Dell Storage Center

SCv2000 and SCv2020 Storage System
Owner's Manual

Regulatory Model: E09J, E10J
Regulatory Type: E09J001, E10J001

Notes, Cautions, and Warnings

NOTE: A NOTE indicates important information that helps you make better use of your computer.

CAUTION: A CAUTION indicates either potential damage to hardware or loss of data and tells you how to avoid the problem.

WARNING: A WARNING indicates a potential for property damage, personal injury, or death.

Contents

About this Guide

This guide describes how to perform service and maintenance on an SCv2000/SCv2020 storage system.

Revision History

Document Number: 3CC1P

Revision	Date	Description
A00	April 2015	Initial release

Audience

The information provided in this Owner's Manual is intended for use by Dell end users.

Contacting Dell

Dell provides several online and telephone-based support and service options. Availability varies by country and product, and some services may not be available in your area.

To contact Dell for sales, technical support, or customer service issues go to www.dell.com/support.

- For customized support, enter your system Service Tag on the support page and click **Submit**.
- For general support, browse the product list on the support page and select your product.

Related Publications

The following documentation is available for the SCv2000/SCv2020 storage system.

- *Dell Storage Center SCv2000 and SCv2020 Storage System Getting Started Guide*
  Provides information about an SCv2000/SCv2020 storage system, such as installation instructions and technical specifications.
- *Dell Storage Center SCv2000 and SCv2020 Storage System Deployment Guide*
  Provides information about an SCv2000/SCv2020 storage system, such as hardware features and deployment instructions.
- *Dell Storage Center Release Notes*
  Contains information about new features and known and resolved issues for the Storage Center software.
- *Dell Storage Center SCv2000 Series Virtual Media Update Instructions*
  Describes how to install Storage Center software on an SCv2000/SCv2020 storage system using virtual media. Installing Storage Center software using the Storage Center Virtual Media option is intended for use only by sites that cannot update Storage Center using standard methods.
- *Dell Storage Center Software Update Guide*

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Describes how to upgrade Storage Center software from an earlier version to the current version.

- *Dell Storage Center Command Utility Reference Guide*

  Provides instructions for using the Storage Center Command Utility. The Command Utility provides a command-line interface (CLI) to enable management of Storage Center functionality on Windows, Linux, Solaris, and AIX platforms.

- *Dell Storage Center Command Set for Windows PowerShell*

  Provides instructions for getting started with Windows PowerShell cmdlets and scripting objects that interact with the Storage Center via the PowerShell interactive shell, scripts, and PowerShell hosting applications. Help for individual cmdlets is available online.

- *Dell Storage Client Administrator's Guide*

  Provides information about the Dell Storage Client and how it can be used to manage a Storage Center.

- *Dell Enterprise Manager Administrator's Guide*

  Contains in-depth feature configuration and usage information

- *Dell TechCenter*

  Provides technical white papers, best practice guides, and frequently asked questions about Dell Storage products. Go to: http://en.community.dell.com/techcenter/storage/.

About the SCv2000/SCv2020 Storage System

The SCv2000/SCv2020 storage system provides the central processing capabilities for the Storage Center Operating System (OS) and management of RAID storage.

The SCv2000/SCv2020 storage system holds the physical disks that provide storage for the Storage Center. If additional storage is needed, the SCv2000/SCv2020 also supports SC100/SC120 expansion enclosures.

SCv2000/SCv2020 Monitoring and Diagnostics

The Storage Center Operating System (OS) generates alert messages for temperature, fan, disk, power, and storage controller conditions. Use the Dell Storage Client to view these alerts.

The SCv2000/SCv2020 also has LED indicators that identify possible problems with the storage system.

> **NOTE:** Dell OpenManage Server Administrator does not support the SCv2000/SCv2020.

SCv2000/SCv2020 Storage System Hardware

The SCv2000/SCv2020 is a 2U storage system that supports up to 24 2.5–inch hot-swappable SAS hard drives installed vertically side-by-side.

The SCv2000/SCv2020 ships with two power/supply cooling fan modules and up to two redundant storage controllers. The storage controller contains multiple I/O ports that provide communication with front-end servers and back-end storage.

SCv2000/SCv2020 Storage System Front Panel Features and Indicators

The front panel of the SCv2000/SCv2020 contains power and status indicators, a system identification button, and a seven-segment display.

In addition, the hard drives are installed and removed through the front of the storage system chassis.
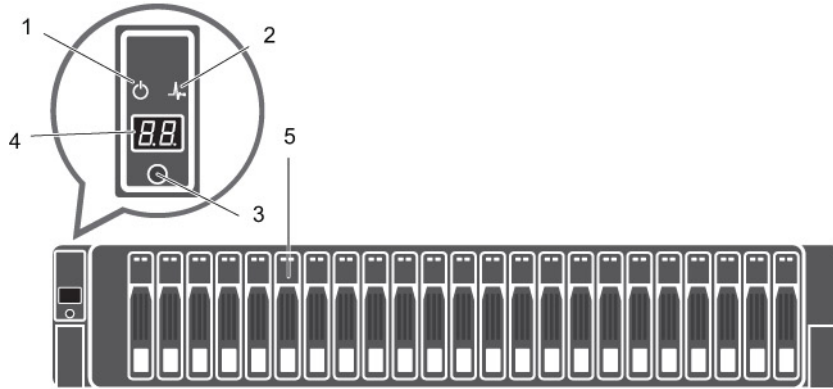
Figure 1. SCv2000 Front Panel View

Item	Name	Icon	Description
1	Power indicator	⏻	Lights when the storage system power is on.
			• **Off**: No power
			• **On steady green**: At least one power supply is providing power to the storage system
2	Status indicator	⎍	Lights when at least one power supply is supplying power to the storage system.
			• **Off**: No power
			• **On steady blue**: Power is on and firmware is running
			• **Blinking blue**: Storage system is busy booting or updating
			• **On steady amber**: Hardware detected fault
			• **Blinking amber**: Software detected fault
3	Identification button	ⓘ	Lights when the storage system identification is enabled.
			• **Off**: Normal status
			• **Blinking blue**: Storage system identification enabled
4	Unit ID display	—	Displays the storage system identification number (01).
5	Hard drives	—	Up to 12 3.5–inch or 24 2.5–inch SAS hard drives

About the SCv2000/SCv2020 Storage System

SCv2000/SCv2020 Back-Panel Features and Indicators

The back panel of the SCv2000/SCv2020 shows the storage controller indicators and power supply indicators.
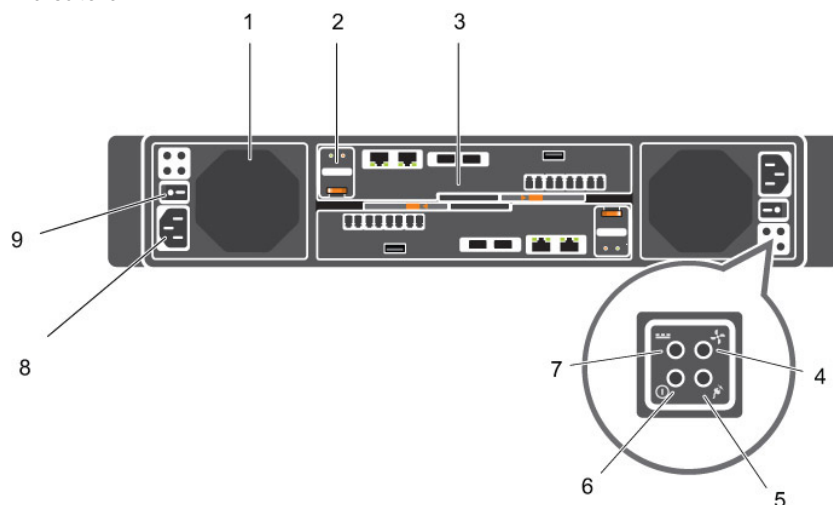

Figure 2. SCv2000/SCv2020 Back Panel View

Item	Name	Icon	Description
1	Power supply/ cooling fan module (PSU) (2)	—	Contains a 580 W power supply and fans that provide cooling for the storage system.
2	Battery backup unit (BBU) (2)	—	Allows the storage controller to shut down gracefully when a loss of AC power is detected.
3	Storage controller (1 or 2)	—	Each storage controller module contains: • **Back-end ports**: Two 6 Gbps SAS ports • **Front-end ports**: Fibre Channel ports, iSCSI ports, or SAS ports • **MGMT port**: Embedded Ethernet/iSCSI port, which is typically used for system management NOTE: The MGMT port can share iSCSI traffic if the Flex Port license is installed. • **REPL port**: Embedded iSCSI port, which is typically used for replication to another Storage Center
4	Cooling fan fault indicator (2)	⚘	• **Off**: Normal operation • **Steady amber**: Fan fault or there is a problem communicating with the PSU • **Blinking amber**: PSU is in programming mode
5	AC power fault indicator (2)	⚲	• **Off**: Normal operation • **Steady Amber**: A PSU has been removed or there is a problem communicating with the PSU • **Blinking amber**: PSU is in programming mode

Item	Name	Icon	Description
6	AC power status indicator (2)	⏻	• **Off**: AC power is off, or the power is on but the module is not in a controller, or it may indicate a hardware fault • **Steady green**: AC power is on • **Blinking green**: AC power is on and the PSU is in standby mode
7	DC power fault indicator (2)	▬▬▬	• **Off**: Normal operation • **Steady amber**: A PSU has been removed, or there is a DC or other hardware fault, or there is a problem communicating with the PSU • **Blinking amber**: PSU is in programming mode
8	Power socket (2)	—	Accepts a standard computer power cord.
9	Power switch (2)	—	Controls power for the storage system. There is one switch for each power supply/cooling fan module.

