upwards to remove it as described in [section “Removing the air cowl” on page 22](#).
- ▶ Remove the four screws of the heat sink in a crossover pattern (see [figure 9 on page 26](#)).
- ▶ Loosen the heat sink carefully by turning it back and forth. Then lift it up and off.
- ▶ Clean the upper side of the processor using a lint-free cloth.



New heat sinks come with thermal paste already applied. When reusing used heat sinks, you need to apply thermal paste.

- ▶ Place the heat sink on the processor (see [figure 8 on page 25](#)).
- ▶ Fasten the heat sink by tightening the four screws in a crossover pattern (see [figure 8 on page 25](#)).
- ▶ Fit the air cowl as described in [chapter “Completion” on page 61](#).
- ▶ Close the server, connect all power plugs to the power outlets, and switch on the server as described in [chapter “Completion” on page 61](#).

6 Main memory



CAUTION!

Follow the safety instructions in the chapter [“Safety instructions” on page 13](#).

The system board has a total of 12 slots (6 for each CPU) for memory modules (DIMMs), which are suitable for both RDIMM memory modules (registered DIMM with the capacities 2048, 4096 and 8192 MB) and UDIMM memory modules (unbuffered DIMM with the capacities 1024 and 2048 MB).

The board supports a maximum memory configuration of 24 GB for UDIMM memory modules and 96 GB for RDIMM memory modules. A mixture of these two module types is not permitted.

The SDDC function (Single Device Data Correction or Chipkill) is only supported for RDIMM memory modules.

6.1 Equipping rules

The 6 slots for each CPU for the main memory are divided into two banks (bank 1 and bank 2) with 3 channels each (A, B and C).

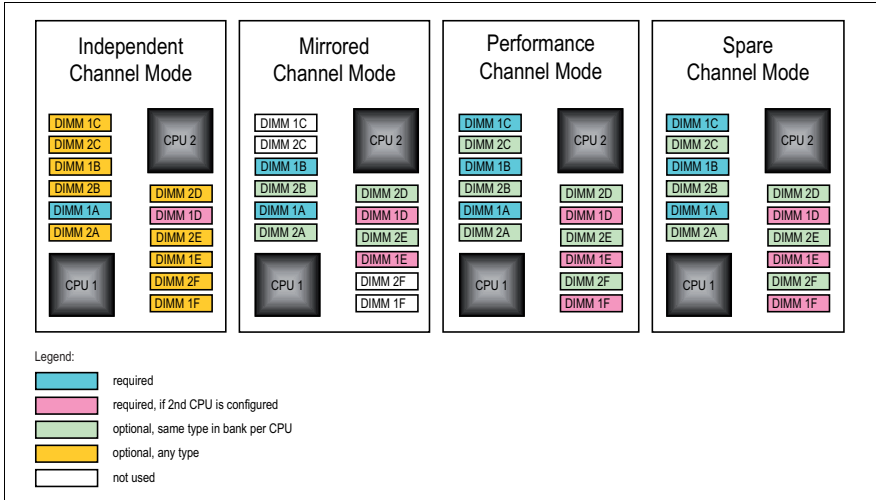


Figure 12: Equipping the main memory in the different modes

Independent Channel Mode

- Allows all channels to be equipped in any order.
- Works with DIMMs of different clock frequencies and sets them at the lowest frequency.
- Works with both UDIMM memory modules and RDIMM memory modules.

Mirrored Channel Mode

- Requires identical modules on channels A & B (1st CPU) and on C & D (2nd CPU).
- Half of the capacity is used for mirroring – the available memory for applications amounts to just half of the installed memory.
- Channel C (1st CPU) or channel F (2nd CPU) are not available in this mode.
- RDIMM memory modules are supported.

Performance Channel Mode

- Requires identical modules on all channels of each bank for each CPU.
- RDIMM memory modules are supported.

Spare Channel Mode

- Requires identical modules on all channels of each bank for each CPU.
- One-third of the capacity is used as a spare area – this reduces the usable memory for applications to two-thirds.
- RDIMM memory modules are supported.

Notes on equipping

- Equipping always starts at DIMM slot 1A.
- The minimum memory configuration is 1 DIMM per system board in Independent Channel Mode.
- Memory modules with different clock rates may be mixed. The system automatically adjusts itself to the lowest clock rate.
- The greater the capacity of the memory module, the further away from the CPU it must be equipped. This applies for each channel.
- Single and dual ranked memory modules may be mixed. Quad ranked memory modules, on the other hand, must be used exclusively.
- In mirror mode and in spare mode, memory modules of different capacities may be mixed on a bank by bank basis (2x2, see figure "[Equipping the main memory in the different modes](#)" on [page 32](#)).
- The assignment of the DIMM slots to the memory banks and channels is imprinted on the system board next to the DIMM slots.

6.2 Extending/replacing the main memory

- ▶ Open the server as described in [chapter “Preparation” on page 19](#).
- ▶ Lift the air cowl upwards to remove it as described in [section “Removing the air cowl” on page 22](#).

Removing installed memory modules

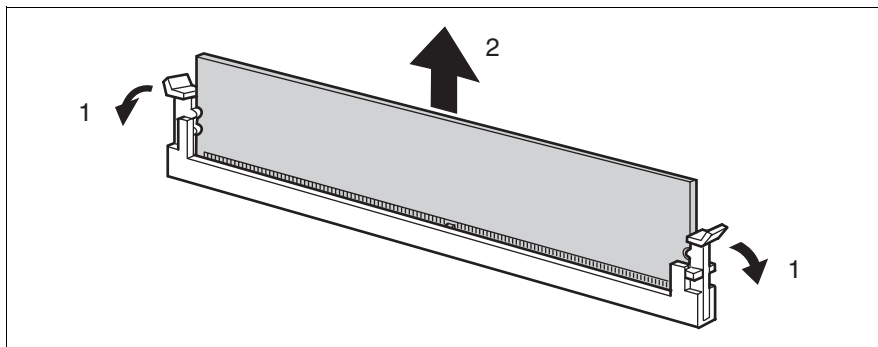


Figure 13: Removing a memory module

- ▶ Fold the ejection levers outwards on both sides of the corresponding slot (1). This will cause the memory module installed in the slot to be ejected.
- ▶ If the slot was already equipped: Remove the memory module (2).

Inserting memory modules

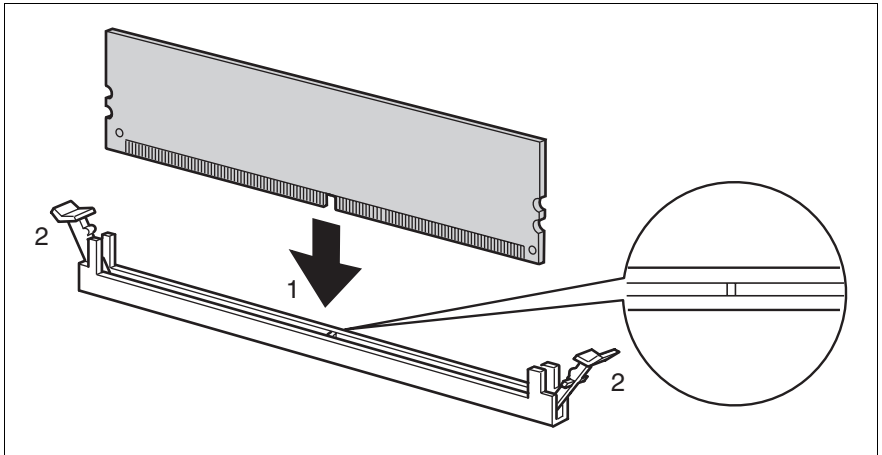


Figure 14: Inserting a memory module

- ▶ Insert the memory module into the slot (1) and carefully press it down until the ejection levers on the sides engage (2).
- ▶ Fit the air cowl as described in [chapter "Completion" on page 61](#).
- ▶ Close the server, connect all power plugs to the power outlets, and switch on the server as described in [chapter "Completion" on page 61](#).

