

SAN Volume Controller 8.3.1

Quick Start Guide
Machine Types 2145, 2147
Models SA2, SV2



Edition notice

This edition applies to version 8, release 3, modification 1 of IBM and to all subsequent modifications until otherwise indicated in new editions.

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Compliance standards

Note: This product was designed, tested, manufactured, and certified for safe operation. It complies with IEC 60950-1 and/or IEC 62368-1 and where required, to relevant national differences/deviations (NDs) to these IEC base standards. This includes, but is not limited to: EN (European Norms including all Amendments under the Low Voltage Directive), UL/CSA (North America bi-national harmonized and marked per accredited NRTL agency listings), and other such derivative certifications according to corporate determinations and latest regional publication compliance standardized requirements.

Regulatory Model ID (RMID) or Machine Type - Modelsl (MT-Ms) may also be used to supplement identification (ID) for worldwide (WW) co-compliance filings or registrations with regulatory bodies.

Safety and environmental notices

Review all safety notices, environmental notices, and electronic emission notices before you install and use the product.

Suitability for telecommunication environment: This product is not intended to connect directly or indirectly by any means whatsoever to interfaces of public telecommunications networks.

To find the translated text for a caution or danger notice, complete the following steps.

1. Look for the identification number at the end of each caution notice or each danger notice. In the following examples, the numbers (C001) and (D002) are the identification numbers.



CAUTION: A caution notice indicates the presence of a hazard that has the potential of causing moderate or minor personal injury. (C001)



DANGER: A danger notice indicates the presence of a hazard that has the potential of causing death or serious personal injury. (D002)

2. Locate the *IBM System Storage SAN Volume Controller Safety Notices* with the user publications that were provided with your system hardware.
3. Find the matching identification number in the *IBM System Storage SAN Volume Controller Safety Notices*. Then, review the topics about the safety notices to ensure that you are in compliance.
4. (Optional) Read the multilingual safety instructions on the system website.
 - a. Go to www.ibm.com/support
 - b. Search for " SAN Volume Controller "
 - c. Click the documentation link.

Safety notices and labels

Review the safety notices and safety information labels before you use this product.

To view a PDF file, you need Adobe Acrobat Reader. You can download it at no charge from the Adobe website:

www.adobe.com/support/downloads/main.html

IBM Systems Safety Notices

This publication contains the safety notices for the IBM® Systems products in English and other languages. Anyone who plans, installs, operates, or services the system must be familiar with and understand the safety notices. Read the related safety notices before you begin work.

Note: The *IBM System Safety Notices* document is organized into two sections. The danger and caution notices without labels are organized alphabetically by language in the "Danger and caution notices by language" section. The danger and caution notices that are accompanied with a label are organized by label reference number in the "Labels" section.

Note: You can find and download the current *IBM System Safety Notices* by searching for Publication number **G229-9054** in the [IBM Publications Center](#).

The following notices and statements are used in IBM documents. They are listed in order of decreasing severity of potential hazards.

Danger notice definition

A special note that emphasizes a situation that is potentially lethal or extremely hazardous to people.

Caution notice definition

A special note that emphasizes a situation that is potentially hazardous to people because of some existing condition, or to a potentially dangerous situation that might develop because of some unsafe practice.

Note: In addition to these notices, labels might be attached to the product to warn of potential hazards.

Finding translated notices

Each safety notice contains an identification number. You can use this identification number to check the safety notice in each language.

To find the translated text for a caution or danger notice:

1. In the product documentation, look for the identification number at the end of each caution notice or each danger notice. In the following examples, the numbers (D002) and (C001) are the identification numbers.



DANGER: A danger notice indicates the presence of a hazard that has the potential of causing death or serious personal injury. (D002)



CAUTION: A caution notice indicates the presence of a hazard that has the potential of causing moderate or minor personal injury. (C001)

2. After you download the *IBM System Safety Notices* document, open it.
3. Under the language, find the matching identification number. Review the topics about the safety notices to ensure that you are in compliance.

Caution notices for the system

Ensure that you understand the caution notices for the system.

Use the reference numbers in parentheses at the end of each notice (for example, D005) to find the matching translated notice in *IBM System Storage SAN Volume Controller Safety Notices*.



CAUTION: The battery contains lithium. To avoid possible explosion, do not burn or charge the battery.

