SpycerNode2
Shared Media Storage
User Manual

ROHDE&SCHWARZ

Make ideas real

Information on manufacturing company

The storage controller modules of the SpycerNode2, a Rohde & Schwarz product, are manufactured by Lenovo®. The original product name is ThinkSystem SR635. LENOVO, LENOVO logo, and THINKSYSTEM are trademarks of Lenovo.

1 Safety and regulatory information

The product documentation helps you use the product safely and efficiently. Follow the instructions provided here and in the following chapters.

Intended use

The R&S system may only be used according to its intended function as described in "Product Description" and within the specified environmental conditions as described in the data sheet. Any other use or extension of this function is considered inappropriate. Inappropriate use may lead to situations resulting in personal injury or property damage.

Observe the operating conditions and performance limits stated in the data sheet.

Target audience

Each person who is responsible for installation, operation, maintenance or setting of the system must read and understand this manual.

To use this manual you should know how to handle computer equipment. Furthermore, to connect the R&S system to a network you should have experience as a network administrator and know how to set up the required network connections on the installation site both in hard- and software.

When performing maintenance tasks on the hardware of the R&S system, you must be qualified to work on, repair and test electrical equipment.

Where do I find safety information?

Safety information is part of the product documentation. It warns you of potential dangers and gives instructions on how to prevent personal injury or damage caused by dangerous situations. Safety information is provided as follows:

- In Chapter 1.1, "Safety instructions", on page 3. The same information is provided in many languages as printed "Safety Instructions". The printed "Safety Instructions" are delivered with the product.
- Throughout the documentation, safety instructions are provided when you need to take care during setup or operation.

1.1 Safety instructions

Products from the Rohde & Schwarz group of companies are manufactured according to the highest technical standards. To use the products safely, follow the instructions provided here and in the product documentation. Keep the product documentation nearby and offer it to other users.

Use the product only for its intended use and within its performance limits. Intended use and limits are described in the product documentation such as the data sheet, manuals and the printed "Safety Instructions". If you are unsure about the appropriate use, contact Rohde & Schwarz customer service.

Using the product requires specialists or specially trained personnel. These users also need sound knowledge of at least one of the languages in which the user interfaces and the product documentation are available.

Never open the casing of the product. Only service personnel authorized by Rohde & Schwarz are allowed to repair the product. If any part of the product is damaged or broken, stop using the product. Contact Rohde & Schwarz customer service at https://supportcenter.gloris.rohde-schwarz.com/.

Lifting and carrying the product

The unpopulated casing of the storage unit (JBOD) can weigh up to 26kg (57lbs), and a single controller up to 19.2 kg (42.3 lb) . Use appropriate lifting methods.

The product is heavy. Do not move or carry the product by yourself. A single person can only carry a maximum of 18 kg safely depending on age, gender and physical condition. Look up the maximum weight in the data sheet. Use the product handles to move or carry the product. Do not lift by the accessories mounted on the product. Accessories are not designed to carry the weight of the product.

To move the product safely, you can use lifting or transporting equipment such as lift trucks and forklifts. Follow the instructions provided by the equipment manufacturer.

Choosing the operating site

Only use the product indoors. The product casing is not waterproof. Water that enters can electrically connect the casing with live parts, which can lead to electric shock, serious personal injury or death if you touch the casing. If Rohde & Schwarz provides accessories designed for your product, e.g. a carrying bag, you can use the product outdoors.

Unless otherwise specified, you can operate the product up to an altitude of 2000 m above sea level. The product is suitable for pollution degree 2 environments where nonconductive contamination can occur. For more information on environmental conditions such as ambient temperature and humidity, see the data sheet.

The system is to be operated only when mounted and mechanically secured into a 19-inch wide rack.

Setting up the product

Always place the product on a stable, flat and level surface with the bottom of the product facing down. If the product is designed for different positions, secure the product so that it cannot fall over.

If the product has foldable feet, always fold the feet completely in or out to ensure stability. The feet can collapse if they are not folded out completely or if the product is moved without lifting it. The foldable feet are designed to carry the weight of the product, but not an extra load.

If stacking is possible, keep in mind that a stack of products can fall over and cause injury.

If you mount products in a rack, ensure that the rack has sufficient load capacity and stability. Observe the specifications of the rack manufacturer. Always install the prod-

ucts from the bottom shelf to the top shelf so that the rack stands securely. Secure the product so that it cannot fall off the rack.

Unplug the system before you move it or if you think it has become damaged in any way.

Connecting to power

The product is an overvoltage category II product. Connect the product to a fixed installation used to supply energy-consuming equipment such as household appliances and similar loads. Keep in mind that electrically powered products have risks, such as electric shock, fire, personal injury or even death.

Take the following measures for your safety:

- The enclosure must only be operated from a power supply input voltage range of 200-240 VAC, frequency is 50 to 60 Hz.
- Before switching on the product, ensure that the voltage and frequency indicated on the product match the available power source. If the power adapter does not adjust automatically, set the correct value and check the rating of the fuse.
- Only use the power cable delivered with the product. It complies with country-specific safety requirements. Only insert the plug into an outlet with protective conductor terminal.
- Only use intact cables and route them carefully so that they cannot be damaged. Check the power cables regularly to ensure that they are undamaged. Also ensure that nobody can trip over loose cables.
- If the product needs an external power supply, use the power supply that is delivered with the product or that is recommended in the product documentation or a power supply that conforms to the country-specific regulations.
- Only connect the product to a power source with a fuse protection of maximum 20 A.
- Ensure that you can disconnect the product from the power source at any time. Pull the power plug to disconnect the product. The power plug must be easily accessible. If the product is integrated into a system that does not meet these requirements, provide an easily accessible circuit breaker at the system level.

Handling batteries safely

The product contains exchangeable or built-in lithium polymer or lithium ion cells or batteries. The use of the word battery in the following always means all types. Only the battery contents are potentially hazardous. As long as a battery is undamaged and the seals remain intact, there is no danger.

Impact, shock or heat can cause damage such as dents, punctures and other deformations. A damaged battery poses a risk of personal injury. Handle a damaged or leaking battery with extreme care. Immediately ventilate the area since the battery releases harmful gases. If you come into contact with the battery fluid, immediately remove all contaminated clothing. Irritation can occur if the battery fluid comes in contact with your skin or eyes. Immediately and thoroughly rinse your skin or eyes with water and seek medical aid.

For safe handling, follow these rules:

- Do not short-circuit the battery.
- Do not mechanically damage the battery. Do not open or disassemble the battery.
- Do not expose the battery to high temperatures such as open flames, hot surfaces and sunlight.
- Only use the battery with the designated Rohde & Schwarz product.
- Only use the appropriate Rohde & Schwarz charger to charge the batteries. If the batteries are improperly charged, there is a risk of explosion. For charging and discharging temperature ranges, see the product documentation.
- Replace exchangeable batteries only with the same battery type.
- Store the battery in the product or use the product packaging.
- Dispose of exchangeable batteries separately from normal household waste as specified by the local waste disposal agency.

If you disregard these rules, you risk serious personal injury or even death due to explosion, fire or hazardous chemical substances. The product documentation provides further details.

If exchangeable batteries or products with built-in batteries are defective, contact the Rohde & Schwarz customer service. Rohde & Schwarz classifies the severity of the defect. When returning batteries or Rohde & Schwarz products containing batteries, use a carrier qualified to transport dangerous goods and notify the carrier of this classification. Follow the carrier's transport stipulations in line with IATA-DGR, IMDG-Code, ADR or RID.

California, USA Only

The Lithium battery adopted on the motherboard of this system contains Perchlorate, a toxic substance controlled in Perchlorate Best Management Practices (BMP) regulations passed by the California Legislature.

When you discard the Lithium battery in California, USA, please follow the related regulations in advance. Perchlorate Material-special handling may apply, see www.dtsc.ca.gov/hazardouswaste/perchlorate.

Cleaning the product

Use a dry, lint-free cloth to clean the product. When cleaning, keep in mind that the casing is not waterproof. Do not use liquid cleaning agents.

Connecting to a network

Before connecting the product to a local area network (LAN), consider the following:

- Always install the latest firmware for the components of your system to reduce security risks.
- For Internet or remote access, use secured connections if applicable, such as HTTPS, SFTP, FTPS instead of HTTP, FTP.
- Ensure that the network settings comply with the security policies of your company. Contact your local system administrator or IT department before connecting your product to your company network.

- When connected to a network, the product may potentially be accessed from the Internet, which may be a security risk. For example, attackers might misuse a network to remotely access and damage the product.

Meaning of safety labels

Safety labels on the product warn against potential hazards.

⚠	Potential hazard Read the product documentation to avoid personal injury or product damage.
	Heavy product Be careful when lifting, moving or carrying the product. Carrying the product requires a sufficient number of persons or transport equipment.
⚡	Electrical hazard Indicates live parts. Risk of electric shock, fire, personal injury or even death.
	Hot surface Do not touch. Risk of skin burns. Risk of fire.
⏚	Protective conductor terminal Connect this terminal to a grounded external conductor or to protective ground. This connection protects you against electric shock if an electric problem occurs.

1.2 Labels on the product

Labels on the casing inform about:

- Personal safety, see "Meaning of safety labels" on page 7.
- Product and environment safety, see see table below.
- Identification of the product, see Chapter 3.4, "System ID and serial numbers", on page 16:

Table 1-1: Labels regarding product and environment safety

	Labeling in line with EN 50419 for disposal of electrical and electronic equipment after the product has come to the end of its service life. For more information, see Chapter 8.4, "Disposal", on page 117.
	Labeling in line with directive 2006/66/EC for disposal of batteries after they have come to the end of their service life. For more information, see "Handling batteries safely" on page 5.
	Take care when handling electrostatic sensitive devices.

1.3 Warning messages in the documentation

A warning message points out a risk or danger that you need to be aware of. The signal word indicates the severity of the safety hazard and how likely it will occur if you do not follow the safety precautions.

DANGER

Imminently hazardous situation. Will result in death or serious injury if not avoided.

WARNING

Potentially hazardous situation. Could result in death or serious injury if not avoided.

CAUTION

Potentially hazardous situation. Could result in minor or moderate injury if not avoided.

NOTICE

Potential risks of damage. Could result in damage to the supported product or to other property.

1.4 Where to find key documents on Rohde & Schwarz

Certificates issued to Rohde & Schwarz that are relevant for your country are provided at www.rohde-schwarz.com/key-documents, e.g. concerning:

● Quality management
● Environmental management
● Information security management
● Accreditations

1.5 Korea Certification Class A

이 기기는 업무용(A급) 전자파 적합기기로서 판매자 또는 사용자는 이 점을 주의하시기 바라며, 가정외의 지역에서 사용하는 것을 목적으로 합니다.

2 Documentation overview

This section provides an overview of the SpycerNode2 user documentation. Unless specified otherwise, you find the documents at:

https://www.rohde-schwarz.com/manual/spycernode2/

Further documents are available at:

www.rohde-schwarz.com/product/spycernode2/

2.1 Getting started manual

Introduces the SpycerNode2 and describes how to set up and start working with the product. Includes basic operations for first use, and general information, e.g. safety instructions, etc..

- A printed version is delivered with the product.
- A web version of the getting started can be found here.

2.2 User manuals and help

Separate user manuals are provided for the base unit and the software applications:

- Base unit manual
  Contains the description of the hardware modules and basic functions and maintenance. Includes the contents of the getting started manual.

- R&S®Device Manager (software manual)
  A web application that provides for an easy setup and use of R&S solutions. All Rohde & Schwarz systems on a network can be operated via a single interface, without the hussle of complex console configurations and laborious maintenance work.
  The R&S®Device Manager user manual is available for registered users on the global Rohde & Schwarz information system (GLORIS) at https://gloris.rohde-schwarz.com

- Spycer (software manual)
  Spycer is data and content control software developed by the Rohde & Schwarz. It allows you to easily maintain transparency and control over video and audio data and their associated metadata. The software offers conclusive rights management, browsing, searching and viewing of video and audio material.
  Spycer user manual is available for registered users on the global Rohde & Schwarz information system (GLORIS) at https://gloris.rohde-schwarz.com

- SpycerPAM (software manuall)
  SpycerPAM is a production asset management software that fundamentally improves the use of creative tools. Placed at the core of your workflow, it offers functionalities such as powerful search functions, easy rights management, automatic proxy generation/preview and much more.

The SpycerPAM user manual is available for registered users on the global Rohde & Schwarz information system (GLORIS) at https://gloris.rohde-schwarz.com

This user manual is also available for download or for immediate display on the Internet.

2.3 Printed safety instructions

Provides safety information in many languages. The printed document is delivered with the product.

2.4 Data sheet

The data sheet contains the technical specifications of the SpycerNode2. It also lists the firmware applications and their order numbers, and optional accessories.

2.5 Third-party documentation

Various hardware modules of the SpycerNode2 are delivered as a third-party appliance. For hardware-related information, read and follow the instructions provided by the manufacturer of the appliance.

Storage controller documentation:

* ThinkSystem SR635 user documentation:
  https://pubs.lenovo.com/sr635/
* ThinkSystem SR635 setup manual:
  https://thinksystem.lenovofiles.com/help/topic/7Y98/sr635_setup_guide.pdf
* ThinkSystem SR635 maintenance manual:
  https://thinksystem.lenovofiles.com/help/topic/7Y98/sr635_mainte-
  nance_manual.pdf

3 Product Description

This chapter gives an overview of the front and rear panel of the system detailing the respective controls, connectors and interfaces.

3.1 Function

SpycerNode2 is a Rohde & Schwarz enterprise-class storage solution for the media and entertainment market segment. It is designed to support your media data and demanding transactions when working with ever larger amounts of unstructured data storage and management across diverse workloads. The easy-to-use interface, high performance file system, market-leading erasure coding mechanisms and many more functions let you focus on creative work.

As each department or division attempts to satisfy its own storage and performance needs, your organization can find itself with many disparate systems isolated from each other. This can result in expensive resource duplication, complicated management and isolated pools of data. In addition, the resulting islands of information may hold valuable insights that may not be accessible in such a fragmented environment. Traditional RAID is no longer an effective mechanism for data protection for modern disk drives, since it can take several hours or even days to rebuild a failed drive. Advanced erasure coding to spread the data and shorten recovery time is required to avoid the catastrophic results of multi-disk failures with traditional RAID.

SpycerNode2 with its ideal physical sizes as a building block is easy to install and deploy. IT managers appreciate features such as two-digit front-panel shelf ID, activity and status indicators for all key components, alarms and lockable carriers.
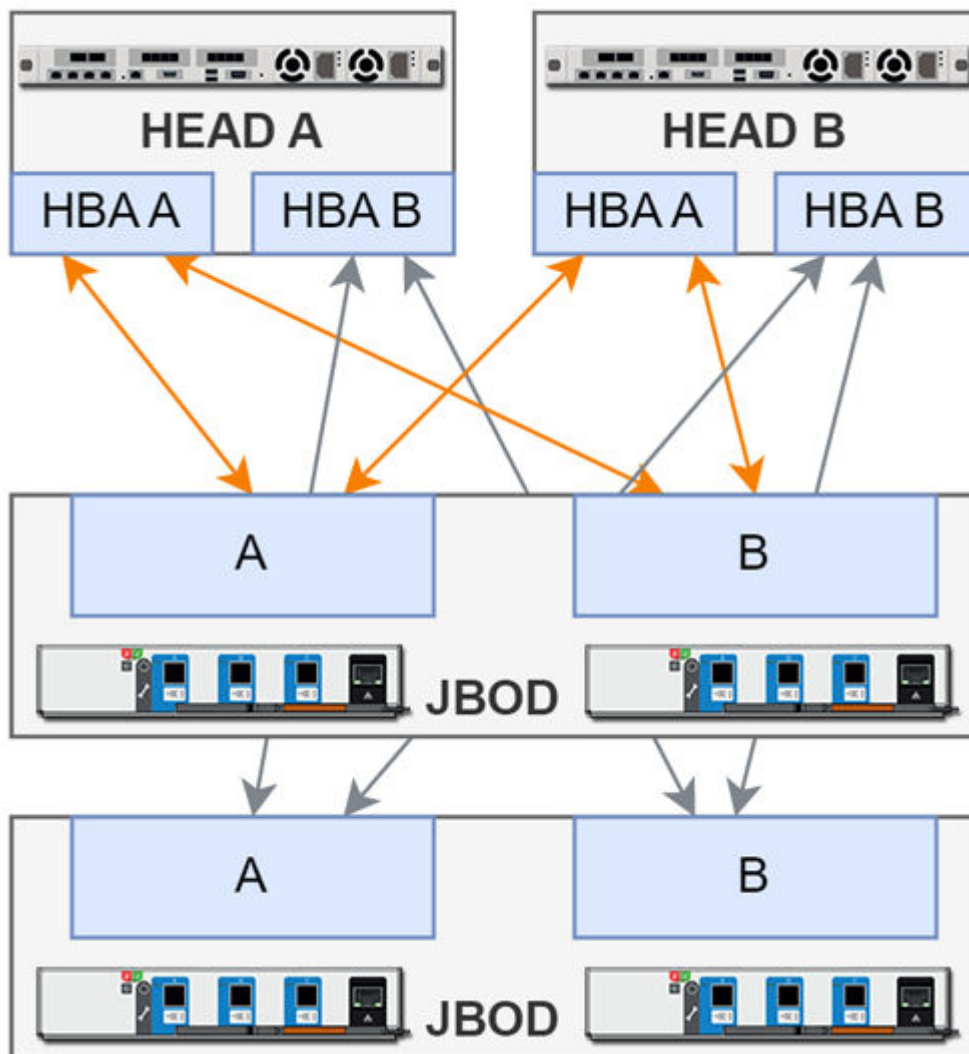
3.2 Models

SpycerNode2 is available in the following hardware platforms with different configurations and scale-up options:
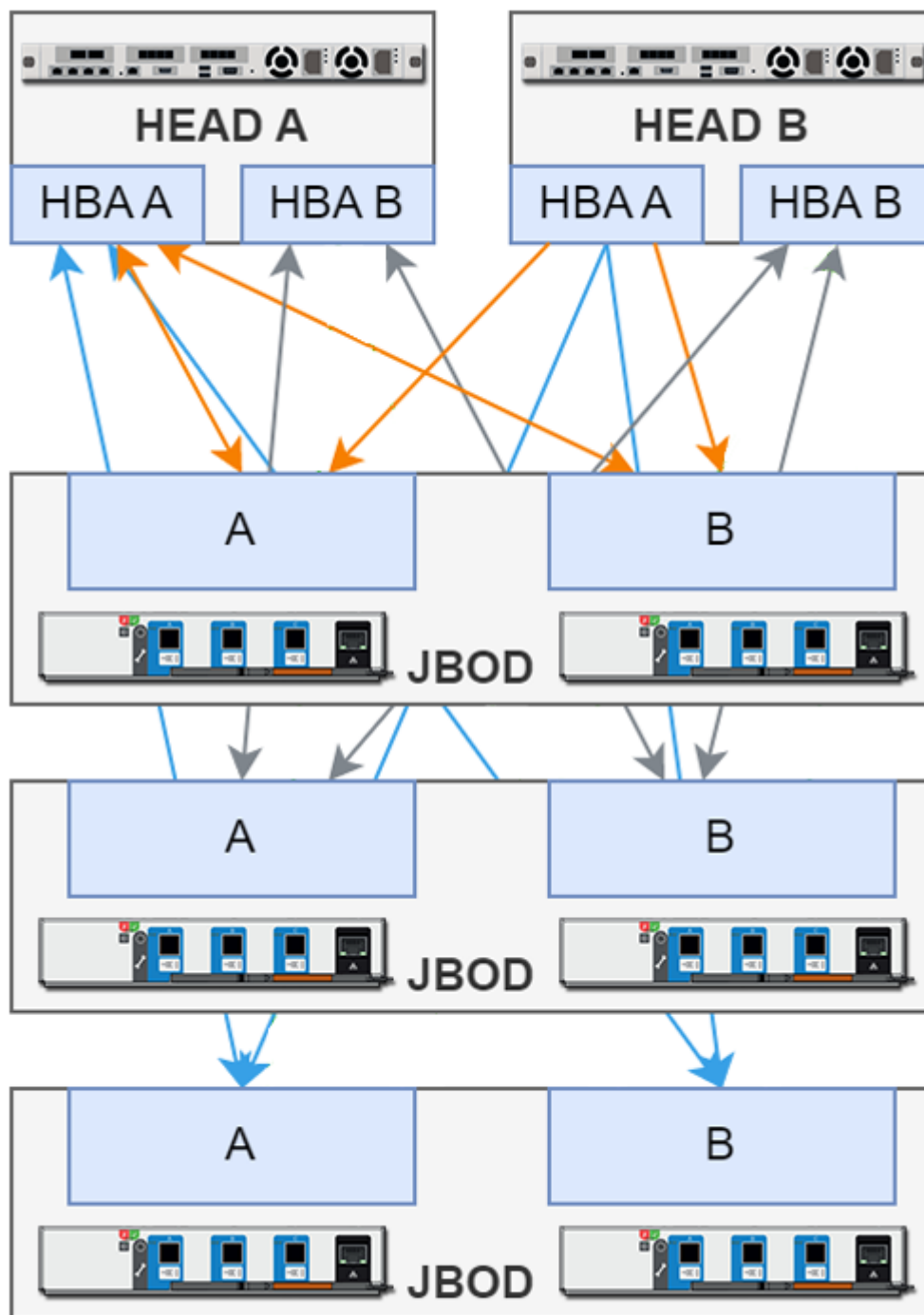
Single JBOD (default configuration)
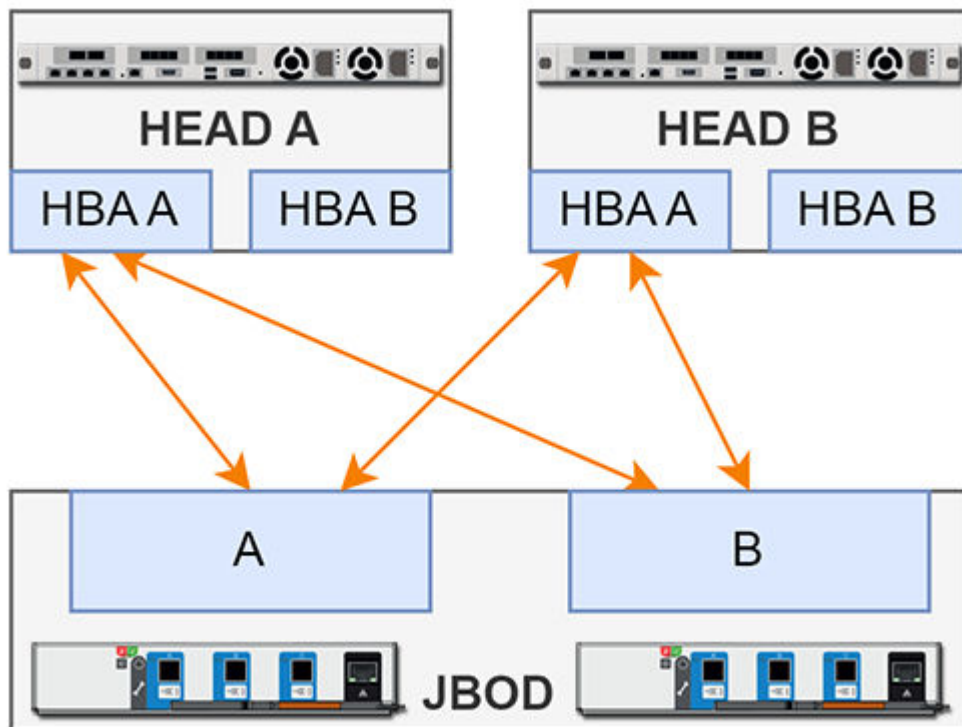
- One storage JBOD unit connected over single link
- 2 x dual-port connection
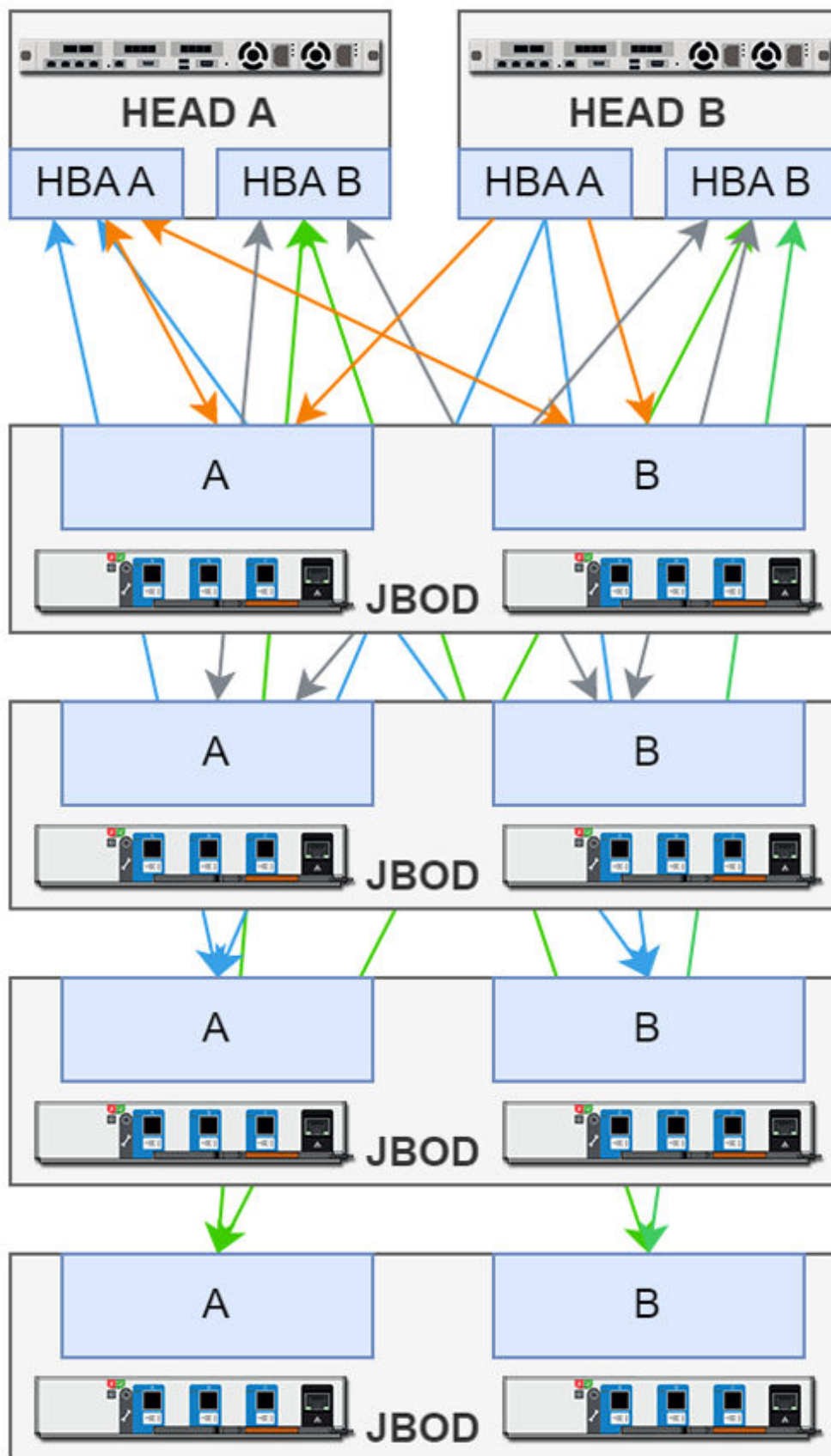- Up to 1.68PB with 84bay-JBOD and 20 TB HDDs

Dual JBOD

- Two storage JBOD units connected over single link
- 4 x dual-port or 2 x quad-port HBAs connection
- Up to 3.36PB with 84bay-JBOD and 20 TB HDDs

Triple JBOD

- Three storage JBOD units connected over single link
- 4 x quad-port HBAs connection
- Up to 5.04 PB with 84bay-JBOD and 20 TB HDDs

Quad JBOD

- Four storage JBOD units connected over single link
- 4 x quad-port HBAs connection
- Up to 6.72PB with 84bay-JBOD and 20 TB HDDs

3.3 Certified clients

SpycerNode2 exposes the storage via the NSD (Network Shared Disk) protocol to the ethernet network. A NSD client is any server or workstation that has the native Spectrum Scale protocol installed and is designated to operate as a client. Physically reading or writing user data to the SAN disks is done on behalf of the NSD clients that trigger the disk operations.

The following operating systems are supported for native Spectrum Scale 5 clients:

- Windows 10 (>= version 1809, OS Build 17763), Windows 11 (>= OS Build 22000)
- RHEL (and compatible distributions): 7.9 / 8.x / 9.x
- SLES15 SP4 (or later)
- Ubuntu 20.04 and 22.04

Besides the native clients following file sharing protocols are supported:

Protocol	Version	Operating System
Samba	SMBv2, SMBv3	Linux/Windows/OSX
NFS	NFSv4	Linux/OSX
FTP	-	Linux/Windows/OSX

ⓘ Performance values may differ for individual client configuration.

3.4 System ID and serial numbers

The system ID and the R&S serial number(s) are located on the type plate of the system. In addition, the initial serial numbers provided by the original manufacturer of the controllers is also required when setting up the system.

Type plate location

The type plate itself is located on the slide-out panel (information label) which can be accessed on the front of each of the storage controllers.
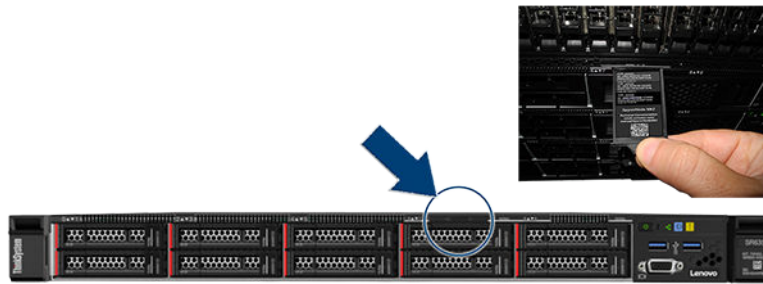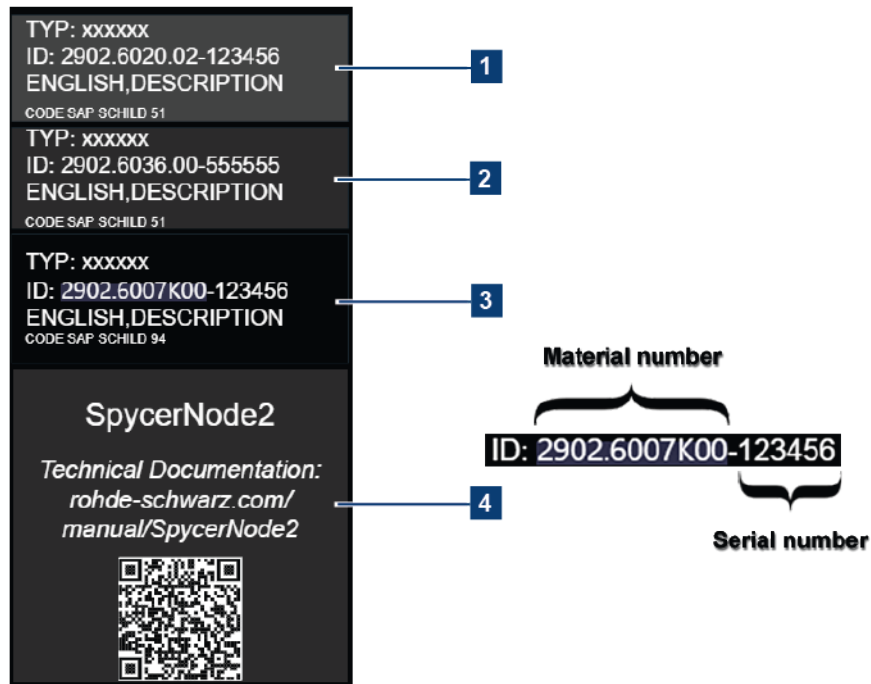
Figure 3-1: Location of the type plate on the slide-out panel

Type plate info

Several system components, each with its own system ID are identified through the type plate on the information label. The system ID itself consist of the material number and the six-digit serial number.

1	Identifies the file server system (consisting of the two single controllers in a bundle)
2	Identifies the current storage controller (single one)
3	Identifies the entire system (Storage JBOD unit + file server)
4	Product name with linkage to the user documentation

OEM serial number

For setup purposes, the serial number of the original equipment manufacturer of the controllers is required.