SCv2000/SCv2020 Storage Controller Features and Indicators

The SCv2000/SCv2020 includes up to two storage controllers in two interface slots.

The storage controllers support Fibre Channel, iSCSI, or SAS front-end ports.

SCv2000/SCv2020 Storage Controller with Fibre Channel Front-End Ports

Features and indictors on a storage controller with Fibre Channel front-end ports.

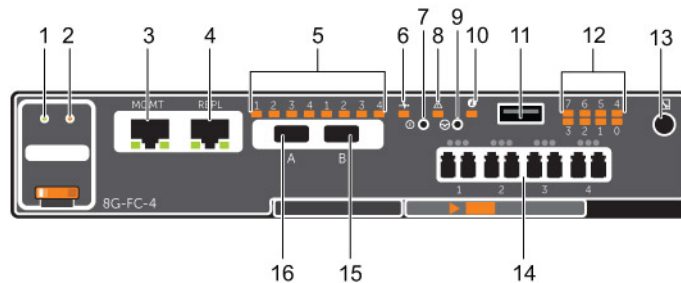Figure 3. Storage Controller with Four 8 Gb Fibre Channel Front-End Ports
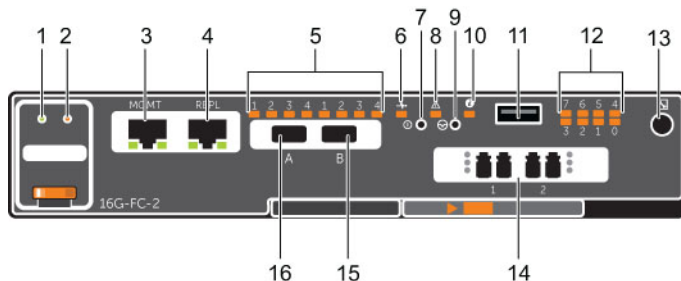
Figure 4. Storage Controller with Two 16 Gb Fibre Channel Front-End Ports

Item	Control/Feature	Icon	Description
1	Battery status indicator	⎍	• **Blinking green (on 0.5 sec. / off 1.5 sec.)**: Battery heartbeat • **Fast blinking green (on 0.5 sec. / off 0.5 sec.)**: Battery is charging

Item	Control/Feature	Icon	Description
			• **Steady green**: Battery is ready
2	Battery fault indicator	⚠	• **Off**: No faults • **Blinking amber**: Correctable fault detected • **Steady amber**: Uncorrectable fault detected; replace battery
3	MGMT port	—	10 Mbps, 100 Mbps, or 1 Gbps Ethernet/iSCSI port used for storage system management and access to the BMC 📝 NOTE: To use the MGMT port as an iSCSI port for replication to another Storage Center, a Flex Port license and replication license are required. To use the MGMT port as a front-end connection to host servers, a Flex Port license is required.
4	REPL port	—	10 Mbps, 100 Mbps, or 1 Gbps Ethernet/iSCSI port used for replication to another Storage Center (requires a replication license) 📝 NOTE: To use the RELP port as a front-end connection to host servers, a Flex Port license is required.
5	SAS activity indicators	—	• **Off**: Port is off • **Steady green**: Port is on, but without activity • **Blinking green**: Port is on and there is activity
6	Storage controller module status	⎍	**On**: Storage controller completed POST
7	Recessed power off button	⏻	Powers down the storage controller if held for more than five seconds
8	Storage controller module fault	⚠	• **Off**: No faults • **Steady amber**: Firmware has detected an error • **Blinking amber**: Storage controller is performing POST
9	Recessed reset button	↺	Reboots the storage controller forcing it to restart at the POST process
10	Identification LED	ⓘ	• **Off**: Identification disabled • **Blinking blue (for 15 sec.)**: Identification is enabled • **Blinking blue (continuously)**: Storage controller shut down to the Advanced Configuration and Power Interface (ACPI) S5 state
11	USB port	⛗	Not for customer use on SCv2000/SCv2020 Storage Systems.
12	Diagnostic LEDs (8)	—	• **Green LEDs 0–3**: Low byte hex POST code • **Green LEDs 4–7**: High byte hex POST code
13	Serial port (3.5 mm mini jack)	⌖	Not for customer use.

Item	Control/Feature	Icon	Description
14	Four or two Fibre Channel ports with three LEDs per port	—	• **All off**: No power • **All on**: Booting up • **Blinking amber**: 2 Gbps activity • **Blinking green**: 4 Gbps activity • **Blinking yellow**: 8 Gbps activity • **Blinking amber and yellow**: Beacon • **All blinking (simultaneous)**: Firmware initialized • **All blinking (alternating)**: Firmware fault
15	Mini-SAS port B	▤⋚	Back-end expansion port B
16	Mini-SAS port A	▤⋚	Back-end expansion port A

SCv2000/SCv2020 Storage Controller with iSCSI Front-End Ports

Features and indictors on a storage controller with iSCSI front-end ports.

Figure 5. SCv2000/SCv2020 Storage Controller with Four 1 GbE iSCSI Front-End Ports

Figure 6. SCv2000/SCv2020 Storage Controller with Two 10 GbE iSCSI Front-End Ports

Item	Control/Feature	Icon	Description
1	Battery status indicator	⎍	• **Blinking green (on 0.5 sec. / off 1.5 sec.)**: Battery heartbeat • **Fast blinking green (on 0.5 sec. / off 0.5 sec.)**: Battery is charging • **Steady green**: Battery is ready
2	Battery fault indicator	⚠	• **Off**: No faults • **Blinking amber**: Correctable fault detected • **Steady amber**: Uncorrectable fault detected; replace battery

Item	Control/Feature	Icon	Description
3	MGMT port	—	10 Mbps, 100 Mbps, or 1 Gbps Ethernet port used for storage system management and access to the BMC
			NOTE: To use the MGMT port as an iSCSI port for replication to another Storage Center, a Flex Port license and replication license are required. To use the MGMT port as a front-end connection to host servers, a Flex Port license is required.
4	REPL port	—	10 Mbps, 100 Mbps, or 1 Gbps Ethernet/iSCSI port used for replication to another Storage Center
			NOTE: To use the RELP port as a front-end connection to host servers, a Flex Port license is required.
5	SAS activity indicators	—	• **Off**: Port is off • **Steady green**: Port is on, but without activity • **Blinking green**: Port is on and there is activity
6	Storage controller module status	⎍	**On**: Storage controller completed POST
7	Recessed power off button	⏻	Powers down the storage controller if held for more than five seconds
8	Storage controller module fault	⚠	• **Off**: No faults • **Steady amber**: Firmware has detected an error • **Blinking amber**:Storage controller is performing POST
9	Recessed reset button	⊘	Reboots the storage controller forcing it to restart at the POST process
10	Identification LED	ⓘ	• **Off**: Identification disabled • **Blinking blue (for 15 sec.)**: Identification is enabled • **Blinking blue (continuously)**: Storage controller shut down to the Advanced Configuration and Power Interface (ACPI) S5 state
11	USB port	⛛	Not for customer use on SCv2000/SCv2020 Storage Systems.
12	Diagnostic LEDs (8)	—	• **Green LEDs 0–3**: Low byte hex POST code • **Green LEDs 4–7**: High byte hex POST code
13	Serial port (3.5 mm mini jack)	⬚	Not for customer use.
14	Four or two iSCSI ports with two LEDs per port	—	• **Off**: No power • **Steady Amber**: Link • **Blinking Green**: Activity
15	Mini-SAS port B	⬛	Back-end expansion port B
16	Mini-SAS port A	⬛	Back-end expansion port A

SCv2000/SCv2020 Storage Controller with SAS Front-End Ports

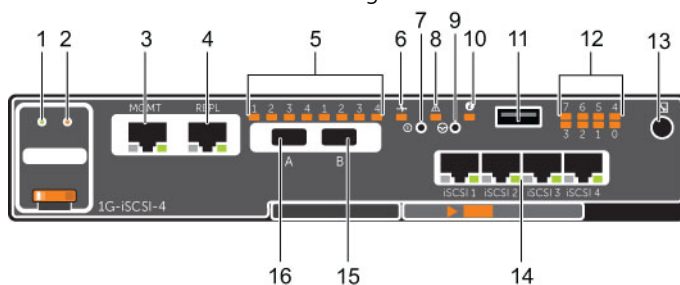Features and indictors on a storage controller with SAS front-end ports.