Do not: Throw or immerse into water, heat to more than 100°C (212°F), repair or disassemble. (C003)



CAUTION:

33.6-46.3 kg (74-102 lbs)	46.3-61.7 kg (102-136 lbs)	≥61.7-100 kg (136-220 lbs)

svc01053

The weight of this part or unit is more than 55 kg (121.2 lb). It takes specially trained persons, a lifting device, or both to safely lift this part or unit. (C011)



CAUTION: To avoid personal injury, before lifting this unit, remove all appropriate subassemblies per instructions to reduce the system weight. (C012)



CAUTION: The doors and covers to the product are to be closed at all times except for service by trained service personnel. All covers must be replaced and doors closed at the conclusion of the service operation. (C013)



CAUTION: CAUTION regarding IBM provided VENDOR LIFT TOOL:

- Operation of LIFT TOOL by authorized personnel only
- LIFT TOOL intended for use to assist, lift, install, remove units (load) up into rack elevations. It is not to be used loaded transporting over major ramps nor as a replacement for such designated tools like pallet jacks, walkies, fork trucks and such related relocation practices. When this is not practicable, specially trained persons or services must be used (for instance, riggers or movers). Read and completely understand the contents of LIFT TOOL operator's manual before using.
- Read and completely understand the contents of LIFT TOOL operator's manual before using. Failure to read, understand, obey safety rules, and follow instructions may result in property damage and/or personal injury. If there are questions, contact the vendor's service and support. Local paper manual must remain with machine in provided storage sleeve area. Latest revision manual available on vendor's website.
- Test verify stabilizer brake function before each use. Do not over-force moving or rolling the LIFT TOOL with stabilizer brake engaged.
- Do not raise, lower or slide platform load shelf unless stabilizer (brake pedal jack) is fully engaged. Keep stabilizer brake engaged when not in use or motion.
- Do not move LIFT TOOL while platform is raised, except for minor positioning.
- Do not exceed rated load capacity. See LOAD CAPACITY CHART regarding maximum loads at center versus edge of extended platform.
- Only raise load if properly centered on platform. Do not place more than 200 lb (91 kg) on edge of sliding platform shelf also considering the load's center of mass/gravity (CoG).
- Do not corner load the platform tilt riser accessory option. Secure platform riser tilt option to main shelf in all four (4x) locations with provided hardware only, prior to use. Load objects are designed to slide on/off smooth platforms without appreciable force, so take care not to push or lean. Keep riser tilt option flat at all times except for final minor adjustment when needed.
- Do not stand under overhanging load.
- Do not use on uneven surface, incline or decline (major ramps).
- Do not stack loads. (C048, part 1 of 2)

- Do not operate while under the influence of drugs or alcohol.
- Do not support ladder against LIFT TOOL.
- Tipping hazard. Do not push or lean against load with raised platform.
- Do not use as a personnel lifting platform or step. No riders.
- Do not stand on any part of lift. Not a step.
- Do not climb on mast.
- Do not operate a damaged or malfunctioning LIFT TOOL machine.
- Crush and pinch point hazard below platform. Only lower load in areas clear of personnel and obstructions. Keep hands and feet clear during operation.
- No Forks. Never lift or move bare LIFT TOOL MACHINE with pallet truck, jack or fork lift.
- Mast extends higher than platform. Be aware of ceiling height, cable trays, sprinklers, lights, and other overhead objects.
- Do not leave LIFT TOOL machine unattended with an elevated load.
- Watch and keep hands, fingers, and clothing clear when equipment is in motion.
- Turn Winch with hand power only. If winch handle cannot be cranked easily with one hand, it is probably over-loaded. Do not continue to turn winch past top or bottom of platform travel. Excessive unwinding will detach handle and damage cable. Always hold handle when lowering, unwinding. Always assure self that winch is holding load before releasing winch handle.
- A winch accident could cause serious injury. Not for moving humans. Make certain clicking sound is heard as the equipment is being raised. Be sure winch is locked in position before releasing handle. Read instruction page before operating this winch. Never allow winch to unwind freely. Freewheeling will cause uneven cable wrapping around winch drum, damage cable, and may cause serious injury. (C048, part 2 of 2)



CAUTION:

- Do not install a unit in a rack where the internal rack ambient temperatures will exceed the manufacturer's recommended ambient temperature for all your rack-mounted devices.
- Do not install a unit in a rack where the air flow is compromised. Ensure that air flow is not blocked or reduced on any side, front, or back of a unit used for air flow through the unit.
- Consideration should be given to the connection of the equipment to the supply circuit so that overloading of the circuits does not compromise the supply wiring or overcurrent protection. To provide the correct power connection to a rack, refer to the rating labels located on the equipment in the rack to determine the total power requirement of the supply circuit.
- (For sliding drawers) Do not pull out or install any drawer or feature if the rack stabilizer brackets are not attached to the rack. Do not pull out more than one drawer at a time. The rack might become unstable if you pull out more than one drawer at a time.
- (For fixed drawers) This drawer is a fixed drawer and must not be moved for servicing unless specified by the manufacturer. Attempting to move the drawer partially or completely out of the rack might cause the rack to become unstable or cause the drawer to fall out of the rack. (R001 part 2 of 2)



CAUTION: Removing components from the upper positions in the rack cabinet improves rack stability during a relocation. Follow these general guidelines whenever you relocate a populated rack cabinet within a room or building.

- Reduce the weight of the rack cabinet by removing equipment starting at the top of the rack cabinet. When possible, restore the rack cabinet to the configuration of the rack cabinet as you received it. If this configuration is not known, you must observe the following precautions.
 - Remove all devices in the 32U position and above.
 - Ensure that the heaviest devices are installed in the bottom of the rack cabinet.

- Ensure that there are no empty U-levels between devices installed in the rack cabinet below the 32U level.
- If the rack cabinet you are relocating is part of a suite of rack cabinets, detach the rack cabinet from the suite.
- If the rack cabinet you are relocating was supplied with removable outriggers they must be reinstalled before the cabinet is relocated.
- Inspect the route that you plan to take to eliminate potential hazards.
- Verify that the route that you choose can support the weight of the loaded rack cabinet. Refer to the documentation that comes with your rack cabinet for the weight of a loaded rack cabinet.
- Verify that all door openings are at least 760 x 230 mm (30 x 80 in.).
- Ensure that all devices, shelves, drawers, doors, and cables are secure.
- Ensure that the four leveling pads are raised to their highest position.
- Ensure that there is no stabilizer bracket installed on the rack cabinet during movement.
- Do not use a ramp inclined at more than 10 degrees.
- When the rack cabinet is in the new location, complete the following steps:
 - Lower the four leveling pads.
 - Install stabilizer brackets on the rack cabinet.
 - If you removed any devices from the rack cabinet, repopulate the rack cabinet from the lowest position to the highest position.
- If a long-distance relocation is required, restore the rack cabinet to the configuration of the rack cabinet as you received it. Pack the rack cabinet in the original packaging material, or equivalent. Also lower the leveling pads to raise the casters off the pallet and bolt the rack cabinet to the pallet. (R002)

Danger notices for the system

Ensure that you are familiar with the danger notices for your system.

Use the reference numbers in parentheses at the end of each notice (for example, D005) to find the matching translated notice in *IBM System Storage SAN Volume Controller Safety Notices*.



DANGER: When working on or around the system, observe the following precautions:

Electrical voltage and current from power, telephone, and communication cables are hazardous. To avoid a shock hazard:

- If IBM supplied a power cord(s), connect power to this unit only with the IBM provided power cord. Do not use the IBM provided power cord for any other product.
- Do not open or service any power supply assembly.
- Do not connect or disconnect any cables or perform installation, maintenance, or reconfiguration of this product during an electrical storm.
- The product might be equipped with multiple power cords. To remove all hazardous voltages, disconnect all power cords.
- Connect all power cords to a properly wired and grounded electrical outlet. Ensure that the outlet supplies proper voltage and phase rotation according to the system rating plate.
- Connect any equipment that will be attached to this product to properly wired outlets.
- When possible, use one hand only to connect or disconnect signal cables.
- Never turn on any equipment when there is evidence of fire, water, or structural damage.
- Disconnect the attached power cords, telecommunications systems, networks, and modems before you open the device covers, unless instructed otherwise in the installation and configuration procedures.

- Connect and disconnect cables as described in the following procedures when installing, moving, or opening covers on this product or attached devices.

To disconnect:

1. Turn off everything (unless instructed otherwise).
2. Remove the power cords from the outlets.
3. Remove the signal cables from the connectors.
4. Remove all cables from the devices.