This OEM serial number is used as password when logging in to:

- R&S®Device Manager web frontend (username: "administrator"). During the initial setup procedure you have the option to change that password to your liking.
- IPMI login (username: "USERID"). Prepend "Rs" to the beginning of the serial number (e.g. "RsJ30AEXPM")
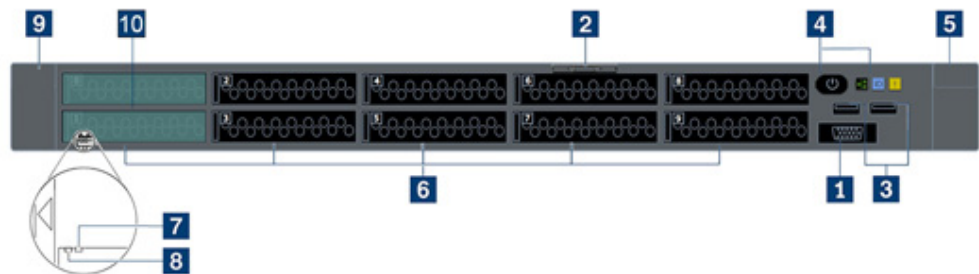
3.5 The front of the system

This section gives an overview of the front of the system.

| 1 | Storage controllers | Two identical controllers providing the file system server services, see Chapter 3.5.1, "Storage controller front view", on page 19. |
| 2 | Storage unit | Contains the main operation system along with the storage JBOD, see Chapter 3.5.2, "Storage unit front view", on page 22. |

3.5.1 Storage controller front view

The SpycerNode2 system has two identical controller units which serve as a file system server for the main storage JBOD unit.


1	VGA connector	Used to attach a high-performance monitor, a direct-drive monitor, or other devices that use a VGA connector.
2	Slide-out information tab	Contains the type plate of the system with material and serial numbers for the entire system and the various components. SeeChapter 3.4, "System ID and serial numbers", on page 16.
3	USB 3.2 Gen 1 (5 Gbps) connectors	Attach a USB-compatible device, such as a USB keyboard, USB mouse, or USB storage device.
4	Operator information panel	For information about the controls and status LEDs on the operator information panel, see "Operator information panel (controller)" on page 20.
5	Rack latch (right)	If your server is installed in a rack, you can use the rack latches to help you slide the server out of the rack. You also can use the rack latches and screws to secure the server in the rack so that the server cannot slide out, especially in vibration-prone areas. For more information, refer to the chapter Chapter 4.2.1, "Mounting the system into a rack", on page 42.
6	Hot-swap drive bays	The number of the installed drives in your server varies by model. When you install drives, follow the order of the drive bay numbers. The EMI integrity and cooling of the server are protected by having all drive bays occupied. The vacant drive bays must be occupied by drive fillers.

7	Drive status LED (yellow)	Status • **Solid yellow** - The drive has an error. • **Blinking yellow (blinking slowly, about one flash per second)** - The drive is being rebuilt. • **Blinking yellow (blinking rapidly, about four flashes per second)** - The RAID adapter is locating the drive.
8	Drive activity LED (green)	Status • **Solid green** - The drive is powered but not active. • **Blinking green** - The drive is active.
9	Rack latch (left)	See 5
10	Dynamic Media Cache	2 x NVMe for the Dynamic Media Cache (DMC) feature (optional). See also "Dynamic Media Cache (DMC)" on page 21.

Operator information panel (controller)

The operator information panel of the server provides controls and LEDs. The following illustration shows the operator information panel of the storage controller.
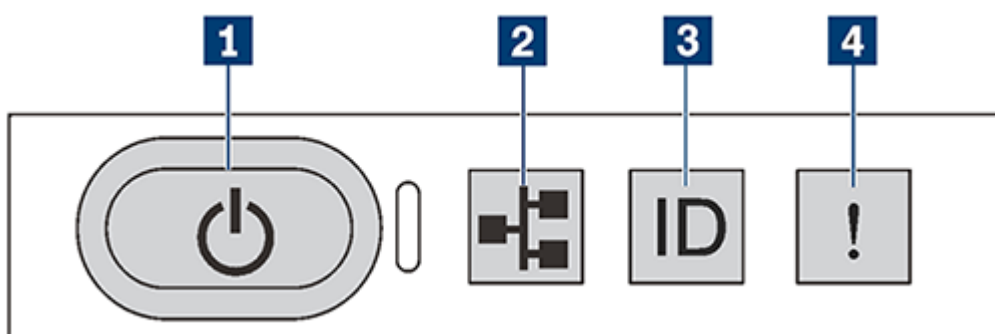
1	Power button with power status LED	You can press the power button to power on the server when you finish setting up the server. You also can hold the power button for several seconds to power off the server if you cannot shut down the server from the operating system. The power status LED helps you determine the current power status.		
		Status	**Color**	**Description**
		Solid ON	Green	The server is on and running.
		Slow blinking (about one flash per second)	Green	The server is off and is ready to be powered on (standby state).
		OFF	Green	There is no ac power applied to the server.
2	Network activity LED (for OCP 3.0 Ethernet adapter)	When an OCP 3.0 Ethernet adapter is installed, the network activity LED on the front I/O assembly helps you identify the network connectivity and activity. If no OCP 3.0 Ethernet adapter is installed, this LED is off.		
		Status	**Color**	**Description**
		ON	Green	The server is connected to a network.

		Blinking	Green	The network is connected and active.	
		OFF	Green	The server is disconnected from the network.	
3	System ID button with system ID LED	Use this system ID button and the blue system ID LED to visually locate the server. A system ID LED is also located on the rear of the server. Each time you press the system ID button, the state of both the system ID LEDs changes. The LEDs can be changed to on, blinking, or off. You can use a remote management program to change the state of the system ID LEDs to assist in visually locating the server among other servers.			
4	System error LED	**Status**	**Color**	**Description**	**Action**
		ON	Yellow	An error has been detected on the server. Causes might include but not limited to the following errors: • Processor error • Memory module error • Storage failure • PCIe adapter failure • Power supply error • Fan failure • Mainboard failure	Check the event log to determine the exact cause of the error.
		OFF	None.	The server is off or the server is on and is working correctly.	

Dynamic Media Cache (DMC)

As an optional feature, SpycerNode2 provides high-performance support using Dynamic Media Cache for demanding media applications. DMC enchances delivery using NVMe and ensures automatically that the most active data is being cached. The DMC layer can be purchased additionally and can hold up to 8TB of the busiest data.
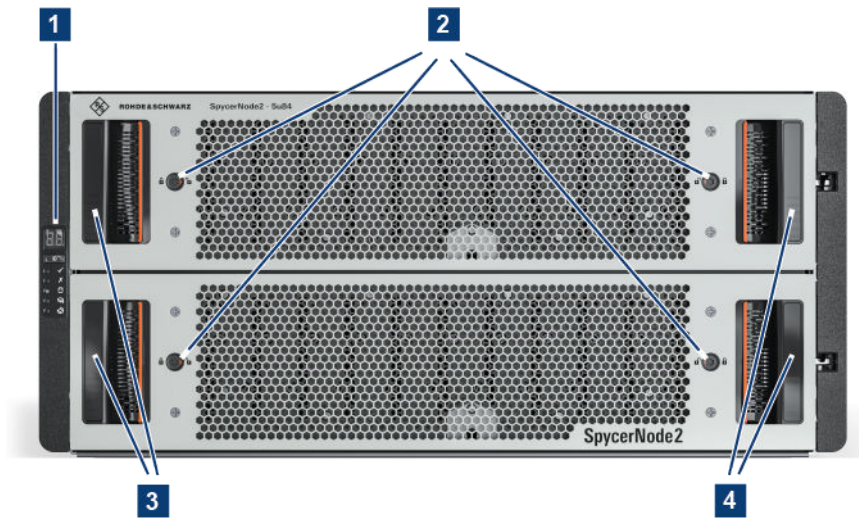
ⓘ The cache can improve the performance for read operations to the SMB and NFS shares.

The status of the dynamic media cache can be monitored in the Health Panel, see Chapter 7.3.2, "Monitoring through the R&S®Device Manager", on page 89

3.5.2 Storage unit front view

1	Operating panel (main unit)	See topic "Operating panel (storage unit)" on page 22.
2	Anti-tamper locks	The red arrows on the locks will point inwards if the locks are disengaged. Unlock them if necessary by rotating them counterclockwise using a screwdriver with a torx T20 bit.
3/4	Drawer status LEDs	See topic "Drawer LEDs" on page 24.

Operating panel (storage unit)
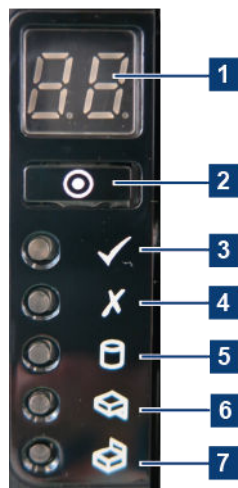
1	Unit ID display	Displays the enclosure identification number (for use with multiple enclosure systems), but can be configured by the ID switch.
2	ID Switch	Used to set the Unit ID display (refer to chapter Chapter 5.3, "Setting the unit identification number", on page 62 for details).
3	Power on / Standby	Fore more information see Table 3-1
4	Module fault	

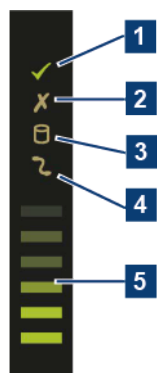| 5	Logical status
6	Drawer 1 fault
7	Drawer 2 fault

Table 3-1: Operating panel LEDs

Unit ID display	Power (green/ amber)	Module fault (amber)	Logical status (amber)	Drawer 1 fault	Drawer 2 fault	Associ- ated LEDs or alarms	Status
X	ON	OFF	OFF	OFF	OFF		Power on, all func- tions good
X	ON	ON	X	X	X	Single beep, then double	Operating panel power on (5s) test state.
X	ON	ON	X	OFF	OFF	PSU fault LEDs, fan fault LEDs	Any PSU fault, fan fault, over or under tempera- ture
X	ON	ON	X	OFF	OFF	SBB mod- ule LEDs	Any SBB module fault
X	ON	F	X	OFF	OFF		Enclosure logical fault (e.g. VPD config. error)
X	ON	F	X	OFF	OFF	Module status LED on SBB module	Unknown (invalid or mixed) SBB mod- ule type installed, I2C Bus failure (inter SBB comms) JBOD VPD configura- tion error
*X=Disregard; F=Flashing							

Unit ID display	Power (green/ amber)	Module fault (amber)	Logical status (amber)	Drawer 1 fault	Drawer 2 fault	Associated LEDs or alarms	Status
X	ON	F	X	OFF	OFF	PSU fault LEDs, fan fault LEDs	Unknown (invalid or mixed) PSU module type installed, or I2C Bus failure (PSU comms)
X	ON	X	ON	OFF	OFF	DDIC fault LED, drawer fault LED	Drive failure has occurred causing loss of availability or redundancy
X	ON	X	X	ON	OFF	Fault LED on drawer 1	Fault present on drawer 1 (drive, cable or fanout card fault)
X	ON	X	X	OFF	ON	Fault LED on drawer 2	Fault present on drawer 2 (drive, cable or fanout card fault)
F	X	X	X	X	X		SES controlled enclosure identify
*X=Disregard; F=Flashing							

Drawer LEDs

1	Sideplane OK/Power good	Fore more information see Table 3-2
2	Drawer fault	
3	Logical fault	
4	Cable fault	
5	Activity bar graph	Shows the amount of data I/O from zero segments lit (no I/O) to all six segments lit (maximum I/O). The Activity bar graph is a 6-segment drive activity meter, showing activity of the SAS interface to the sideplane. For zero activity, no segments are lit, scaling linearly until all segments are lit when the interface is transferring data at full capacity

Table 3-2: Drawer LEDs activity

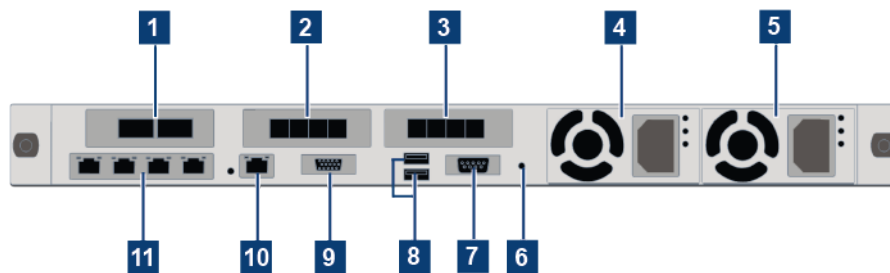| Sideplane OK/ Power (green)	Sideplane fault (amber)	Logical fault (amber)	Cable fault (amber)	Activity bar graph (green)	Status
ON	OFF	OFF	OFF	X	Sideplane card OK/Power good
X	ON	X	X	OFF	Sideplane card fault
ON	X	ON	X	X	Drive fault (host indicated)
OFF	X	X	ON	OFF	Cable fault
ON	OFF	OFF	OFF	ON	Drive activity

3.6 The rear of the system

This section gives an overview of the rear of the system.

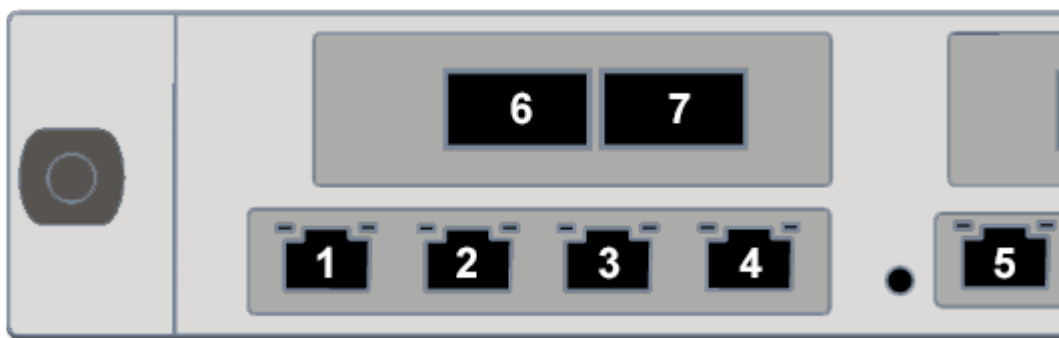| 1	Storage controllers	Contain the I/O modules, see Chapter 3.6.1, "Storage controller rear view", on page 26.
2	Storage unit	Contains the main operation system along with the JBODs (storage), see Chapter 3.6.2, "Storage unit rear view", on page 30.

3.6.1   Storage controller rear view

The rear of the head unit provides access to several connectors and components, including the power supplies, PCIe adapters, serial port, and Ethernet connectors.

1	100Gbit Ethernet card	2 x high speed storage network ports (100 Gbit)
2	SAS PCI controller (left)	12 Gbit SAS ports that provide the connection to the JBOD module of the storage unit(s).
3	SAS PCI controller (right)	See also
4	Power supply left	The hot-swap redundant power supplies help you avoid significant interruption to the operation of the system when a power supply fails. You can purchase a power supply option from Lenovo and install the

5	Power supply right	power supply to provide power redundancy without turning off the server.
6	NMI button	Press this button to force a nonmaskable interrupt (NMI) to the processor. This way, you can make the operating system halt (such as Windows Blue Screen) and take a memory dump. You might have to use a pen or the end of a straightened paper clip to press the button.
7	Serial port	Used to connect to the host system serial interface.
8	2 x USB 3.2 Gen 1 (5 Gbps)	Used to attach a device that requires a USB 2.0 or 3.1 connection, such as a USB keyboard, USB mouse, or USB storage device.
9	VGA connector	Used to attach a high-performance monitor, a direct-drive monitor, or other devices that use a VGA connector.
10	IPMI management network connector	Used to attach an Ethernet cable to manage the baseboard management controller (BMC).
11	Ethernet connectors on OCP 3.0 Ethernet adapter (	The OCP 3.0 Ethernet adapter provides three Ethernet connectors for network connections. One of the Ethernet connectors on the OCP 3.0 Ethernet adapter can also function as a management connector using the shared management capacity. If the shared management connector fails, traffic can automatically switch over to another connector on the adapter.

Network ports

1	1Gbit LAN connection, host-to-host connection.
	Reserved for the connection to the other storage controller. See also "Controller interconnection" on page 50
2	1Gbit DHCP connection.
	Use to integrate the device into a local DNS network to automatically detect your system, and to establish access to the R&S®Device Manager, see also Chapter 5.4.1, "Using Dynamic Host Configuration Protocol (DHCP)", on page 63
3	10 Gbit static IP connection (10.0.0.4).
	Use to integrate the device into a local network, and to establish access to the R&S®Device Manager, see also Chapter 5.4.2, "Using static IP", on page 68
4	Disabled
5	IPMI management network connector.
	Attach an Ethernet cable to manage the baseboard management controller (BMC).

6	High speed storage network ports (100 Gbit). Use to connect to further storage devices.
7	High speed storage network ports (100 Gbit). Use to connect to further storage devices.

Rear view LEDs

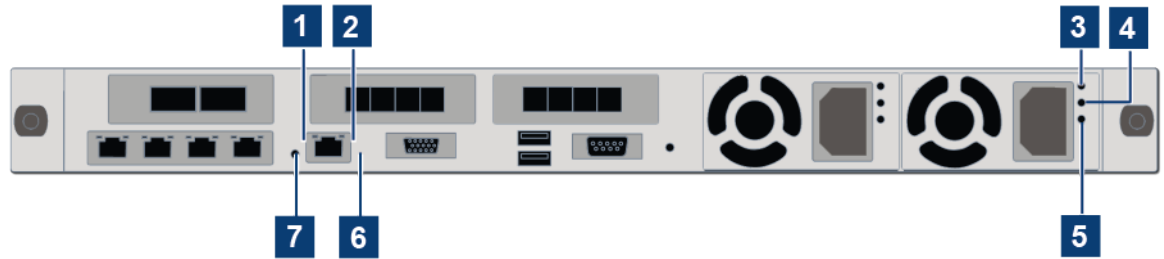The rear of the storage controller provides system ID LED, system error LED, Ethernet LEDs, and power supply LEDs.

Table 3-3: LEDs on the rear of the storage controller

1	Ethernet link LED
2	Ethernet activity LED
3	Power input LED
4	Power output LED
5	Power supply error LED
6	System ID LED
7	System error LED

Table 3-4: Ethernet LEDs

Ethernet status LED	Color	Status	Description
(1) Ethernet link LED	Green	On	Network link is established.
	None	Off	Network link is disconnected
(2) Ethernet activity LED	Green	Blinking	Network link is connected and active
	None	Off	The server is disconnected from a LAN.

Table 3-5: Power supply LEDs

LED	Description
(3) Power input LED	• Green: The power supply is connected to the AC power source. • Off: The power supply is disconnected from the AC power source or a power problem occurs.
(4) Power output LED	• Green: The server is on and the power supply is working normally • Blinking green: The power supply is in the zero-output mode (standby). When the server power load is low, one of the installed power supplies enters into the standby state while the other one delivers the entire load. When the power load increases, the standby power supply will switch to active state to provide sufficient power to the system. To disable zero-output mode, start the Setup utility, go to "Advanced" ➜ "Power" ➜ "Zero Output" and select "Disable". If you disable the zero-out mode, both power supplies will be in the active state. • Off: The server is powered off, or the power supply is not working properly. If the server is powered on but the LED is off, replace the power supply.
(5) Power supply error LED	• Yellow: The power supply has failed. To resolve the issue, replace the power supply • Off: The power supply is working normally

Table 3-6: System LEDs

| LED	Description
System ID LED	The blue system ID LED helps you to visually locate the head unit. A system ID LED is also located on the front of the head unit. Each time you press the system ID button, the state of both the system ID LEDs changes. The LEDs can be changed to on, blinking, or off. You can also use the ThinkSystem System Manager or a remote management program to change the state of the system ID LEDs to assist in visually locating the server among other servers.
System error LED	The system error LED helps you to determine if there are any system errors. • LED yellow - An error has been detected on the server. Causes might include but not limited to the following errors: 　– Processor error 　– Memory module error 　– Storage failure 　– PCIe adapter failure 　– Power supply error 　– Fan failure 　– Mainboard failure • LED is off - The head unit is off or it is on and is working correctly.

3.6.2 Storage unit rear view

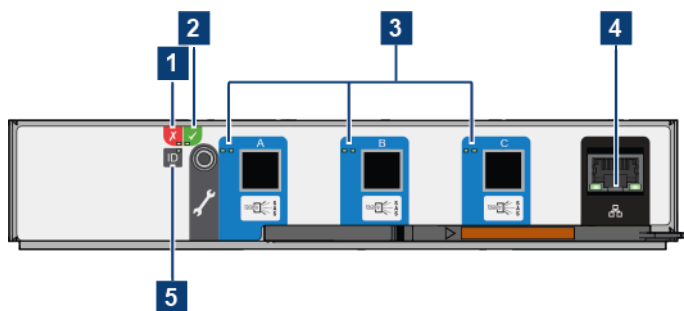The rear of the chassis provides access to the JBOD modules, the cooling fans, and the power supply units.
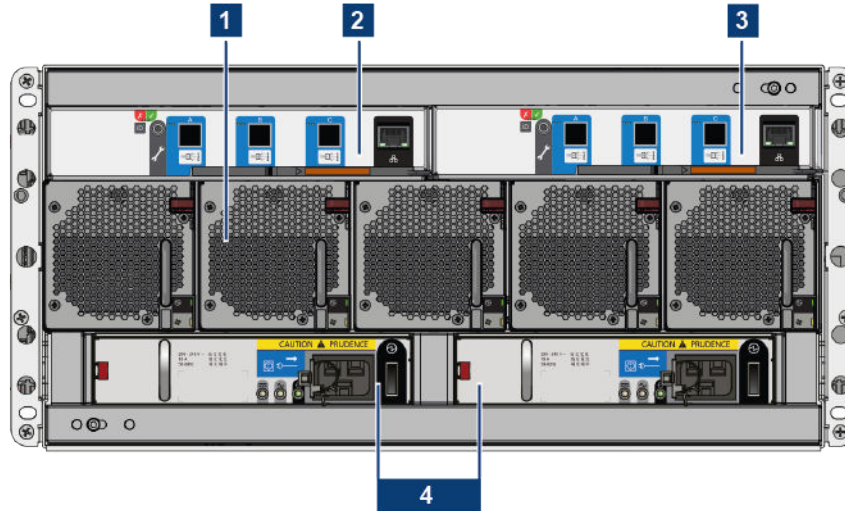
1	Cooling fans (5x)	For more information see
2	JBOD I/O module	For more information see "JBOD module" on page 30
3		
4	Power supply unit (2x)	For more information see
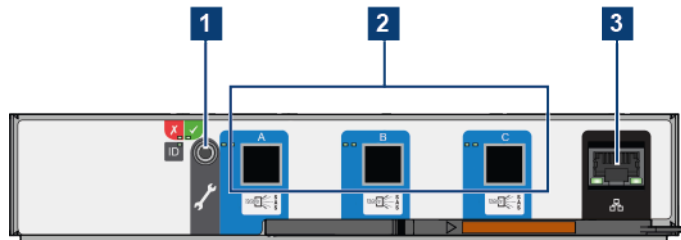
JBOD module

1	Serial port	For internal use only.
2	Mini SAS HD connectors	Connection to controller
3	Ethernet connector	For internal use only

JBOD module LEDs

1	Fault	Amber when there is a fault in the module
2	OK	Green when the module is operating correctly. Flashing green when there is a VPD error.
3	SAS activity	Steady green when there is a connection but no activity. Flashing green when there is a connection and activity.
4	Ethernet status	• OFF: no connection • Steady green: network link is active • Flashing green: network activity
		Indicates the network speed • OFF: no link • Amber: 10/100Mb/ • Green: 1Gb/s
5	ID	Blue when the module is being identified.

Cooling fan

The storage unit contains five fan modules for cooling the disk drives and the JBOD modules.
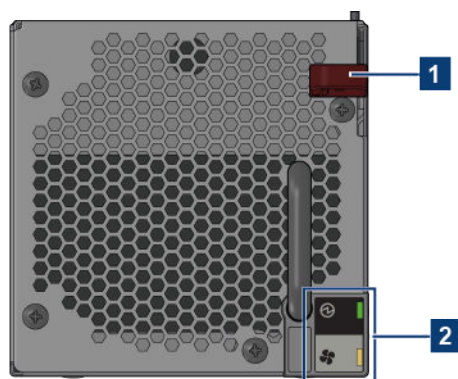
1	Release latch	Locks the fan cooling module.
2	LEDs	For more information see Table 3-7
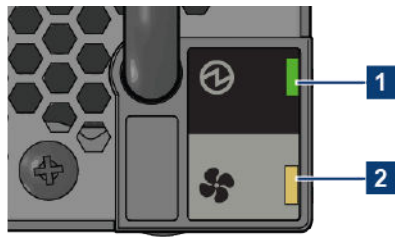
Table 3-7: Cooling fan LEDs

1	Module OK	Constant green indicates that the fan is working correctly.		
		Module OK (green)	**Fan fault (amber)**	**Status**
		ON	X	Module good (battery and fan)
		X	OFF	Fan OK
		X	ON	Communication lost with fan module controller
		X	ON	Reported fan speed is out of tolerance
2	Fan fault	Amber indicates that a fan has failed.		

If a power supply unit/power cooling module is removed from the enclosure, the fans will increase speed to provide sufficient cooling. However, if the enclosure is powered on with only one power supply unit/power cooling module, it is assumed that a blanking plate is in place for the missing units, and the fans will run at the normal speed.

ⓘ The enclosure should never be run for more than a few seconds with any slot not occupied either by the appropriate component or a blanking plate. Doing so will disrupt the airflow and can result in overheating

Power supply unit (storage unit)
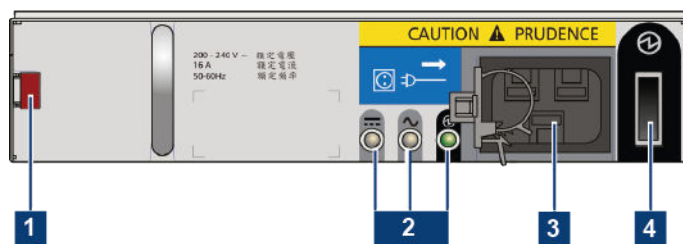
1	Release latch	Locks the power supply unit.
2	LEDs	For more information see Table 3-8.
3	Power connector	Power is provided by two 2200 W PSU's These require an input of 200 to 240 VAC at 50 to 60 Hz. The IEC C20 AC connector requires a C19 AC jack.
4	Power switch	Turns the unit on or off.

Dual PSUs provide redundant power for the system: if one PSU fails, the other will keep the system running while you replace the faulty module. The PSUs are hot-swappable. Replacement of a PSU can be performed while the enclosure is running, but the procedure must be completed within two minutes of the removal of the defective PSU. Ensure you have a replacement PSU before you remove the defective PSU.

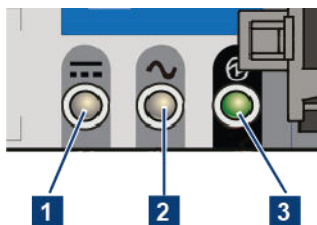The enclosure chassis is locked to prevent PSUs from being inserted upside down.

Table 3-8: Power supply unit LEDs

PSU fail (amber)	AC fail (amber)	Power OK (green)	Status
OFF	OFF	OFF	No AC power to either PSU.
ON	ON	OFF	PSU present but not supplying power.
OFF	OFF	ON	Mains AC present, switch on. This PSU is providing power output.
OFF	OFF	Flashing	AC power present, PSU in standby mode (i.e. other PSU is providing power output).
Flashing	Flashing	OFF	PSU firmware download.
ON	ON	OFF	PSU Alert State (usually due to reaching critical temp).
OFF	ON	OFF	Mains AC to this PSU has failed, PSU is not supplying power, other PSU is providing power.
ON	ON	ON	GEM software lost communication with PSU.
ON	X	OFF	PSU has failed.
X=Disregard			

3.7 Storage

The storage drives are provided with dual interfaces connected into separate storage domains. Therefore, a fault in one controller does not prevent the other from operating.

All drives are dual ported, so more than one initiator will be communicating with the device at any point in time. All drives therefore support SCSI reservations. This is a

method to allow a controller to "own" access to a given device, reserving it for its exclusive use.

The drives provide error detection and correction capabilities. These are reported to the application in line with the SCSI specifications.

ⓘ The storage drives are shipped separately along with the product, and have to be installed prior to commissioning. The order of the drives in the storage bays is virtualized, therefore, we recommend to use the drive labels included in the shipment package to correctly map your drive layout.

The drive slots are mapped as follows:
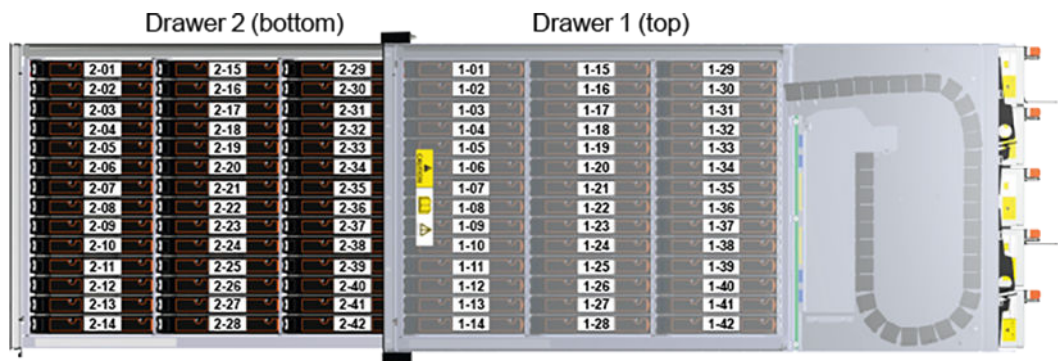
3.7.1 Storage layout and capacity

Your storage system contains two storage disk bays (top drawer and bottom drawer), each providing 3 storage arrays.

ⓘ When installing the drives (or extending the storage capacity) there is a top-to-bottom loading priority:

1. Always start at the top drawer with the front array, proceed with the middle array, and finish with the back array.

2. Repeat the same for the bottom drawer. Thereat, the number of loaded arrays in the top drawer must equal the same number of the bottom one (e.g. if the top drawer has 1 loaded array then the bottom drawer should have exactly 1 loaded array as well).
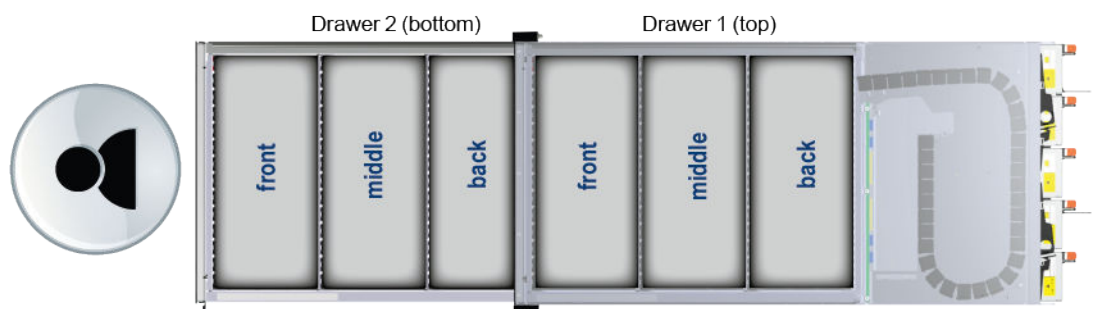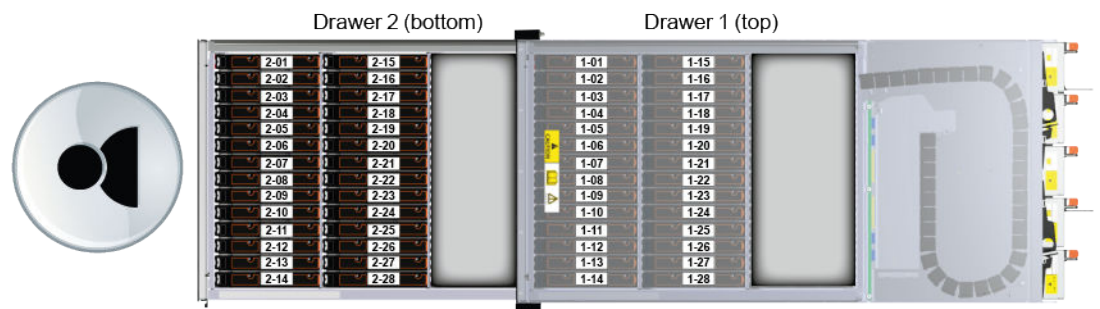
A storage unit can have up to three different storage layouts: One-third load configuration, Two-third load configuration, or Full-load configuration.
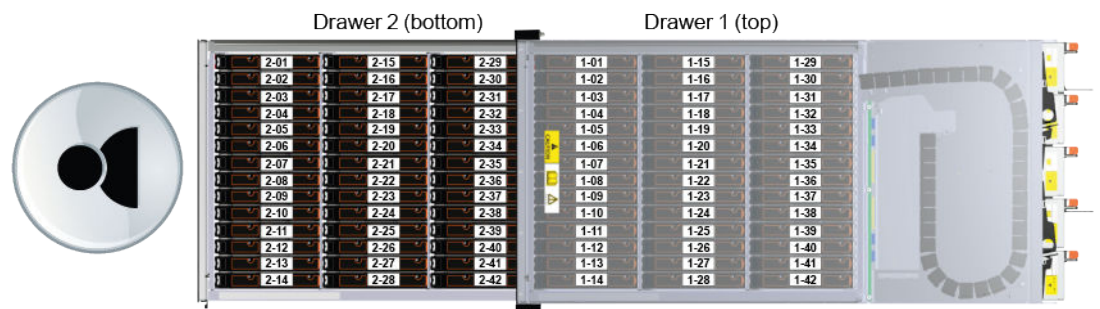
One-third load configuration
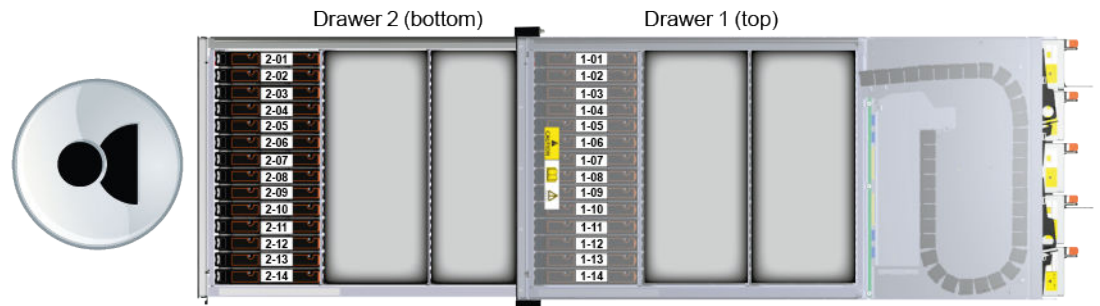
Two-third load configuration

Full-load configuration

Bundle capacity options

A storage bundle consists of 28 disk drives. Each bundle is intended for 2 disk arrays - 14 pcs for the top and 14 pcs for the bottom storage bay.