7 Accessible drive



CAUTION!

Follow the safety instructions in the chapter [“Safety instructions”](#) on page 13.

Insert the optical drive that can be delivered as an option in a mounting frame before sliding it in the server. The parts required for the installation are shown in the photo below:

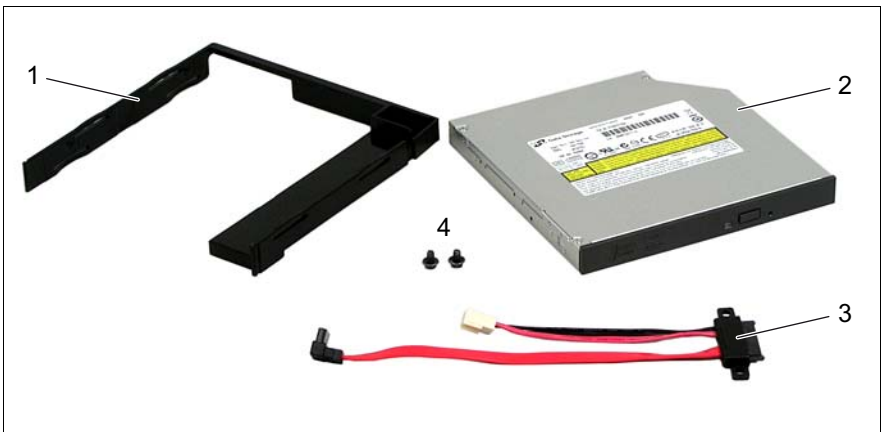


Figure 15: Parts required for installing the SATA DVD drive

- 1 Mounting frame
- 2 DVD drive
- 3 Connection cable
- 4 Screws for fastening the connection cable.

7.1 Installing a SATA DVD drive

- ▶ Open the server as described in [chapter “Preparation” on page 19](#).
- ▶ First remove the dummy module by pushing it forward out of the housing.



CAUTION!

Keep the dummy module for future use. If you remove the accessible drive again and do not replace it with a new one, the dummy module must be reinstalled to comply with EMC regulations and to satisfy cooling requirements and fire protection measures.

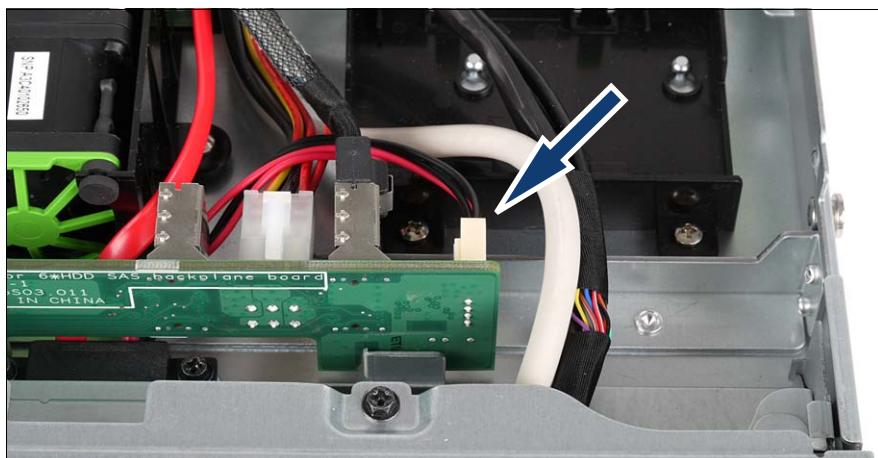


Figure 16: Connecting the DVD cable

- ▶ Connect the free ends of the DVD cable to the corresponding connectors on the HDD backplane (see arrow) or on the system board ("SATA ODD", see also [section “Cable diagrams” on page 68](#)).

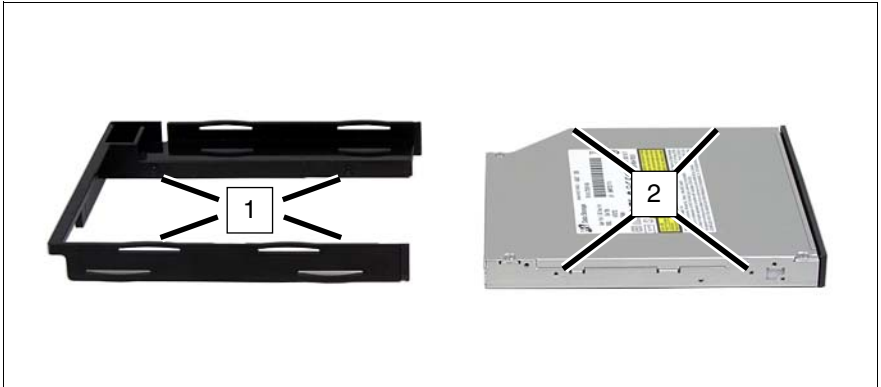


Figure 17: Position of the pins in the mounting frame and the openings on the DVD drive

- ▶ Insert the DVD drive into the mounting frame so that the plastic pins (1) on both sides of the mounting frame are inserted into the openings (2) on the outsides of the drive.



Figure 18: The DVD drive ready to be installed

- ▶ Push the DVD drive into the slot from the outside until it engages.
- ▶ Close the server, connect all power plugs to the power outlets, and switch on the server as described in [chapter "Completion" on page 61](#).

8 HDD modules



CAUTION!

Follow the safety instructions in the chapter [“Safety instructions”](#) on page 13.

The server can accommodate two further hard disk drive modules (HDDs) instead of the DVD drive. To do this, you need a conversion kit consisting of the following parts:

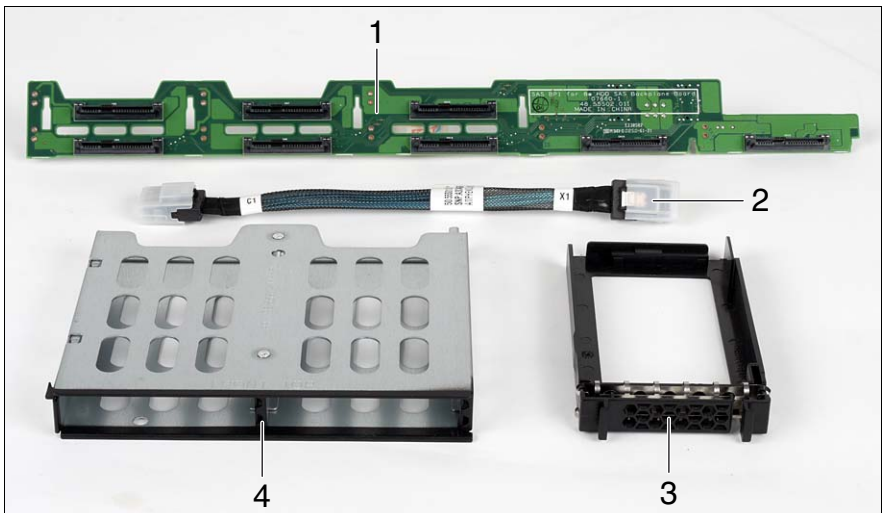


Figure 19: Backplane for eight HDD modules

- 1 Backplane for up to 8 HDDs
- 2 Second SAS cable
- 3 Dummy HDD (for possible empty drive tray)
- 4 Drive cage for up to two additional HDDs

► Open the server as described in [chapter “Preparation”](#) on page 19.