To connect:

1. Turn off everything (unless instructed otherwise).
 2. Attach all cables to the devices.
 3. Attach the signal cables to the connectors.
 4. Attach the power cords to the outlets.
 5. Turn on the devices.
- Sharp edges, corners and joints might be present in and around the system. Use care when handling equipment to avoid cuts, scrapes and pinching. (D005)



DANGER: Heavy equipment—personal injury or equipment damage might result if mishandled. (D006)



DANGER: DANGER: Serious injury or death can occur if loaded lift tool falls over or if a heavy load falls off the lift tool. Always completely lower the lift tool load plate and properly secure the load on the lift tool before moving or using the lift tool to lift or move an object. (D010)



DANGER: Multiple power cords. The product might be equipped with multiple power cords. To remove all hazardous voltages, disconnect all power cords. (L003)



or



DANGER: Observe the following precautions when working on or around your IT rack system:

- Heavy equipment—personal injury or equipment damage might result if mishandled.
- Always lower the leveling pads on the rack cabinet.
- Always install stabilizer brackets on the rack cabinet.
- To avoid hazardous conditions due to uneven mechanical loading, always install the heaviest devices in the bottom of the rack cabinet. Always install servers and optional devices starting from the bottom of the rack cabinet.
- Rack-mounted devices are not to be used as shelves or work spaces. Do not place objects on top of rack-mounted devices.



- Each rack cabinet might have more than one power cord. Be sure to disconnect all power cords in the rack cabinet when directed to disconnect power during servicing.

- Connect all devices installed in a rack cabinet to power devices installed in the same rack cabinet. Do not plug a power cord from a device installed in one rack cabinet into a power device installed in a different rack cabinet.
- An electrical outlet that is not correctly wired could place hazardous voltage on the metal parts of the system or the devices that attach to the system. It is the responsibility of the customer to ensure that the outlet is correctly wired and grounded to prevent an electrical shock. (R001 part 1 of 2)



DANGER: Racks with a total weight of > 227 kg (500 lb.), Use Only Professional Movers! (R003)




DANGER: Do not transport the rack via fork truck unless it is properly packaged, secured on top of the supplied pallet. (R004)

DANGER:



Main Protective Earth (Ground):

This symbol is marked on the frame of the rack.

The **PROTECTIVE EARTHING CONDUCTORS** should be terminated at that point. A recognized or certified closed loop connector (ring terminal) should be used and secured to the frame with a lock washer using a bolt or stud. The connector should be properly sized to be suitable for the bolt or stud, the locking washer, the rating for the conducting wire used, and the considered rating of the breaker. The intent is to ensure the frame is electrically bonded to the **PROTECTIVE EARTHING CONDUCTORS**. The hole that the bolt or stud goes into where the terminal conductor and the lock washer contact should be free of any non-conductive material to allow for metal to metal contact. All **PROTECTIVE EARTHING CONDUCTORS** should terminate at this main protective earthing terminal or at points marked with . (R010)

Special caution and safety notices

This information describes special safety notices that apply to the system. These notices are in addition to the standard safety notices that are supplied; they address specific issues that are relevant to the equipment provided.

Inspecting the system for unsafe conditions

Use caution when you are working in any potential safety hazardous situation that is not covered in the safety checks. If unsafe conditions are present, determine how serious the hazards are and whether you can continue before you correct the problem.

Before you begin

Before you start the safety inspection, make sure that the power is off, and that the power cord is disconnected.

About this task

Each device has the required safety items that are installed to protect users and support personnel from injury. Only those items are addressed.

Important: Good judgment must also be used to identify potential safety hazards due to the attachment of non-IBM features or options that are not covered by this inspection guide.

If any unsafe conditions are present, you must determine how serious the apparent hazard might be and whether you can continue without first correcting the problem. For example, consider the following conditions and their potential safety hazards:

Electrical hazards (especially primary power)

Primary voltage on the frame can cause serious or lethal electrical shock.

Explosive hazards

A damaged CRT face or a bulging capacitor can cause serious injury.

Mechanical hazards

Loose or missing items (for example, nuts and screws) can cause serious injury.

To inspect each node for unsafe conditions, use the following steps. If necessary, see any suitable safety publications.