When extending the capacity of the system, please bear in mind that storage bundles of the same type must also be of the same size, meaning you cannot mix different bundle sizes. This applies also in cases when a further JBOD unit is added.

The following capacity bundles are available for purchase:

Disk type	Capacity options (in TB)
SSD	26 53 107 215
HDD	224 448 560

3.7.2 Storage configuration options and extensions

The system can be operated with both SSD or HDD disk types as well as with a mixed type of storage drives. When extending the storage, the capacity of the additional disks needs to match the capacity of the existing ones (per disk type).

Single JBOD options

The following configuration options apply only to the first storage unit (JBOD 1) of the system. Note that this is the only one storage unit that allows SSD / Mixed configurations.

ⓘ SSDs are always first in the loading order starting with the first array, and proceeding to the middle array and back array.

Once a HDD array is added then any following disk array must be also HDD.
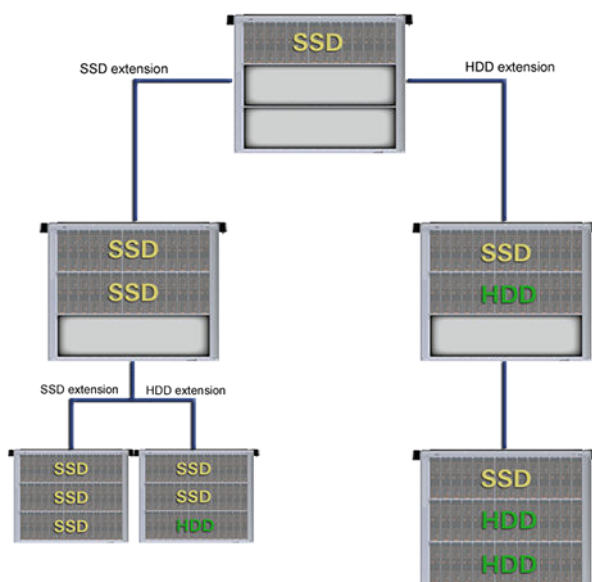
The HDD storage configuration of a single JBOD can have the usual one-third, two-third, or full configuration layouts. When extending the capacity of a HDD configuration you cannot add subsequent SSDs to that configuration, only further HDDs are allowed. Switching to SSDs or mixed configuration will involve a complete removal of the exiting layout and a new setup as depicted above.
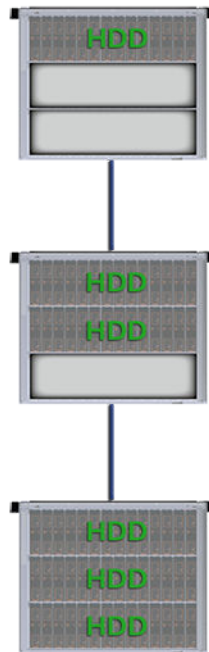
Multiple JBOD options

ⓘ When using SSDs, only the first storage unit (JBOD 1) can be equipped with that type of drives. Any subsequent storage units (JBOD 2 - 4) are to be equipped with HDD drives only.

A complete HDD-only configuration with all the storage units (JBOD 1 - 4) is also possible.

Important: JBODs need to be fully loaded (all three arrays occupied top and bottom) before adding another JBOD.
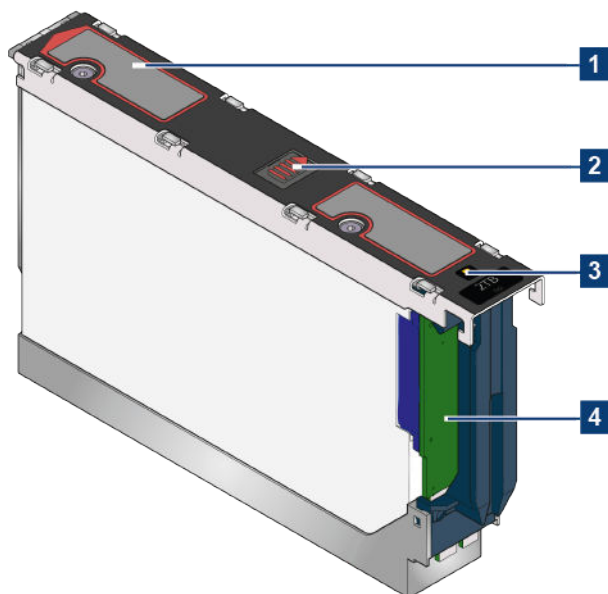

JBOD 1 SSD Options
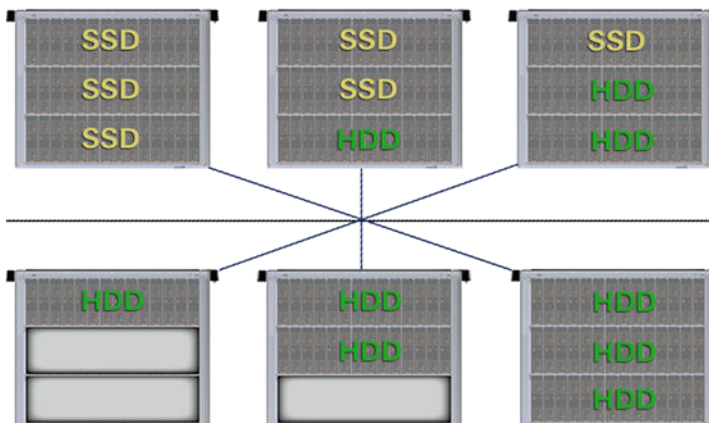
JBOD 2 - 4 Options

3.7.3 Drive carriers

Each drive is housed in a carrier that enables secure insertion of the drive into the slot.

1	Slide latch
2	Latch button
3	Drive failure LED
4	Dongle

The following drive types are supported:

- HDD - 3.5" 7200rpm SAS drive
- SDD - 2.5" SAS solid state drive with 3.5" adapter

ⓘ   Contact your storage vendor for details of other hard disk drives that are available for use in theSpycerNode2 storage system.

The drive carrier has a single amber LED which is lit when the drive has a fault.

4 Getting Started

This chapter describes the proper installation of SpycerNode2.

This equipment must be installed or serviced by trained personnel. We assume you are qualified in the servicing of equipment and trained in recognizing hazards energy levels in products. Access to the equipment is by the use of a tool, lock and key, or other means of security, and is controlled by the authority responsible for the location.

4.1 Preparing for use

Here, you can find basic information about setting up the product for the first time.

4.1.1 Lifting and carrying

The SpycerNode2 can be heavy, e.g. if fully equipped. Use an appropriate lifting equipment, see "Lifting and carrying the product" on page 4

When installing or removing the product from a rack do not attempt to lift the system by yourself, always get others to assist you.

4.1.2 Unpacking and checking

1. Unpack the storage unit of the SpycerNode2 carefully.
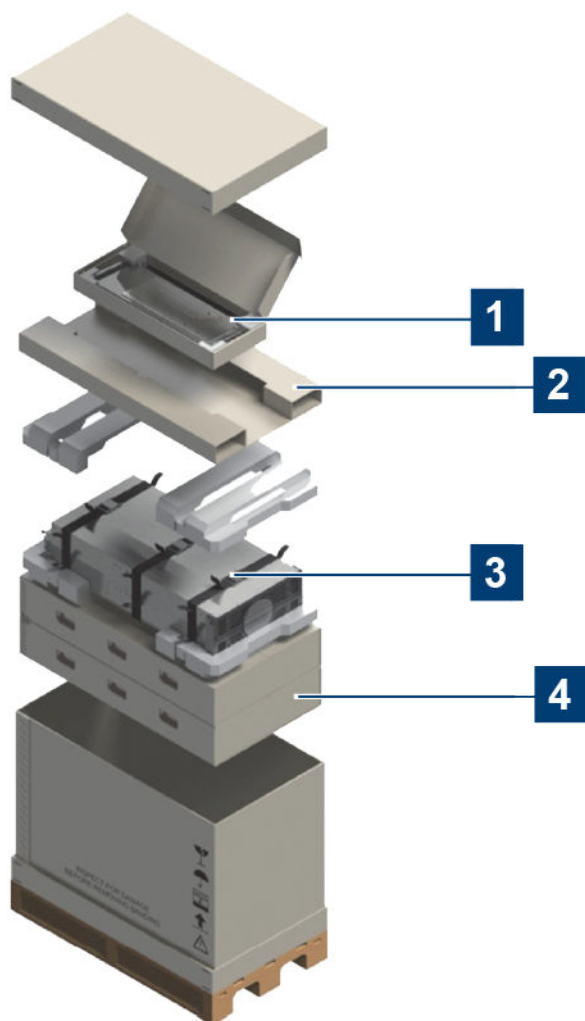
1	Rail kit
2	Accessories
3	Main storage unit (5U server)
4	Drive carriers

2. Retain the original packing material. Use it to protect the control elements and connectors when transporting or shipping the product

3. Using the delivery notes, check the equipment for completeness.

4. Check the equipment for damage.

5. Unpack the head units.

6. Repeat steps 2 - 4 for each of the storage controllers.
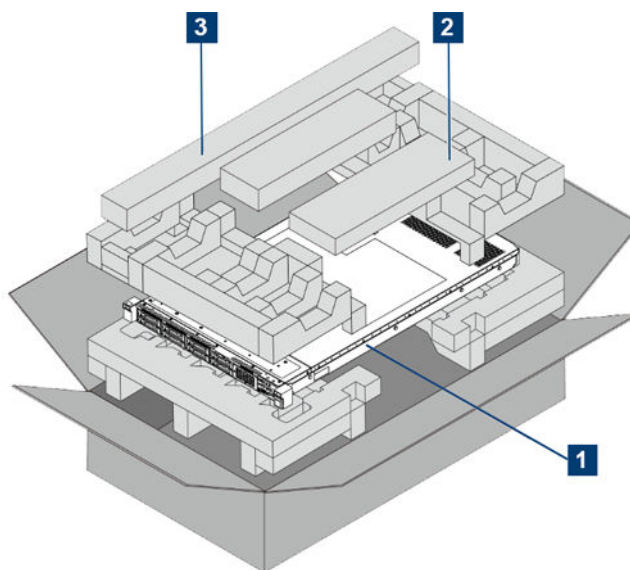
1	Storage controller (1U server)
2	Accessories (including items such as cable management, power cords and documentation.)
3	Rail kit

If the delivery is incomplete or equipment is damaged, contact Rohde & Schwarz.

4.1.3 Choosing the operating site

Specific operating conditions ensure proper operation and avoid damage to the product and connected devices. For information on environmental conditions such as ambient temperature and humidity, see the data sheet.

Before you begin, make sure the site intended for setup and operation meets the following requirements:

- Standard power from an independent source or rack power distribution unit with a UPS for at least 6 inlets (2 head units x 2 power inlets + 2 power inlets per main unit).
- Host computer with the correct firmware, BIOS and drivers, and software versions.

Before setting up the enclosure, make sure the following is available:

- SAS HBA
- Mini-SAS HD to host cable(s).
- Power cords
- Rack kit

The power cords and the rail kits are already included in the delivery box (separately for both the storage JBOD unit and each of the storage controllers).

See also "Choosing the operating site" on page 4.

4.2 Installation

This section describes the hardware installation of the product.

4.2.1 Mounting the system into a rack

This sections describes the installation of the product into a rack and lists the requirements prior to the installation.

4.2.1.1 Rack system precautions

The following safety requirements must be considered when the unit is mounted in a rack.

- The rack construction must be capable of supporting the total weight of the installed enclosure(s) and the design should incorporate stabilizing features suitable to prevent the rack from tipping or being pushed over during installation or in normal use.

- The system must be operated with low pressure rear exhaust installation [back pressure created by rack doors and obstacles not to exceed 5 pascal (0.5mm water gauge)].

- The rack design should take into consideration the maximum operating ambient temperature for the unit, consult the data sheet.

- The rack should have a safe electrical distribution system. It must provide over-current protection for the unit and must not be overloaded by the total number of units installed in the rack. When addressing these concerns consideration should be given to the electrical power consumption rating shown on the nameplate.

- The electrical distribution system must provide a reliable earth for each unit in the rack.

- The design of the electrical distribution system must take into consideration the total earth leakage current from all the power supplies in all the units. The rack may require labeling with "HIGH LEAKAGE CURRENT. Earth connection essential before connecting supply".

4.2.1.2 Installing the storage unit into a rack

This topic describes the installation of the storage unit only, see also Chapter 3.5, "The front of the system", on page 18

ⓘ   A Torx T20 screwdriver is needed to lock and unlock the drawers.

1. **CAUTION!** Electrostatic discharge. Ensure that you have fitted and checked a suitable anti-static wrist or ankle strap and observe all conventional ESD precautions when handling electric components. If possible, avoid contact with backplane components and module connectors.

   Ensure the pre-assembled rails are at their shortest length.

2. Locate the rail pins inside the front of the rack and extend the length of the rail assembly to align to the rear pins.

3. Ensure the pins are fully located in the square or round holes in the rack posts.
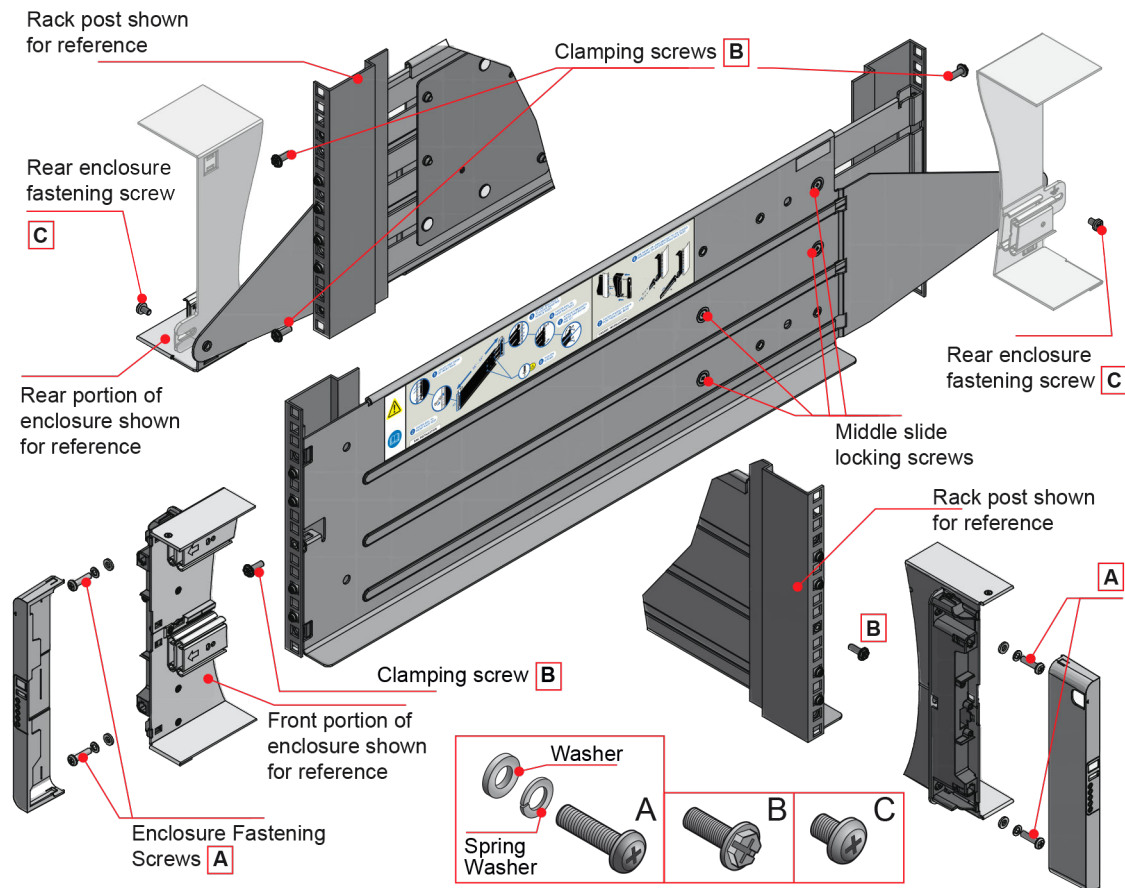
4. Fully tighten all clamping screws (left and right) and middle slide locking screws.

5. Ensure the rear spacer clips (x4) are fitted tight to the edge of the rack post.

6. **CAUTION!** Safe lifting. Do not lift the storage unit by the handles on the rear modules. They are not designed to take the weight. Only lift from underneath the main chassis.

   Slide the enclosure fully home on its rails.

7. Fasten the front of the enclosure using the enclosure fastening screws (x4) as shown in the figure above.

8. Fix the rear of the enclosure to the hold down bracket with the rear enclosure fixing screws (x2).

ⓘ   Use the long or short hold down bracket depending on the distance from the rack post to the enclosure hold down slot. Ensure the sliding nut is at the rear of the slot prior to fitting the bracket to the post, then slide the nut along the slot to enable the rear enclosure fastening screw to be fitted.

💡   For rack depths where the rack posts are behind the enclosure hold down slots:
- Swap the left and right hold down brackets.
- Insert the long flange between the rack post and chassis side.
- The sliding nut head must always face away from the enclosure, no matter the configuration used.
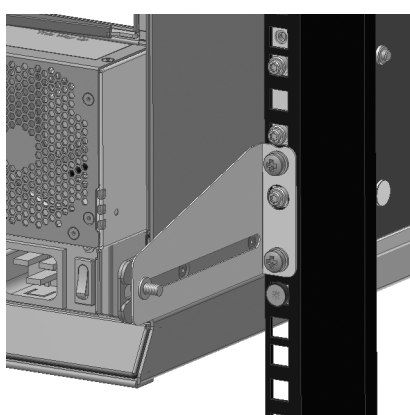
4.2.1.3   Installing a storage controller into a rack

This topic describes the installation of the storage controller only, see also Chapter 3.5, "The front of the system", on page 18

For a complete rack mounting guide please refer to the original manufacturer documentation:

https://pubs.lenovo.com/sr635/rack_install_guide1.pdf.

Refer also to the following video from the original manufacturer:

💡   https://www.youtube.com/watch?v=xUvk5R276uQ.
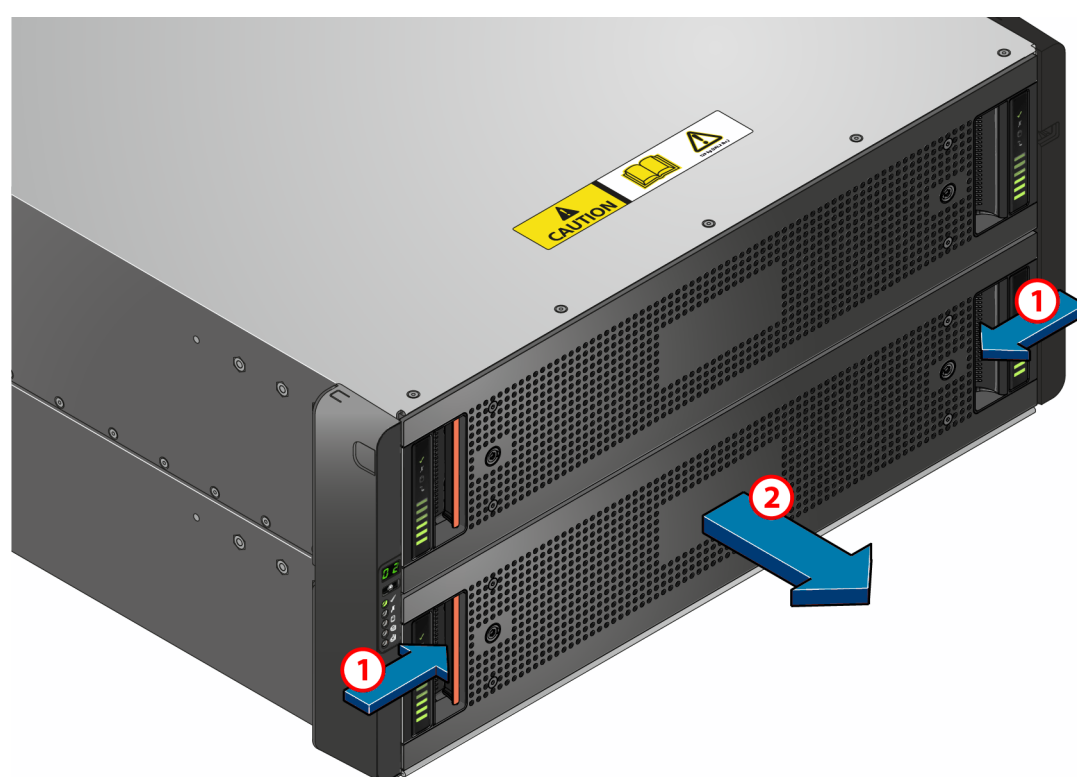
4.2.2   Installing the drives

This chapter describes the installation of the drives. There are two drive bays (top and bottom) each divided into three sections. Thus - depending also on the storage volume option purchased - your system can have one-third, two-third, or full-load configuration. For detailed information on the various configuration options, refer to chapter Chapter 3.7, "Storage", on page 33.

ⓘ The storage drives are shipped separately along with the product, and have to be installed prior to commisioning. The order of the drives in the storage bays is virtualized, and may bear no resemblance to the order shown here. Therefore, we recommend to use the drive labels included in the shipment package to correctly map your drive layout.

Opening a storage bay

To get access to the storage bays (top/bottom), the front drawers must be first opened. To open a drawer do the following:

1. Push the drawer latches inward and hold them.

2. Pull the drawer all the way out until it locks open.

Installing the drives

► With the drawer open insert the drives with the lock mechanism facing left. Push the drive downwards (1) and hold it down while sliding the drive carrier plate in the direction (2) as shown below. This locks the drive in place.
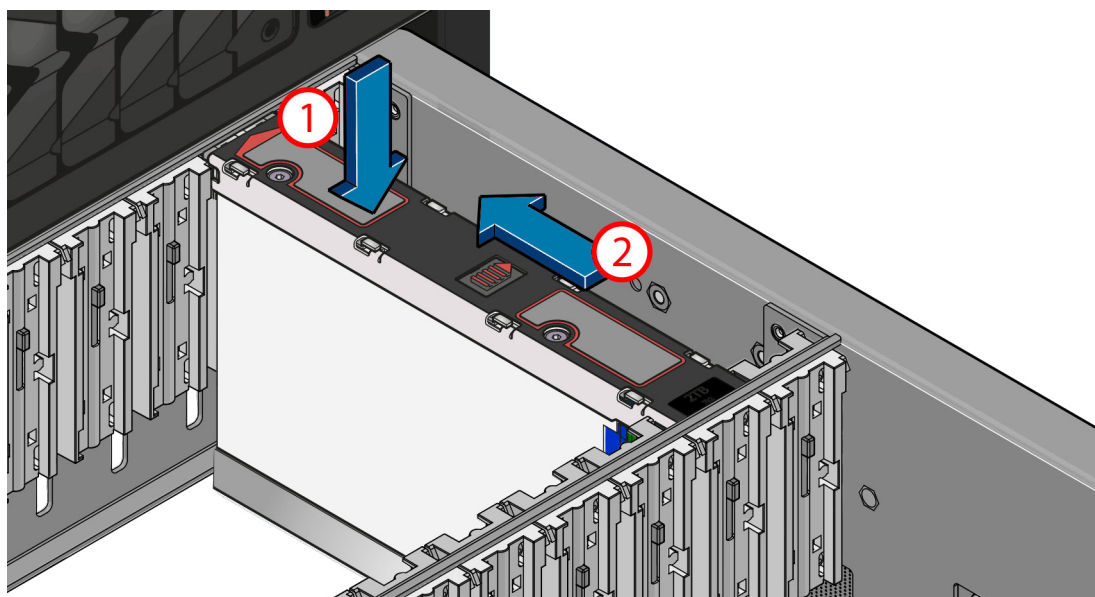
Depending on your purchase option the system can have up to three different storage layout configurations, see also Chapter 3.7.1, "Storage layout and capacity", on page 34
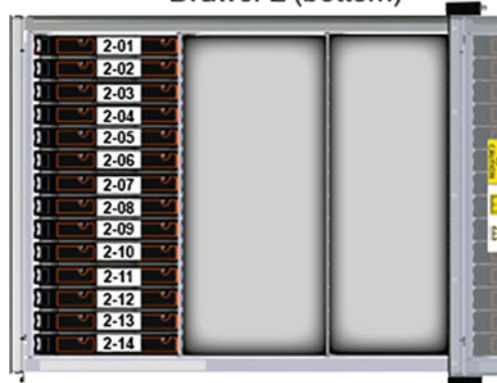
One-third load configuration

1. In the top storage bay, install 14 drives into slot 1-01 through 1-14 of the front storage array.

Drawer 1 (top)
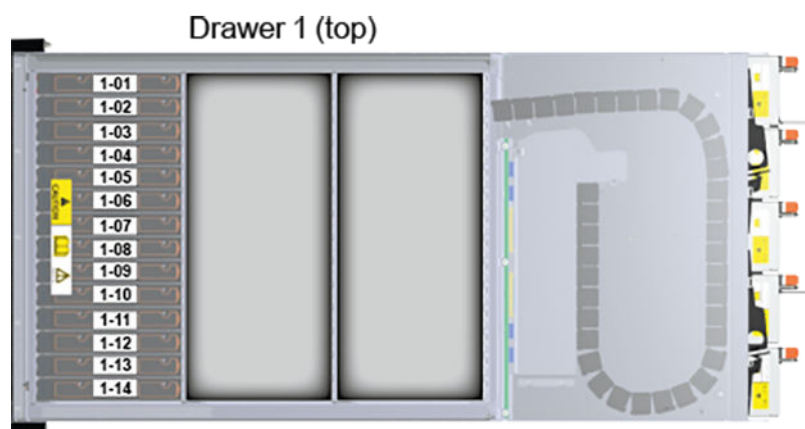
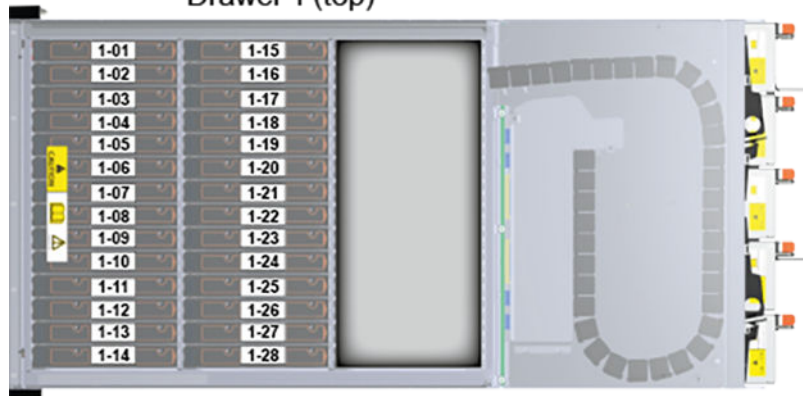**Note:** Make sure the drives are securely locked into place.

2. Label the drives as depicted using the labels from the delivery (left to right).

3. Optionally lock the drives with Torx T20, and close the drawer.

4. In the bottom storage bay, install the remaining 14 drives into slot 2-01 through 2-14 of the front storage array.

5. Label the drives as depicted using the labels from the delivery (left to right).

6. Optionally lock the drives with Torx T20, and close the drawer.
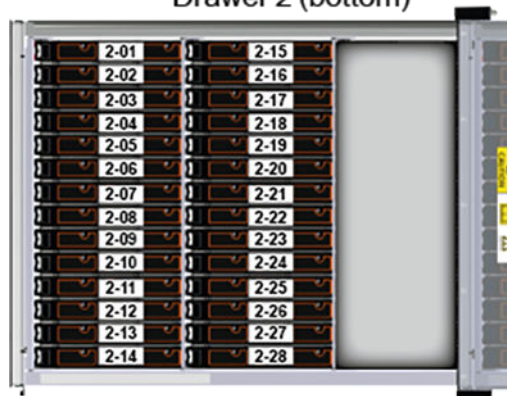
Two-third load configuration

1. In the top storage bay, install 28 drives into slot 1-01 through 1-28.

2. Label the drives as depicted using the labels from the delivery (left to right).

3. Optionally lock the drives with Torx T20, and close the drawer.

4. In the bottom storage bay, install the remaining 28 drives into slot 2-01 through 2-28.
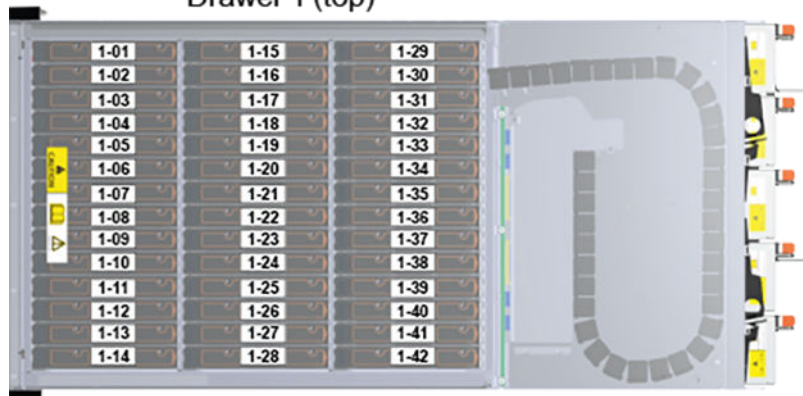
Drawer 2 (bottom)

5.   Label the drives as depicted using the labels from the delivery (left to right).

6.   Optionally lock the drives with Torx T20, and close the drawer.

Full-load configuration

1.   In the top storage bay, install 42 drives into slot 1-01 through 1-42.

Drawer 1 (top)

2.   Label the drives as depicted using the labels from the delivery (left to right).

3.   Optionally lock the drives with Torx T20, and close the drawer.

4.   In the bottom storage bay, install the remaining 42 drives into slot 2-01 through 2-42.

Drawer 2 (bottom)

5. Label the drives as depicted using the labels from the delivery (left to right).

6. Optionally lock the drives with Torx T20, and close the drawer.

4.2.3   Connecting to power source

> **NOTICE**
>
> **Loss of data/corrupt data**
>
> In the event of a power failure the device will be abruptly switched off. This can result in corrupt data, loss of data and equipment damage.
>
> Connect the system to an uninterruptible power supply redundantly on two phases.

> ⚠ **WARNING**
>
> **Electrical shock**
>
> For operator safety and correct system function the enclosure of the system must be grounded before applying power. Proper grounding of the electrical outlet can be verified by a certified electrician.

1. Provide a suitable power source with electrical overload protection fo meet the requirements laid down in the data sheet.

2. Ensure that the socket outlets are located near the system and are easily accessible.

3. **CAUTION!** Electrostatic discharge. Ensure that you have fitted and checked a suitable anti-static wrist or ankle strap and observe all conventional ESD precautions when handling electric components. If possible, avoid contact with backplane components and module connectors.

    CAUTION! Power supply covers check!. Make sure that the power supply cover fasteners (screws or rivets) have not been removed or tampered with.

For the storage unit, connect C19 AC power plugs to both C20 AC power sokets as shown.
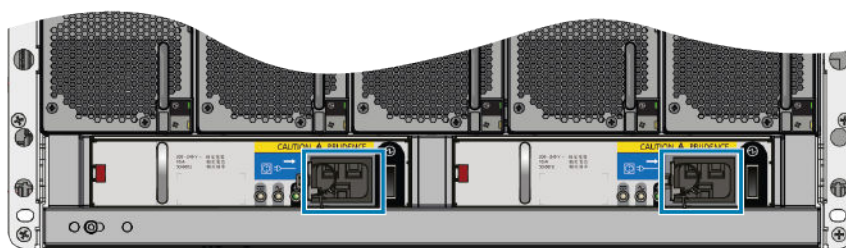
4. For the two storage controllers, connect C19 AC power plugs to both C20 AC power sokets as shown.
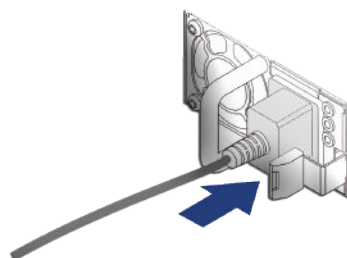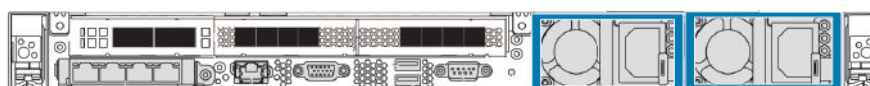
4.2.4 Connecting controllers and JBOD modules

This section describes the cabel connections between the controller units and the JBOD of the storage unit(s). The basic configuration includes a single JBOD setup which can be extended all the way to four JBODs. For more information on the different models, see Chapter 3.2, "Models", on page 11.