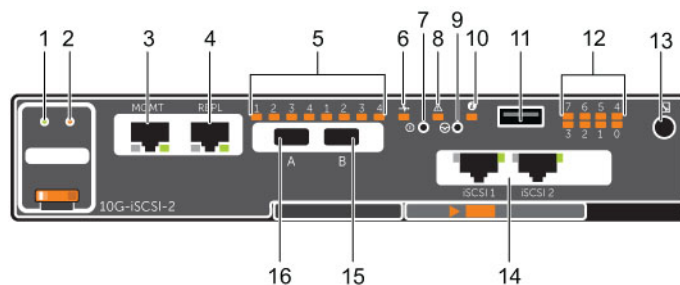Figure 7. SCv2000/SCv2020 Storage Controller with Four 12 Gb SAS Front-End Ports

Item	Control/Feature	Icon	Description
1	Battery status indicator	⎍	• **Blinking green (on 0.5 sec. / off 1.5 sec.)**: Battery heartbeat • **Fast blinking green (on 0.5 sec. / off 0.5 sec.)**: Battery is charging • **Steady green**: Battery is ready
2	Battery fault indicator	⚠	• **Off**: No faults • **Blinking amber**: Correctable fault detected • **Steady amber**: Uncorrectable fault detected; replace battery
3	MGMT port	—	10 Mbps, 100 Mbps, or 1 Gbps Ethernet port used for storage system management and access to the BMC **NOTE:** To use the MGMT port as an iSCSI port for replication to another Storage Center, a Flex Port license and replication license are required. To use the MGMT port as a front-end connection to host servers, a Flex Port license is required.
4	REPL port	—	10 Mbps, 100 Mbps, or 1 Gbps Ethernet/iSCSI port used for replication to another Storage Center **NOTE:** To use the RELP port as a front-end connection to host servers, a Flex Port license is required.
5	SAS activity indicators	—	• **Off**: Port is off • **Steady green**: Port is on, but without activity • **Blinking green**: Port is on and there is activity
6	Storage controller module status	⎍	**On**: Storage controller completed POST
7	Recessed power off button	⏻	Powers down the storage controller if held for more than five seconds
8	Storage controller module fault	⚠	• **Off**: No faults • **Steady amber**: Firmware has detected an error • **Blinking amber**:Storage controller is performing POST

About the SCv2000/SCv2020 Storage System

Item	Control/Feature	Icon	Description
9	Recessed reset button	⊖	Reboots the storage controller forcing it to restart at the POST process
10	Identification LED	ⓘ	• **Off**: Identification disabled • **Blinking blue (for 15 sec.)**: Identification is enabled • **Blinking blue (continuously)**: Storage controller shut down to the Advanced Configuration and Power Interface (ACPI) S5 state
11	USB port	⌁	Not for customer use on SCv2000/SCv2020 Storage Systems.
12	Diagnostic LEDs (8)	—	• **Green LEDs 0–3**: Low byte hex POST code • **Green LEDs 4–7**: High byte hex POST code
13	Serial port (3.5 mm mini jack)	⬚	Not for customer use.
14	Four Mini-SAS High Density (HD) ports	—	Front-end connectivity ports ✎ **NOTE:** The mini-SAS HD ports are for front-end connectivity only and cannot be used for back-end expansion.
15	Mini-SAS port B	⧉	Back-end expansion port B
16	Mini-SAS port A	⧉	Back-end expansion port A

SCv2000/SCv2020 Drives

Dell Enterprise hard disk drives (HDDs) and Enterprise Solid-State Drives (eSSDs) are the only drives that can be installed in an SCv2000/SCv2020 storage system. If a non-Dell Enterprise drive is installed, Storage Center prevents the drive from being managed.

The drives in an SCv2000 storage system are installed horizontally. The drives in an SCv2020 storage system are installed vertically. The indicators on the drives provide status and activity information.

Figure 8. SCv2000/SCv2020 Drive Indicators

Item	Name	Indicator Code
1	Drive activity indicator	• **Blinking green**: Drive activity • **Steady green**: Drive is detected and there are no faults
2	Drive status indicator	• **Off**: Normal operation • **Blinking amber (on 1 sec. / off 1 sec.)**: Drive identification is enabled

Item	Name	Indicator Code
		• **Blinking amber (on 2 sec. / off 1 sec.)**: Drive failed
		• **Steady amber**: Drive is safe to remove

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Replacing SCv2000/SCv2020 Components

This section describes how to remove and install components of an SCv2000/SCv2020 storage system.

This document assumes that the customer has received the replacement component and is ready to install it.

Safety Precautions

Always follow these safety precautions to avoid injury and damage to Storage Center equipment.

If equipment described in the document is used in a manner not specified by Dell, the protection provided by the equipment may be impaired. For your safety and protection, observe the rules described in the following sections.

> **NOTE:** See the safety and regulatory information that shipped with each Storage Center component. Warranty information may be included within this document or as a separate document.

Installation Safety Precautions

Follow these safety precautions:

- Dell recommends that only individuals with rack-mounting experience install an SCv2000/SCv2020 storage system in a rack.
- Make sure the storage system is fully grounded at all times to prevent damage from electrostatic discharge.
- When handling the storage system hardware, you should use an electrostatic wrist guard (not included) or a similar form of protection.

The storage system chassis MUST be mounted in a rack; the following safety requirements must be considered when doing so:

- The rack construction must be capable of supporting the total weight of the installed chassis and the design should incorporate stabilizing features suitable to prevent the rack tipping or being pushed over during installation or in normal use.
- To avoid danger of the rack toppling over, do not slide more than one chassis out of the rack at a time.
- The rack design should take into consideration the maximum operating ambient temperature for the unit, which is 57°C.

Electrical Safety Precautions

Always follow electrical safety precautions to avoid injury and damage to Storage Center equipment.

⚠️ **WARNING: Disconnect power from the storage system when removing or installing components that are not hot-swappable. When disconnecting power, first power down the storage system using the Dell Storage Client and then unplug the power cords from all the power supplies in the storage system.**

- Provide a suitable power source with electrical overload protection. All Storage Center components must be grounded before applying power. Make sure that there is a safe electrical earth connection to power supply cords. Check the grounding before applying power.
- The plugs on the power supply cords are used as the main disconnect device. Make sure that the socket outlets are located near the equipment and are easily accessible.
- Know the locations of the equipment power switches and the room's emergency power-off switch, disconnection switch, or electrical outlet.
- Do not work alone when working with high-voltage components.
- Use rubber mats specifically designed as electrical insulators.
- Do not remove covers from the power supply unit. Disconnect the power connection before removing a power supply from the storage system.
- Do not remove a faulty power supply unless you have a replacement model of the correct type ready for insertion. A faulty power supply must be replaced with a fully operational module power supply within 24 hours.
- Unplug the storage system chassis before you move it or if you think it has become damaged in any way. When powered by multiple AC sources, disconnect all supply power for complete isolation.

Electrostatic Discharge Precautions

Always follow electrostatic discharge (ESD) precautions to avoid injury and damage to Storage Center equipment.

Electrostatic discharge (ESD) is generated by two objects with different electrical charges coming into contact with each other. The resulting electrical discharge can damage electronic components and printed circuit boards. Follow these guidelines to protect your equipment from ESD:

- Dell recommends that you always use a static mat and static strap while working on components in the interior of the storage system chassis.
- Observe all conventional ESD precautions when handling plug-in modules and components.
- Use a suitable ESD wrist or ankle strap.
- Avoid contact with backplane components and module connectors.
- Keep all components and printed circuit boards (PCBs) in their antistatic bags until ready for use.

General Safety Precautions

Always follow general safety precautions to avoid injury and damage to Storage Center equipment.

- Keep the area around the storage system chassis clean and free of clutter.
- Place any system components that have been removed away from the storage system chassis or on a table so that they are not in the way of foot traffic.
- While working on the storage system chassis, do not wear loose clothing such as neckties and unbuttoned shirt sleeves, which can come into contact with electrical circuits or be pulled into a cooling fan.

- Remove any jewelry or metal objects from your body because they are excellent metal conductors that can create short circuits and harm you if they come into contact with printed circuit boards or areas where power is present.
- Do not lift a storage system chassis by the handles of the power supply units (PSUs). They are not designed to hold the weight of the entire chassis, and the chassis cover may become bent.
- Before moving a storage system chassis, remove the PSUs to minimize weight.
- Do not remove drives until you are ready to replace them.

NOTE: To ensure proper storage system cooling, hard drive blanks must be installed in any hard drive slot that is not occupied.

Pre-Replacement Procedures

Perform the procedures described in this section before replacing a component of an SCv2000/SCv2020 storage system.

Sending Diagnostic Data Using Dell SupportAssist

Use Dell SupportAssist to send diagnostic data to Dell Technical Support Services.

1. Click **Send SupportAssist Data Now**. The **Send Support Assist Data Now** dialog box appears.
2. Select **Storage Center Configuration** and **Detailed Logs**.
3. Click **OK**.

Shutting Down a Storage Controller

If you are replacing a storage controller, use the Dell Storage Client to shut down the storage controller.

About this task

If the storage system has two storage controllers, shutting down one storage controller causes the Storage Center to fail over to the other storage controller. which continues to process I/O. If the storage system has only one storage controller, shutting it down results in a system outage.

Steps

1. Click the **Hardware** tab.
2. In the **Hardware** tab navigation pane, select the storage controller to shut down.
3. In the right pane, click **Shutdown/Restart Controller**. The **Shutdown/Restart Controller** dialog box appears.
4. Select **Shutdown** from the drop-down menu.
5. Click **OK**. The selected storage controller is shut down.

Shutting Down the Storage System

If you are replacing the storage system chassis or rack rails, use the Dell Storage Client to shut down the storage system.

About this task

⚠ CAUTION: Shutting down the storage system results in a system outage.

Steps

1. Select **Actions** → **System** → **Shutdown/Restart**. The **Shutdown/Restart** dialog box appears.
2. Select **Shutdown** from the first drop-down menu.
3. Click **OK**.

After the storage system shuts down, unplug the power cables from the power supply/cooling fan modules.

Replacing the Front Bezel

The front bezel is a cover for the front panel of the storage system.

About this task
The front bezel must be removed from the front panel when replacing hard drives.