Removing an existing DVD drive or dummy module

- ▶ Disconnect the DVD cable plug from the system board and from the HDD backplane.

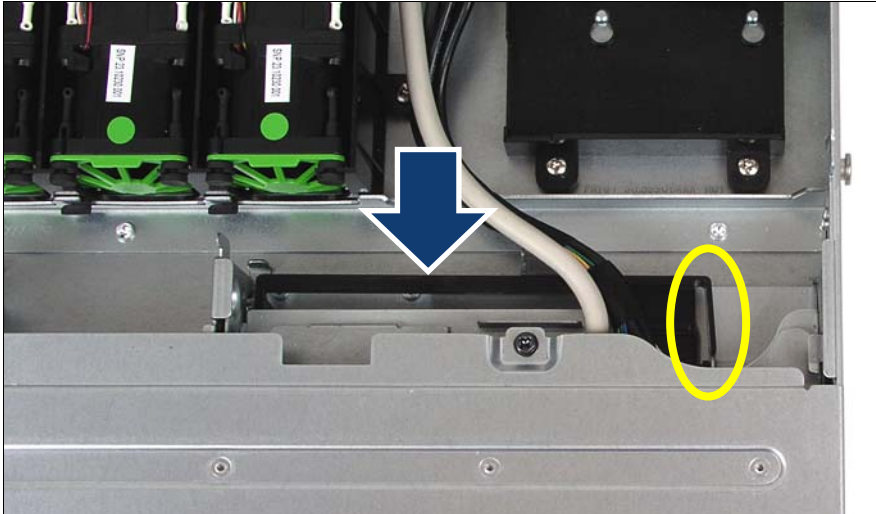


Figure 20: Removing the DVD drive or dummy module

- ▶ Remove the DVD drive module or dummy module by pushing it forward out of the housing.

i In order to be able to push out the module, you must press the lock on the side (see oval) sideways.

Removing the DVD drive cage

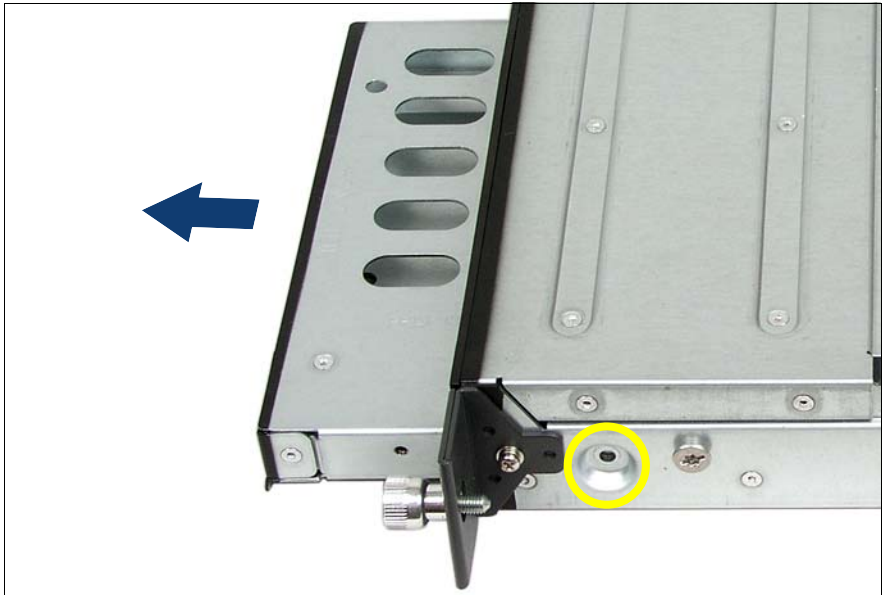


Figure 21: Demounting the DVD drive cage

- ▶ Loosen the screw on the right hand side (see circle) and move the DVD drive cage outwards in the direction of the arrow.

Removing the existing backplane (6x HDD)

- ▶ Remove all HDD modules from the housing.

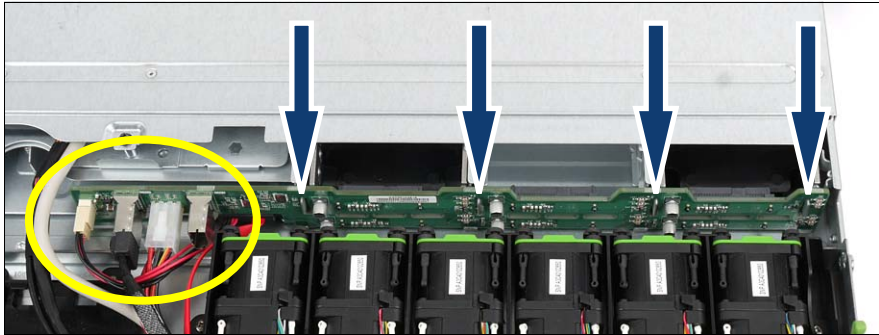


Figure 22: Removing the HDD backplane

- ▶ Disconnect all cables from the HDD backplane (see oval).
- ▶ Lift the HDD backplane over the metal bars (see arrows) and then remove it in the direction of the rear of the server.



Install HDD backplanes in the reverse order.

Installing the backplane (8x HDD)

- ▶ Place the HDD backplane (8x HDD) on the designated bars on the housing (see [figure 22](#)) and press it down carefully.
- ▶ Connect all the required cables to the HDD backplane (see [section “Cabling for up to 8 HDD modules” on page 70](#)).

Installing the drive cage for 8x HDD

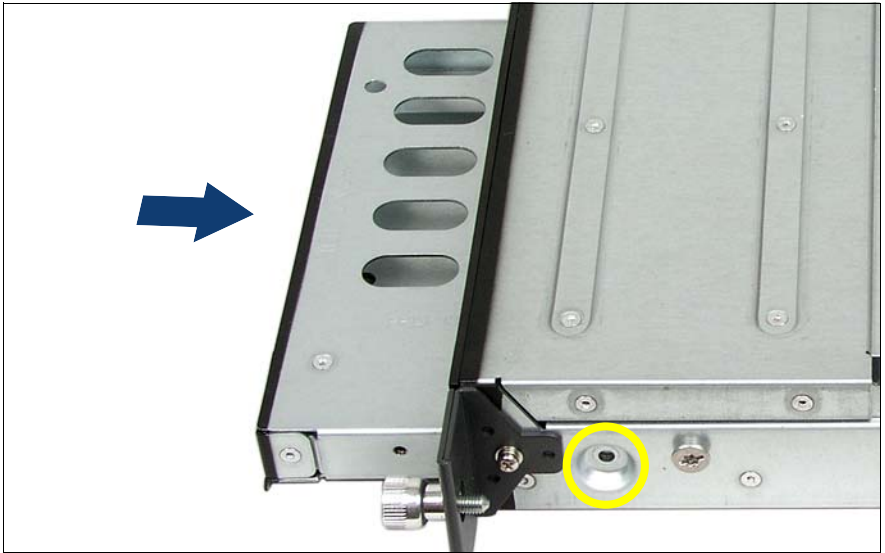


Figure 23: Installing the HDD drive cage

- ▶ Push the drive cage for the two additional HDD modules into the housing.
- ▶ Screw the drive cage in place (see circle).