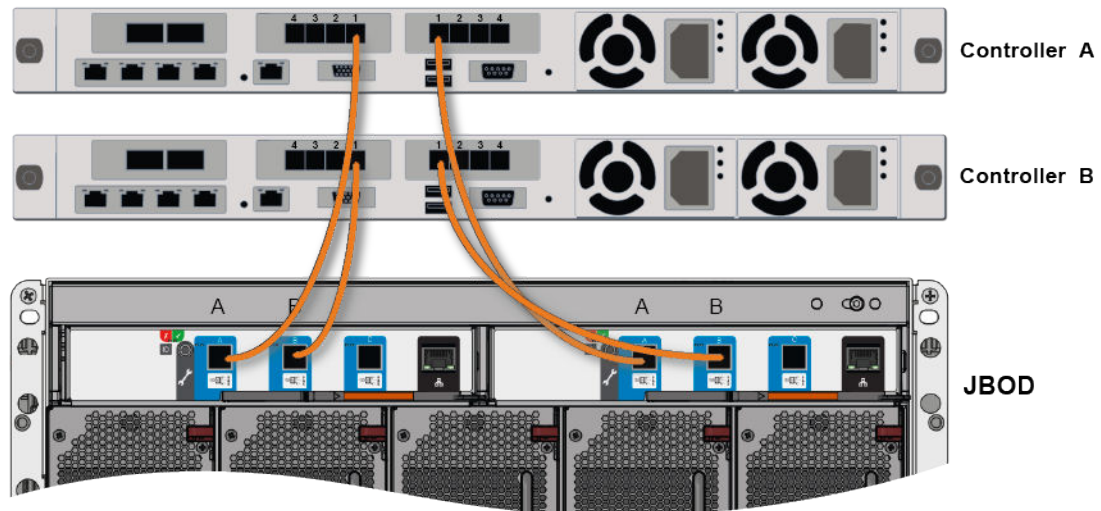**Controller interconnection**

Connect both controller units through the host-to-host connection port.
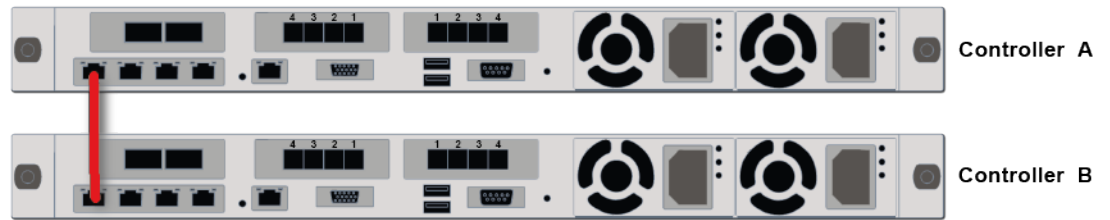
Single JBOD setup

Connect the SAS HD connectors from the controllers A and B to the JBOD I/O modules as described below.

Head unit		JBOD
Unit A	**Unit B**	
SAS left, port 1		JBOD left, port A
SAS right, port 1		JBOD right, port A
	SAS left, port 1	JBOD left, port B
	SAS right, port 1	JBOD right, port B

Dual JBOD setup

Connect the SAS HD connectors from the controllers A and B to the JBOD I/O modules as described below.
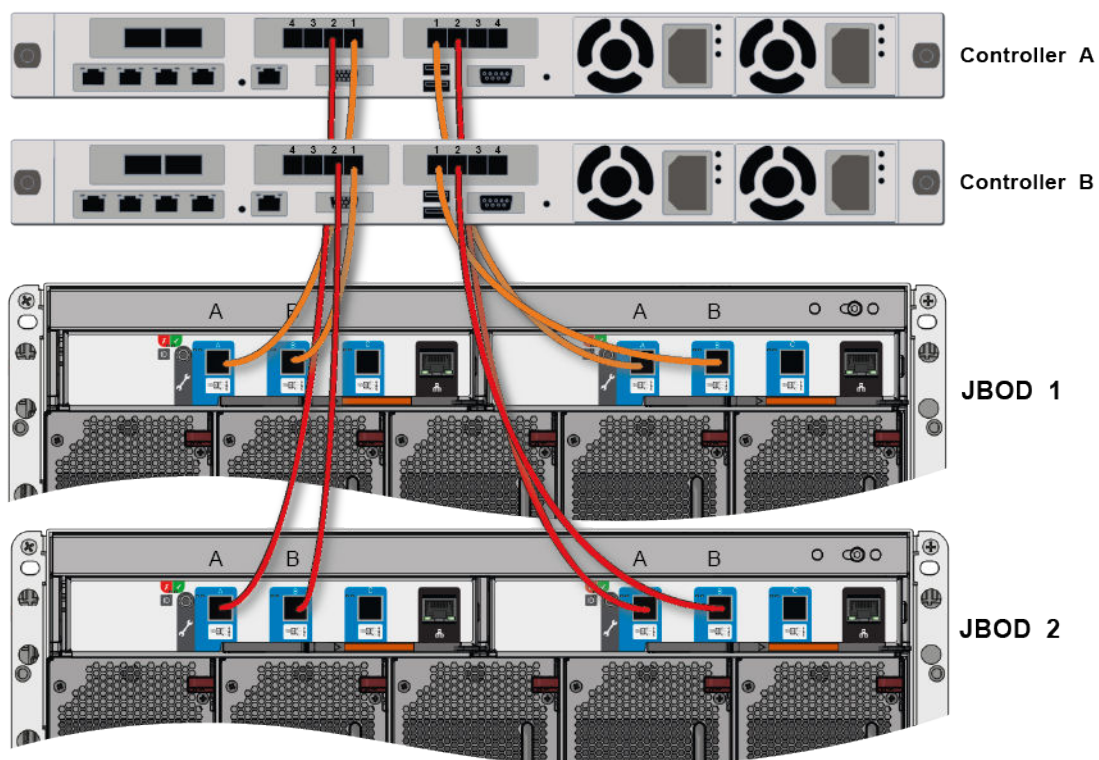
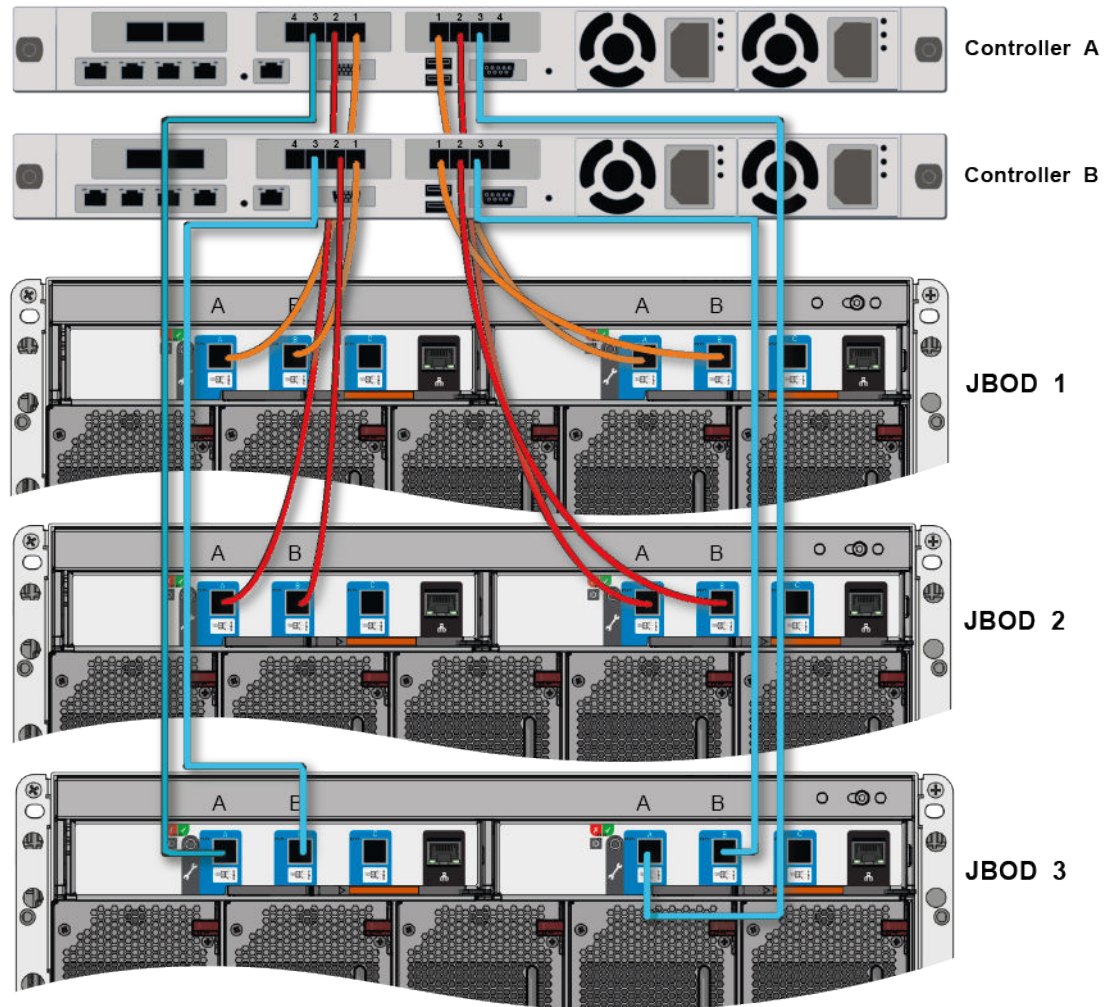| Head unit		JBOD 1	JBOD 2
Unit A	**Unit B**		
SAS left, port 1		JBOD left, port A	
SAS right, port 1		JBOD right, port A	
	SAS left, port 1	JBOD left, port B	
	SAS right, port 1	JBOD right, port B	
SAS left, port 2			JBOD left, port A
SAS right, port 2			JBOD right, port A
	SAS left, port 2		JBOD left, port B
	SAS right, port 2		JBOD right, port B

Triple JBOD setup

Connect the SAS HD connectors from the controllers A and B to the JBOD I/O modules as described below.

Head unit		JBOD 1	JBOD 2	JBOD 3
Unit A	**Unit B**			
SAS left, port 1		JBOD left, port A		
SAS right, port 1		JBOD right, port A		
	SAS left, port 1	JBOD left, port B		
	SAS right, port 1	JBOD right, port B		

Head unit	JBOD 1	JBOD 2	JBOD 3
SAS left, port 2		JBOD left, port A	
SAS right, port 2		JBOD right, port A	
	SAS left, port 2	JBOD left, port B	
	SAS right, port 2	JBOD right, port B	
SAS left, port 3			JBOD left, port A
SAS right, port 3			JBOD right, port A
	SAS left, port 3		JBOD left, port B
	SAS right, port 3		JBOD right, port B

Quad JBOD setup

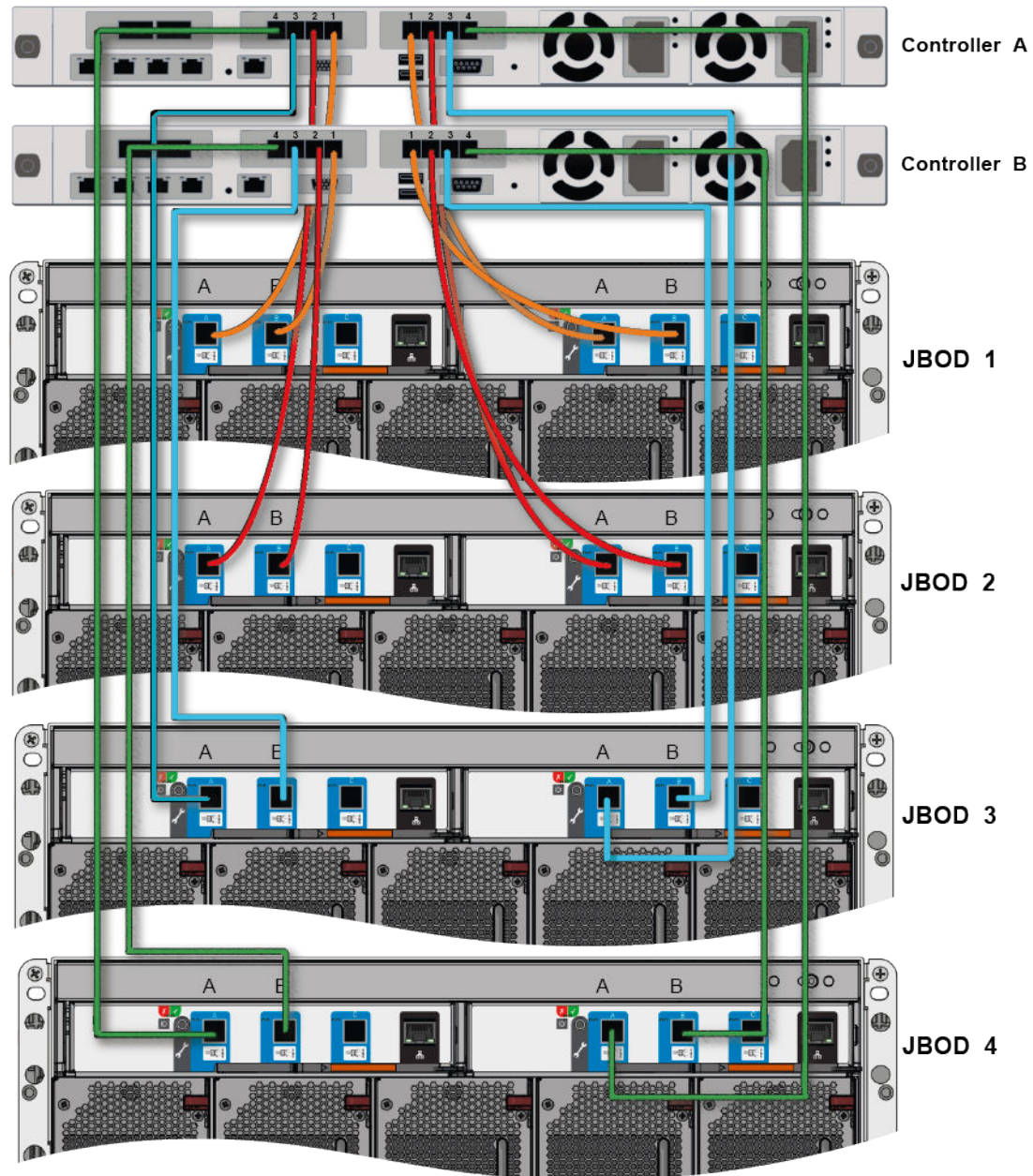Connect the SAS HD connectors from the controllers A and B to the JBOD I/O modules as described below.

Head unit		JBOD 1	JBOD 2	JBOD 3	JBOD 4
Unit A	**Unit B**				
SAS left, port 1		JBOD left, port A			

Head unit		JBOD 1	JBOD 2	JBOD 3	JBOD 4
SAS right, port 1		JBOD right, port A			
	SAS left, port 1	JBOD left, port B			
	SAS right, port 1	JBOD right, port B			
SAS left, port 2			JBOD left, port A		
SAS right, port 2			JBOD right, port A		
	SAS left, port 2		JBOD left, port B		
	SAS right, port 2		JBOD right, port B		
SAS left, port 3				JBOD left, port A	
SAS right, port 3				JBOD right, port A	
	SAS left, port 3			JBOD left, port B	
	SAS right, port 3			JBOD right, port B	
SAS left, port 4					JBOD left, port A
SAS right, port 4					JBOD right, port A
	SAS left, port 4				JBOD left, port B
	SAS right, port 4				JBOD right, port B

4.2.5 Connecting to networks

1. Connect your storage backbone switch to any of the 100 Gbit Ethernet connectors using a 100 GbE QSFP cable.

2. Connect the system to your local network using the 1/10 Gbit Ethernet connectors.

| 1	1 Gbit LAN connection, host-to-host connection.
	Reserved for the connection to the other storage controller. See also "Controller interconnection" on page 50
2	1 Gbit DHCP connection.
	Use to intgrate the device into a local DNS network to automatically detect your system, and to establish access to the R&S®Device Manager, see also Chapter 5.4.1, "Using Dynamic Host Configuration Protocol (DHCP)", on page 63
3	10 Gbit static IP connection (10.0.0.4).
	Use to intgrate the device into a local network, and to establish access to the R&S®Device Manager, see also Chapter 5.4.2, "Using static IP", on page 68
4	Disabled
5	IPMI management network connector.
	Aattach an Ethernet cable to manage the baseboard management controller (BMC).

5 Commissioning

This chapter describes setup and configuration of SpycerNode2.

5.1 Starting the system

After a proper installation of the system you may start SpycerNode2 at any time.

1. To turn on the storage unit, press the power switches briefly on the rear of the system.
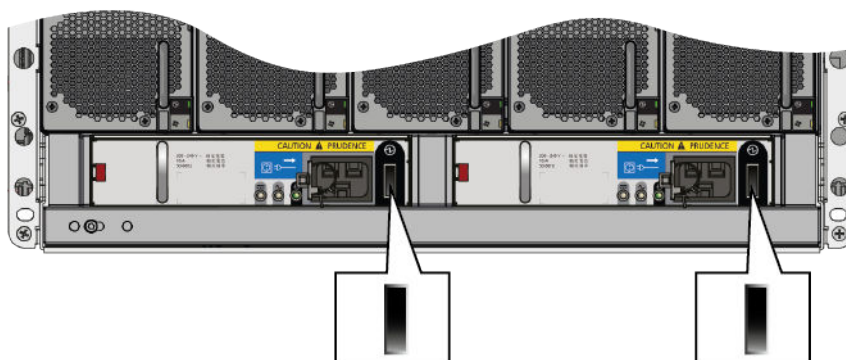
2. To turn on the storage controllers, press the power switches briefly on the front of each of the units.

5.2 R&S network switch configuration

This chapter describes how to set up the network switch.

5.2.1 Initial configuration

The R&S network switch needs an initial configuration before it can be accessible for management. For best performance your network topology must support jumbo frames.

1. Connect the power supply.

2. Connect the serial port of the host PC to the console port of the switch with the DB9 to RJ-45 cable. If your host PC does not have a native serial port you can use a USB-to-RS232 adapter.
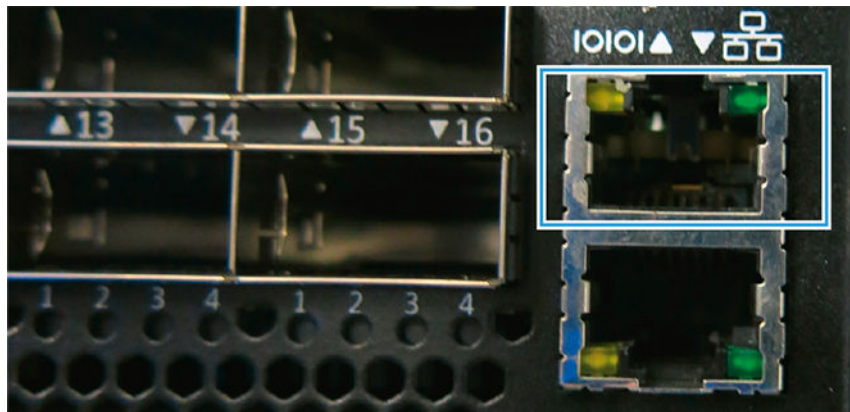
3. Open terminal program (recommended: **Putty**).

4. Configure a serial terminal program.

Parameter	Settings
Baud rate	115200
Data bits	8
Stop bits	1
Parity	None
Flow control	None

5. Log in:

OS	Username	Password
Onyx OS (MLNX-OS)	admin	admin

5.2.2 Configuring a static IP for management interface

ⓘ You will only be required to perform the procedure below if your switch configuration has been initially set to DHCP. Also, if setting up the switch for the first time, a quick start wizard from the original manufacturer will be presented to set a static IP address.

1. Enter `enable`

   The terminal changes to admin mode:
   `switch [master] #`

2. Enter `configure terminal.`

   The terminal changes to config mode:
   `switch [master] (config) #`

3. Use the following commands:
   ```
   switch [master] (config) # no interface mgmt0 dhcp
   switch [master] (config) # interface mgmt0 ip address
   <IP><NETMASK>
   ```

5.2.3 Configuring MTU

Configure MTU (Jumbo Frames): The Value must be 9216. These settings have to be done for each port.

Using the network switch terminal follow the instructions below.

1. Enter `enable`

   The terminal changes to admin mode:
   `switch [master] #`

2. Enter `configure terminal.`

   The terminal changes to config mode:
   `switch [master] (config) #`

3. Enter `interface [switch]/[port]-[switch]/[port] shutdown`

4. Enter `configuration write` to save the configuration

5. Enter `show interfaces` to check the configuration.

   The network switch is now configured.

5.2.4 Optional settings

Once the network switch is set up, further settings can be optionally configured.

Configure port for splitter cable

Configure the port for splitter cable to connect 10Gbit clients to the switch.

► Enter `interface ethernet 1/[port number you want to split] module-type qsfp-split-4`.

Display IP interface

► Enter `show IP Interface` to connect via DHCP to display IP interfaces.

Display current IP address of the management interface

► Use the following commands:

switch [master] (config) # show interfaces mgmt0 brief	
Interface mgmt0 status:	
Comment:	
Admin up:	yes
Link up:	yes
DHCP running:	no
IP address:	172.23.73.51
Netmask:	255.255.240.0
Secondary address:	172.23.73.100/20 (alias: 'mgmt0:0')
IPv6 enabled:	yes
Autoconf enabled:	no
Autoconf route:	yes
Autoconf privacy:	no
DHCPv6 running	no
IPv6 addresses:	1
IPv6 address:	fe80::e61d:2dff:fe68:fd6e/64
Speed:	1000Mb/s
Duplex:	full
Interface type:	ethernet
Interface source:	physical
MTU	1500
HW address:	E4:1D:2D:68:FD:6E

5.3 Setting the unit identification number

The unit identification number is not set before the first system power on. The display is set to "00" (flashing). The enclosure continues to power up even if the unit identification number is not set. How to set the unit identification number using the ID switch is described below.

1. Press and hold the ID switch button on the operating panel for a period of five seconds. The left-hand digit flashes.

2. Press and release the ID switch button to increment the number until the required digit is reached.

3. Press and hold the ID switch button for a period of five seconds. The right-hand digit flashes.

4. Press and release the ID switch button to increment the number until the required digit is reached.

5. Press and hold the ID switch button for a period of five seconds to finish setting the number. Values of "01" to "99" are valid.

5.4 Initial Setup

For initial setup the device must be integrated into a network to establish access to the R&S®Device Manager. The Device Manager is the tool that allows you to configure and monitor all R&S devices connected within a local network.

The network connection can be done via two of the network ports at the rear of the system. However, depending on which one you choose, different settings must be applied, since the one is set to DHCP (Dynamic Host Configuration Protocol) and the other one to static IP (10.0.0.4).
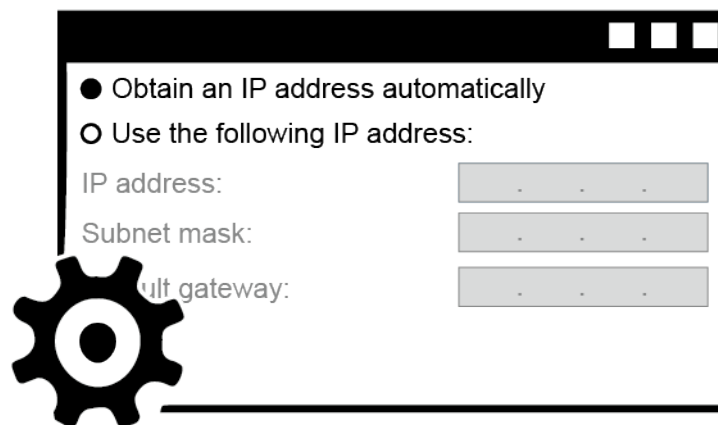
5.4.1 Using Dynamic Host Configuration Protocol (DHCP)

With a zeroconf capable PC/MAC it is possible to automatically detect network services. You can also use a zeroconf browser to view all zeroconf capable devices in your network. If your PC is not zeroconf capable use tools such as Bonjour.exe for the automatic detection of network services or connect your system using a static IP address.

1. Connect port ens5f11 to a PC/Mac.

ens5f1
DHCP
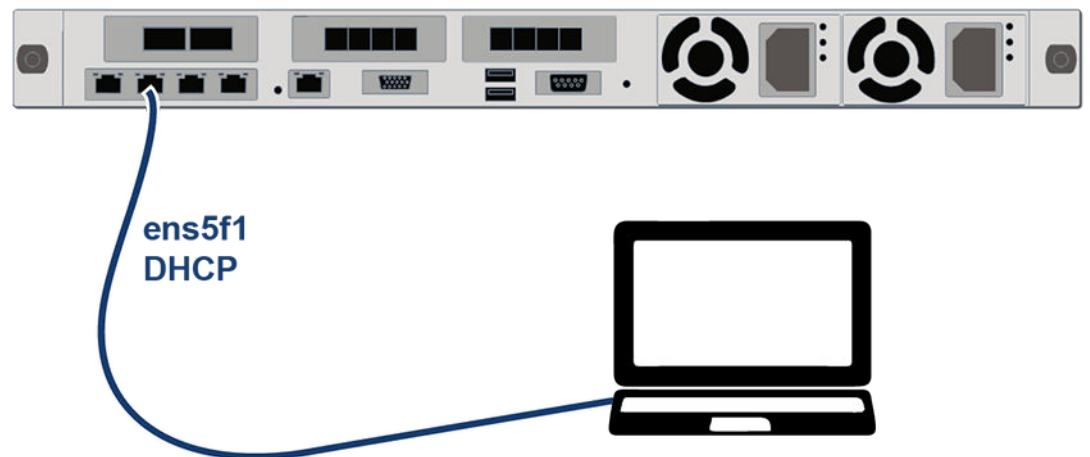
2. Select "Obtain an IP address automatically" on the PC/Mac.

● Obtain an IP address automatically
○ Use the following IP address:
IP address:
Subnet mask:
ult gateway:

3. Enter the host name of the controller in the Chrome web browser to open the R&S®Device Manager on your local system.

Tip: The controller name follows the pattern **sno2-[OEM serial number]** (i.e. enter http://sno2-j30aexpm in the web browser).

4. The first time you log in, enter the following credentials:
    Username: "administrator"
    Password: "[OEM serial number]"
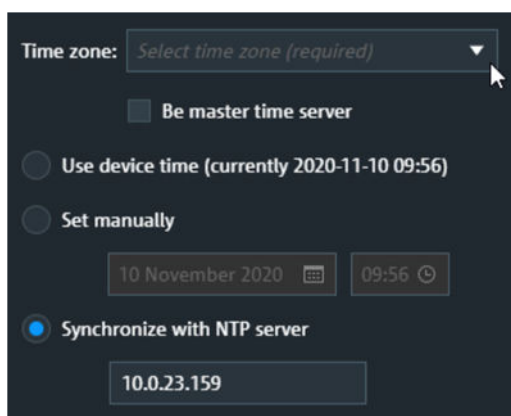
5. Define new hostname and password for the system:
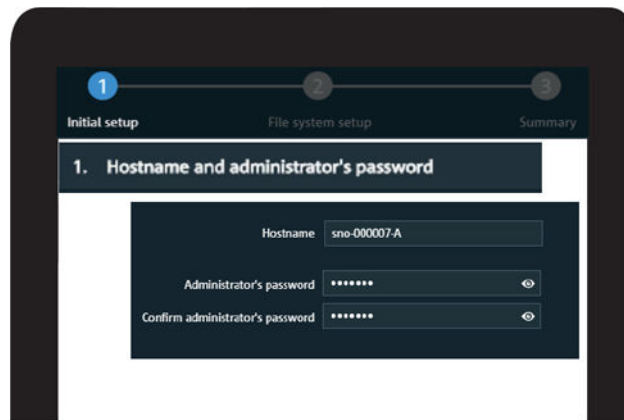
Note: The password must contain at least six characters.

Note: The password credentials defined in this step apply also to the other network services running on the system, such as Samba Share.

Note: For systems equipped with two controllers, each of the configuration settings have to be performed separately for each one of the controllers. The Wizard will guide you through that process and will label the current controller as active (Controller A/B).

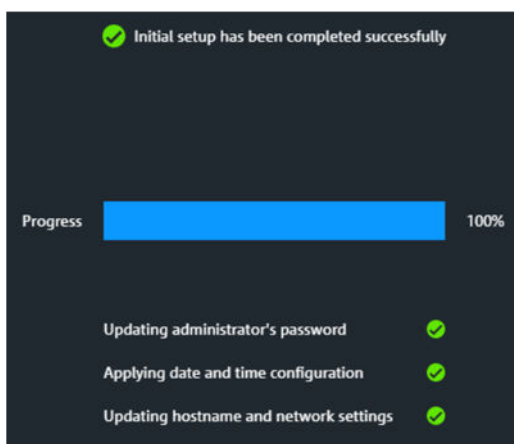6. Specify date and time settings for the system.

Time zone	Select your time zone from various predefined selection options.
Be master time server	Set the checkbox if you want to designate this particular system as the main NTP server within your local network.
Use device time	Read the current date and time of the device and set it as default.
Set manually	Manual entry of the date and time settings.
Synchronize with NTP server	Synchronize the date and time settings with a central NTP server from your local network.

7. Select the ens5f1 network port section and make sure the Interface status is set to ON and dhcp mode is enabled. The IP address and Netmask are set automatically.
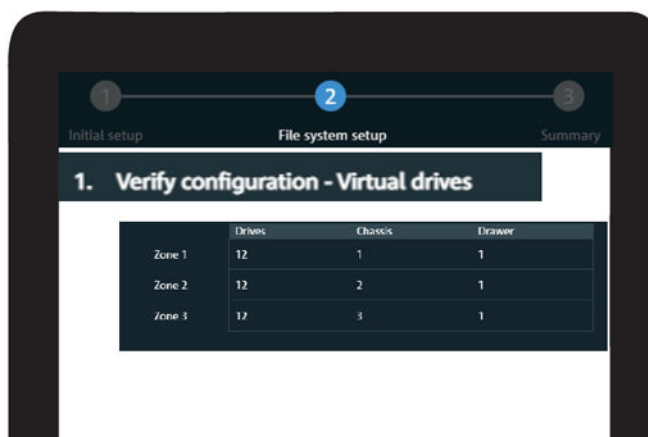

With this step, the first part of the setup is completed.

Note: Please note that Link Aggregation (bonding) of network ports is not possible in this initial stage. To perform the bonding, the Setup Wizard has to be completed first.

8. In the next installation phase, the file system configuration is carried out. First, the metadata drives and the installed storage capacity are displayed.

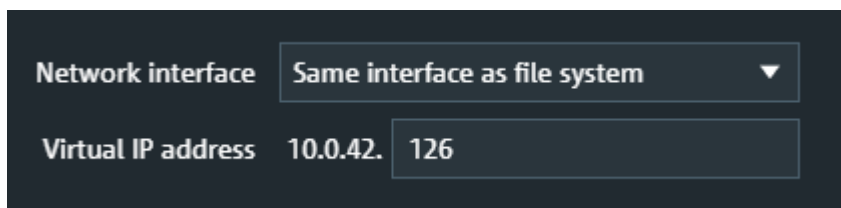| Zone 1	Shows the number of metadata drives, the drive type, the capacity, and RAID level.
Zone 2 / Zone 3	Shows the installed storage drives type, their capacity and the level of RAID protection. Each zone represents a single drive set which consists always of 30 drives. A system with half the capacity will have only one zone populated.

Note: In this step you have the option to restart the entire setup procedure by clicking the "Restart wizard" button.

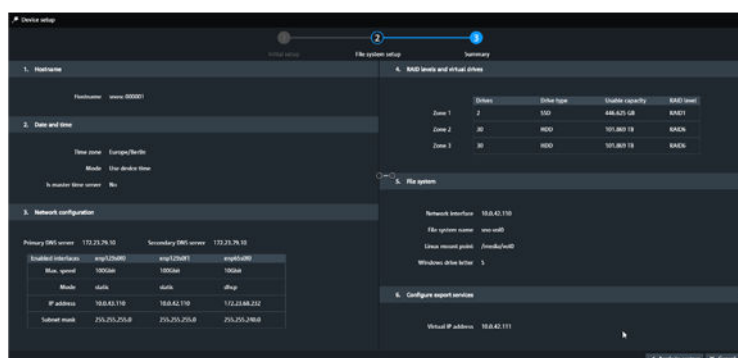9. In the next step you select the interface for your storage network connection.

Network interface (IP)	Select the network interface for your file system. The connection is usually established via the 100Gbit interfaces.
File system name	Provide a name for your file system.
Linux mount point	Define the mount path for this file system at your connected Linux native clients.
Windows drive letter	Define the drive letter designation for the your file system at your connected Windows native clients.