Steps
1. Use the system key to unlock the keylock at the left end of the bezel.
2. Lift the release latch next to the keylock.
3. Rotate the left end of the bezel away from the front panel.
4. Unhook the right end of the bezel and pull the bezel away from the storage system.
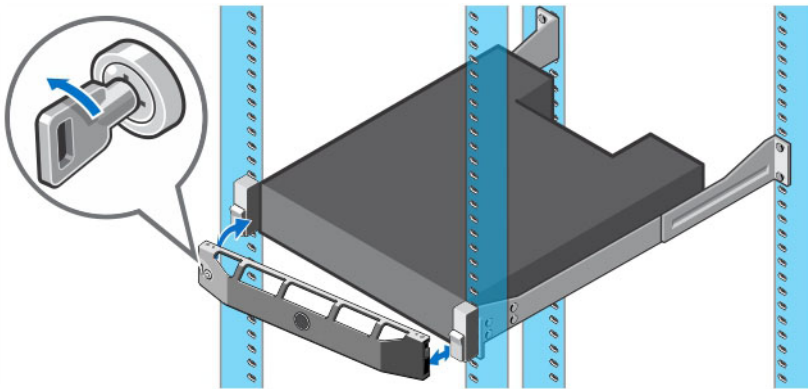
Figure 9. Replacing the Front Bezel

5. Hook the right end of the replacement bezel onto the front panel of the storage system.
6. Insert the left end of the bezel into the securing slot until the release latch snaps into place.
7. Secure the bezel with the keylock.

Replacing Power Supply/Cooling Fan Modules

The SCv2000/SCv2020 storage system supports two hot-swappable power supply/cooling fan modules.

The fans that cool the storage system and the power supplies are integrated into the power supply/cooling fan module and cannot be replaced separately. If one power supply/cooling fan module fails, the second module continues to provide power to the storage system.

> NOTE: When a power supply/cooling fan module fails, the fan speed in the remaining module increases significantly to provide adequate cooling. The fan speed decreases gradually when a new power supply/cooling fan module is installed.

Identifying the Failed Power Supply

To determine which power supply failed, use the Dell Storage Client.

1. Click the **Hardware** tab.
2. In the **Hardware** tab navigation pane, select the Storage Center.

3. Expand the failed storage system entry.
4. In the **Hardware Alerts** area, find the hardware alert that identifies the enclosure with the failed power supply.
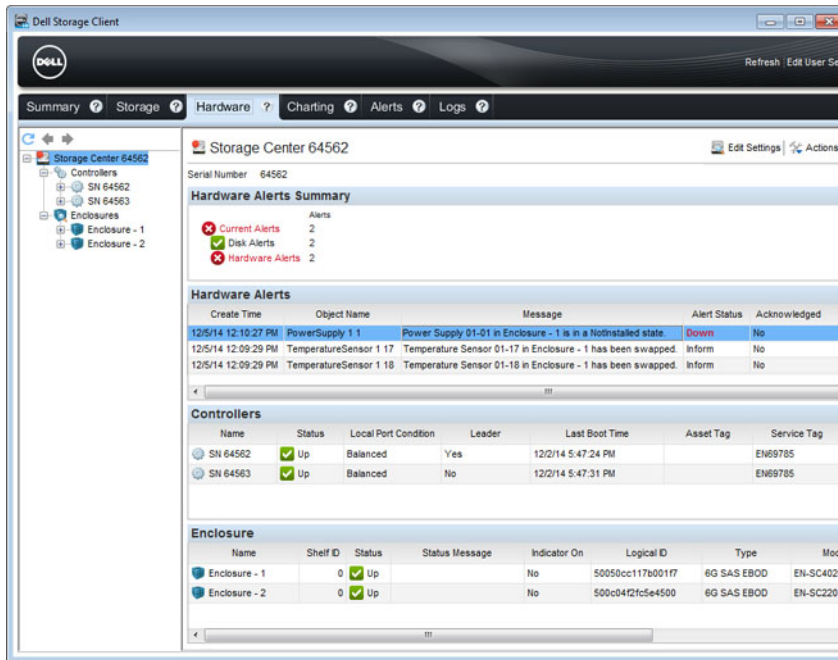
Figure 10. Hardware Alert Identifying the Enclosure with the Failed Power Supply

5. In the **Hardware** tab navigation pane, expand the enclosure identified in the previous step and select **Power Supplies**. The status of each power supply is displayed in the **Power Supplies** tab.
6. Select the failed power supply. The location of the failed power supply is displayed in the **Power Supply View** tab.
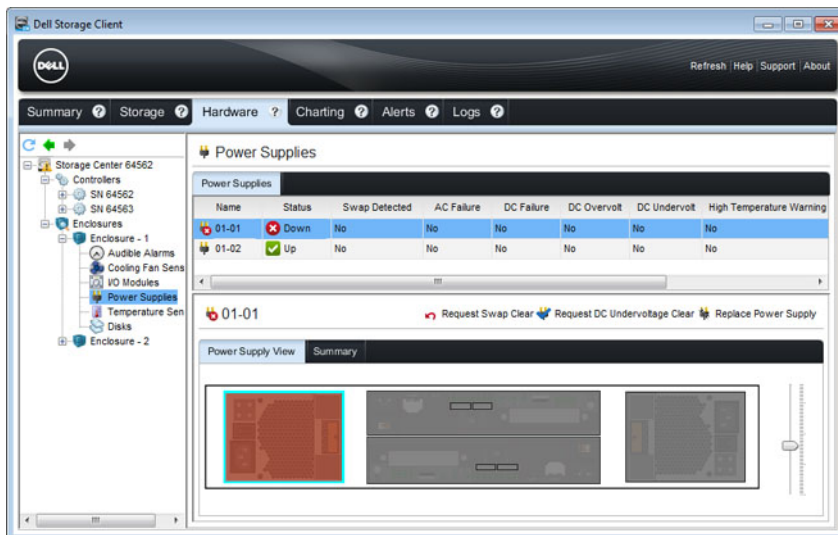
Figure 11. Rear View of the Enclosure Showing the Failed Power Supply

Replacing SCv2000/SCv2020 Components

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Identifying the Failed Cooling Fan

To determine which cooling fan failed, use the Dell Storage Client.

1. Click the **Hardware** tab.
2. In the **Hardware** tab navigation pane, select the Storage Center.
3. In the **Hardware Alerts** area, find the hardware alert that identifies the enclosure with the failed cooling fan.
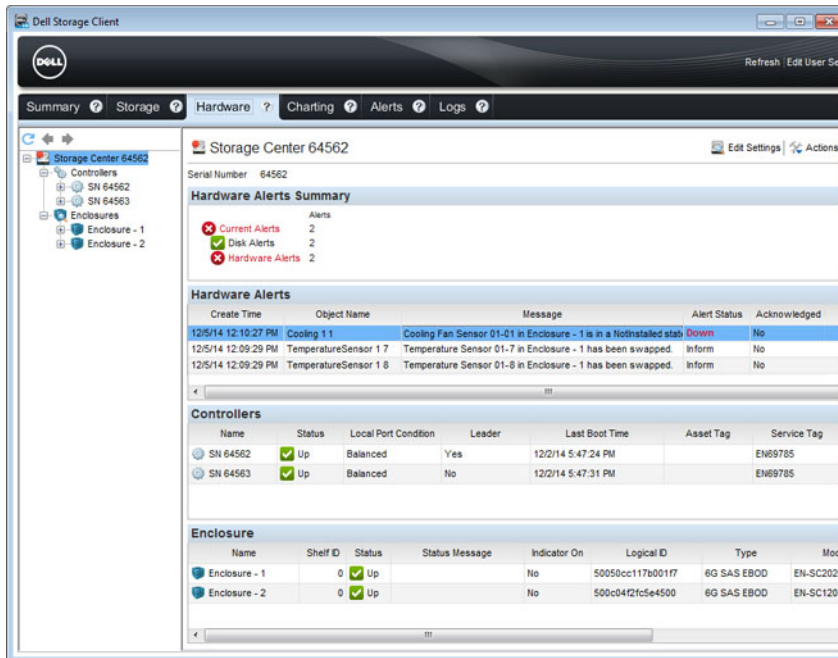
Figure 12. Hardware Alert Identifying the Enclosure with the Failed Cooling Fan

4. In the **Hardware** tab navigation pane, expand the enclosure identified in the previous step.
5. Select **Cooling Fan Sensors**. The status of each cooling fan is displayed in the **Cooling Fans** tab.
6. Select the failed cooling fan. The location of the failed cooling fan is displayed in the **Cooling Fan View** tab.

Replacing SCv2000/SCv2020 Components
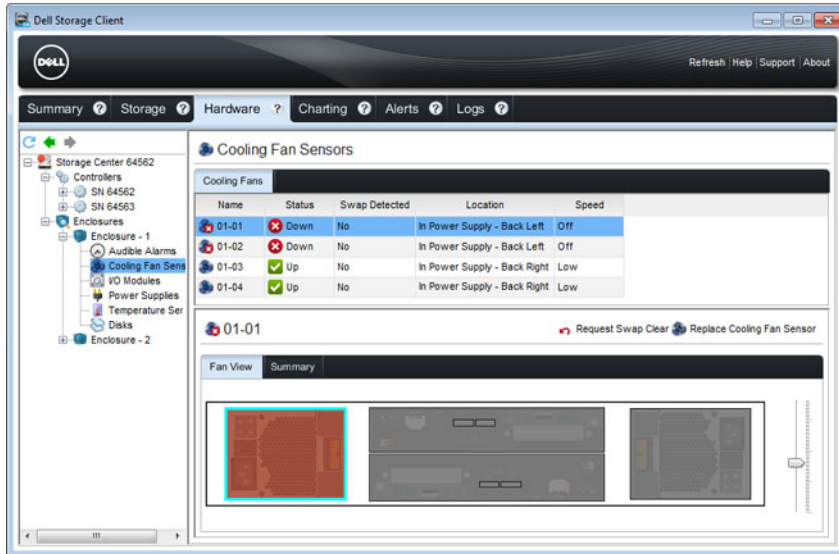
Figure 13. Rear View of the Enclosure Showing the Failed Cooling Fan

Replacing a Power Supply/Cooling Fan Module

Use this procedure to replace a failed power supply/cooling fan module.