Inserting the HDD modules



Figure 24: Installation positions of additional HDD modules

- ▶ Push the additional HDD modules into the two drives (left side = HDD #6, right side = HDD #7) of the drive cage.
- ▶ Close the server, connect all power plugs to the power outlets, and switch on the server as described in [chapter "Completion" on page 61](#).

9 Expansion cards and iBBU



CAUTION!

Follow the safety instructions in the chapter [“Safety instructions”](#) on [page 13](#).

9.1 Installing an expansion card in riser cards

The server has three slots for PCIe expansion cards. These are integrated in the system using riser cards (see positions (1) - (3) in [figure 25](#)). The individual slots can be equipped as follows:

- Riser card #1: PCIe x8, standard and low-profile expansion cards
- Riser card #2: PCIe x8, only low-profile expansion cards
- Riser card #3: PCIe x4, internal, only for (low-profile) RAID controllers
- ▶ Open the server as described in [chapter “Preparation”](#) on [page 19](#).

Removing the riser card holders

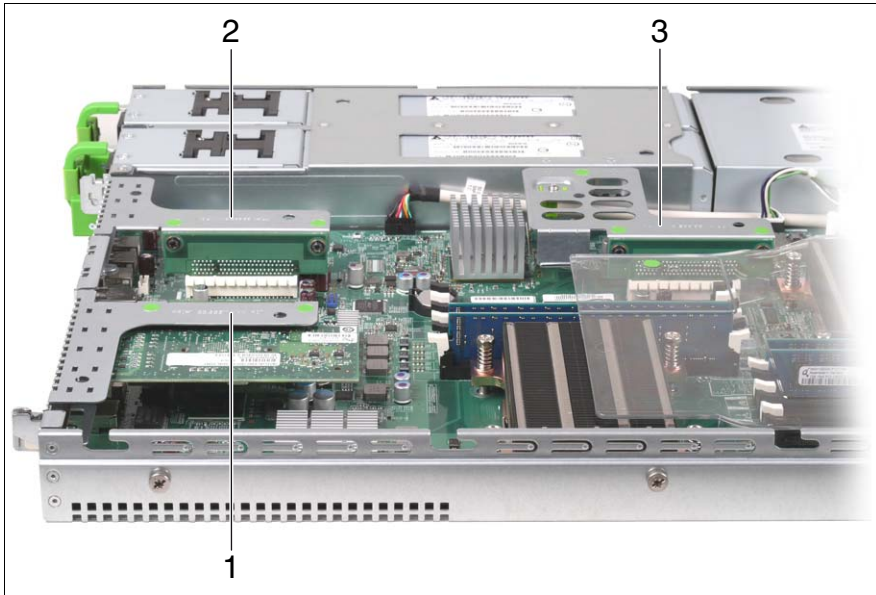


Figure 25: Position of riser card holders 1-3

- ▶ If necessary, disconnect the cables from the relevant expansion card.
- ▶ Pull the required riser card holder upwards to remove it.

Installing an expansion card

- ▶ Please read the documentation supplied with the expansion card.
- ▶ Connect any required cables to the expansion card.



Figure 26: Riser card holder #2 with riser card

- ▶ Remove the rear cover (1) from the riser card holder.



Keep the rear cover for future use.

If you remove the expansion card, you must replace the rear cover to comply with EMC regulations and to satisfy cooling requirements and fire protection measures.

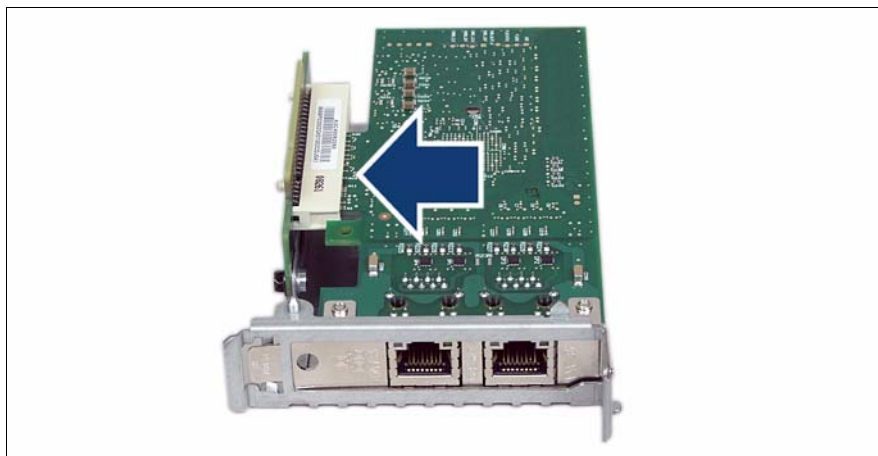


Figure 27: Riser card holder equipped with a controller

- ▶ Insert the board into the riser card holder of the same height.
 - i** Make sure that the rear cover is positioned in the designated groove.
- ▶ If necessary, connect the cables to the expansion card and the other components.

Reinstalling the riser card holders

- ▶ Position the riser card holder over the relevant slot on the system board.
- ▶ Carefully push the riser card holder into the slot by pressing on the green points.
- ▶ Close the server, connect all power plugs to the power outlets, and switch on the server as described in [chapter "Completion" on page 61](#).

9.2 Installing a modular RAID controller

A modular RAID controller can be installed in the server as an option. Riser card holder #3 (see [figure 25 on page 48](#)) is intended solely for this purpose.

Removing riser card holder #3

- ▶ Lift riser card holder #3 from its slot.

Installing a RAID controller

- ▶ Please read the documentation supplied with the RAID controller.
- ▶ Connect any required cables onto the RAID controller.

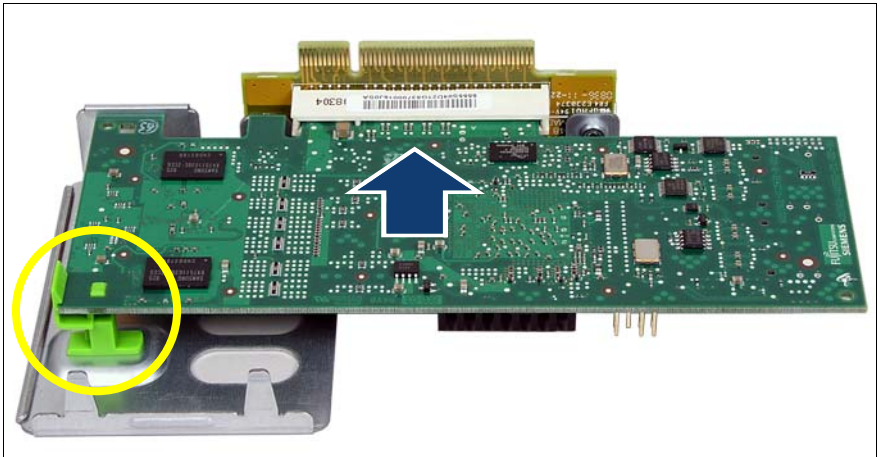


Figure 28: Installing the RAID controller in riser card holder #3

- ▶ Carefully push the RAID controller into the slot of riser #3.