10. Define a virtual IP address for the export services (e.g. via Samba). It is already preset to the same subnet domain, thus you have to provide only the last three digits. If required, you can also change the network interface for the export services.


11. A summary is presented in the last step with the option to make changes to the file system and virtual IP configuration settings. Press "Apply to system" to confirm the settings.

Note: Completing the Easy Setup Wizard will provide the basic settings required to start operating your system. Further settings options are available after completing the initial setup.
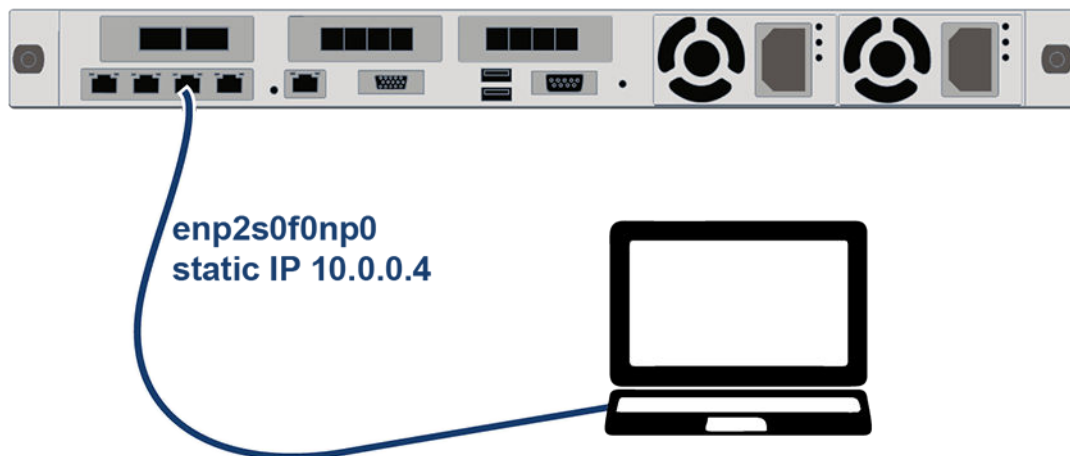
12. On the main page of the Device Manager select the corresponding system and click on "Open settings".

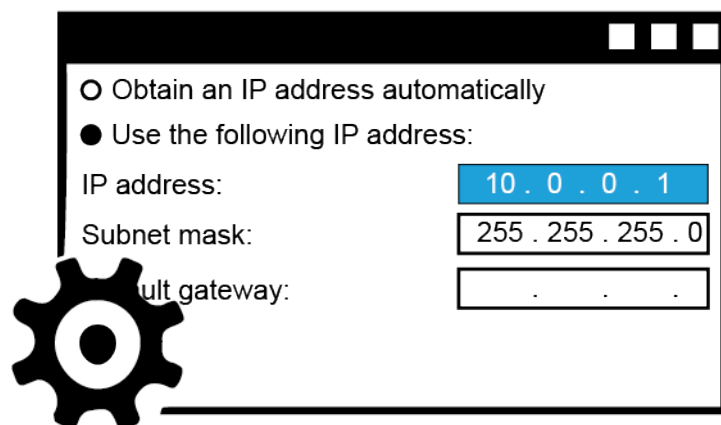13. Navigate to "System > Restart and shutdown" and opt for the reboot option.
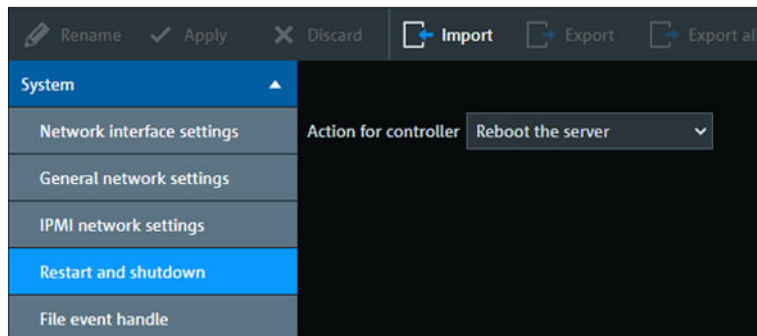
The SpycerNode2 is now properly installed and ready for first use
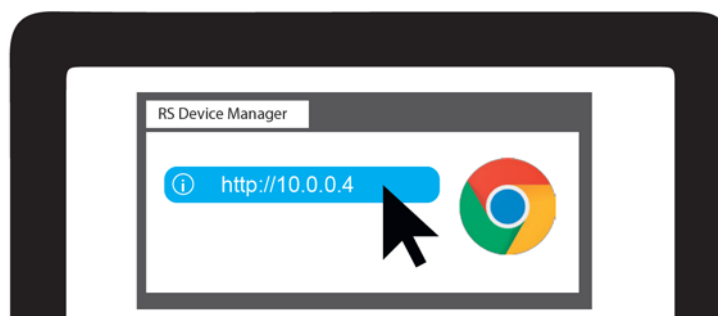
5.4.2   Using static IP

1. Connect port enp2s0f0np0 to a PC/Mac

2. Change the IP for the connected network interface in the network settings of your PC/Mac to "10.0.0.1".
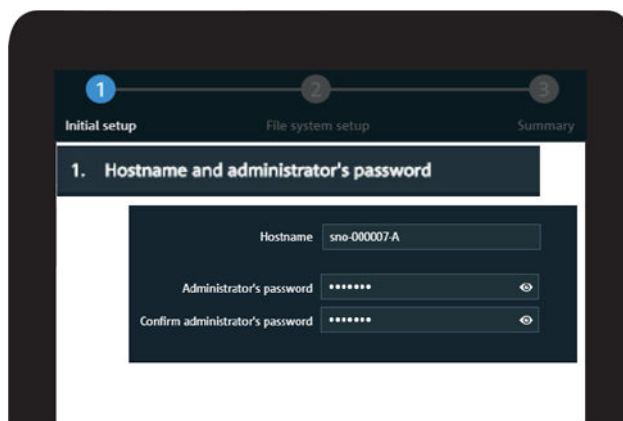
3. Enter the static IP in the Chrome web browser to open the R&S®Device Manager on your local system. (i.e. http://10.0.0.4)

4. Locate the OEM serial number of the device which is to be found on the front of the storage controller.

5. The first time you log in, enter the following credentials:
   Username: "administrator"
   Password: "[OEM serial number]"

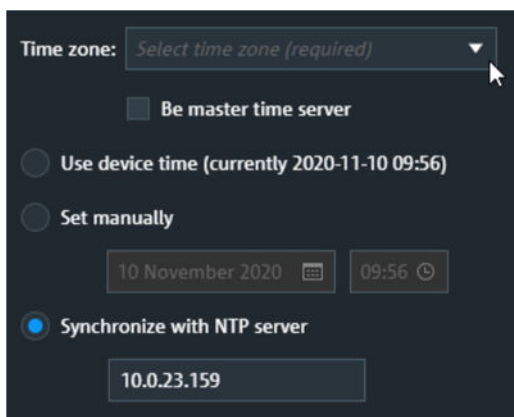6. Define hostname and password for the system:

Note: The password must contain at least six characters.

Note: The password credentials defined in this step apply also to the other network services running on the system, such as Samba Share.
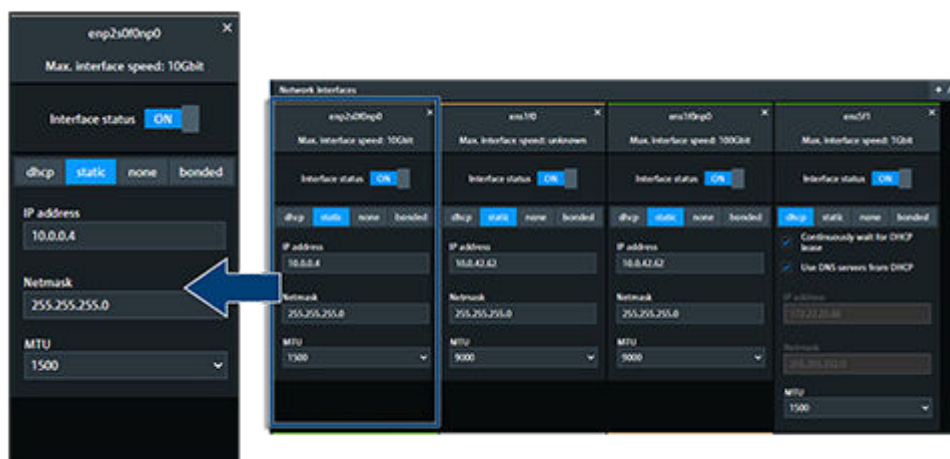
Note: For systems equipped with two controllers, each of the configuration settings have to be performed separately for each one of the controllers. The Wizard will guide you through that process and will label the current controller as active (Controller A/B).

7. Specify date and time settings for the system.

Time zone	Select your time zone from various predefined selection options.
Be master time server	Set the checkbox if you want to designate this particular system as the main NTP server within your local network.
Use device time	Read the current date and time of the device and set it as default.
Set manually	Manual entry of the date and time settings.
Synchronize with NTP server	Synchronize the date and time settings with a central NTP server from your local network.

8. The network settings are displayed in the enp2s0f0np0 network port section. The IP address is set to 10.0.0.4 and the Netmask to 255.255.255.0. If you wish to use another static IP address you can enter it here into the IP address field.

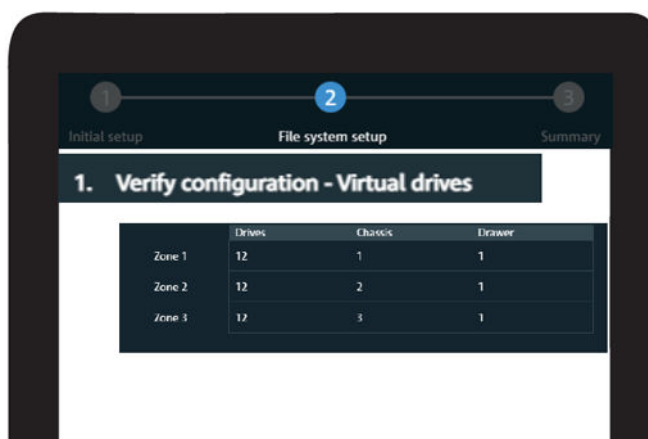With this step, the first part of the setup is completed.

Note: Please note that Link Aggregation (bonding) of network ports is not possible in this initial stage. To perform the bonding, the Setup Wizard has to be completed first.

9. In the next installation phase, the file system configuration is carried out. First, the metadata drives and the installed storage capacity are displayed.

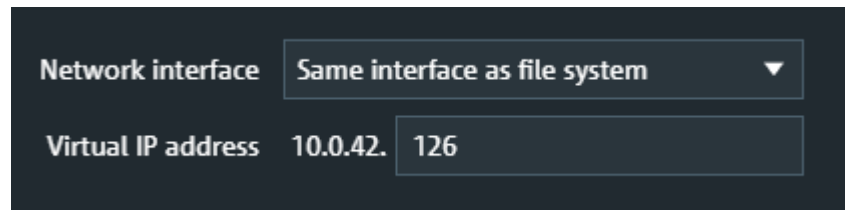| Zone 1	Shows the number of metadata drives, the drive type, the capacity, and RAID level.
Zone 2 / Zone 3	Shows the installed storage drives type, their capacity and the level of RAID protection. Each zone represents a single drive set which consists always of 30 drives. A system with half the capacity will have only one zone populated.

Note: In this step you have the option to restart the entire setup procedure by clicking the "Restart wizard" button.

10. In the next step you select the interface for you storage network connection.

Network interface (IP)	Select the network interface for your file system. The connection is usually established via the 100Gbit interfaces.
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Linux mount point	Define the mount path for this file system at your connected Linux native clients.
Windows drive letter	Define the drive letter designation for the your file system at your connected Windows native clients.

11. Define a virtual IP address for the export services (e.g. via Samba). It is already preset to the same subnet domain, thus you have to provide only the last three digits. If required, you can also change the network interface for the export services.

12. A summary is presented in the last step with the option to make changes to the file system and virtual IP configuration settings. Press "Apply to system" to confirm the settings.
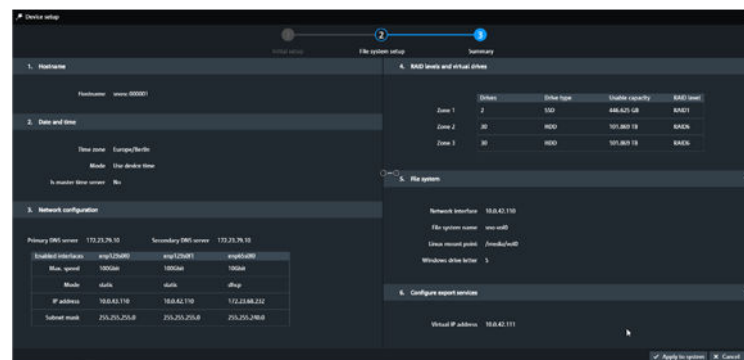
Note: Completing the Easy Setup Wizard will provide the basic settings required to start operating your system. Further settings options are available after completing the initial setup.

13. On the main page of the Device Manager select the corresponding system and click on "Open settings".

14. Navigate to "System > Restart and shutdown" and opt for the reboot option.
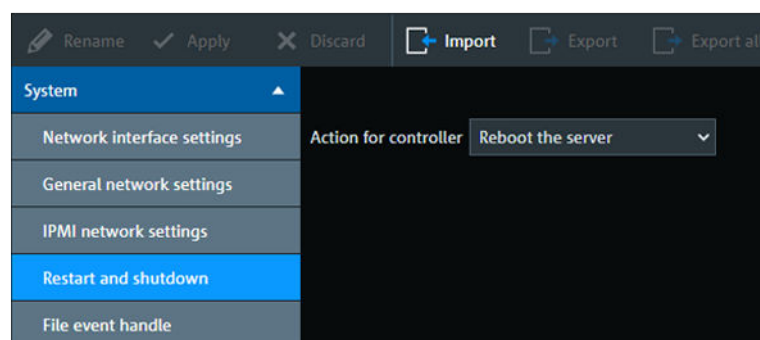
The SpycerNode2 is now properly installed and ready for first use

6 Operation

This chapter describes the operation of the system.

6.1 Using the R&S®Device Manager

For operation and system monitoring use the R&S®Device Manager, the convenient solution developed by Rohde & Schwarz to manage and monitor your R&S systems in a common network.

1. Enter the host name of the controller (see controller label) in the Chrome web browser to open the R&S®Device Manager on your local system. (e.g. http://sno2-100768-a.local).

2. Select "Login" to get access to all configuration options.

   The Login window opens.

3. Enter username and password. The default passwords are provided below:

username	administrator
password	[serial number of your device] (see typeplate label) or the password that has been defined during the Easy Setup procedure

   Note: If you log in for the first time, the Easy Setup Wizard will start automatically, see Chapter 5.4, "Initial Setup", on page 62 . You will have the option to change the default password and create a new user.

4. Select the "Spycer storage" tab.
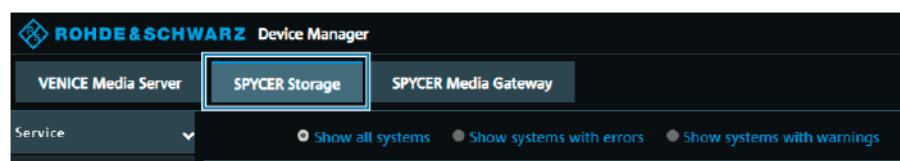
5. Select the corresponding device.

   The complete settings menu of the device is now available

7 Administration

This chapter provides information and procedures for performing a range of administrative-level tasks on your product.

7.1 Updating the system

The Rohde & Schwarz Installer (RSI) is used to install/update the entire software environment required to operate R&S systems. The RSI is an executable that needs to run on a computer with a Windows operating system in order to update one or more R&S systems over the network.

7.1.1 Types of RSI packages

There are currently three different types of RSI packages. Please refer to the GLORIS site for your system at https://gloris.rohde-schwarz.com and download the linked RSI packages.

(i) When updating a system, the RSI packages have to be installed in the following specific order according to their type:

- **File system RSI.** This contains a new version of the file system, either Spectrum Scale or StorNext.
- **Operating system RSI.** This contains fixes and improvements for the operating system.
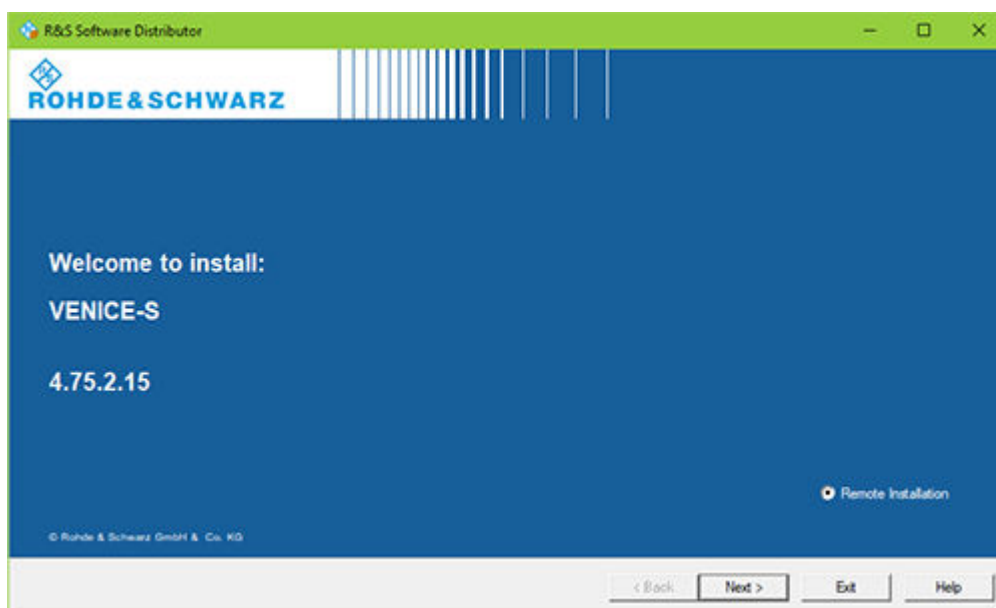- **Software RSI.** This updates the R&S software such as R&S®VENICE and Spycer.

(i) Please be aware that the system will automatically reboot within ten minutes after the installation of a file system or operating system RSI.

7.1.2 Using an RSI

The RSI package is a Windows executable that can remotely update R&S systems in the network.

Always make sure to install the RSI packages in the correct order according to their type, see Chapter 7.1.1, "Types of RSI packages", on page 75

1. Download the latest version of the installation package (zip-file) from https://gloris.rohde-schwarz.com on your host PC.

2. On a Windows system, start the installer with a double click.

   First, the version information of the current installer is provided.

3. Click the "Next" button.

   The installer will list all software (operating system, drivers and tools) which will be updated.
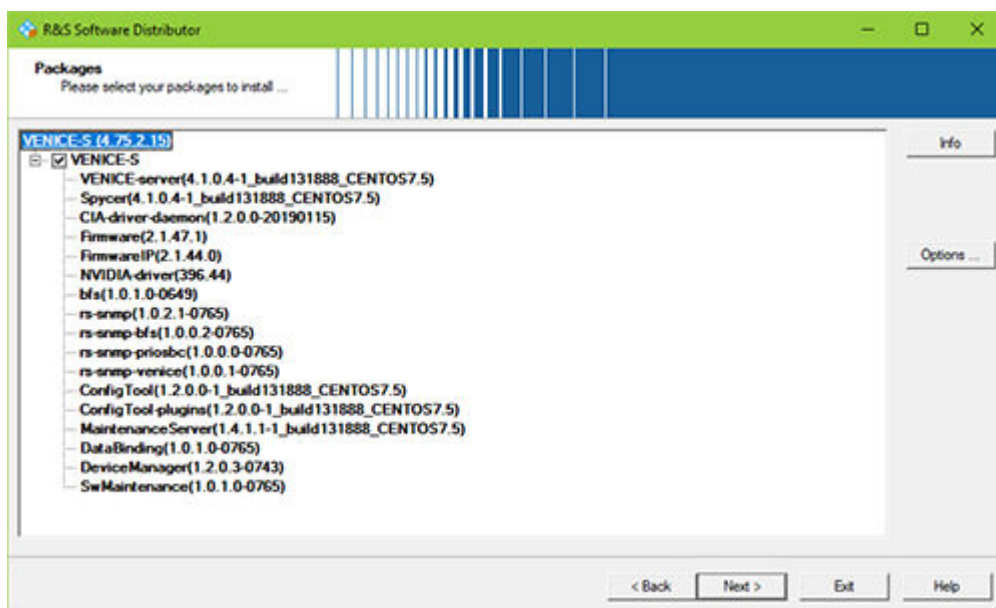
4. Click "Next" to proceed to the next section.

   A list is shown with all newer R&S systems detected in the network. In the first column, you can select one or more systems to be updated.

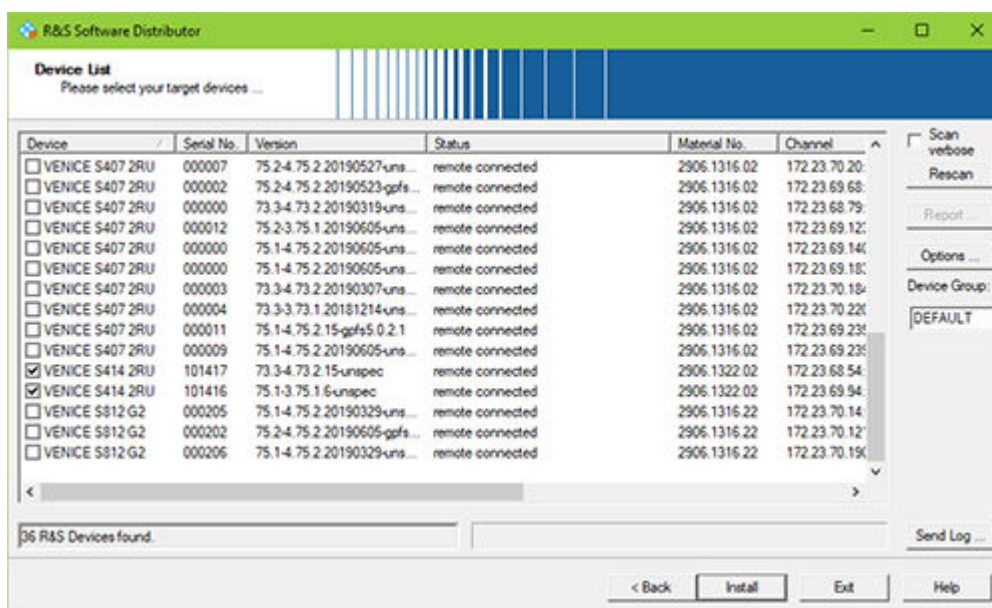5. Click "Install" to start the installation. The current status will be shown in the "Status" column.

   Note: Please be aware that the system will automatically reboot within ten minutes after the installation of a file system or operating system RSI.

7.1.3 RSI troubleshooting

This section provides information on what to do in case an RSI installation fails.

7.1.3.1 Logs

Logs of the installation process are created on the systems involved. The logs are located under *var/log/rohde-schwarz/swupdate/rsi-installer_<YYYY-MM-DD>__<HH-MM-SS>.txt.*

7.1.3.2 Error codes

If errors occur during the installation, the RSI will show error codes displayed on the monitor, without having to open the log files. Some errors can be rectified on site while others require to contact the R&S support department for assistance. If the latter is the case, please provide the code number of the error(s) in question.

Error code	Message	Description & possible solution
5	Installer already running!	-
30	Failed unpacking Windows client installers!	Disk volume is full or installation packages are defective.
31	Failed importing new packages!	Disk volume is full or installation packages are defective.

| Error code	Message	Description & possible solution
32	Failed updating!	Disk volume is full or installation packages are defective.
33	Failed installing meta package!	The meta package of the product is defective or required packages are missing.
34	Image version is 'X', must be at least 'Y'!	Operating system image is not compatible with the RSI. Possible cause is the attempt to install a new RSI on an obsolete/outdated image.
35	Machine UUID '/etc/opt/rohde-schwarz/machine-uuid' is missing!	Installation failed on the system. Try executing fbms-setup.sh.
36	System configuration '/etc/opt/rohde-schwarz/swupdate.conf' is missing!	Installation failed on the system. Try executing fbms-setup.sh.
37	This RSI is for CentOS 'X', but this system is running 'Y'!	The CentOS version of the system is not compatible with the RSI. Either update the system or use an appropriate RSI.
38	Package 'zvbi' is not installed. Please contact the support!	The 'zvbi' package has to be installed manually. Please contact R&S support department.
39	NVIDIA driver 'X' is missing!	Please contact R&S support department.
40	Failed installing NVIDIA driver!	More details can be found in the log file on the system. Please contact R&S support department.
41	Failed configuring NVIDIA driver!	nvidia-smi -e 0 command has failed. Call up the command in a shell, gather the information details and contact R&S support department.
42	zip_unpack() failed: argument missing (1: X, 2: Y)	Not enough parameters for the internal RSI execution. Please contact R&S support department.
43	Failed unpacking ZIP file!	Unpacking process failed. More details can be found in the log file on the system. Please contact R&S support department.
44	Needed hotfix is missing!	More details can be found in the log file on the system. Please contact R&S support department.
45	The new version is older than the currently installed version!	A downgrade to an older version is not possible.
46	Unpacking tar.gz archives failed!	Unpacking the (rus-configd-plugins|rus-extra).tar.gz archive has failed. Please contact R&S support department.
47	CentOS version is 'X', but must be at least 'Y'!	CentOS version is outdated. Upgrade first the operating system.

Error code	Message	Description & possible solution
48	CentOS version is 'X', but must be lower than 'Y'!	The newer CentOS version is not compatible with this outdated RSI. Use a newer RSI version.
49	Please perform a manual downgrade before installing this version!	A downgrade is required. All packages must be uninstalled using '/opt/rohde-schwarz/fbms-uninstall.sh uninstall'.

7.2 Installing the Spectrum Scale client

This section describes the Spectrum Scale client installation on your system. This procedure might be necessary after system update, or due to troubleshooting.

7.2.1 Installing under Linux

1. In the R&S®Device Manager navigate to "Maintenance > Software installer", and download the corresponding SSFS installer package.
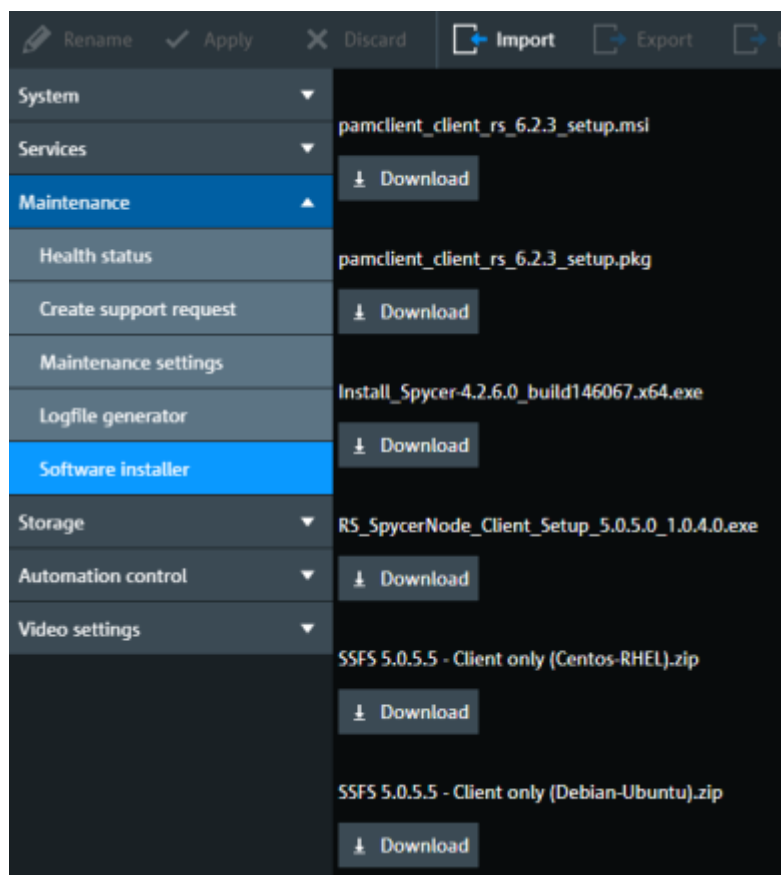
2. Unpack the corresponding archives locally.

3. Install the packages

    a) For CentOS-RHEL use the following command:

```
yum -y install gpfs.base*.rpm gpfs.docs*.rpm gpfs.gpl*.rpm
gpfs.gskit*.rpm gpfs.msg.en_US*.rpm gpfs.license.std*.rpm
```

    b) For Debian-Ubuntu use the following command:

```
dpkg --install gpfs.base*.deb gpfs.docs*.deb gpfs.gpl*.deb
gpfs.gskit*.deb gpfs.license*.deb gpfs.msg.en_US*.deb
```

4. Next, install the driver for the current Kernel:
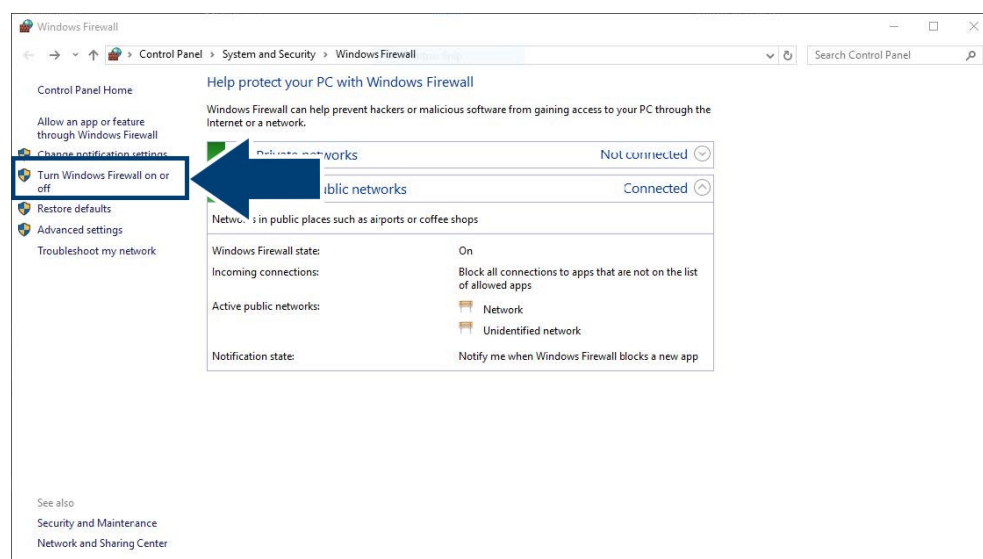
```
/usr/lpp/mmfs/bin/mmbuildgpl
```

7.2.2 Installing under Windows

Preparations

(i) If you are unfamiliar with these settings, contact your system administrator. Note that creating a new user requires a current account with administrator rights.

1. Open the Windows Control Panel to disable the Windows firewall.

2. Select "Turn Windows Firewall on or off".

3. Select "Turn off Windows Firewall" in both "Private network settings" and in "Public network settings".
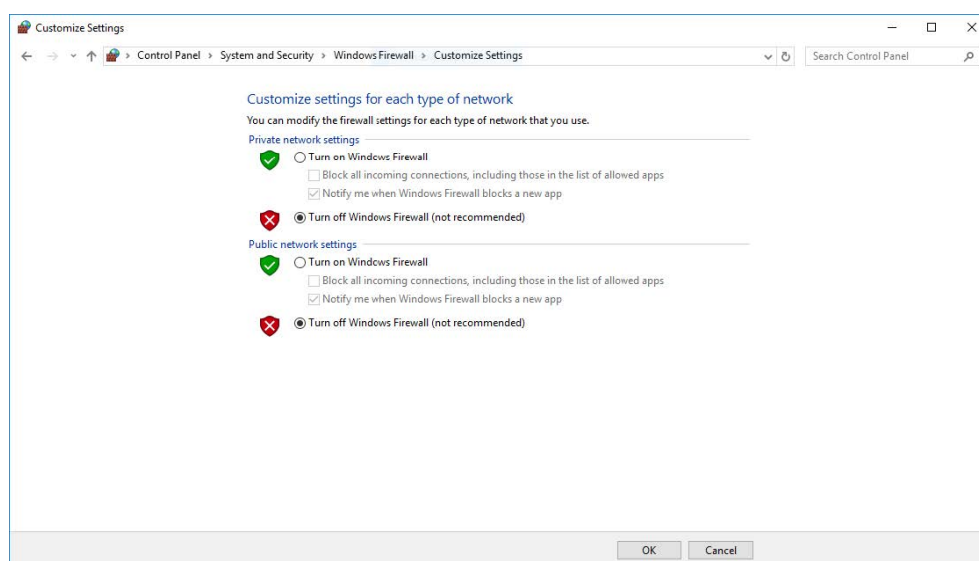
4. Confirm your changes with "OK".

5. Disable SECURE BOOT in the mainboard BIOS.

6. Unzip the file `GPFS_Client.zip to C:\`

Installing the Mellanox network card

1. Instal the network card according to the Mellanox installation manual.

2. Change the directory to:
   `C:\GPFS_Client\Network\Mellanox\MCX556AECAT-DRV`

3. In administration mode execute:
   `MLNX_WinOF2-2_0_50000_All_x64`

4. Follow the instructions on screen.

5. Select "Complete Installation".

   Note: If a firmware update is necessary it is done automatically through the installation routine.