Prerequisites

1. Use SupportAssist to send diagnostic data to Dell Technical Support Services.

About this task
You can replace power supply/cooling fan modules one at a time without shutting down the storage system.

Steps

1. Press the power switch on the power supply/cooling fan module to turn it off.
2. Remove the hook-and-loop strap that secures the power cable and disconnect the power cable from the power supply/cooling fan module.
3. Push the release tab on the power supply/cooling fan module and slide it out of the chassis using the handle.

   ⚠ **CAUTION: The power supply/cooling fan modules are heavy. To avoid injury, use both hands while removing the module.**
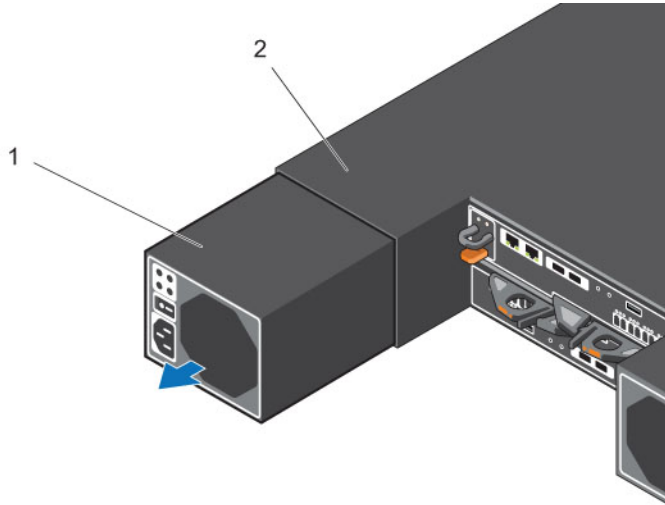
Figure 14. Removing a Power Supply/Cooling Fan Module

    1.   Power supply/cooling fan module   2.   Storage system chassis

4. Slide the replacement power supply/cooling fan module into the chassis until it is fully seated and the release tab clicks into place.
5. Connect the power cable to the power supply/cooling fan module and make sure that the cable is plugged into a power outlet.
6. Secure the power cable using the hook-and-loop strap.
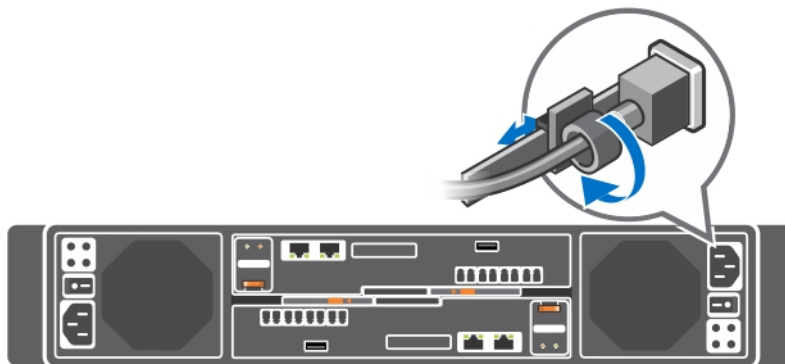
Figure 15. Securing the Power Cable

7. Press the power switch on the power supply/cooling fan module to turn it on.

    NOTE: Allow several seconds for the storage system to recognize the power supply/cooling fan module and determine its status. When the power supply/cooling fan module is functioning properly, the AC power status indicator turns green and the three fault indicators are off.

8. In the Dell Storage Client, make sure that the replacement power supply/cooling fan module is recognized and shown as up and running.

Next steps

1. Use SupportAssist to send diagnostic data to Dell Technical Support Services.

Replacing Hard Drives

The SCv2000/SCv2020 storage systems support hot-swappable hard drives.

The SCv2000 storage system supports up to 12 3.5-inch hard drives installed in a four-column, three-row configuration. The SCv2020 storage system supports up to 24 2.5-inch hard drives installed vertically side-by-side. Hard drives are connected to a backplane through hard drive carriers. Hard drive blanks are installed in the hard drive bays that are not occupied.

Dell Enterprise Plus Drives are the only drives that can be installed in an SCv2000/SCv2020 storage system. If a non Dell Enterprise Plus Drive is installed, Storage Center prevents the drive from being managed.

SCv2000/SCv2020 Storage System Drive Numbering

In an SCv2000/SCv2020 storage system, the drives are numbered from left to right.

Dell Storage Client identifies drives as $XX-YY$, where XX is the number of the unit ID of the storage system, and YY is the drive position inside the storage system.

- An SCv2000 holds up to 12 drives, which are numbered left to right in rows starting from 0 at the top-left drive.
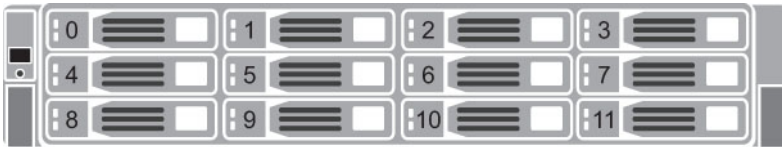
Figure 16. SCv2000 Drive Numbering

- An SCv2020 holds up to 24 drives, which are numbered left to right starting from 0.

Figure 17. SCv2020 Drive Numbering

Identifying the Failed Hard Drive

To determine which hard drive failed, use the Dell Storage Client.

1. Click the **Hardware** tab.
2. In the **Hardware** tab navigation pane, select the Storage Center.
3. In the **Hardware Alerts** area, find the hardware alert that identifies the enclosure with the failed hard drive.
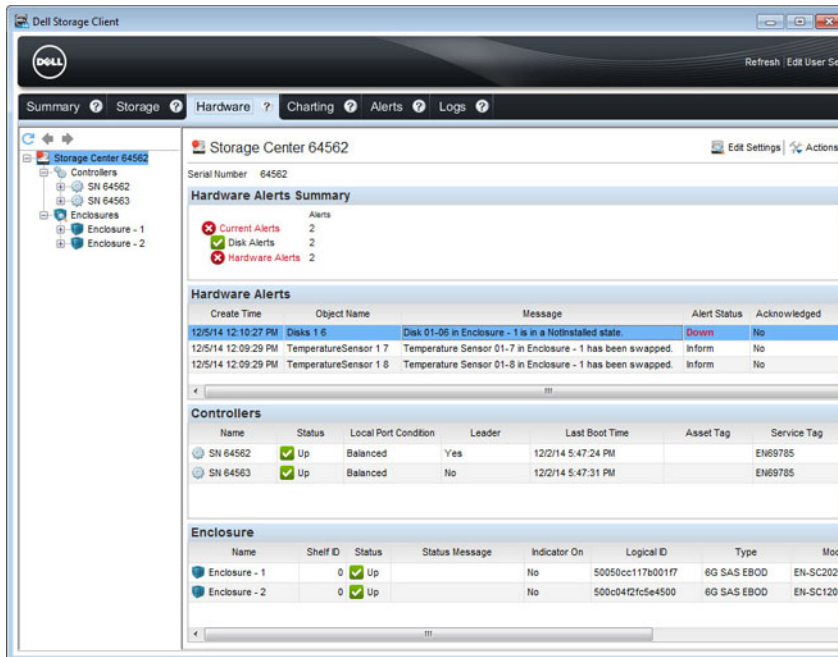
Figure 18. Hardware Alert Identifying the Enclosure with the Failed Hard Drive

4. In the **Hardware** tab navigation pane, expand the enclosure identified in the previous step.
5. Select **Disks**. The status of each hard drive is displayed in the **Disks** tab.
6. Select the failed hard drive. The location of the failed hard drive is displayed in the **Disk View** tab.
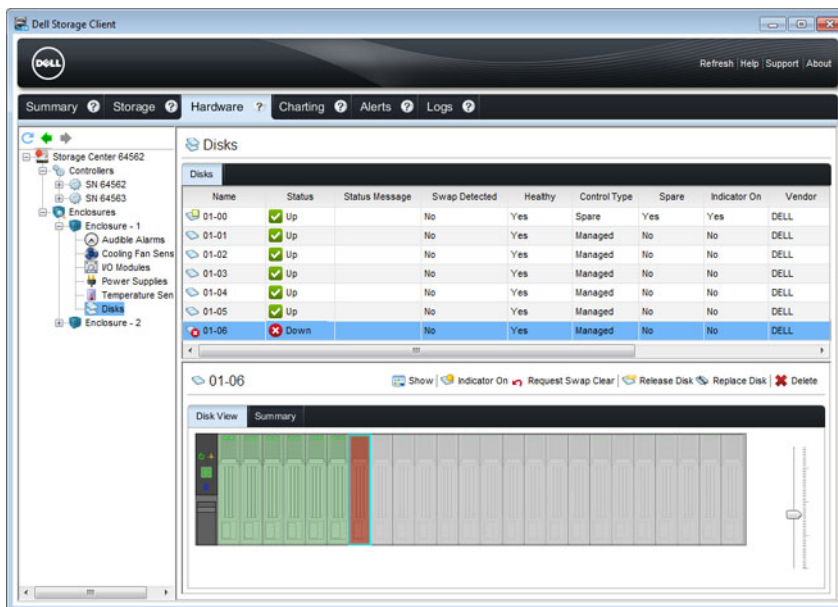
Figure 19. Front View of the Enclosure Showing the Failed Hard Drive

If desired, you can open a wizard to guide you through the replacement steps. To do so, right-click on the failed hard drive.