Make sure that the RAID controller is positioned correctly (see circle).

Installing the riser card holder

- ▶ Position the riser card holder over the relevant slot on the system board.
- ▶ Carefully push the riser card holder into the slot by pressing on the green points.

- ▶ Close the server, connect all power plugs to the power outlets, and switch on the server as described in [chapter “Completion” on page 61](#).

9.3 Installing an iBBU

If a modular RAID 5 controller is installed in riser card #3, you can add an iBBU (intelligent Battery Backup Unit) to it.

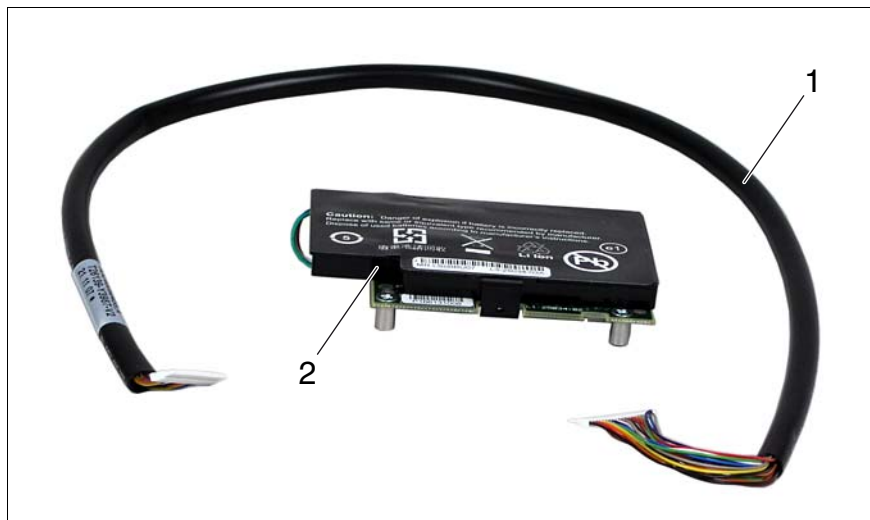


Figure 29: iBBU installation kit

- 1 Connection cable from the iBBU to the RAID 5 controller
- 2 iBBU

- ▶ Open the server as described in [chapter “Preparation” on page 19](#).

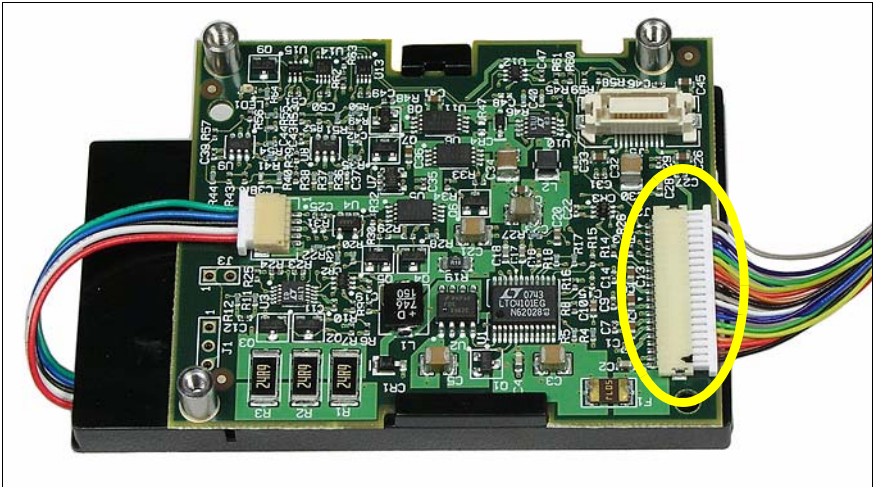


Figure 30: Cable connection on the underside of the iBBU

- ▶ Insert the iBBU cable into the corresponding connection on the underside of the iBBU (see oval).



Figure 31: Position of the iBBU holder in the server



Figure 32: Installing the iBBU

- ▶ Install the iBBU in its holder in the server as follows:
 1. Slide the iBBU under the two plastic pins of the iBBU holder (1).
 2. Press down the iBBU on the opposite side until you feel it click into place (2).

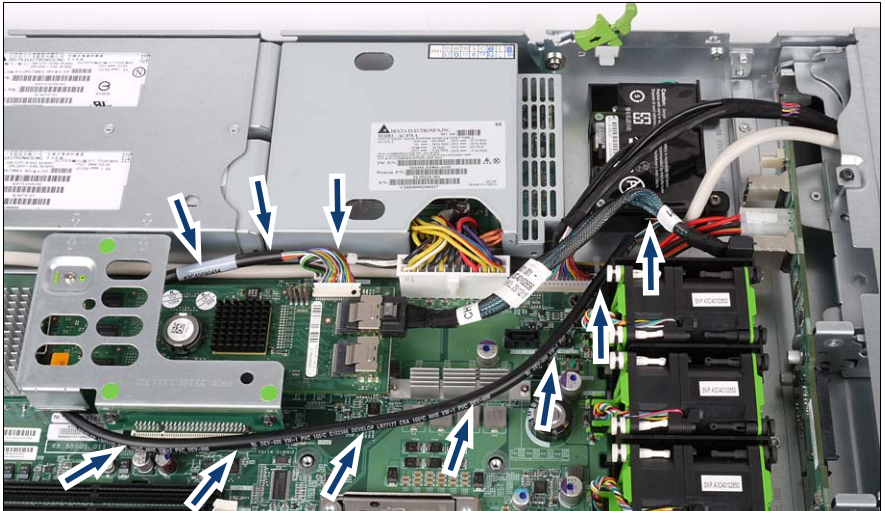


Figure 33: iBBU - Routing the cable

- ▶ Route the iBBU cable as shown.



The iBBU cable must pass beneath the power cable that crosses the iBBU cable.

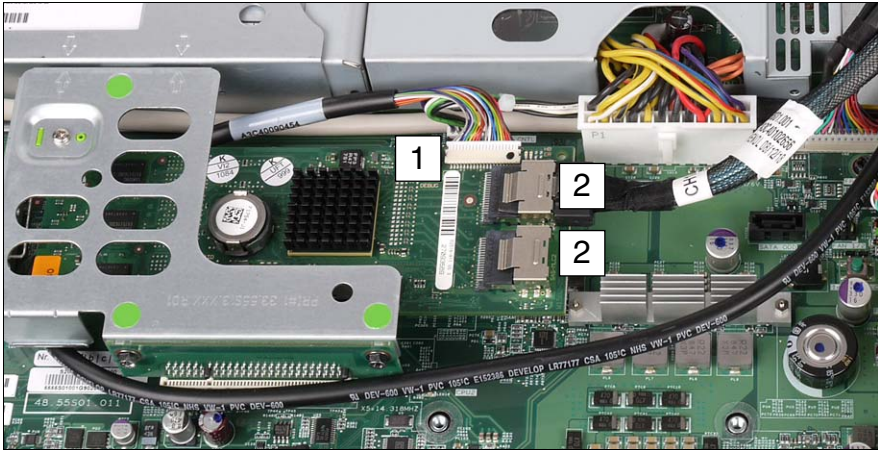


Figure 34: Connecting the cable to the modular RAID 5 controller

- ▶ Connect the free end of the iBBU connection cable to the corresponding connector on the RAID 5 controller (1).

i The connector is protected against polarity reversal, in other words, the plug can only be connected one way round.