6. Change the directory to:
   `C:\GPFS_Client\Network\Mellanox\MCX556AECAT_FW_Tools`

7. In administration mode execute:
   `WinMFT_x64_4_10_0_104`

8. Follow the onscreen instruction of the installation routine.

9. Open a Windows command shell (cmd) in administrator mode.

10. Change the corresponding directory:
    `cd c:\Program Files\mellanox\winmft`

11. Change the port type to Ethernet by using the following command:

    a) For a dual Mellanox network card:

```
mlxconfig -d /dev/mst/mt4119_pciconf0 set LINK_TYPE_P1=2
LINK_TYPE_P2=2
```

    b) For a single port Mellanox network card:

```
mlxconfig -d /dev/mst/mt4119_pciconf0 set LINK_TYPE_P1=2
```

12. Type in y to apply the Ethernet mode.

```
Device #1:
----------

Device type:    ConnectX5
PCI device:     /dev/mst/mt4119_pciconf0

Configurations:          Current New
...
        LINK_TYPE_P1    IB(1)   ETH(2)
        LINK_TYPE_P2    IB(1)   ETH(2)
...
Apply new Configuration? ? (y/n) [n] : y
Applying... Done!

-I- Please reboot machine to load new configurations.
```

Now you can proceed with the network settings.

Mellanox network card configuration
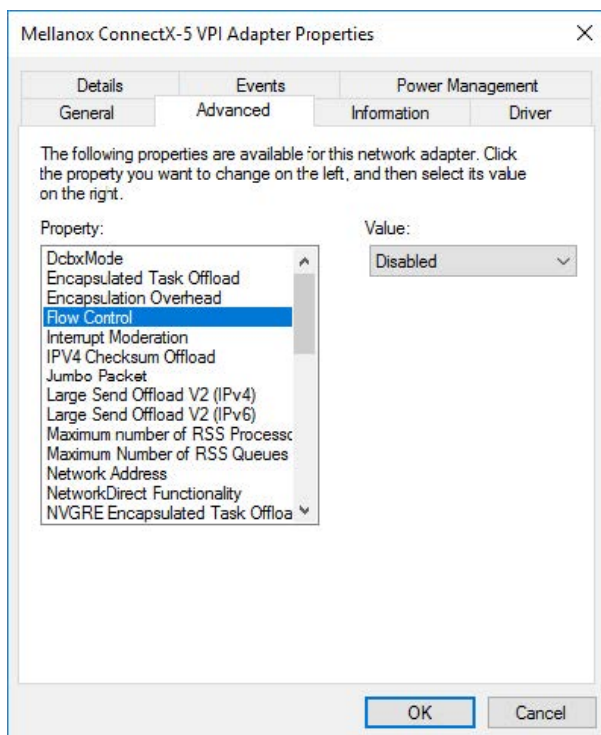
ⓘ If you are unfamiliar with these settings, contact your system administrator.

1. Open the "Mellanox ConnectX-5 VPI Adapter Properties".

2. Disable "IPv6" in the Ethernet properties.

3. Set a static IPv4 network address that is in the address area of your GPFS cluster.

4. Disable "Power Management".
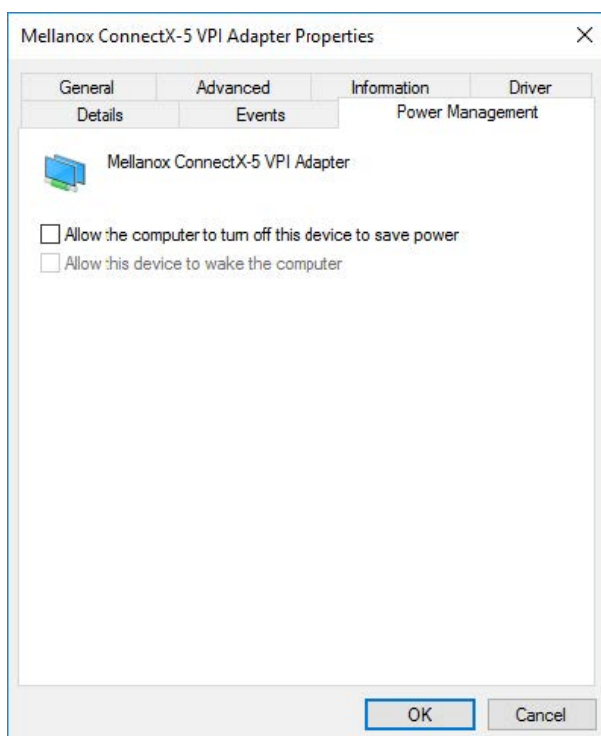
5. Disable "Flow Control".

6. Set the "Jumbo Packet" to **9014**.
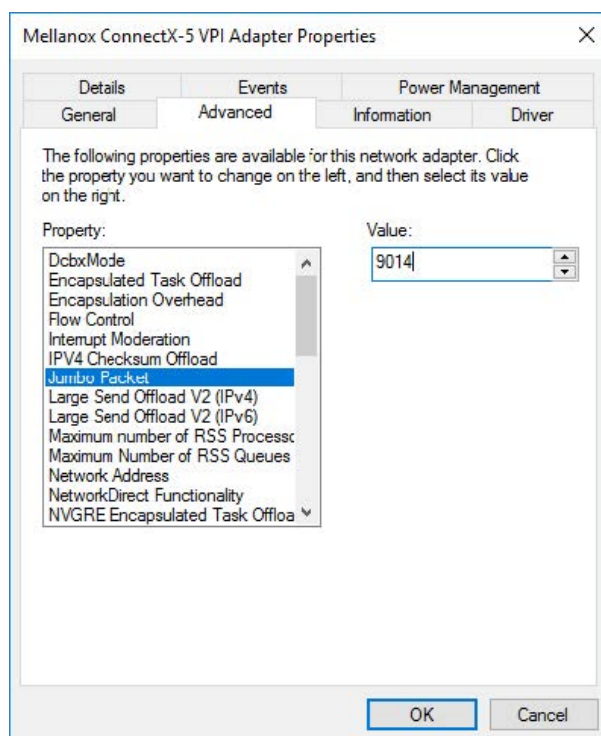
The configuration of the network card is complete.

Installing Spectrum Scale

1. In the R&S®Device Manager navigate to "Maintenance > Software installer", and download the corresponding SSFS installer package.
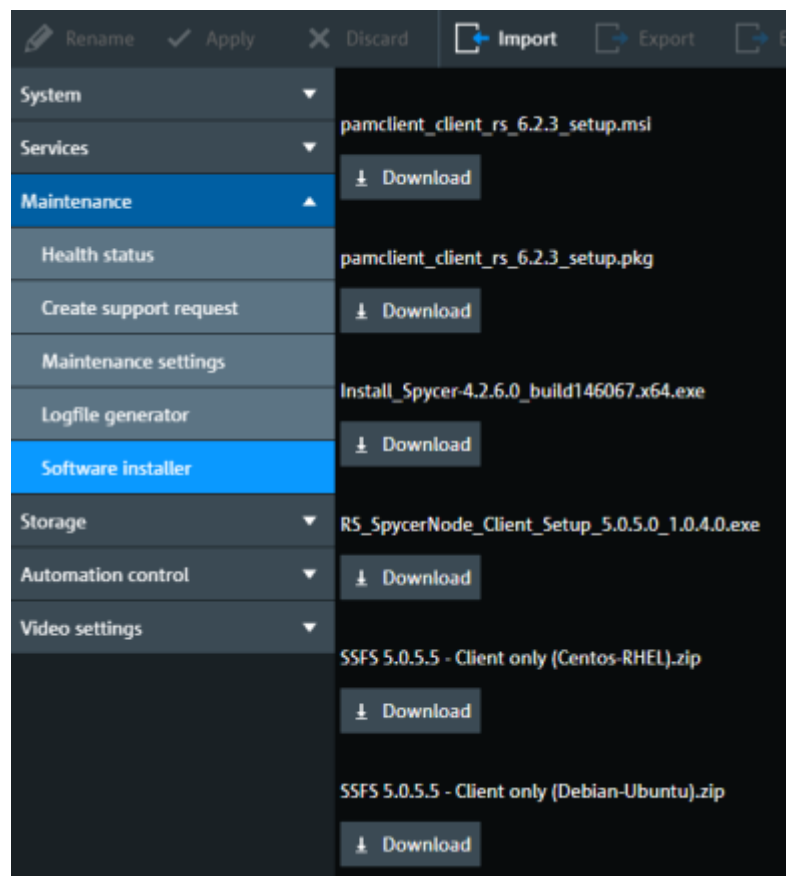
2. Execute the client installer on your client device and accept the license agreement.

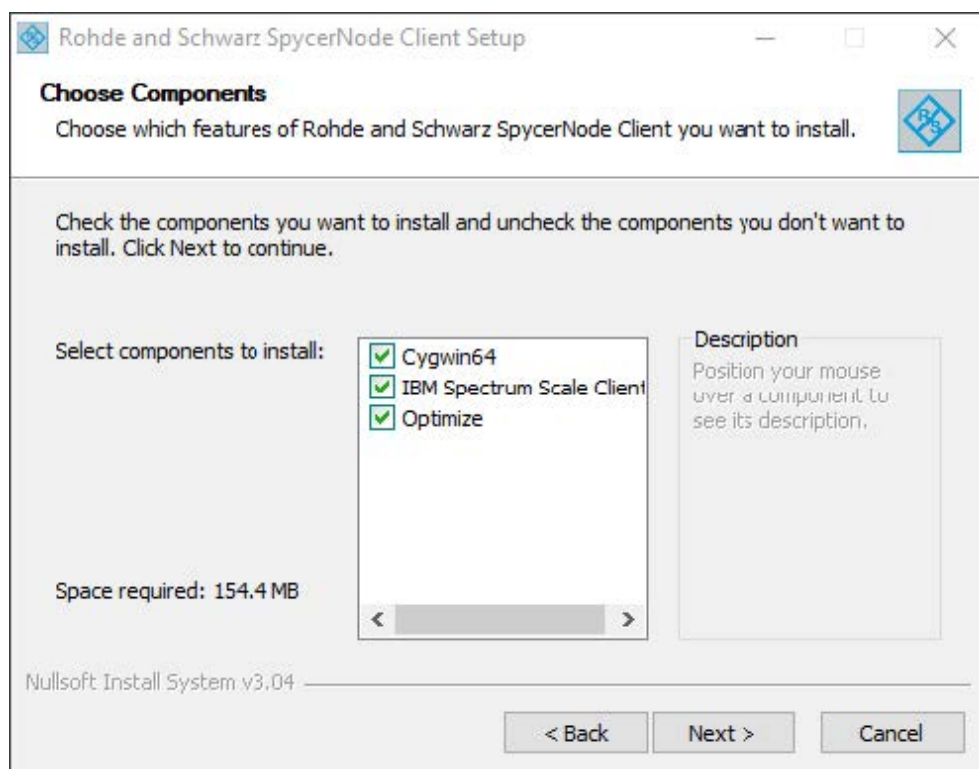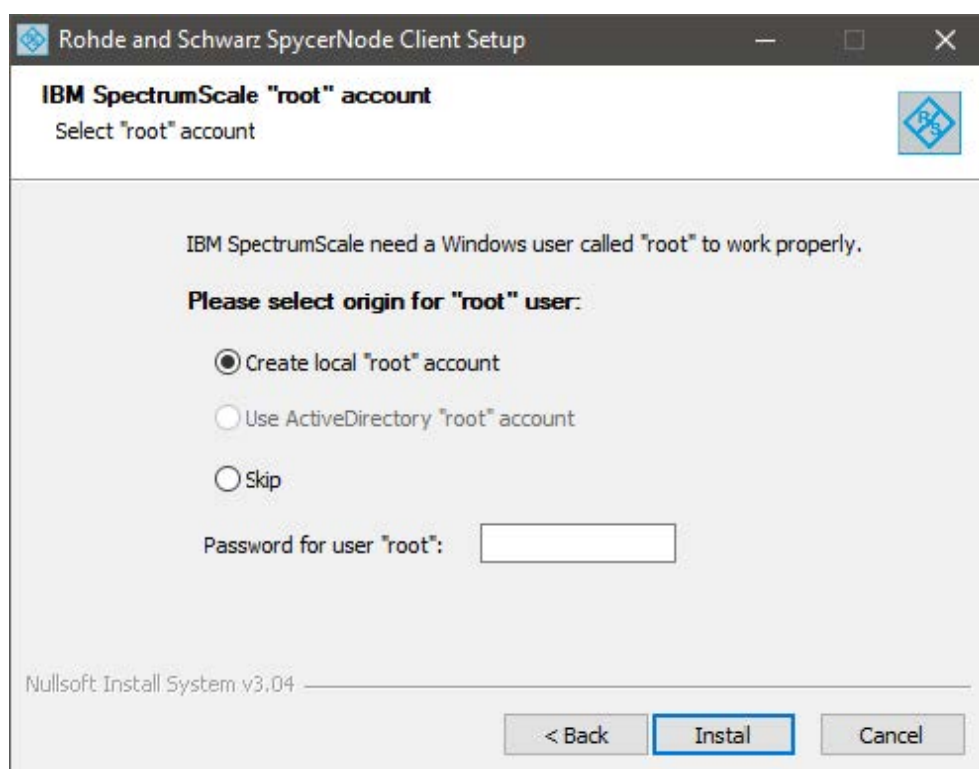3. Select all components to install.

4. Create a local "root" account with password if this hasn't been already done.

5. Confirm with "Install".

   The Spectrum Scale Client installation has been successfully completed.

7.2.3 Adding a native Spectrum Scale client to an existing cluster

1. Start Spectrum Scale on the client.

2. Copy the public SSH keys from all system controllers to the client:
   ```
   #> ssh-copy-id -o StrictHostKeyChecking=no <client hostname>
   ```

3. Login to a SpycerNode controller that is already part of the existing cluster to add the client system to the cluster.
   ```
   #> mmaddnode -N <client hostname>
   #> mmchlicense client --accept -N <client hostname>
   ```

4. Change client specific Spectrum Scale settings.

5. Set the pagepool size.
   ```
   #> mmchconfig pagepool=16G -N <client hostname> -I
   ```

   Note: The recommended pagepool size for clients is 16 GB. The minimum size for the pagepool is 2 GB.

Changing a drive letter

If you need to change the drive letter of the file system on Windows clients do the following:

1. Unmount the file system from all nodes first.
   ```
   #> mmumount -a
   ```

2. Change the drive letter (add ":" to the letter, e.g. "S:").
   ```
   #> mmchfs sno-vol0 -t <drive letter>
   ```

3. Re-mount the file system on all nodes.
   ```
   #> mmmount -a
   ```


7.2.4 Removing a native Spectrum Scale client

1. Login to a R&S storage system that is part of the cluster.

2. Shutdown Spectrum Scale on the client node.
   ```
   #> mmshutdown -N <client hostname>
   ```

3. Remove the client from the cluster.
   ```
   #> mmdelnode -N <client hostname>
   ```

## 7.3  System monitoring

You can monitor single parts of your system using SNMP data points, or you can use the R&S®Device Manager that allows you to query the state of the SpycerNode2 and single parts of the hardware. You will be able to define critical values and configure an e-mail notification as well. Remote management (IPMI) is also possible via the R&S®Device Manager.

### 7.3.1  Monitoring through SNMP

The Simple Network Management Protocol (SNMP) is a standard Internet protocol for the device management in IP networks. SNMP allows you to e.g. monitor and query the state of several SpycerNode devices in a network or single parts of the hardware.

SpycerNode provides a **RS-SPYCERNODE-V1-MIB** that allows you to query the state of the system or parts of it, using SNMP. To access the MIB file via the Device Manager navigate to "Maintenance" > "Software installer" and download the "rs-snmp-mibs.zip" package.
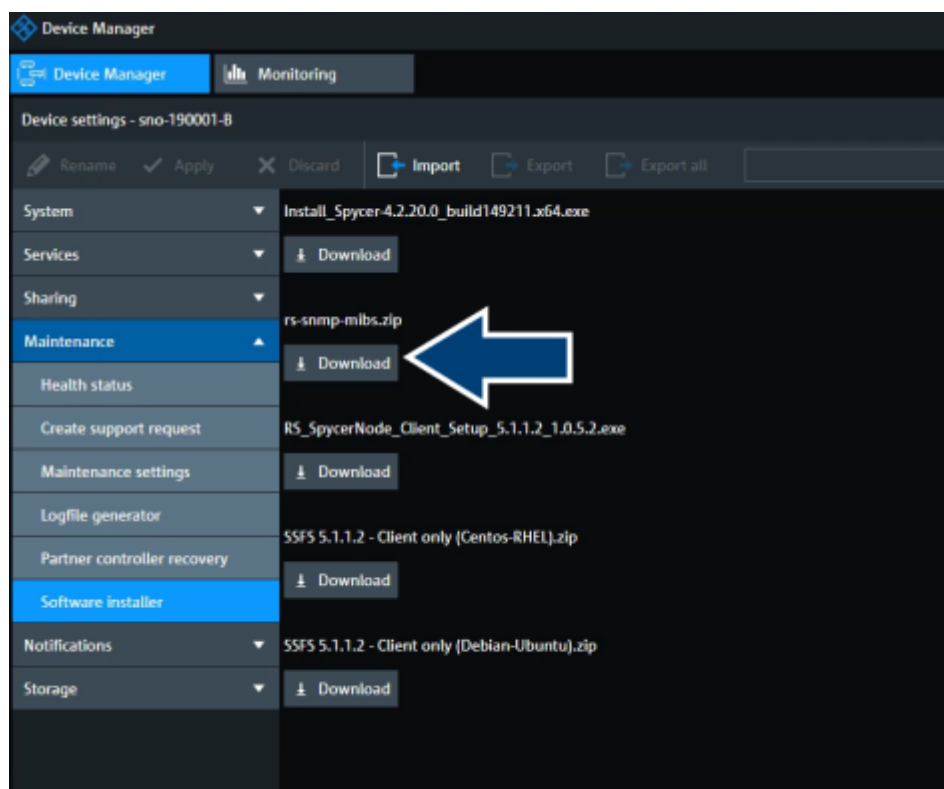


| File | OIDs | Object | Value |
|---|---|---|---|
| RS-SPYCERNODE-V1-MIB | .1.3.6.1.4.1.2566.127.1.4.1.6.1.1.1.12.1.0 | Chassis Fan 1 | RPM (Rounds per minute) |
| | .1.3.6.1.4.1.2566.127.1.4.1.6.1.1.1.12.2.0 | Chassis Fan 2 | |

| File | OIDs | Object | Value |
|------|------|--------|-------|
| | .1.3.6.1.4.1.2566.127.1.4.1.6.1.1.1.1 2.3.0 | Chassis Fan 3 | |
| | […] | […] | |
| | .1.3.6.1.4.1.2566.127.1.4.1.6.1.1.1.1 3.1.0 | Chassis Temp 1 | Temperature in °C |
| | .1.3.6.1.4.1.2566.127.1.4.1.6.1.1.1.1 3.2.0 | Chassis Temp 2 | |
| | .1.3.6.1.4.1.2566.127.1.4.1.6.1.1.1.1 3.3.0 | Chassis Temp 3 | |
| | […] | […] | |
| | .1.3.6.1.4.1.2566.127.1.4.1.6.1.1.1.1 4.1.4.0 | Status System Disk 1 | "OK"/"Critical"/"Not installed" |
| | .1.3.6.1.4.1.2566.127.1.4.1.6.1.1.1.1 4.2.4.0 | Status System Disk 2 | |
| | .1.3.6.1.4.1.2566.127.1.4.1.6.1.1.1.1 4.3.4.0 | Status System Disk 3 | |
| | […] | […] | |
| | .1.3.6.1.4.1.2566.127.1.4.1.6.1.1.1.1 0.1.3.0 | Status PSU | "OK"/"Critical" |
| | 1.3.6.1.4.1.2566.127.1.4.1.6.1.1.1.10 .1.3.0 | Status PSU | |

## 7.3.2  Monitoring through the R&S®Device Manager

The Device Manager monitors critical system components in realtime and displays the gathered information.

The Health Panel for the SpycerNode2 provides both visual and statistics details about the status of the system components. The panel can be accessed by selecting the corresponding system and navigating to "Maintenance > Health status".

SNOMK2
SNOMK2-Main-Local



**1**

SNOMK2-Main-Remote



**2**

SNOMK2-JBODChassis 1



**3**



| 1-29 | 1-30 | 1-31 | 1-32 | 1-33 | 1-34 | 1-35 | 1-36 | 1-37 | 1-38 | 1-39 | 1-40 | 1-41 | 1-42 | 2-29 | 2-30 | 2-31 | 2-32 | 2-33 | 2-34 | 2-35 | 2-36 | 2-37 | 2-38 | 2-39 | 2-40 | 2-41 | 2-42 |

**4**

| 1-15 | 1-16 | 1-17 | 1-18 | 1-19 | 1-20 | 1-21 | 1-22 | 1-23 | 1-24 | 1-25 | 1-26 | 1-27 | | | 2-16 | 2-17 | 2-18 | 2-19 | 2-20 | 2-21 | 2-22 | 2-23 | 2-24 | 2-25 | 2-26 | 2-27 | 2-28 |

| 1-1 | 1-2 | 1-3 | 1-4 | 1-5 | 1-6 | 1-7 | 1-8 | 1-9 | 1-10 | 1-11 | 1-12 | 1-13 | 1-14 | 2-1 | 2-2 | 2-3 | 2-4 | 2-5 | 2-6 | 2-7 | 2-8 | 2-9 | 2-10 | 2-11 | 2-12 | 2-13 | 2-14 |

Drawer 1 (top)            Front                    Drawer 2 (bottom)          Front

| Chassis 1 alarm_state | OK |
|---|---|
| Chassis 1 btu_consumption | 3999BTU/h |
| Chassis 1 CanisterSN 1 | IMS0989198G145E |
| Chassis 1 CanisterSN 2 | IMS0989198G100T |
| Chassis 1 ID | SP-3584-E12EBD |
| Chassis 1 power_consumption | 1173W |

**5**

▶ Disk State

▶ Fan Speed

▶ Temperature

▶ Power Supply Unit

▼ Cache



**6**

Maximum Cache Capacity: 4000000 MB

Currently Cache in use: 0 MB

0.00 % in use

| 1 | Main Local | Currently selected storage controller (indicated as "Local"). The graphic displays the status of the power supply units. |
|---|---|---|
| 2 | Main Remote | Second storage controller (indicated as "Remote"). If clicked on, it becomes the currently selected controller.  |
| 3 | Storage unit (JBOD) | The graphic displays the status of the power supply units, and the cooling fans.<br><br>If your system consists of several storage units, those will be also additionally displayed here (Chassis \<number>). |
| 4 | Disk arrays status. | Displays graphically the state of each disk drive within the arrays. Green indicates normal operation, red indicates malfunction or total failure. |
| 5 | Components status | The first section displays general information on the main components of the system. In the second section, each component category is separated in a drop-down menu and can be extended to view the details on any single component. |
| 6 | Dynamic media cache | Shows the state of the NVMe disks, their overall capacity, and the capacity currently in use. |

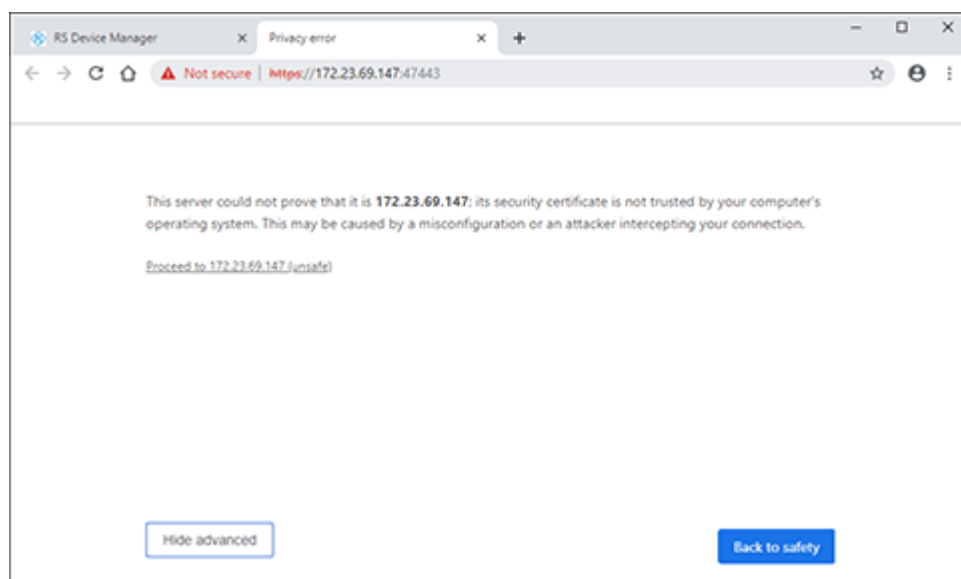### 7.3.3 Monitoring the disk arrays

1. Open the R&S®Device Manager on your local system.

2. Select "Storage monitoring" in the settings menu.
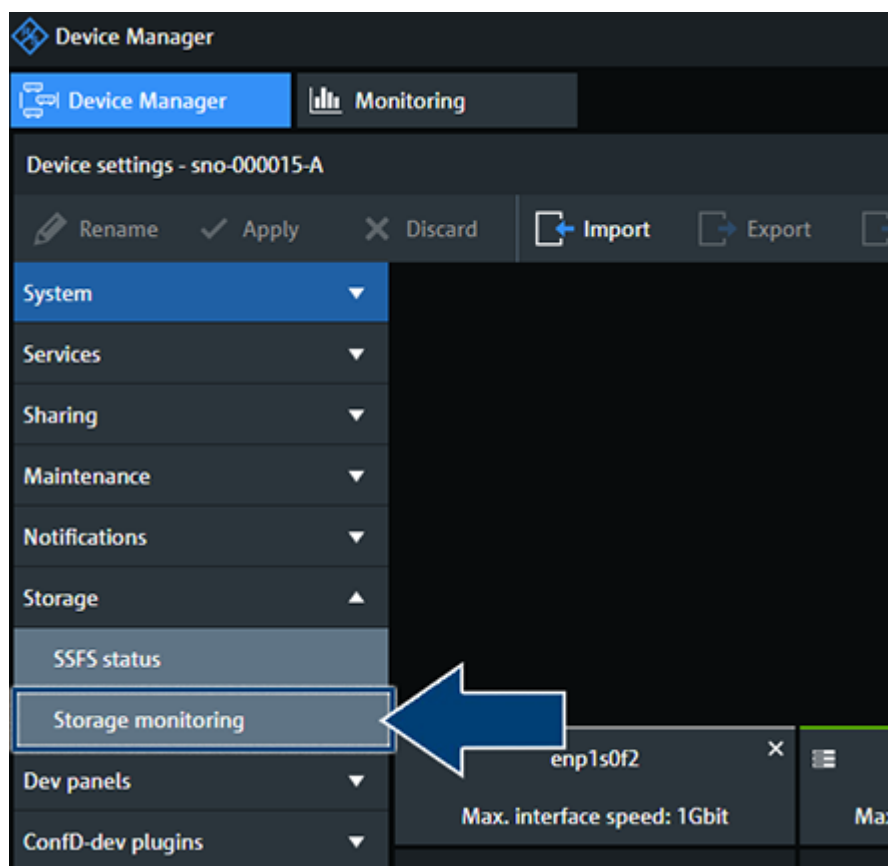
3. If you open this tab for the first time you will get a "Not secure" note. Select "Advanced" to continue.
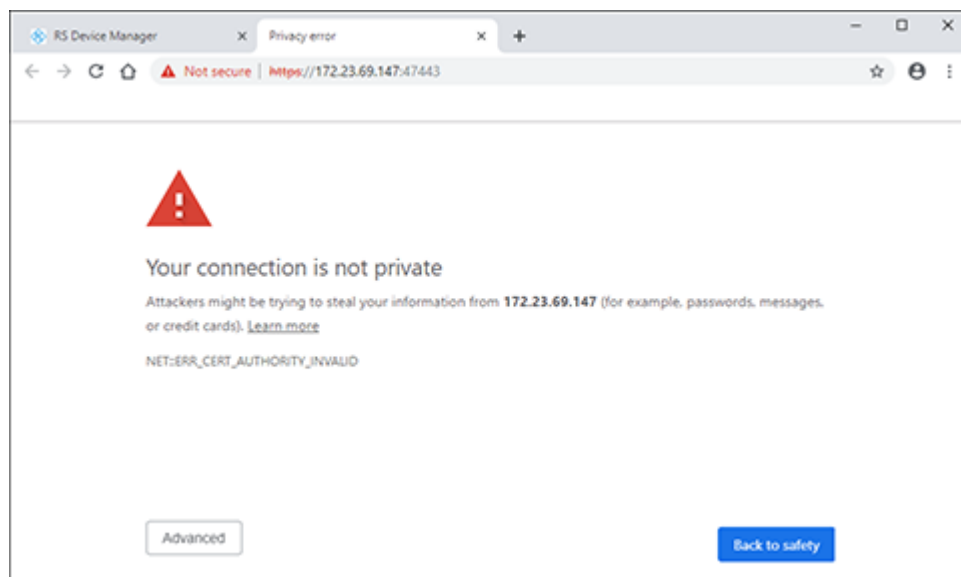


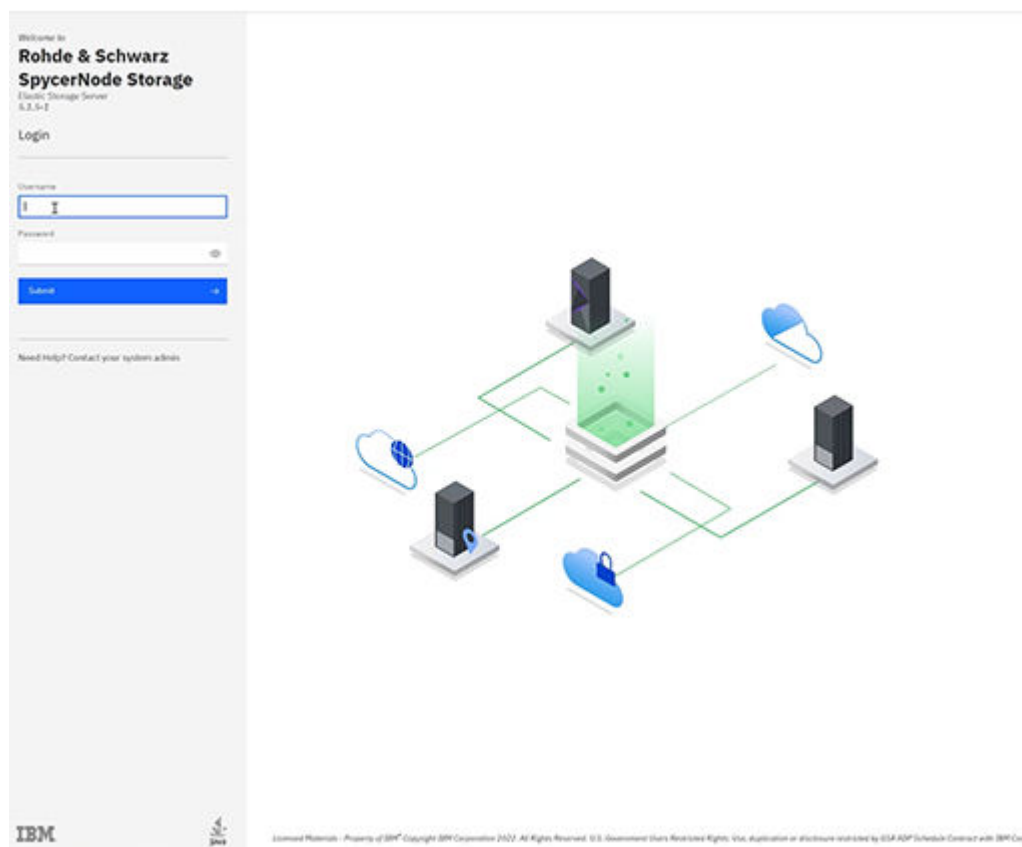4. Select "Proceed to xxx.xx.xx.xxx (unsafe) to continue.
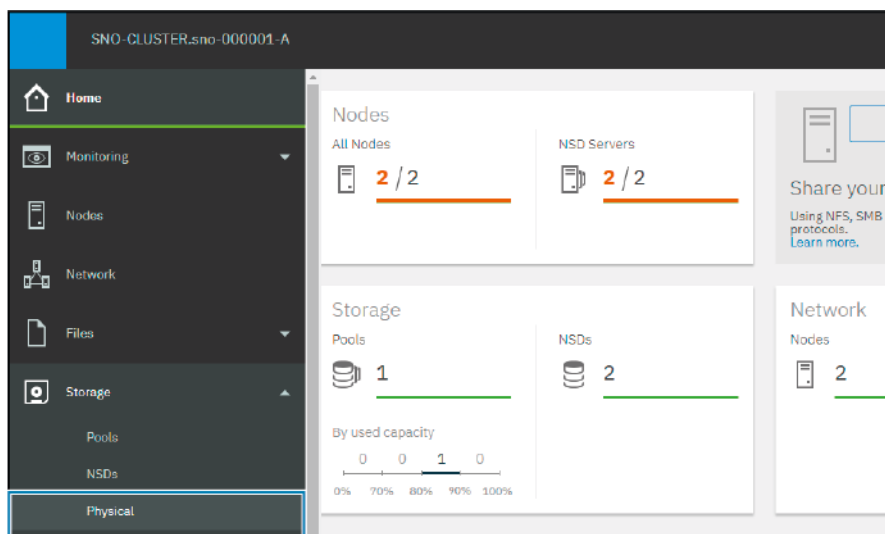
The login window of the monitoring interface opens.