Replacing SCv2000/SCv2020 Components

Replacing a Hard Drive

Use this procedure to replace a failed hard drive.

Prerequisites

1. Use SupportAssist to send diagnostic data to Dell Technical Support Services.

About this task

Hard drives can be replaced one at a time without shutting down the storage system.

Steps

1. Remove the front bezel.

   A solid amber light appears next to the failed hard drive, indicating the drive is ready to be removed.

2. Press the release button to open the hard drive carrier release handle.

3. Slide the hard drive out until it is free of the hard drive slot.
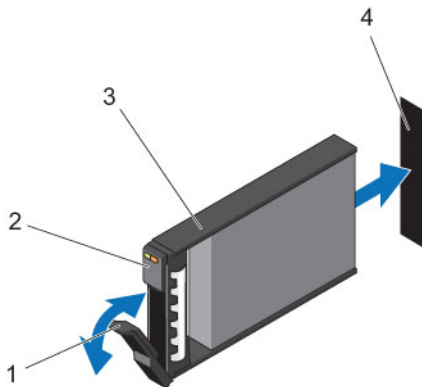
Figure 20. Replacing a Hard Drive

1.	Hard drive carrier release handle	2.	Hard drive indicators
3.	Hard drive carrier	4.	Hard drive slot

4. Press the release button on the replacement hard drive to open the hard drive carrier release handle.

   NOTE: Hold the hard drive by the plastic part of the hard drive carrier or the handle.

5. Insert the hard drive carrier into the hard drive slot until the carrier contacts the backplane.

   ⚠ **CAUTION: Do not remove the hard drive blanks that are installed in hard drive slots that are not occupied. The hard drive blanks ensure proper cooling of the storage system.**

6. Close the hard drive carrier handle to lock the hard drive in place.

   NOTE: Allow several seconds for the storage system to recognize the hard drive and determine its status. When functioning properly, the hard drive's status indicator turns green. In addition, the hard drive indicator turns green in the Dell Storage Client.

7. Replace the front bezel.

8. In the Dell Storage Client, make sure that the replacement hard drive is recognized and shown as up and running.

   If the Dell Storage Client informs you that there are unassigned disks, see the *Storage Center System Manager Administrator's Guide* for instructions on managing unassigned disks.

Next steps

1. Use SupportAssist to send diagnostic data to Dell Technical Support Services.

Install Hard Drives in Storage System

An SCv2000/SCv2020 storage system is shipped with drives installed and empty drive blanks are inserted in the unused slots.

Prerequisites

Use these instructions if you have purchased new hard drives for your SCv2000/SCv2020 storage system

About this task

The following instructions show the installation of the Dell Enterprise hard drive for reference only.
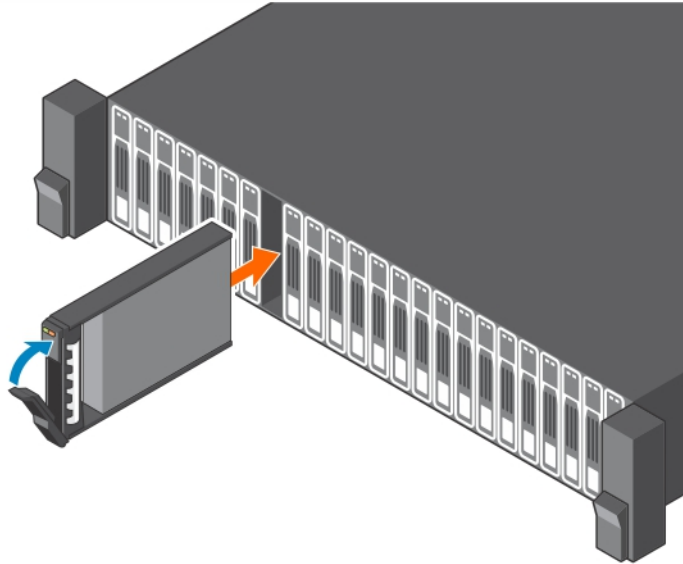
Figure 21. Installing Dell Enterprise Hard Drives in a Storage System

Steps

1. Remove empty drive blank.
2. Open the hard drive carrier handle and insert the hard drive carrier into the hard drive slot.
    Start on the left side of the storage system with slot 0 and install drives from left to right.
3. Slide the drive into the slot until the hard drive carrier contacts the backplane.
4. Close the hard drive carrier handle to lock the hard drive in place.
5. Continue to push firmly until you hear a click and the hard drive carrier handle fully engages.
6. Insert drive blanks into any open slots in the chassis.
    All of the drive slots in the storage system must be filled with a drive or drive blank.

Related Links

> Storage System Drive Numbering

Replacing the Storage Controller Battery

Each storage controller contains a hot-swappable battery. The battery supplies enough emergency power to back up vital information in the event of AC power loss.

Prerequisites

1. Use SupportAssist to send diagnostic data to Dell Technical Support Services.

About this task

Storage controller batteries can be replaced without shutting down the storage system.

Steps

1. Press the release tab and then slide the battery out of the storage controller.
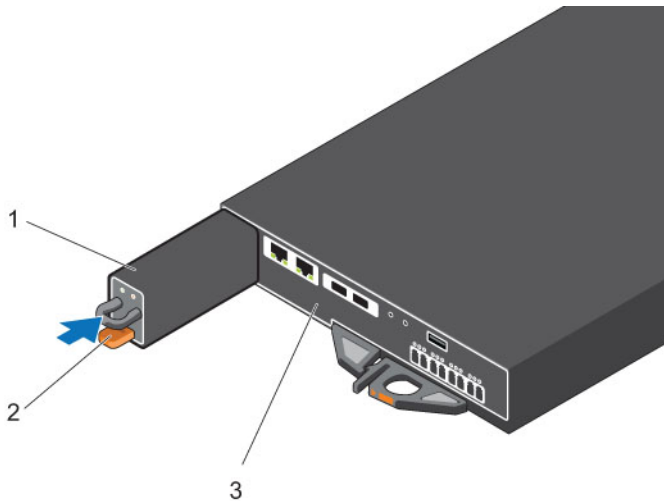
Figure 22. Replace the Storage Controller Battery

1. Battery	2. Release tab
3. Storage controller	

2. Align the replacement battery with the slot on the storage controller.
3. Slide the battery into the storage controller until the release tab clicks into place.

Next steps

1. Use SupportAssist to send diagnostic data to Dell Technical Support Services.

Replacing a Storage Controller

The SCv2000/SCv2020 storage system supports redundant hot-swappable storage controllers.

Storage controllers provide the following data path and storage management functions for the storage system:

- Monitoring and controlling some storage system environment elements such as temperature, fan, power supplies, and storage system LEDs

- Controlling access to hard drives
- Communicating storage attributes and states to the storage system

> ![note icon] **NOTE:** Do not return the storage controller battery with the failed storage controller. A new battery is not included with a replacement storage controller.

Identify the Failed Storage Controller

To determine which storage controller failed, use the Dell Storage Client .

1. Click the **Hardware** tab.
2. In the **Hardware** tab navigation pane, select the Storage Center.
3. In the **Hardware Alerts** area, find the hardware alert that identifies the enclosure with the failed storage controller.
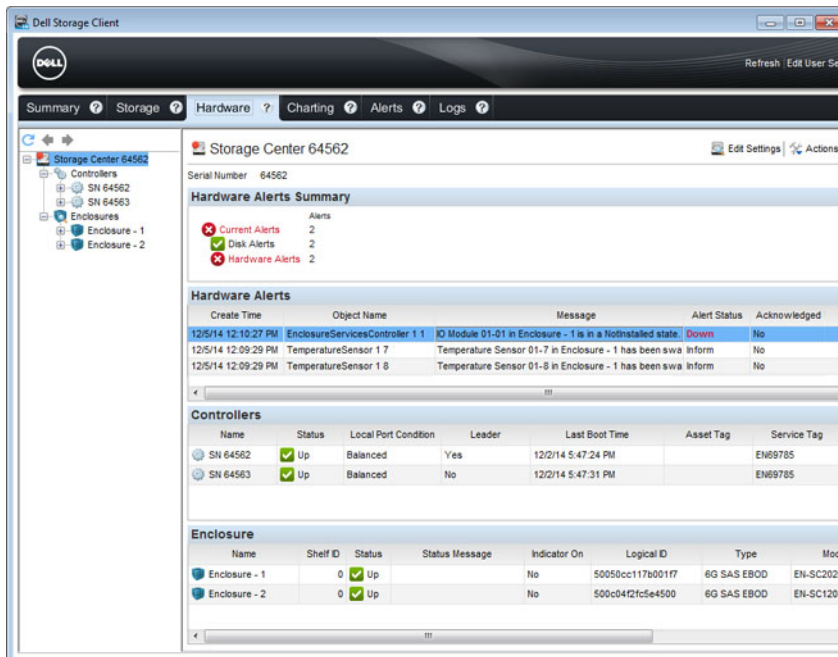
Figure 23. Hardware Alert Identifying the Enclosure with the Failed Storage Controller

4. In the Hardware tab navigation pane, expand the **Enclosures** entry.
5. Click **I/O Modules**. The status of each storage controller is displayed in the **I/O Modules** tab.
6. Select the failed storage controller to display its location in the **IO Module View** tab.
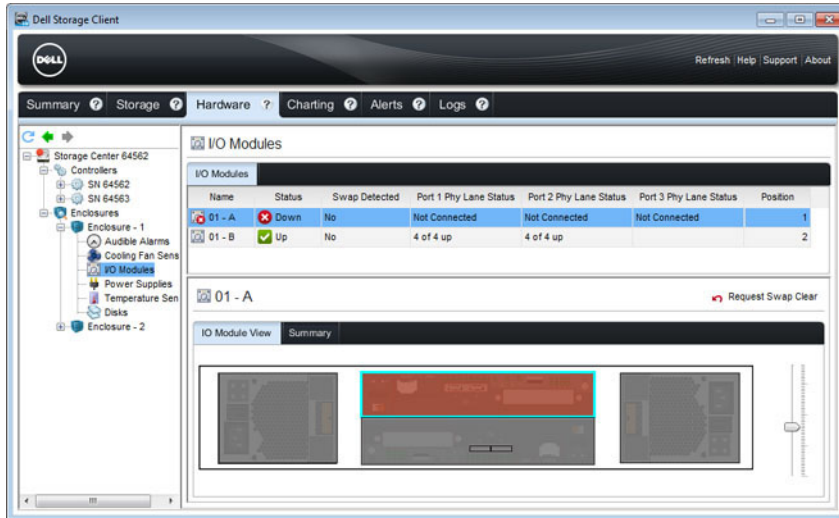
Figure 24. Rear View of the Enclosure Showing the Failed Storage Controller

Replace a Single Storage Controller

Use this procedure to replace a single failed storage controller.