- ▶ Connect the SAS cable(s) to the corresponding connectors on the RAID 5 controller (2).
- ▶ Close the server, connect all power plugs to the power outlets, and switch on the server as described in [chapter “Completion” on page 61](#).

10 USB solid state disk (uSSD)



CAUTION!

Follow the safety instructions in the chapter [“Safety instructions” on page 13.](#)

The system board has a slot – possibly covered by an installed modular RAID controller – for a USB solid state disk (uSSD). It can be used as optional memory for software (e.g. VMware) or as a software dongle.

- ▶ Open the server as described in [chapter “Preparation” on page 19.](#)
- ▶ Remove riser card holder #3.



Figure 35: Position of the uSSD on the system board

- ▶ Insert the uSSD in its slot (see circle) and screw it in place.
- ▶ Install riser card holder #3.
- ▶ Close the server, connect all power plugs to the power outlets, and switch on the server as described in [chapter “Completion” on page 61.](#)

11 Trusted Platform Module (TPM)



CAUTION!

Follow the safety instructions in the chapter [“Safety instructions”](#) on page 13.

The Trusted Platform Module (TPM) is installed on the system board between riser cards #1 and #2 (see photo below). It is used for safe storage of key information (e.g. drive encryption using Windows BitLocker Drive Encryption).

- ▶ Open the server as described in [chapter “Preparation”](#) on page 19.

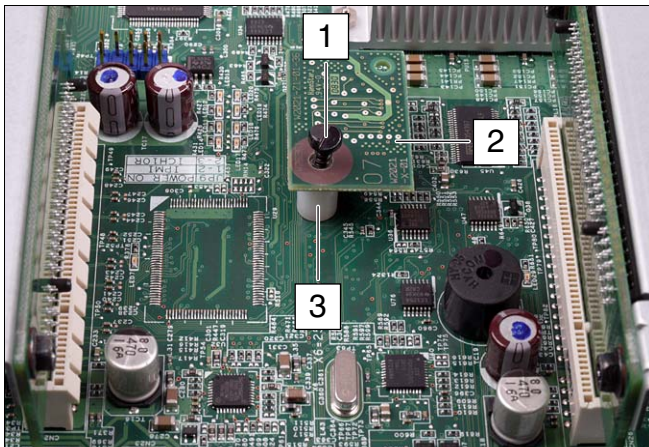


Figure 36: Installing the TPM module

- ▶ Insert the plastic post supplied (3) into the square opening between riser cards #1 and #2 on the system board. Make sure that the post engages.
- ▶ Insert the TPM (2) in the corresponding socket on the system board and secure it using the screw supplied (1).
- ▶ Close the server, connect all power plugs to the power outlets, and switch on the server as described in [chapter “Completion”](#) on page 61.

12 Completion



CAUTION!

Follow the safety instructions in the chapter [“Safety instructions”](#) on page 13.

12.1 Fitting the air cowl

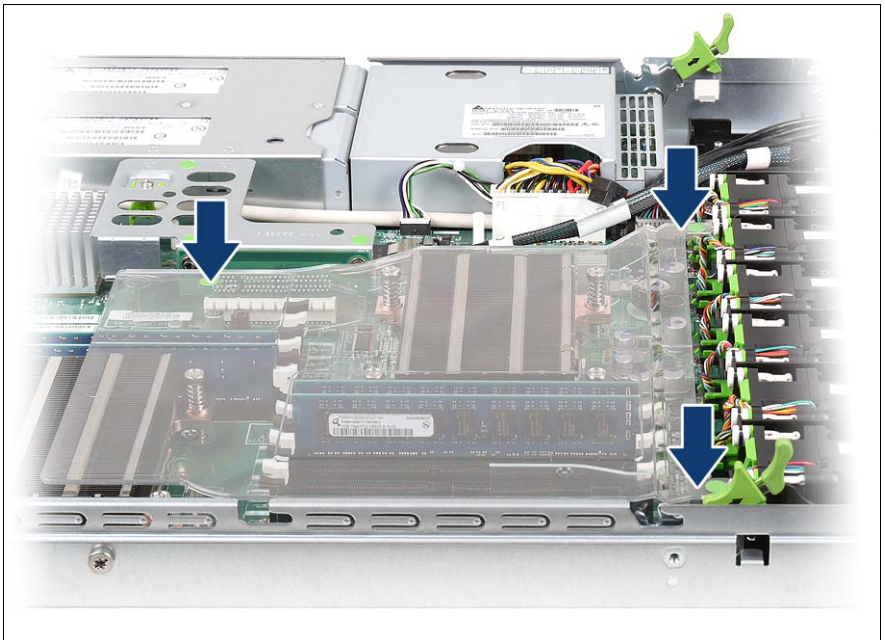


Figure 37: Fitting the air cowl

- Refit the air cowl. Please note the information described below.

- The plastic pin of the air cowl must slot into the groove of the system board (see circle):

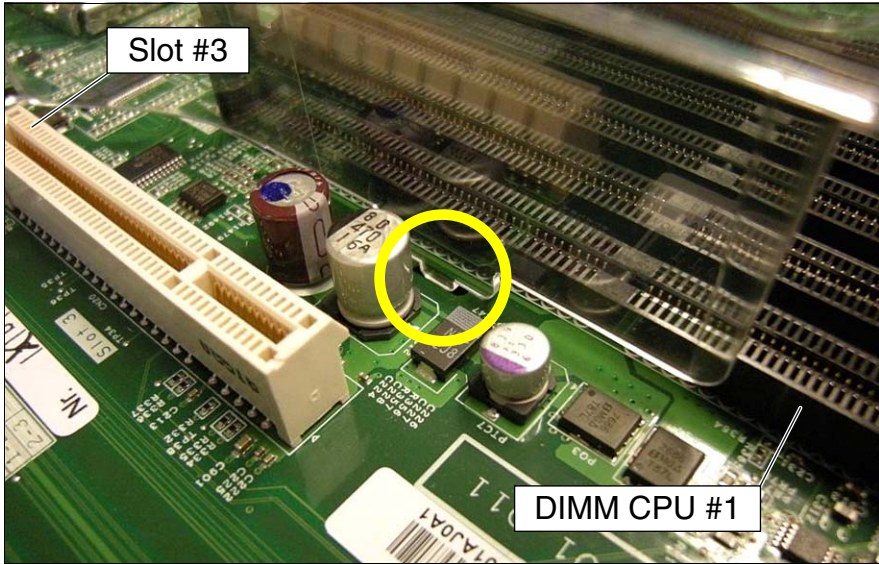


Figure 38: Position of the plastic pin of the air cowl

- The air cowl must be hooked into the fan brackets on the left and right as seen from the front (in this case, the right side):