5.  Enter username and password. The default credentials are given below:
    **username: admin - password: admin001**



6.  Select "Physical" in the "Storage" menu.

7. If necessary select one of the arrays to get more information.

   If you have to replace a disk array follow the instructions in Chapter 8.2.1, "Replacing a drive carrier", on page 107

## 7.4 System administration

This chapter describes the procedures on how to recover the system after having exchanged a the storage controllers.

### 7.4.1 System image recovery

This section describes the procedures on how to recover the system image.

#### 7.4.1.1 Preparing a bootable USB drive

This instructions guide you through the process of preparing a bootable USB drive to be able to create a backup system image. The same drive will be then used to recover the system disk image.

**Downloading the R&S backup software**

1. If not already registered in GLORIS, the Rohde & Schwarz Service and Support portal, please do so to get access to the download area: https://gloris.rohde-schwarz.com/rs.com~extnet~app~registration~web/form/register.

   **Note:** After an initial registration, your new profile will be checked and verified by Rohde & Schwarz. As this is not an automated process, it may take a while before you can proceed.

2. Login with your credentials to the GLORIS system: https://idp1.aaa.rohde-schwarz.com/logon/LogonPoint/tmindex.html.

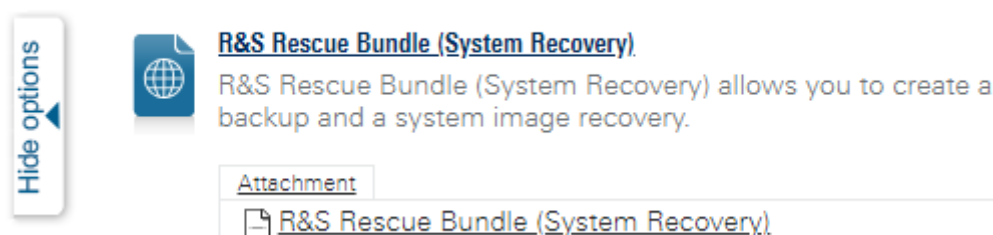3. Upon successful login, navigate to "Support & Services > My Products > Broadcast & Media".

4. Depending on the number of product groups you have access to, you will find a different amount of products on the page. Select the Media storage tab and select your product.

5. Set the filter to Firm-/Software and search for "R&S RESCUE BUNDLE (SYSTEM RECOVERY)".
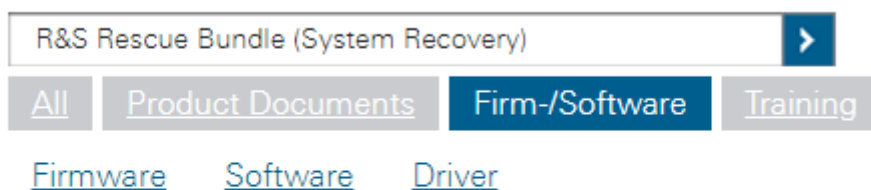


6. Download the archive file and store it on a Window system for further use.

   Proceed next with the creation of the installation media.

**Creating the installation media**

In this instruction sequence we will use the software bundle downloaded in the previous instruction to prepare a bootable flash drive.

ⓘ  This procedure is only possible on a Windows operating system.

1. Prepare an empty USB drive. The device should have the following specifications:

| Size | 32 GB or more |
|------|---------------|
| Type | USB 3 |

2. Unzip the archive on your Windows system. It contains two main programs:

| | |
|---|---|
| **Rufus-3.4.exe** | Rufus is a third-party utility that helps format and create bootable USB flash drives, such as USB keys, or memory sticks. |
| **rus-rescue-v-2.4.iso** | R&S imaging and cloning tool used to create backups and restore system images. |

3. Connect the USB drive to the system.

4. Execute the **Rufus-3.4.exe** software (version 3.4.1430 or higher).

5. Click the "SELECT" button to navigate to the ISO file.
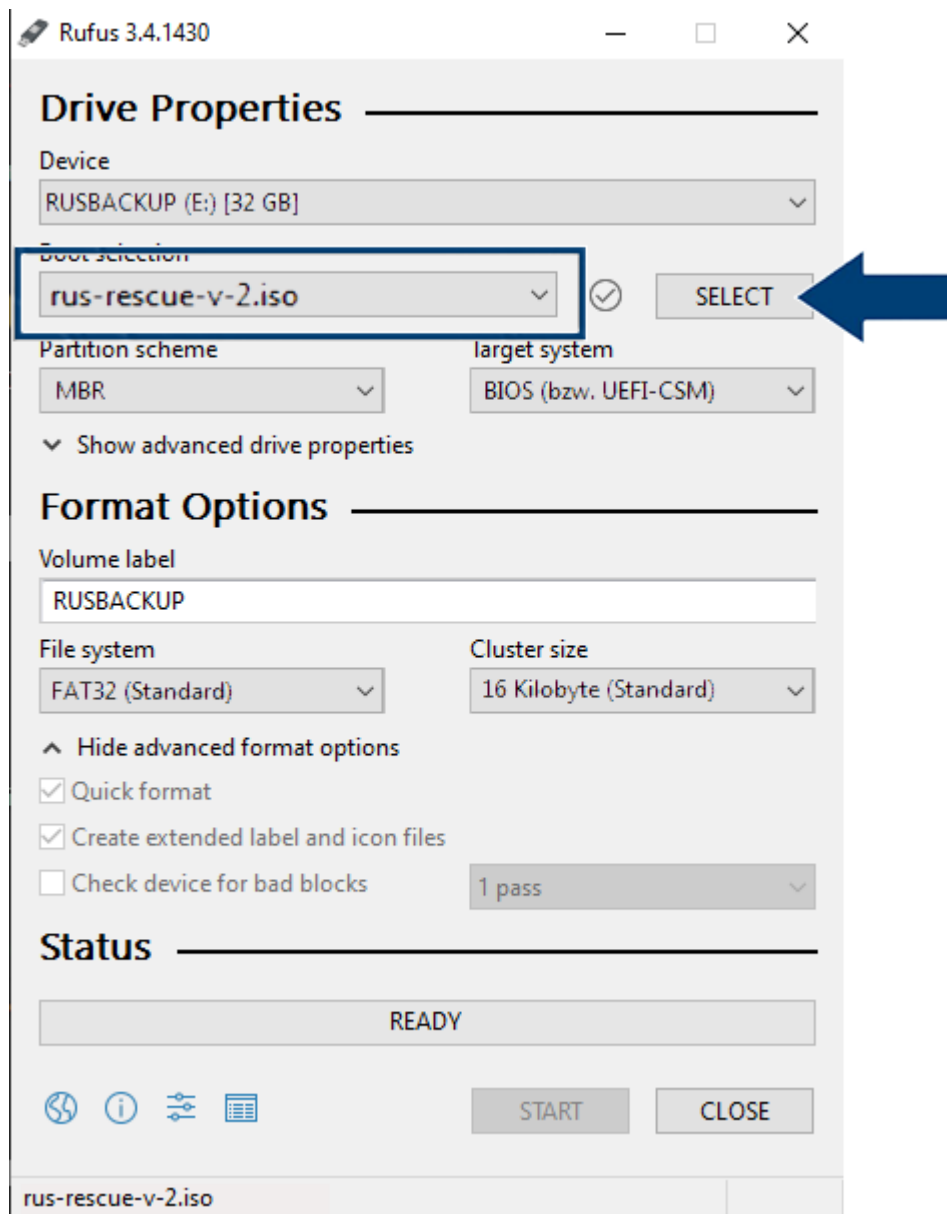


6. 6. Enter RUSBACKUP as volume label, select FAT32 as file system, and 16 kB for the cluster size.
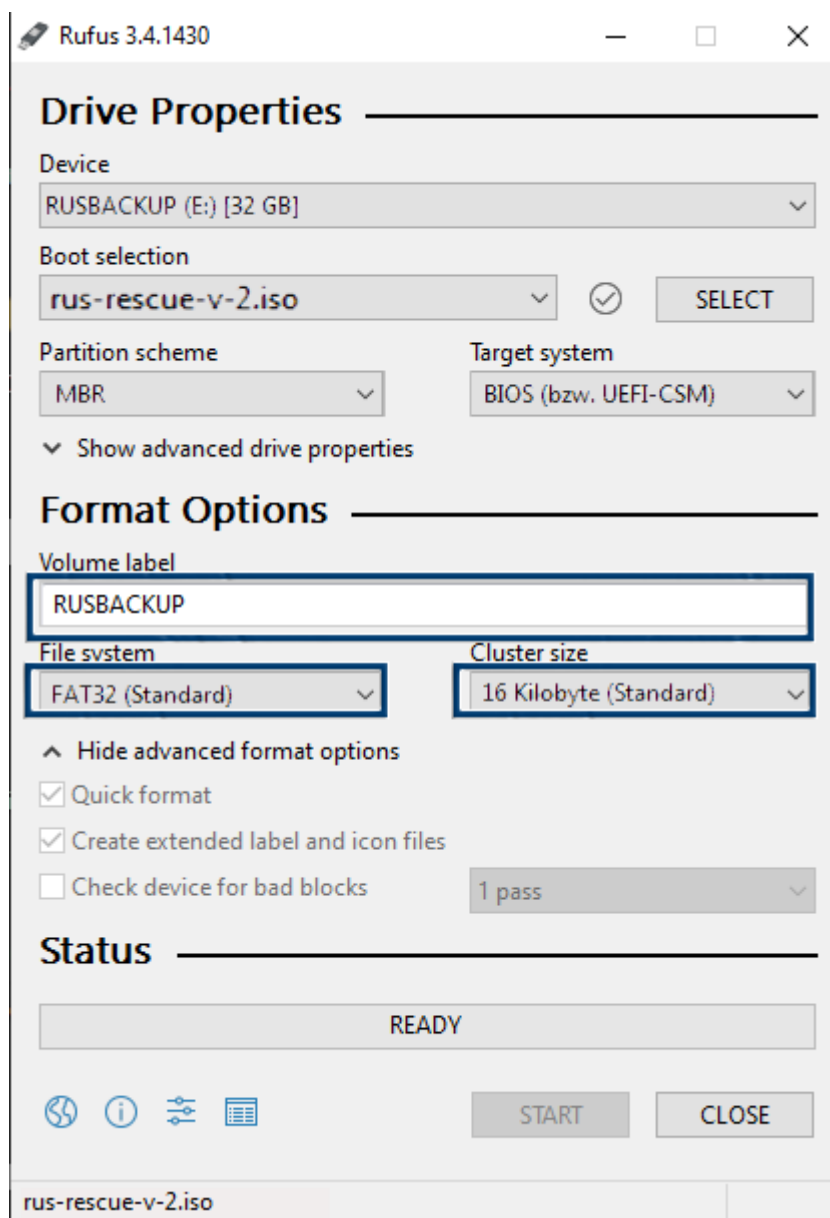
7. Initiate the process with the "START" button.
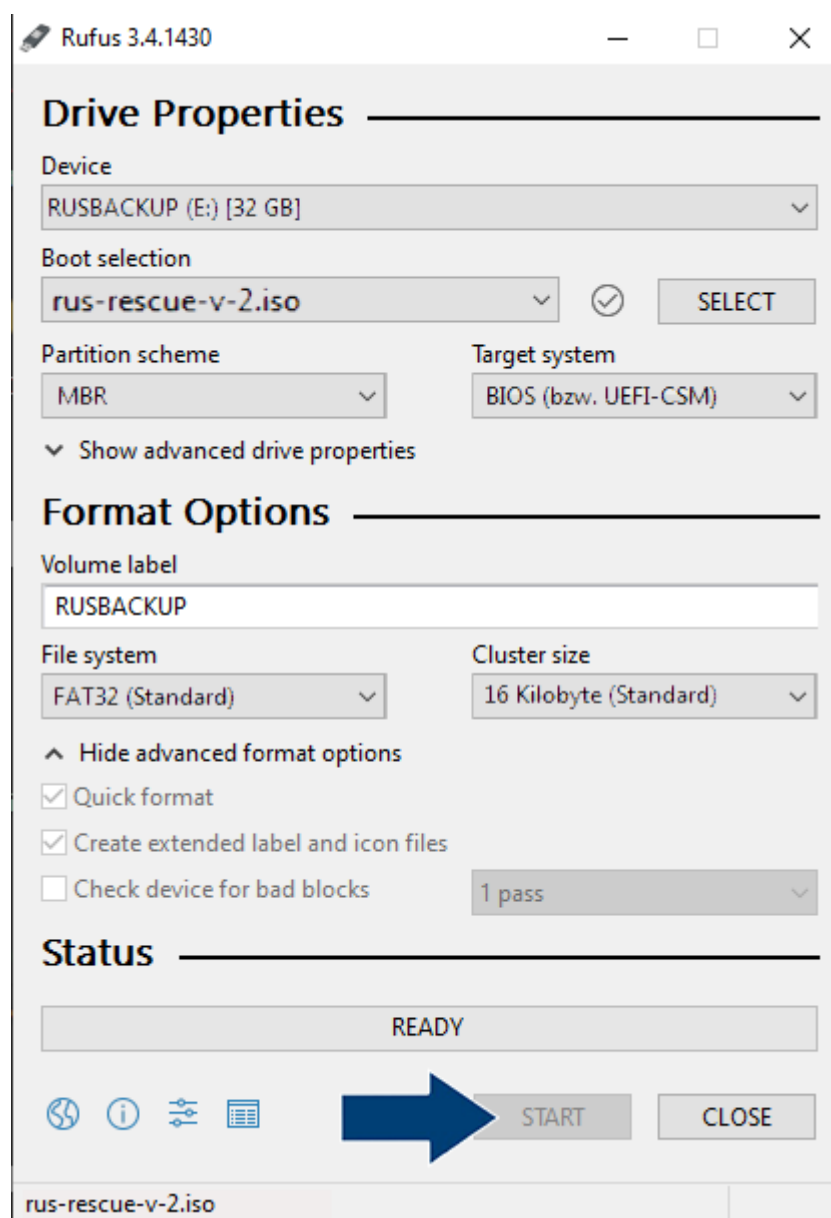
USB flash drive is now ready for use.

### 7.4.1.2 Creating a backup image

The following describes the steps to make a backup image of the current system disk and save it to the USB flash drive.

1. If appropriate, disconnect all externally connected storage devices from the system.

2. Connect the bootable USB flash drive created in Chapter 7.4.1.1, "Preparing a bootable USB drive", on page 94.

3.  Turn on the system. At the indicated moment during start-up you have to press [F11] to enter the boot menu.

4.  Select the USB flash drive as the boot device.

```
              Rohde & Schwarz Rescue Tools

    RuS Rescue
    Local operating system in harddrive (if available)
    Memory test using Memtest86+

                  Press [Tab] to edit options

  * RuS Rescue Tools based on Clonezilla Live Version.
  * Please observe that the RuS backup and recovery feature
    was developed exclusively for R&S hardware and is not
    intended for devices of other manufacturers.
  * For possible malfunctions, damages or losses associated
    with the usage of the feature on non-DVS hardware,
    R&S offers no support and cannot be held liable.
```
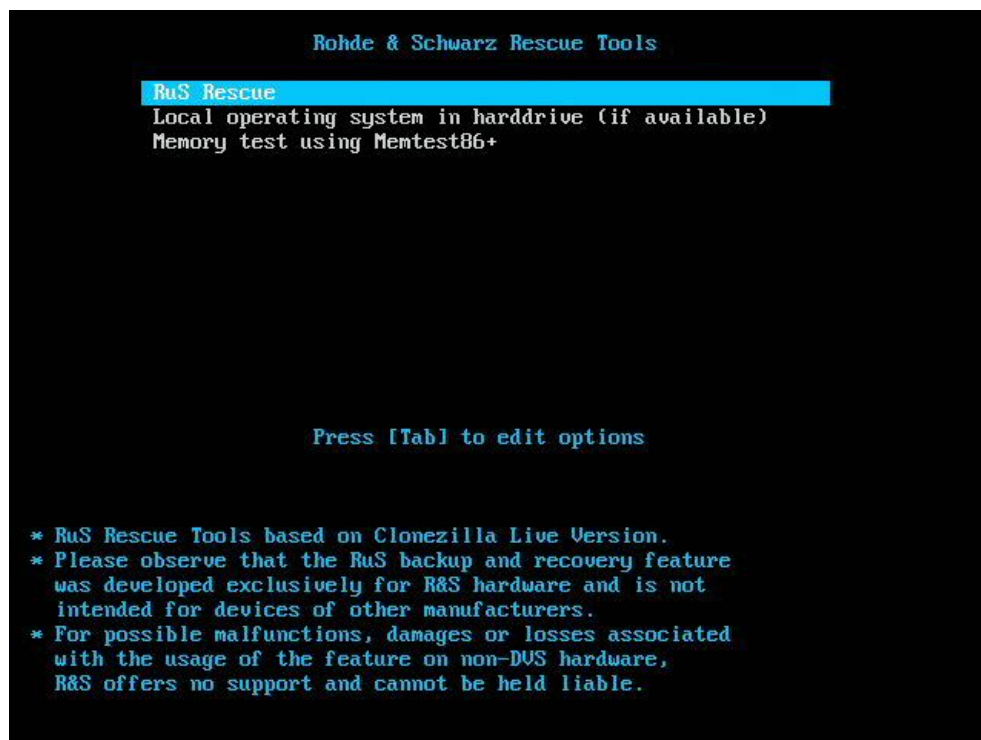
5.  Press "Enter". The system will boot from the USB flash drive. You will see a window on the screen where you can select the R&S Rescue environment for loading.

    **Note:** To complete the loading of the R&S Rescue environment some user entries are required. For this follow the instructions given on the screen.
    The loading of the environment and the process itself will both try to initialize hardware that may not be present on your system. Any error messages displayed during loading/initialization, e.g. "Failed" or "Warning", can be disregarded. The backup/recovery process should work nonetheless.

6.  Select RuS Rescue and press "Enter".
    Once the loading has finished, you will see the RuS Rescue script with its options on the screen. Your display should look similar to the following:

```
--- RuS Rescue ---

1 - Backup on internal USB device
2 - Restore from internal USB device
3 - Backup on self selected external device
4 - Restore from self selected external device
5 - Reboot the system
6 - Poweroff the system

0 - Exit

Enter selection:
```

Note: If you do not perform any action, RuS Rescue will be loaded automatically after 30 seconds.

7. **NOTICE!** Data loss. Selecting the wrong source device may lead to an unwanted configuration and malfunctions when the system is operating.
   Continue with the following steps only if you are able to identify the correct source device.

   To create a backup image of your system disk and save it to the USB flash drive, press [1] and then [Enter].

   A list of possible source devices will be detailed on the screen. The system disk normally is the 'ATA' disk with, for example, 'sda', 'sdb' or 'sdc' as its device name (e.g.: **1:0:0:0 disk ATA <device info> /dev/sda**).

   Note: Ex factory the system will be delivered with 'sda' as the default system disk. If other configurations have been made later or on customer request, this may be different.

8. Enter the name of the system disk: Type in e.g. sda (or in other cases "sdb", "sdc", etc.) and press [Enter]

   The system will ask you to enter the image name for the backup image to be saved to the USB flash drive. By entering the name of an already existing backup image you can overwrite it.

9. Type in the name of the image you want to save to the USB flash drive for a later recovery. To confirm your entry press [Enter].

   The system will ask you to confirm your selection and whether you want to continue:

   Note: To abort the process at this point enter "n" for 'no' and press [Enter]. You will be redirected to the RuS Rescue script.
   After starting the process its termination is no longer possible.

10. To start the backup process type in "y" for 'yes' and press [Enter].

    The program starts the backup process. Its progress will be indicated on the screen.

    Note: The backup process may take some time.

If during the process the screen turns black, press [Space] to get it back again.

When the system has finished the backup process, you will be notified about this. Then after pressing [Enter], you will be redirected to the R&S Rescue script once more where you can choose, for example, 'reboot' or 'poweroff' to restart or turn off the system.

7.4.1.3 Restoring the system

The following section describes the steps to make a recovery of the system disk.

> **NOTICE**
>
> **Total loss of data**
> Selecting the wrong device for restoring the system partition will lead to a total loss of data.
> Do not execute any commands if you are not sure about the correct target device.

1. If appropriate, disconnect all externally connected storage devices from the system.

2. Connect the bootable USB flash drive created in Chapter 7.4.1.1, "Preparing a bootable USB drive", on page 94.

3. Turn on the system. At the indicated moment during start-up you have to press [F11] to enter the boot menu.

   The boot menu is displayed on the screen.

4. Select the USB flash drive as the boot device and press [Enter].

   The system will boot from the USB flash drive. You will see a window on the screen where you can select the R&S Rescue environment for loading.

   Note: To complete the loading of the R&S Rescue environment some user entries are required. For this, follow the instructions given on the screen.
   The loading of the environment and the process itself will both try to initialize hardware that may not be present on your system. Any error messages displayed during loading/initialization, e.g. "Failed" or "Warning", can be disregarded. The backup/recovery process should work nonetheless.

5. Select RuS Rescue and press [Enter].

   Once the loading has finished, you will see the R&S Rescue script with its options on the screen. Your display should look similar to the following:

```
--- RuS Rescue ---

1 - Backup on internal USB device
2 - Restore from internal USB device
3 - Backup on self selected external device
4 - Restore from self selected external device
5 - Reboot the system
6 - Poweroff the system

0 - Exit

Enter selection:
```

Note: If you do not perform any action, RuS Rescue will be loaded automatically after 30 seconds.

6. **NOTICE!** Data loss. A recovery will overwrite all your data.
   Continue with the following steps only when you are able to identify the correct target device.

   To restore your system disk from the USB flash drive, press [2] and then [Enter].

   A list of possible source devices will be detailed on the screen. The system disk normally is the 'ATA' disk with, for example, 'sda', 'sdb' or 'sdc' as its device name (e.g.: **1:0:0:0 disk ATA <device info> /dev/sda**).

   Note: Ex factory the system will be delivered with 'sda' as the default system disk. If other configurations have been made later or on customer request, this may be different.

7. Enter the name of the system disk: Type in e.g. "sda" (or in other cases "sdb", "sdc", etc.) and press [Enter].

   A further list of possible source images will be detailed on the screen. If there is only the R&S recovery image on the USB flash drive, this one will be listed. If there are several images, all images will be displayed.

8. . Select the image you want to use for the recovery. Normally, it provides the serial number of the SpycerNode system in its name. To confirm your choice press [Enter].

   The system will ask you to confirm your selection and whether you want to continue.

   Note: To abort the process at this point enter "n" for 'no' and press [Enter]. You will be redirected to the RuS Rescue script.
   After starting the process its termination is no longer possible.

9. To start the recovery process type in "y" for 'yes' and press [Enter].

   The program starts the recovery process. Its progress will be indicated on the screen.

   Note: The recovery process may take some time.

If during the process the screen turns black, press [Space] to get it back again.

When the system has finished the recovery process, you will be notified. Then after pressing [Enter], you will be redirected to the RuS Rescue script once more where you can choose, for example, 'reboot' or 'poweroff' to restart or turn off the system. The next time the system is started, it will load the restored operating system.

7.4.2 Storage controller recovery

This chapter describes the procedure on how to recover the system e.g. after exchanging a failed storage controller.

Replacing a controller

Make sure a replacement unit is available before removing the failed storage controller.

1. Disconnect all power and network cables from the controller to be replaced.

2. Remove the controller completely from the rack.

3. Mount the new controller unit into the rack, see Chapter 4.2.1, "Mounting the system into a rack", on page 42.

4. Install the new controller unit as described in Chapter 4.1, "Preparing for use", on page 39, Chapter 4.2.3, "Connecting to power source", on page 49, Chapter 4.2.4, "Connecting controllers and JBOD modules", on page 50, and Chapter 4.2.5, "Connecting to networks", on page 57.

Partner controller recovery

This option allows you to re-install a recovery image, e.g. after having exchanged a failed storage controller. This backup image is created each day interchangeably, meaning controller "A" stores the image of controller "B" and vice versa.

⚠ **CAUTION**

Data loss

Starting the process will erase the memory of the partner controller. During the recovery the partner controller is occupied and not available. Recovery takes about 50 minutes.

1. After having exchanged a controller module, log in to its partner controller in the Device Manager and open the settings menu.

2. Navigate to "Maintenance" > "Partner controller recovery".
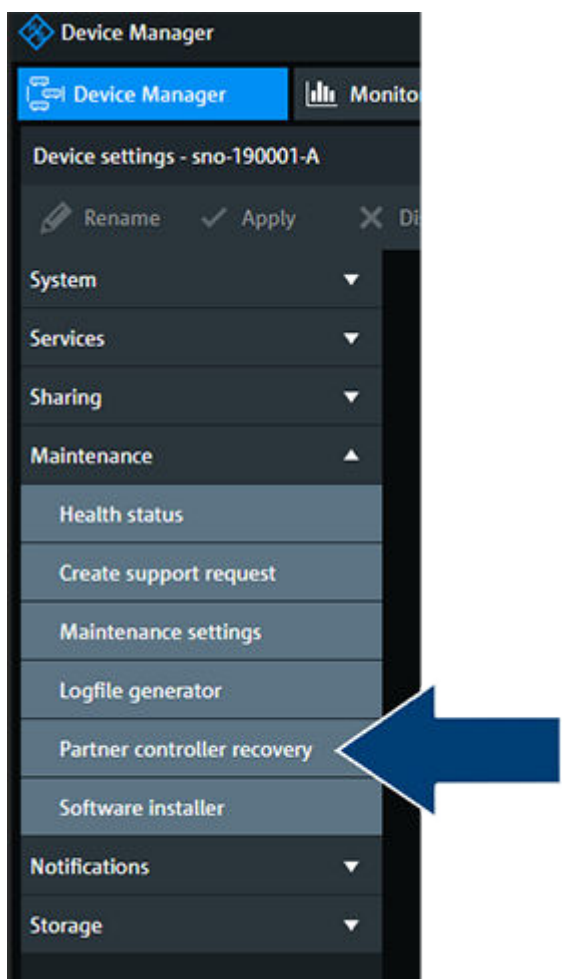
3. Selcet "Recover".

4. Click "Start" to initiate the automated recovery process. Thereat, the backup image stored on the active controller will be installed on the replacement unit.
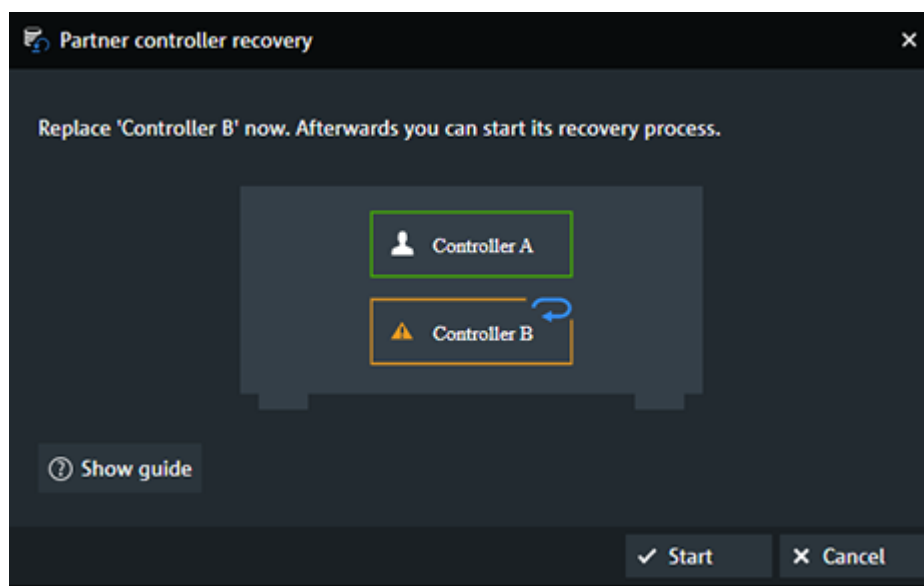
5. The recovery procedure is now initiated. The progress of each of the steps is indicated on the screen.

    Note: Please note that the process may take up to 50 minutes.

6. The recovery image is now installed on the replaced controller. Click "Finish" to exit the dialog.

Progress:

Prepare recovery procedure	✓
Powercycle remote canister	✓
Booting recovery operating system	✓
Preparing file system	✓
Restore operating system and configuration	✓
Reboot	✓
Reboot into restored operating system	✓
Applying necessary hardware settings	✓
Applying required firmware updates	✓
Reboot	✓
Reboot to apply firmware upgrades	✓
Finish remaining firmware updates	✓
Restoring NVR cache system disk partitions	✓
Finish restore procedure	✓

8 Maintenance

This chapter explains the maintenance work that you can perform on your own. For each work a detailed procedure description is given. If you experience trouble with the system that cannot be resolved with the work described here, please contact your local vendor or Rohde & Schwarz directly.

8.1 Safety

This equipment must be installed or serviced by trained personnel. We assume you are qualified in the servicing of equipment and trained in recognizing hazards energy levels in products. Access to the equipment is by the use of a tool, lock and key, or other means of security, and is controlled by the authority responsible for the location.

Please observe the following safety measures when performing maintenance tasks:

- Electrical grounding is required for operator safety and correct system function. Proper grounding of the electrical outlet can be verified by a certified electrician.
- Computer hardware contains components that are sensitive to electrostatic discharge. If you touch them without precautionary measures, they can be destroyed. It is recommended that you fit and check a suitable anti-static wrist or ankle strap and observe all conventional END precautions when handling plug-in modules and components. Avoid contact with midplane components and module connectors.
- Always have available a replacement or blank module before removing the old module. When you replace a module, you must never leave an empty bay in the rear of the enclosures.
- All rear modules are part of the enclosures and may be only removed when a replacement can be immediately installed. The system must not be operated without all modules in place.
- Unplug the system before you move it or think it might be damaged in any way.
- Do not remove cooling fans, PSUs or JBOD modules unless you have a replacement of the correct type ready to install.
- Adequate space around the system must be spared to allow the cooling system to work properly. Leave approximately 50 mm (2.0 in.) of open space around the front and rear of the enclosures. Do not place any object in front of the cooling modules.

8.2 Storage unit (JBOD) maintenance

This chapter describes maintenance task for the storage unit.

8.2.1 Replacing a drive carrier

This section describes the process of replacing a defective drive carrier.

Identifying a defective drive

1. Open the R&S Device Manager and navigate to the drive monitoring interface as described in Chapter 7.3.3, "Monitoring the disk arrays", on page 91.
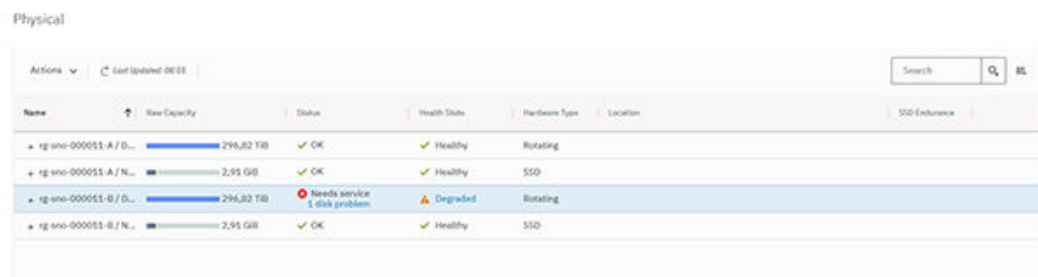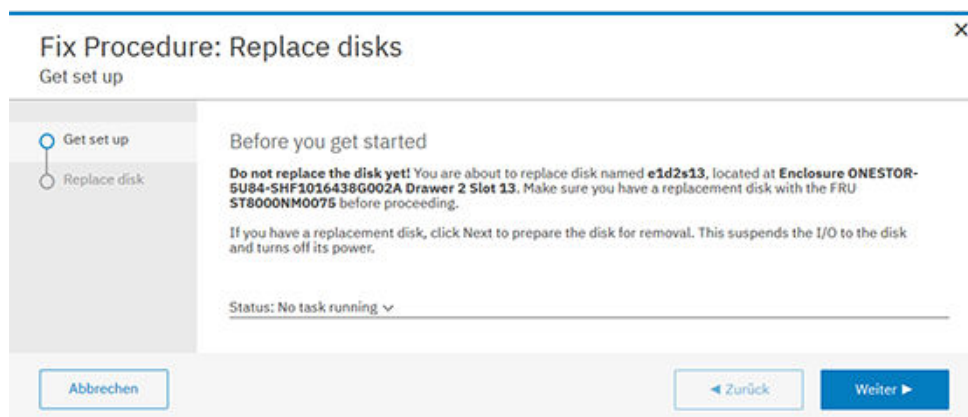


2. Select "Replace Broken Disks..." in the context menu.

The "Fix Procedure" wizard opens.