Prerequisites

1. Use SupportAssist to send diagnostic data to Dell Technical Support Services.
2. Shut down the storage controller using the Dell Storage Client.

About this task

Storage controllers can be replaced one at a time without shutting down the storage system.

Steps

1. Make sure all of the cables are labeled.
2. Disconnect all of the cables from the storage controller that was shut down.
3. Remove the battery from the storage controller.
4. Squeeze the release tab on the storage controller release lever.
5. Pull the release lever away from the chassis.
6. Grasp the release lever and pull the storage controller away from the chassis.

Figure 25. Replacing a Storage Controller

1.	Power supply/cooling fan module	2.	Storage controller
3.	Release lever		

7. Locate the battery removed in a previous step and insert it into the replacement storage controller.
   a. Align the battery with the slot on the storage controller.
   b. Slide the battery into the storage controller until the release tab clicks into place.
8. Insert the replacement storage controller into the chassis until it is fully seated.

   NOTE: The bottom storage controller is installed upside down.
9. Reconnect the cables to the storage controller.
10. Push the release lever toward the chassis until it clicks into place. The storage controller is powered on.

   NOTE: When a storage controller is powered on, there is a one-minute delay while the storage controller prepares to boot. During this time, the only indication that the storage controller is powered on are the LEDs on the storage controller. After the one-minute delay, the fans and LEDs turn on as an indication that the storage controller is starting up.
11. In the Dell Storage Client, make sure that the replacement storage controller is recognized and shown as up and running.

   NOTE: If the Storage Center software on the replacement storage controller is older than the software on the existing storage controller, the storage system updates the replacement storage controller with the software version on the existing storage controller. The Storage Center software update on the replacement storage controller may take from 15 to 45 minutes to complete.
12. Clear the swap status for the temperature sensor and I/O module.
   a. Click the **Hardware** tab.
   b. In the **Hardware** tab navigation pane, expand the enclosure.
   c. Select **Temperature Sensors**.
   d. In the right pane, right-click the sensor, then click **Request Swap Clear**.

   e. Select **I/O Modules**.

   f. In the right pane, right-click the module, then click **Request Swap Clear**.

   g. Click the **Alerts** tab.

   h. Right-click the alerts for the temperature sensor and I/O modules, then click **Acknowledge**.

> **NOTE:** The alerts may not appear immediately. If the alerts do not appear, wait 10 seconds and then click **Refresh**.

Next steps

1. Use SupportAssist to send diagnostic data to Dell Technical Support Services.

Replace Both Storage Controllers in Succession

Use this procedure to replace both storage controllers, one at a time.

Prerequisites

1. Use SupportAssist to send diagnostic data to Dell Technical Support Services.
2. Shut down the left storage controller.

About this task

This procedure is useful if you are swapping out degraded, but operational storage controllers.

Steps

1. Make sure all of the cables are labeled.
2. Disconnect all of the cables from the left storage controller
3. Remove the battery from the left storage controller.
4. Squeeze the release tab on the storage controller release lever.
5. Pull the release lever away from the chassis.
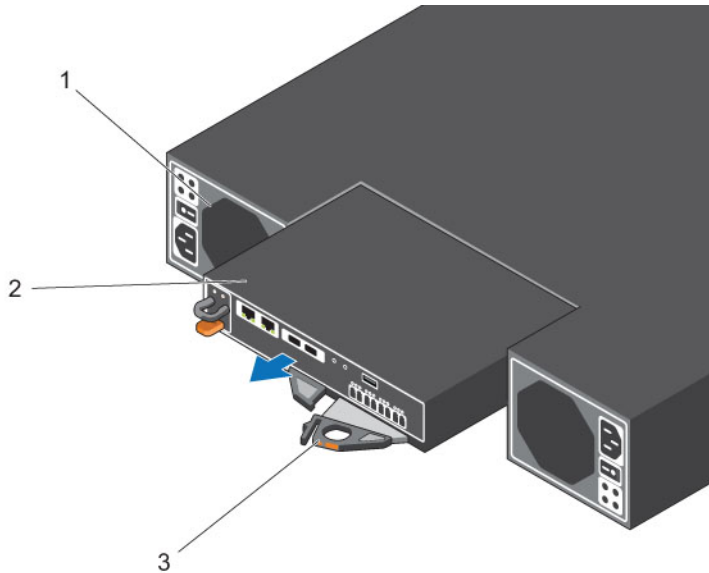6. Grasp the release lever and pull the storage controller away from the chassis.
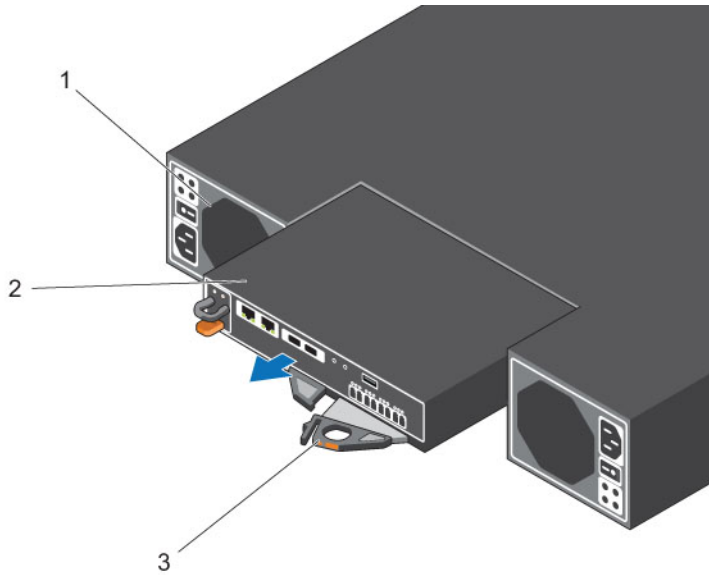
Figure 26. Replacing a Storage Controller

1. Storage controller	2. Release lever

7. Locate the battery removed in a previous step and insert it into the replacement storage controller.
   a. Align the battery with the slot on the storage controller.
   b. Slide the battery into the storage controller until the release tab clicks into place.
8. Insert the replacement storage controller into the chassis until it is fully seated.
9. Reconnect all the cables to the left storage controller.
10. Push the release lever toward the chassis until it clicks into place. The storage controller is powered on.

    > **NOTE:** When a storage controller is powered on, there is a one-minute delay while the storage controller prepares to boot. During this time, the only indication that the storage controller is powered on are the LEDs on the storage controller. After the one-minute delay, the fans and LEDs turn on as an indication that the storage controller is starting up.

11. In the Dell Storage Client, make sure that the replacement storage controller is recognized and shown as up and running.

    > **NOTE:** If the Storage Center software on the replacement storage controller is older than the software on the existing storage controller, the storage system updates the replacement storage controller with the software version on the existing storage controller. The Storage Center software update on the replacement storage controller may take from 15 to 45 minutes to complete.

12. Clear the swap status for the temperature sensor and I/O module.
   a. Click the **Hardware** tab.
   b. In the **Hardware** tab navigation pane, expand the enclosure.
   c. Select **Temperature Sensors**.
   d. In the right pane, right-click the sensor, then click **Request Swap Clear**.
   e. Select **I/O Modules**.
   f. In the right pane, right-click the module, then click **Request Swap Clear**.
   g. Click the **Alerts** tab.

h. Right-click the alerts for the temperature sensor and I/O modules, then click **Acknowledge**.

> **NOTE:** The alerts may not appear immediately. If the alerts do not appear, wait 10 seconds and then click **Refresh**.

13. Clear the swap status for the temperature sensor and acknowledge the alert.
    a. Click the **Hardware** tab.
    b. In the **Hardware** tab navigation pane, expand the enclosure.
    c. Select **Temperature Sensors**.
    d. In the right pane, right-click the sensor, then click **Request Swap Clear**.
    e. Click the **Alerts** tab.
    f. Right-click the alert and select **Acknowledge**.

    > **NOTE:** The alert may not appear immediately. If the alert does not appear, wait 10 seconds and then click **Refresh**.

14. Shut down the other storage controller and repeat the previous steps.

Next steps

1. Use SupportAssist to send diagnostic data to Dell Technical Support Services.

Replace Both Storage Controllers Simultaneously

If you need to replace both storage controllers at the same time, contact Dell Technical Support Services for assistance.