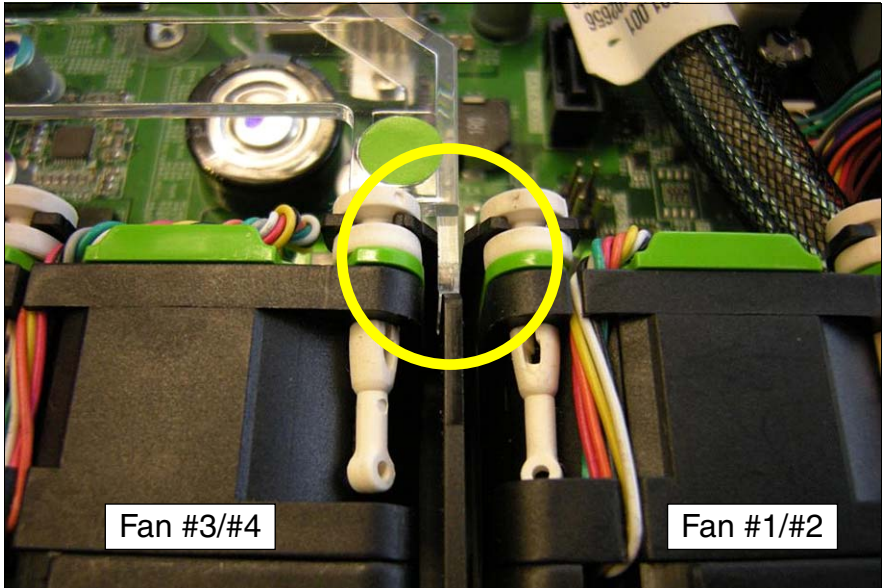


Figure 39: Position of the fan bracket (right side) of the air cowl

- The air cowl must be hooked into the fan brackets on the left and right as seen from the front (in this case, the left side):

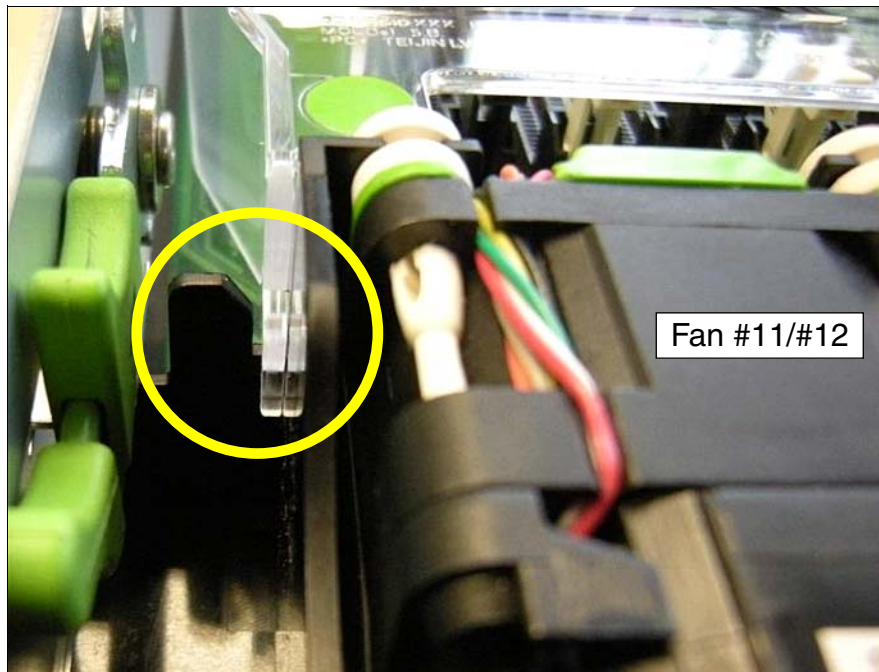


Figure 40: Position of the fan bracket (left side) of the air cowl

12.2 Closing the server

- ▶ Position the housing cover so that it protrudes about 1 cm over the back edge.

Make sure that each bolt is positioned in the corresponding nut.

- ▶ Push the housing cover all the way forward until it clicks into place.
- ▶ Fit the fan cover (see [“Removing the fan cover” on page 20](#)).
- ▶ Insert the server into the rack. (The operating manual for the server describes how to install it).



CAUTION!

At least two people are needed to position the server in the rack.

- ▶ Connect all power plugs to the power outlets and switch on the server.

13 Cabling

13.1 Cabling overview

No.	Part no.	Description	From	To
1	A3C40102683	Front VGA cable	Front panel board	System board
2	A3C40102687	SATA cable ODD	Optical Disk Drive (ODD)	1. SATA connection (system board) 2. HDD backplane
3	A3C40102656	SAS HDD cable	Onboard SATA connection or RAID controller in slot 3	HDD backplane (CN1 or CN2)
4	A3C40102678	Front panel cable	The control panel	System board
5	T26139-Y3987-V2	iBBU cable	iBBU	RAID controller