3. Follow the instructions of the wizard.

Removing a drive

1. Identify which drawer contains the drive to be replaced. If the drive number is known, the plan in the following figure can be used. If the drive has failed, the drive fault LED will be lit amber on the relevant drawer.

Drawer 2 (bottom)   Drawer 1 (top)
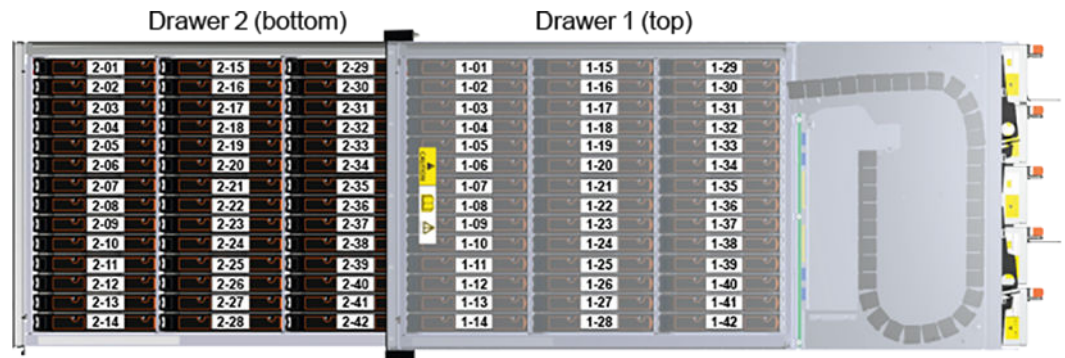
2. Open the relevant drawer.

3. Locate the drive to be replaced, either by using the drive plan in the figure in step 1 or by looking for the amber LED on the drive that indicates a fault.

4. Push the drive carrier latch in the direction shown to unlock the drive.
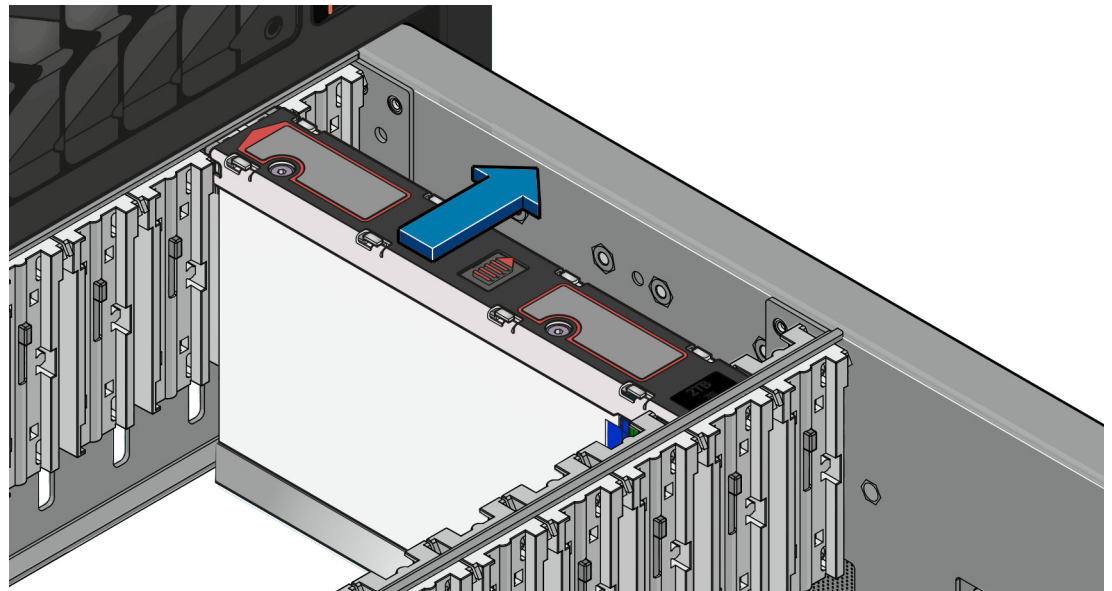
5. Pull the drive upwards and out of the drawer.
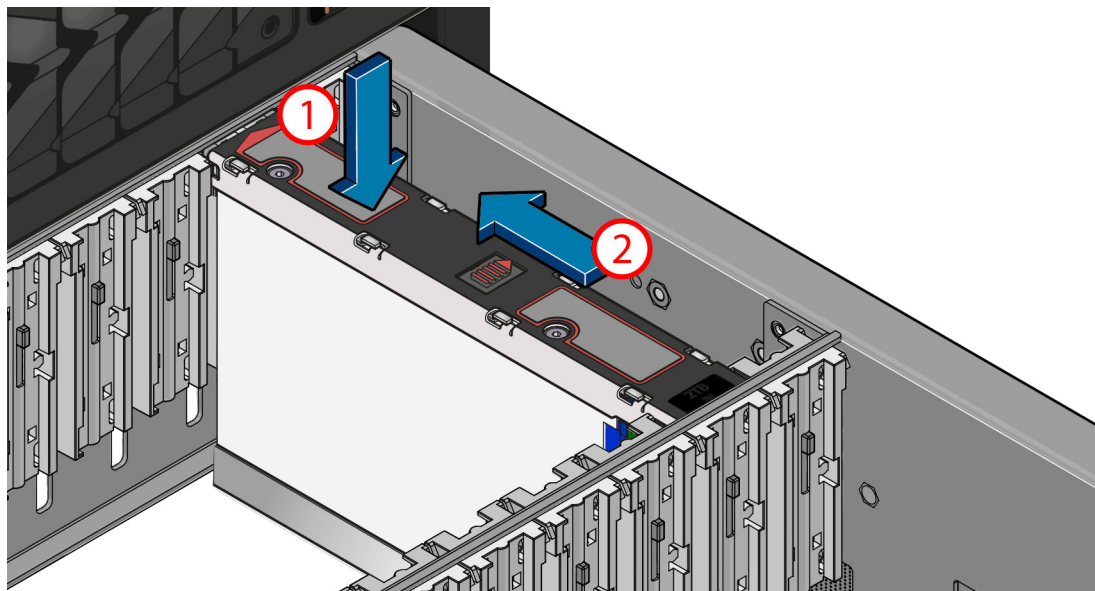
NOTICE

Overheating damage

If you are not going to replace the drive immediately, close the drawer so that correct airflow and cooling are maintained within the enclosure.

Installing a new drive

ⓘ   Failed drives must be replaced with approved drives. Contact your storage vendor for details.

1. Lower the drive carrier into the slot, with the drive capacity label facing towards you (1).

2. Push the drive carrier downwards and hold it down while sliding the drive carrier plate in the direction. This locks the drive in place (2).

3. Check that the release latch has returned to its locked position.
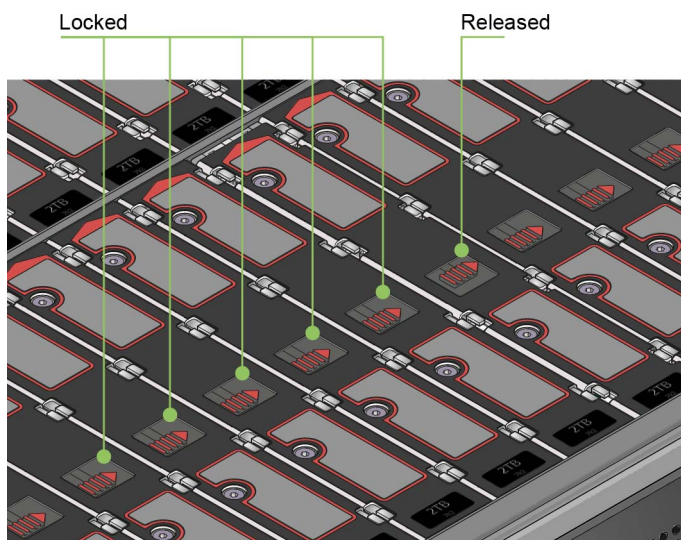
4. Close the drawer.

> **NOTICE**
>
> **Overheating damage**
>
> An incorrect airflow can damage components.
>
> The drawers must be populated with drives in whole arrays at a time (there are 3 arrays of 14 drives per drawer). Thereat, the number of loaded arrays in the top drawer must equal the same number of the bottom one (e.g. if the top drawer has 1 loaded array then the bottom drawer should have exactly 1 loaded array as well).

8.2.2 Replacing a cooling module

(i) Before removing a module, make sure you have a replacement module to insert.

Removing a cooling module
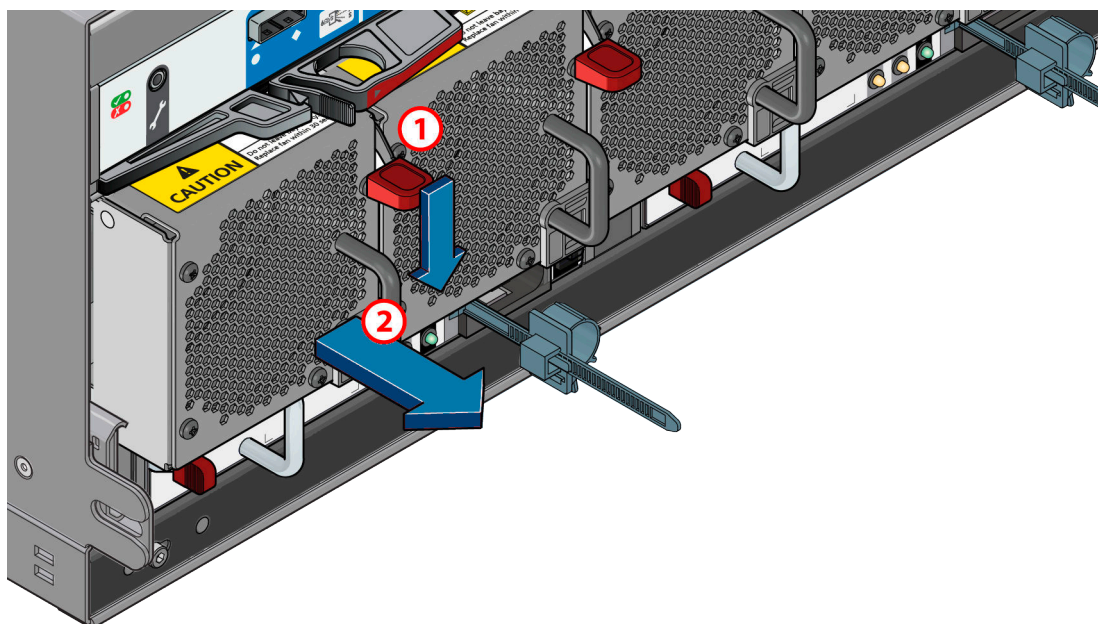
> **NOTICE**
>
> **Overheating damage**
>
> An incorrect airflow can damage components.
>
> The cooling module bay must not be empty for more than two minutes while the enclosure is powered.

1. Identify the cooling module to be removed. If the module has failed, the fan fault LED will be lit amber.
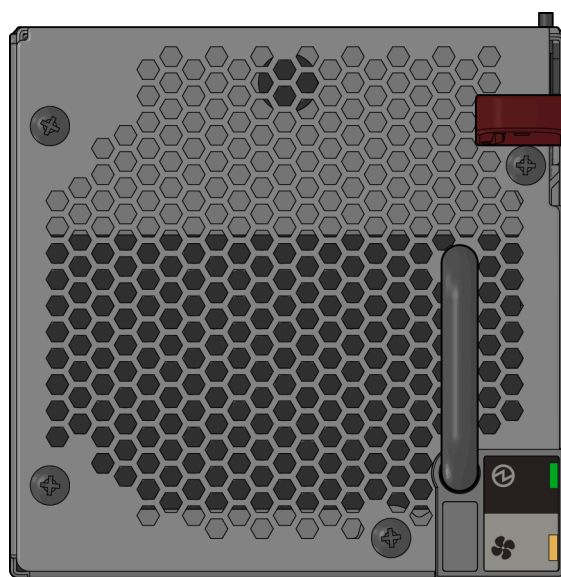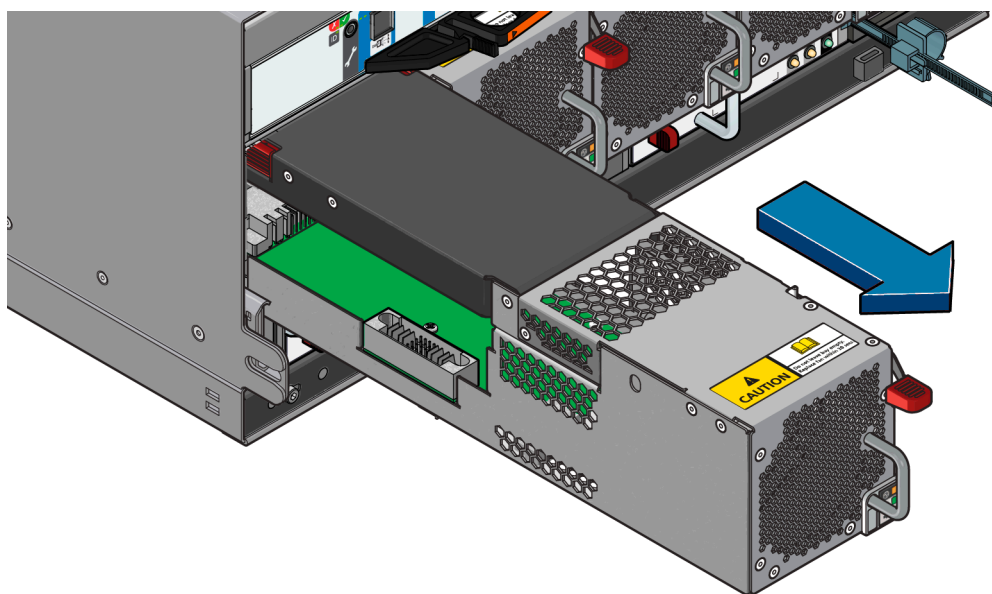
2. Push down and hold the red release latch (1) and pull the module out by its handle (2).

Note: Handle the modules carefully and avoid damaging the connector pins. Do not install if any pins appear to be bent.

3. Pull the module out completely.

Installing a new cooling module

1. Rotate the cooling module so that the red release latch and handle are on the right-hand side.

2.   Slide the cooling module into its slot until the latch clicks home. The enclosure will automatically detect and make use of the new unit.

8.2.3   Replacing a power supply unit

Removing a power supply unit

(i)   Before removing a module, make sure you have a replacement module to insert.


NOTICE

Overheating damage

An incorrect airflow can damage components.

The power supply unit module bay must not be empty for more than two minutes while the enclosure is powered.

---

1.   Identify the power supply unit to be removed using appropriate fault reporting software.

2.   Disconnect the power cord from the hot-swap power supply.

3.   **DANGER!** Danger of electric shock inside.. Never remove the cover of the power supply. Hazardous voltage, current, and energy levels are present inside. There are no serviceable parts inside these components. If you suspect a problem with one of these parts, contact a service technician.

Push the red release latch to the right and hold it (1), then pull the module out by its handle (2).
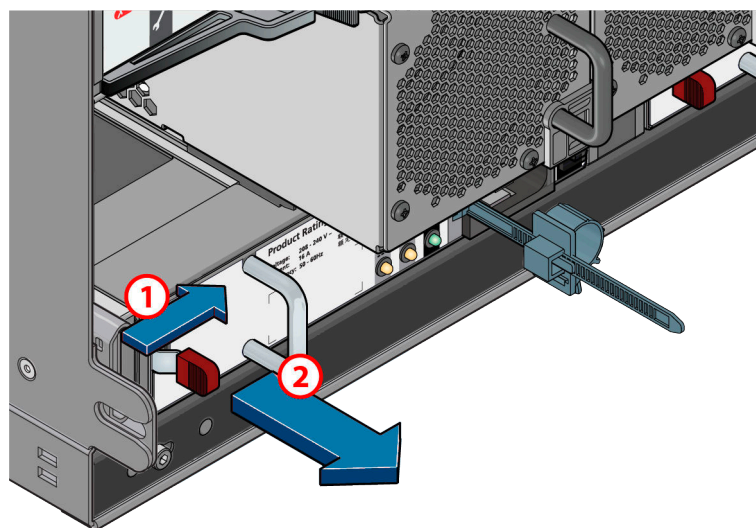
4.   Pull out the module completely.
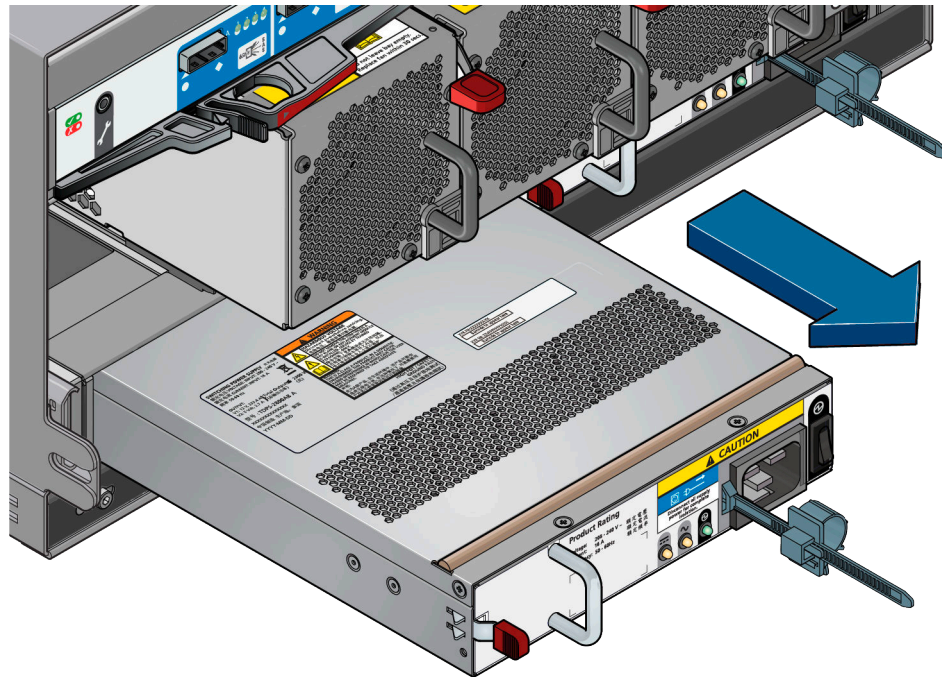
Installing a power supply unit

1. Before installing a new hot-swap power supply, touch the static-protective package that contains the new PSU to any unpainted surface on the outside of the enclosure. Then, take the new hot-swap power supply out of the package and place it on a static-protective surface.

2. Rotate the power supply unit so that the red release latch and handle are on the left-hand side.

3. Slide the power supply unit into its slot until the latch clicks home. The enclosure will automatically detect the new unit.

8.3 Storage controller maintenance

This chapter describes maintenance task for the storage controllers. It includes only those procedures required for an uninterrupted operating mode. For the complete maintenance documentation of the original manufacturer, please refer to: https://think-system.lenovofiles.com/help/topic/7Y98/sr635_maintenance_manual.pdf.

8.3.1 Replacing a cooling fan

You can replace a hot-swap fan without powering off the controller, which helps you avoid significant interruption to the operation of the system.

Working inside the controller with the power on

Observe the following:

- Always use an electrostatic-discharge wrist strap or other grounding systems when working inside the enclosure with the power on.
- Avoid loose-fitting clothing, particularly around your forearms. Button or roll up long sleeves before working inside the enclosure.
- Prevent your necktie, scarf, badge rope, or long hair from dangling into the enclosure.
- Remove jewelry, such as bracelets, necklaces, rings, cuff links, and wrist watches.
- Avoid dropping any metallic objects, such as paper clips, hairpins, and screws, into the server.

ⓘ   Before removing a module, make sure you have a replacement module to insert.

NOTICE

Overheating damage
A hot-swap fan of the storage controller must be replaced within 30 seconds after removal.

1. Remove the top cover:
   Watch video from original manufacturer here: https://www.youtube.com/watch?v=1EcZ56nTwnI&list=PLYV5R7hVcs-DTDY1lmpIPpJVOzo7dKq14&index=22

2. Remove the malfunctioning cooling fan:
   Watch video from original manufacturer here: https://www.youtube.com/watch?v=LqH3386-cx4&list=PLYV5R7hVcs-DTDY1lmpIPpJVOzo7dKq14&index=21

3. Install the new cooling fan:
   Watch video from original manufacturer here: https://www.youtube.com/watch?v=wBEd908k-mY&list=PLYV5R7hVcs-DTDY1lmpIPpJVOzo7dKq14&index=11

8.3.2 Replacing a power supply unit

This chapter describes the replacement of the hot-swappable power supply of the storage controller .

⚠ DANGER

Danger of electric shock inside.

Never remove the cover of the power supply. Hazardous voltage, current, and energy levels are present inside. There are no serviceable parts inside these components. If you suspect a problem with one of these parts, contact a service technician.

ⓘ   Before removing a module, make sure you have a replacement module to insert.

Removing a power supply unit

1. Disconnect the power cord from the hot-swap power supply.

    Note: If you are replacing two power supplies at the same time, do the power sup-
    ply replacement one by one to ensure that the power supply to the controller is not
    interrupted. Do not disconnect the power cord from the second PSU until the power
    output LED for the firstly replaced power supply is lit.

2. Remove the power supply unit:
    Watch video from original manufacturer here: https://www.youtube.com/watch?
    v=ebn7FTdOS8g&list=PLYV5R7hVcs-DTDY1lmpIPpJVOzo7dKq14&index=34

Installing a new power supply unit

1. Before installing a new hot-swap power supply, touch the static-protective package
    that contains the new PSU to any unpainted surface on the outside of the enclo-
    sure. Then, take the new hot-swap power supply out of the package and place it on
    a static-protective surface.

2. Install the new power supply unit:
    Watch video from original manufacturer here: https://www.youtube.com/watch?
    v=SIzcLwAB4oA&list=PLYV5R7hVcs-DTDY1lmpIPpJVOzo7dKq14&index=6

8.3.3 Exchanging a memory module

1. Power off the system.

2. Remove the top cover.
    Watch video from original manufacturer here: https://www.youtube.com/watch?
    v=1EcZ56nTwnI&list=PLYV5R7hVcs-DTDY1lmpIPpJVOzo7dKq14&index=22

3. Remove the air baffle, if such is present.

4. Remove the memory module.

    a) Release the retaining clips on each end of the memory module slot.

b) Grasp the memory module at both ends and carefully lift it out of the slot.
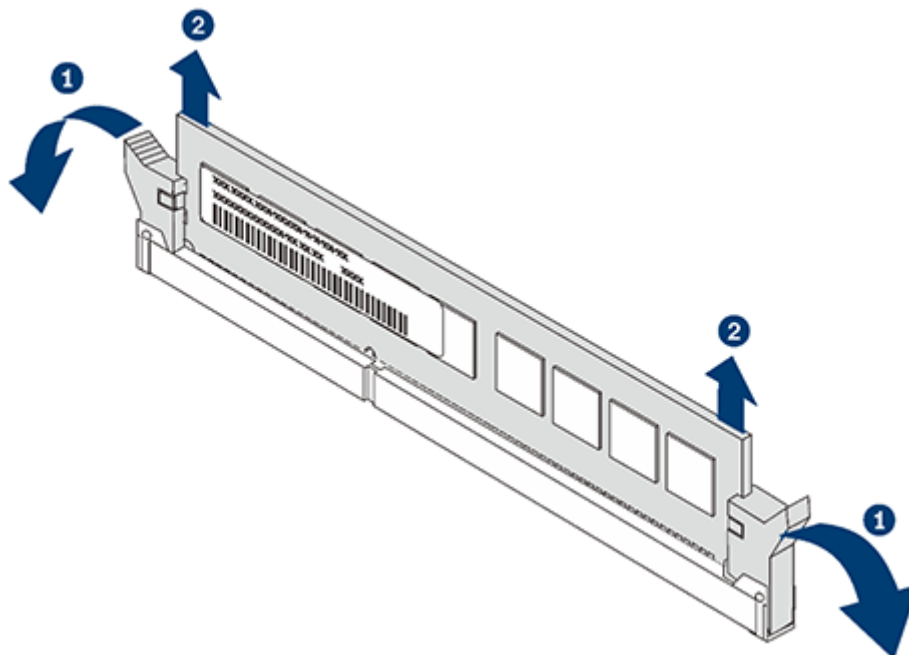
Note: To avoid breaking the retaining clips or damaging the memory module slots, handle the clips gently.

5. Install the new memory module:
Watch video from original manufacturer here: https://www.youtube.com/watch?v=zWstQ-2nCAY

8.3.4 Exchanging the M.2 SSD

Removing the M.2 SSD

Watch video from original manufacturer here: https://www.youtube.com/watch?v=7aPxpC1gasU

Installing the M.2 SSD

Watch video from original manufacturer here: https://www.youtube.com/watch?v=ZXhGoEJT9wQ

8.4 Disposal

Rohde & Schwarz is committed to making careful, ecologically sound use of natural resources and minimizing the environmental footprint of our products. Help us by disposing of waste in a way that causes minimum environmental impact.

Disposing electrical and electronic equipment

A product that is labeled as follows cannot be disposed of in normal household waste after it has come to the end of its service life. Even disposal via the municipal collection points for waste electrical and electronic equipment is not permitted.

Labeling in line with EU directive WEEK =

Rohde & Schwarz has developed a disposal concept for the eco-friendly disposal or recycling of waste material. As a manufacturer, Rohde & Schwarz completely fulfills its obligation to take back and dispose of electrical and electronic waste. Contact your local service representative to dispose of the product.

8.5 Access to R&S® Media Technologies Service & Support

Our web-based Support Center grants direct access to proficient global support for your solutions and improves your support experience significantly.

1. To access the Support & Download Center, create first an R&S GLORIS account at https://gloris.rohde-schwarz.com/.
   For detailed information on the registration process, see https://gloris.rohde-schwarz.com/anonymous/en/pages/toplevel/glorisreg.html.

   Note: Account verification in GLORIS may take several days.

2. Once registered, you can access the Online Support Center at https://supportcenter.gloris.rohde-schwarz.com/, or by scanning the following QR code.


3. Click on "Request a solution" to start the ticketing process.
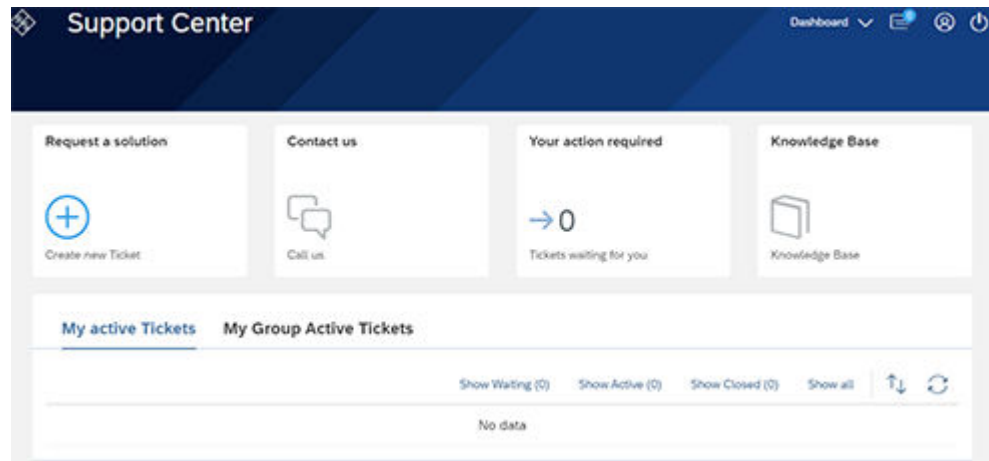
4. Select the first option "I need technical support or have a technical question"

5. Select "by IDs or Numbers".

6. Select "Material and Serial Number" to further identify your system.

   a) Enter the material number. It is printed on the type plate of your product located on the side, rear, or front (slide out label) in the format "xxxx.xxxx.xx" or "xxxx.xxxxKxx".

   b) Enter the serial number below. It is the six-digit number, also part of the system ID on the type plate.

c) Another possibility to get the material number and the serial number is to access the system from the Device Manger and check the system information (see also Chapter 6.1, "Using the R&S®Device Manager", on page 74).
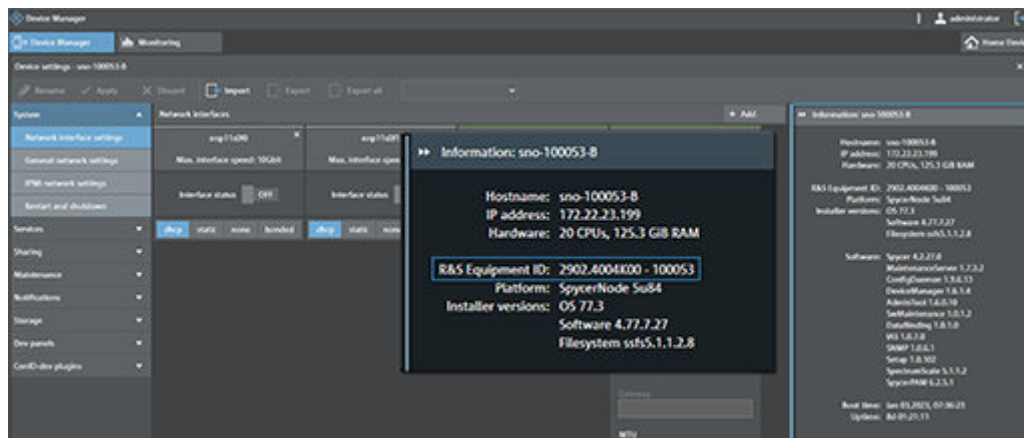
7. In the "Main Category" select "Media Technologies", and under "Subcategory", select the name of your system.

8. In the next section you can add the following information:

   ● Short title of the problem
   ● Full description of the problem
   ● Add attachment to the message (e.g. log files)
     – **NOTE**: Please note that in the ticketing system uploads are limited to 2GB file size. Files larger than 2GB can be uploaded through the Upload Center https://sft.rohde-schwarz.com. If you do so, do not forget to also enable access to your files and share the upload link with us.
     – For this, in the Upload Center enable sharing of the associated files. Next, select "Email Recipient", uncheck "Send Email", and select an "Expires" date. Click on "Send", then copy the link to clipboard and send us that link.
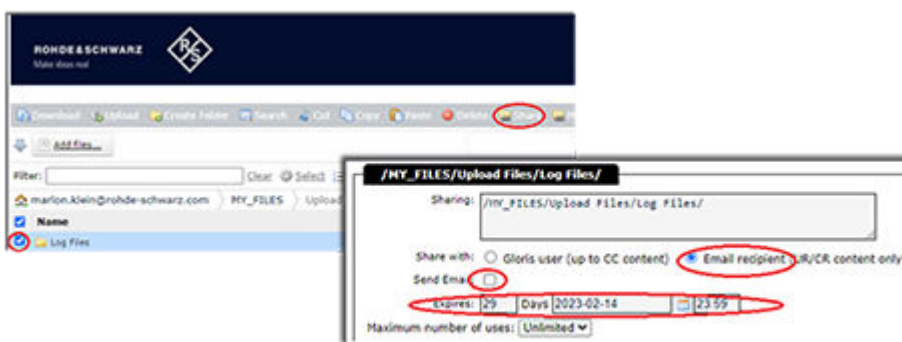
   ● Specify severity level.
   ● If applicable, specify software/firmware version related to the problem.
   ● A customer reference number

9. Before submission, a summary is presented. You can navigate back to change any entry.

10. Click the "Submit" button to finish the process.

A ticket ID will be assigned to your request. Communication is done via portal notes within the Online Support Center or via email with the ticket ID (e.g. [Ticket: 123456]) in the subject line.

Table 8-1: Overview, useful support links

Online Support Center	https://supportcenter.gloris.rohde-schwarz.com/
Download Center	https://gloris.rohde-schwarz.com/
Upload Center	https://sft.rohde-schwarz.com
E-mail	Support.Media@rohde-schwarz.com

8.6 Notifications management for new software releases

The GLORIS web application provides notification settings allowing you to stay up-to-date with the latest software releases as soon as they become available. This way, you can take advantage of the latest maintenance, operating system and security updates without any delay.

1. Log in to your R&S GLORIS account: https://gloris.rohde-schwarz.com/

2. Select "My Profile".
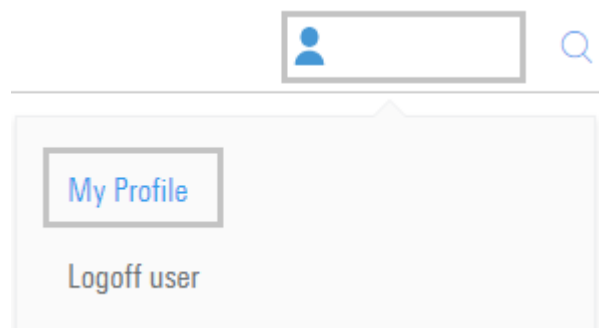
3. Navigate to "Notifications and reminders" and enable "Yes, I want to subsribe to the Notifications Broadcast and Media (DVS)".

Personal data   Content preferences   Notifications and reminders   E-Books & Magazines   Consent management

Notifications and reminders

If you want to get active push e-mail notifications for dedicated applications in GLORIS, please set your preferences on this page.

| Notifications Broadcast and Media (DVS) | ☑ Yes, I want to subscribe to the Notifications Broadcast and Media (DVS) |