Replacing Rack Rails

Rack rails are used to install the SCv2000/SCv2020 storage system into a rack.

Prerequisites

1. Use SupportAssist to send diagnostic data to Dell Technical Support Services.

2. Shut down the storage system using the Dell Storage Client.

About this task
Use this procedure to replace rack rails.

> **NOTE:** Replacing rack rails must be performed during a scheduled maintenance window when the Storage Center system is unavailable to the network.

Steps
1. Make sure all of the cables are labeled.
2. Disconnect all of the cables from the storage system.
3. Remove the storage system from the rack rails.
4. Remove the rack rails from the rack.
5. Install the replacement rack rails in the rack.
6. Install the storage system in the rack rails.
7. Reconnect the cables to the storage system.
8. Start up the storage system.

Next steps

1. Use SupportAssist to send diagnostic data to Dell Technical Support Services.

Post-Replacement Procedures

After replacing a component in the SCv2000/SCv2020 storage system, start up the storage system if it was previously shut down and use SupportAssist to send diagnostic data to Dell Technical Support Services.

Start up the Storage System

If the storage system was previously shut down, perform this procedure to start it up.

1. Plug the power cables into the power supply/cooling fan modules of the storage system.
2. Turn on the storage system by pressing the power switches on the power supply/cooling fan modules.

   > **NOTE:** When the SCv2000/SCv2020 storage system is powered on, there is a one-minute delay while the SCv2000/SCv2020 prepares to boot. During this time, the only indication that the SCv2000/SCv2020 is powered on are the LEDs on the storage controllers. After the one-minute delay, the SCv2000/SCv2020 fans and LEDs turn on as an indication that the storage system is starting to come up.

3. Use the Dell Storage Client to make sure the replacement part is recognized and shown as up and running.

Sending Diagnostic Data Using Dell SupportAssist

Use Dell SupportAssist to send diagnostic data to Dell Technical Support Services.

1. Click **Send SupportAssist Data Now**. The **Send Support Assist Data Now** dialog box appears.
2. Select **Storage Center Configuration** and **Detailed Logs**.
3. Click **OK**.

3

Troubleshooting SCv2000/SCv2020 Components

This section contains basic troubleshooting steps for components inside the SCv2000/SCv2020 storage system.

Troubleshooting Power Supply/Cooling Fan Modules

Use these steps to troubleshoot power supply/cooling fan modules.

1. Check the status of the power supply/cooling fan module using the Dell Storage Client.
2. Determine the status of the power supply/cooling fan module indicators.
   - If the power supply/cooling fan module fault indicator is lit, the power supply/cooling fan has failed.
   - If the AC power indicator is not lit, check the power cord and power source into which the power supply is plugged:
     - Connect another device to the power source and check whether the device works.
     - Connect the power cord to a different power source.
     - Replace the power cord.
3. Reseat the power supply/cooling fan module by removing and reinstalling it.

   > **NOTE:** Allow several seconds for the storage system to recognize the power supply/cooling fan modules and determine its status.

Troubleshooting Hard Drives

Use these steps to troubleshoot hard drives.

1. Check the status of the hard drive using the Dell Storage Client.
2. Determine the status of the hard drive indicators.
   - If the hard drive status indicator blinks amber on 2 seconds / off 1 second, the hard drive has failed.
   - If the hard drive status indicator is not lit, proceed to the next step.
3. Check the connectors and reseat the hard drive.
   a. Remove the hard drive.
   b. Check the hard drive and the backplane to ensure that the connectors are not damaged.
   c. Reinstall the hard drive. Make sure the hard drive makes contact with the backplane.

Troubleshooting Storage Controllers

Use these steps to troubleshoot storage controllers.

1. Check the status of the storage controller using the Dell Storage Client.
2. Check the pins and reseat the storage controller.
   a. Remove the storage controller.
   b. Verify that the pins on the storage system backplane and the storage controller are not bent.
   c. Reinstall the storage controller.
3. Determine the status of the storage controller link status indicators. If the indicators are not green, check the cables.
   a. Shut down the storage controller.
   b. Reseat the cables on the storage controller.
   c. Restart the storage controller.
   d. Recheck the link status indicators. If the link status indicators are not green, replace the cables.

SCv2000/SCv2020 Technical Specifications

This section contains technical specifications of the SCv2000/SCv2020 storage system.

Technical Specifications

The technical specifications of the SCv2000/SCv2020 storage systems are displayed in the following tables.

Drives	
SAS hard drives	**SCv2000**: Up to 12 3.5-inch SAS hot-swappable hard drives (6.0 Gbps)
	SCv2020: Up to 24 2.5-inch SAS hot-swappable hard drives (6.0 Gbps)

Storage Controllers	
Storage controllers	Up to two hot-swappable storage controllers with the following IO options:
	• Two 16 Gbps Fibre Channel ports
	• Four 8 Gbps Fibre Channel ports
	• Two 10 Gbps iSCSI ports
	• Four 1 Gbps iSCSI ports
	• Four 12 Gbps SAS ports

Storage Connectivity	
Configurations	Storage Center supports up to 168 drives in one redundant-path SAS chain
	• An SCv2000 supports up to 13 SC100 expansion enclosures or 6 SC120 expansion enclosures
	• An SCv2020 supports up to 12 SC100 expansion enclosures or 6 SC120 expansion enclosures

Redundant Array of Independent Disks (RAID)	
Controller	Two hot-swappable storage controllers
Management	RAID management using Dell Storage Client 2015 R1

Back-Panel Ports Connectors (per Storage Controller)

Fibre Channel, iSCSI, or SAS connectors	Connection to a Fiber Channel fabric, iSCSI network, or a direct connection to servers with SAS HBAs
Ethernet connectors	**MGMT**: 10 Mbps, 100 Mbps, or 1 Gbps embedded Ethernet port used for Storage Center management **REPL**: 10 Mbps, 100 Mbps, or 1 Gbps embedded iSCSI port used for replication to another Storage Center
SAS connectors	6 Gbps SAS connectors for SAS port redundancy and additional expansion enclosures **NOTE:** SAS connectors are SFF-8086/SFF-8088 compliant
USB connector	One USB 3.0 connector. Not for customer use on SCv2000/SCv2020 storage systems.
Serial connector	**NOTE:** Not for customer use

LED Indicators

Front panel	• One two-color LED indicator for system status. • One single-color LED indicator for power status. • Two digit, seven-segment display indicating the storage system ID number • ID button with a single-color LED indicating startup and pressed states
Hard drive carrier	• One single-color activity LED • One single-color LED status indicator per drive
Storage controller	• Two single-color LEDs per Ethernet port indicating activity and link speed • Four dual-color LEDs per SAS connector indicating port activity and status • One single-color LED indicating status • One single-color LED indicating fault • One single-color LED for identification • Eight single-color LED for diagnostics
Power supply/cooling fan	Four LED status indicators for Power Supply Status, AC Fail status, DC Fail status, and Fan Fail status

Power Supplies

AC power supply (per power supply)	
Wattage	580 W (maximum wattage: 584 W)
Voltage	100−240 VAC (7.6−3.0 A)
Heat dissipation	**SCv2000**: 65 W at 230 VAC and 99 W at 115 VAC **SCv2020**: 65 W at 230 VAC and 99 W at 115 VAC

Power Supplies

Maximum inrush current	Under typical line conditions and over the entire system ambient operating range, the inrush current may reach 45 A per power supply for 40 ms or less

Available Hard Drive Power (Per Slot)

Supported hard drive power consumption (continuous)	Up to 1.2 A at +5 V Up to 0.5 A at +12 V

Physical

Height	8.79 cm (3.46 in.)
Width	48.2 cm (18.98 in.)
Depth	**SCv2000**: 54.68 cm (21.53 in.) **SCv2020**: 54.68 cm (21.53 in.)
Weight (maximum configuration)	**SCv2000**: 29 kg (64 lb) **SCv2020**: 24 kg (53 lb)
Weight without drives	**SCv2000**: 21 kg (46 lb) **SCv2020**: 19 kg (41 lb)

Environmental

For additional information about environmental measurements for specific storage system configurations, see dell.com/environmental_datasheets.

Temperature

Operating	5° to 57°C (41° to 135°F) with a maximum temperature gradation of 10°C per hour 52°C (126°F) maximum 2,000 to 3,048 m (6,562 to 10,000 ft) 47°C (117°F) maximum 3,048 to 4,000 m (10,000 to 13,123 ft)
Storage	−40° to 65°C (−40° to 149°F) at a maximum altitude of 12,000 m (39,370 ft)

Relative humidity

Operating	10% to 80% (noncondensing) with 29°C (84.2°F) maximum dew point
Storage	5% to 95% (noncondensing) with 33°C (91°F) maximum dew point

Maximum vibration

Operating	0.21 G at 5–500 Hz for 15 min
Storage	1.04 G at 2–200 Hz for 15 min

Maximum shock

Operating	Half-sine shock 5 G +/- 5% with a pulse duration of 10 ms +/- 10% (in operational orientations only)

Environmental

Storage	Half-sine shock 30 G +/- 5% with a pulse duration of 10 ms +/- 10% (all sides)

Altitude

Operating	0 to 3,048 m (0 to 10,000 ft) For altitudes above 915 m (3,000 ft), the maximum operating temperature is derated 1°C per 300 m (1°F per 547 ft)
Storage	−300 to 12,192 m (−1000 to 40,000 ft)

Airborne Contaminant Level

Class	G1 or lower as defined by ISA–S71.04–1985

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