Table 1: Cabling overview

13.2 Cable diagrams

13.2.1 Cabling for up to 4 HDD modules

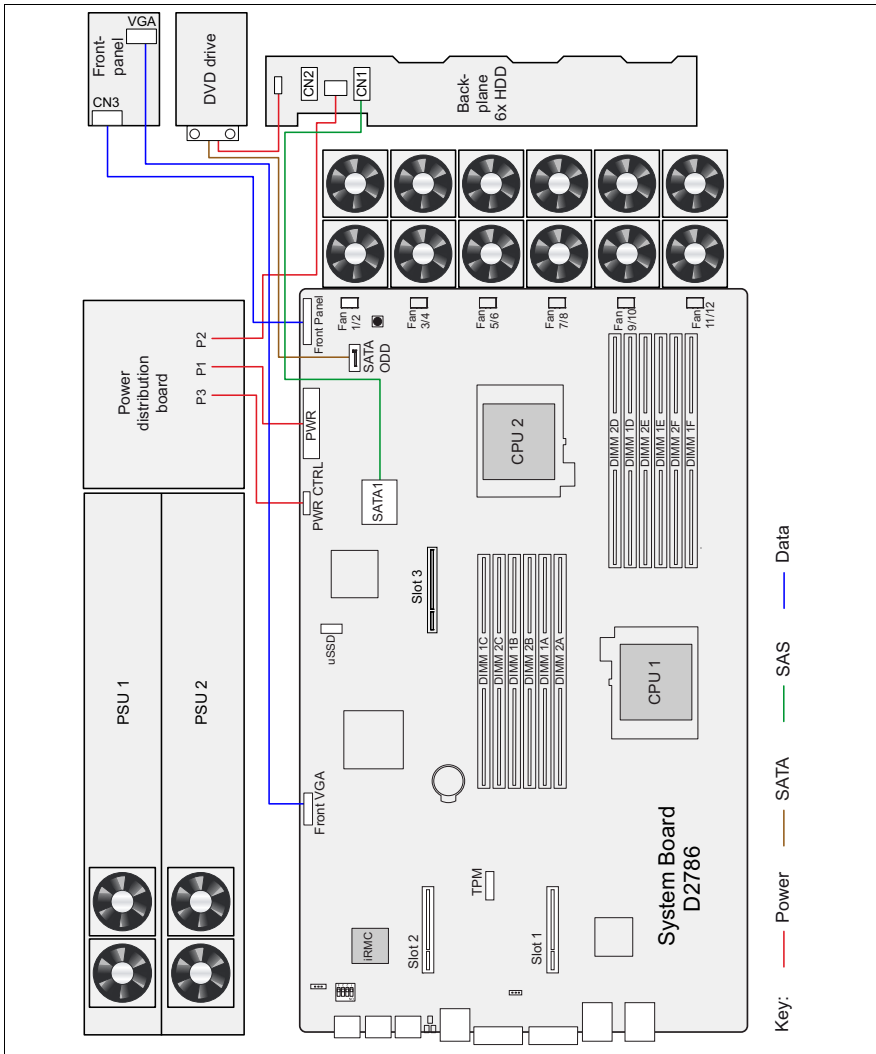


Figure 41: Cable diagram for 4 HDD modules with onboard SATA controller

13.2.2 Cabling for up to 6 HDD modules

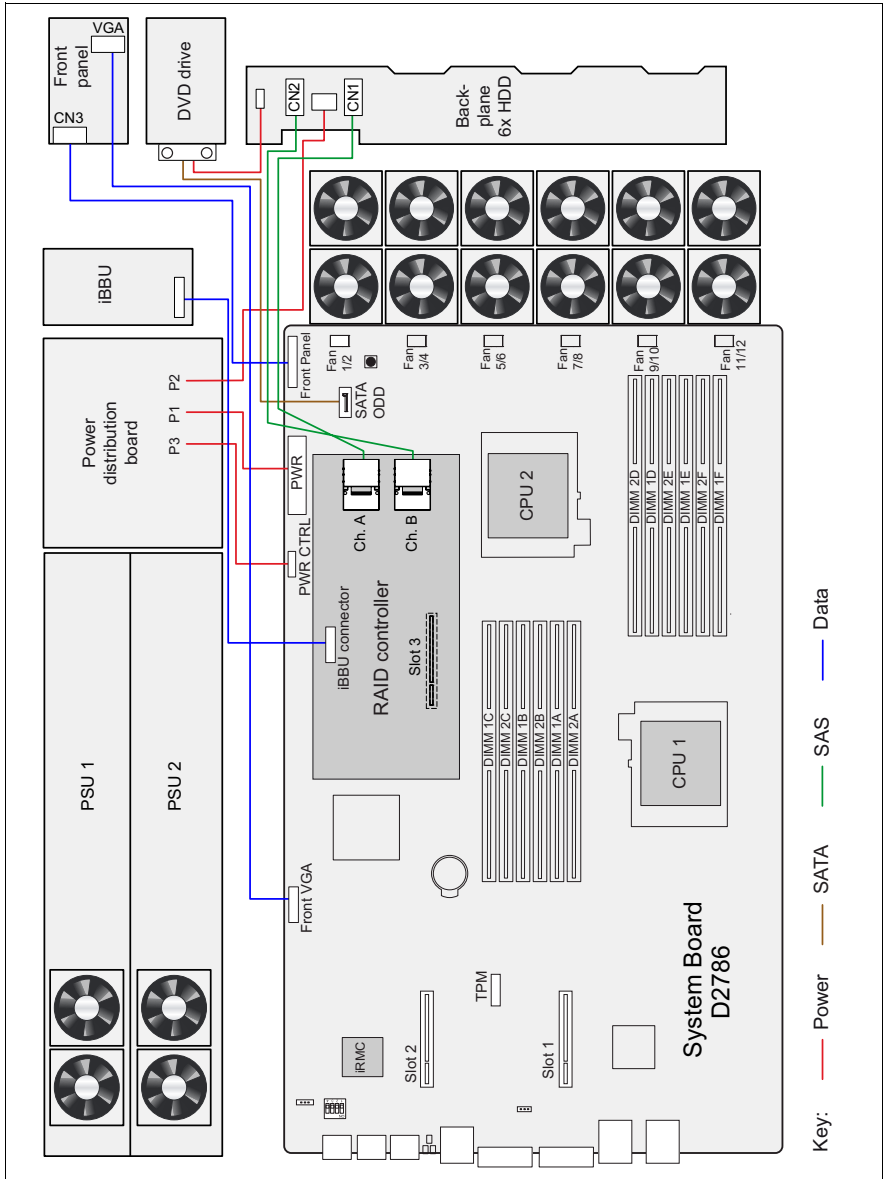


Figure 42: Cable diagram for 6 HDD modules with optional RAID controller

13.2.3 Cabling for up to 8 HDD modules

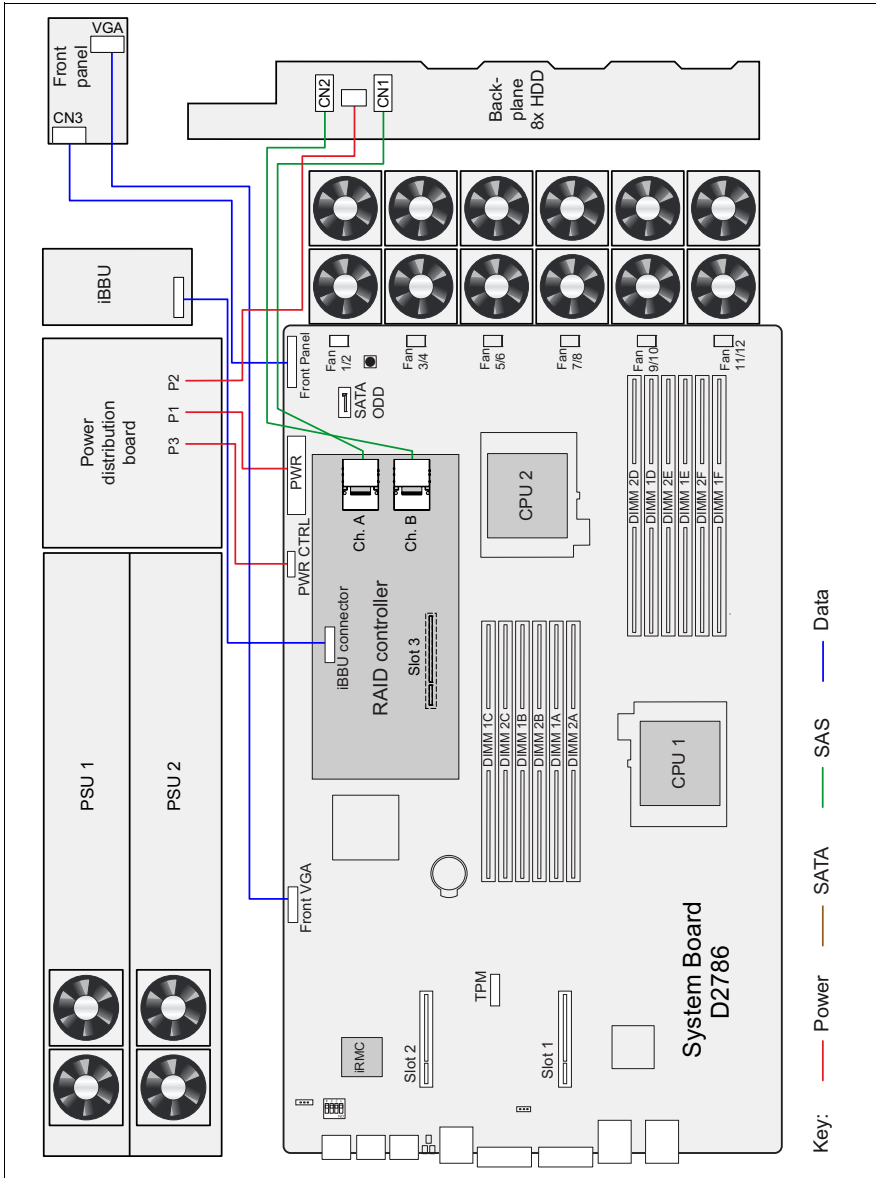


Figure 43: Cable diagram for 8 HDD modules with optional RAID controller

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