Procedure

1. Turn off the system and disconnect the power cord.
2. Check the frame for damage (loose, broken, or sharp edges).
3. Check the power cables by using the following steps:
 - a) Ensure that the third-wire ground connector is in good condition. Use a meter to check that the third-wire ground continuity is 0.1 ohm or less between the external ground pin and the frame ground.
 - b) Ensure that the power cord is the appropriate type, as specified in the parts listings.
 - c) Ensure that the insulation is not worn or damaged.
4. Check for any obvious nonstandard changes, both inside and outside the unit. Use good judgment about the safety of any such changes.
5. Check inside the node for any obvious unsafe conditions, such as metal particles, contamination, water or other fluids, or marks of overheating, fire, or smoke damage.
6. Check for worn, damaged, or pinched cables.
7. Ensure that the voltage that is specified on the product-information label matches the specified voltage of the electrical power outlet. If necessary, verify the voltage.
8. Inspect the power-supply assemblies and check that the fasteners (screws or rivets) in the cover of the power-supply unit are not removed or disturbed.
9. Check the grounding of the network switch before you connect the system to the storage area network (SAN).

Checking external devices

Ensure that you complete an external device check before you install or service the system.

Procedure

To conduct an external device check, complete the following steps.

1. Verify that all external covers are present and are not damaged.
2. Ensure that all latches and hinges are in the correct operating condition.
3. Check the power cords for damage.
4. Check the external signal cables for damage.
5. Check the cover for sharp edges, damage, or alterations that expose the internal parts of the device.
6. Correct any problems that you find.

Checking internal devices

Ensure that you complete an internal device check before you install or service your system.

About this task

To conduct the internal device check, use the following steps.

Procedure

1. Check for any non-IBM changes that were made to the device. If any are present, obtain the “Non-IBM Alteration Attachment Survey,” form number R009, from the IBM branch office. Complete the form and return it to the branch office.
2. Check the condition of the inside of the device for any metal or other contaminants, or any indications of water, other fluid, fire, or smoke damage.
3. Check for any obvious mechanical problems, such as loose components.
4. Check any exposed cables and connectors for wear, cracks, or pinching.

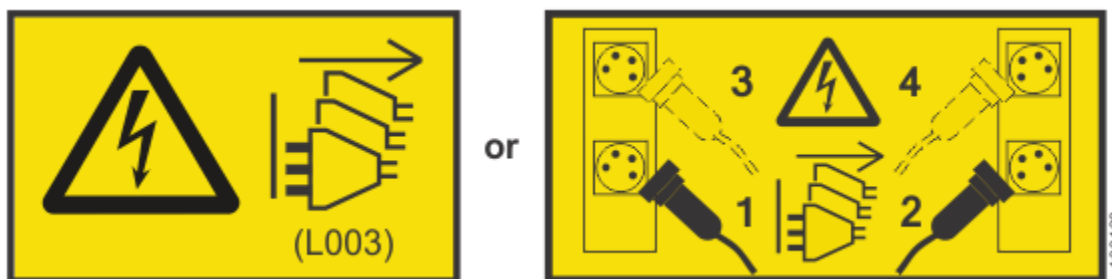
Checking the grounding of the system and redundant AC-power switch

Ensure that you understand how to check the grounding of a system and the optional redundant AC-power switch feature.

About this task



DANGER: Multiple power cords. The product might be equipped with multiple power cords. To remove all hazardous voltages, disconnect all power cords. (L003)



To test the grounding of a system node, follow the steps for the specific system configuration that you are using. Before you start, confirm that you know the model type of your system, and whether you are using redundant AC power. Determine the location of the signal cables that are attached to the system.

When you are asked to test the grounding continuity, use your local procedures to initiate the test. The test is successful if the measured resistance is 0.1 ohm or less.



Attention: Some electrical circuits can be damaged if the external signal cables are present at the node while it is undergoing a grounding test.

Procedure

1. Ensure that the node is powered off. See MAP 5350: Powering off a SAN Volume Controller node in the *IBM SAN Volume Controller Troubleshooting Guide*.
2. Disconnect all signal cables from the node, which includes the following cables:
 - The Fibre Channel cables.
 - The Ethernet cable or cables.
3. If redundant AC power is used, turn off any node that is being supplied from the redundant AC-power switch. Then, remove the power cable to this system from the redundant AC-power switch.
4. Disconnect **both** input power leads from the site power distribution units
5. If redundant AC power is used, test the grounding continuity between a conductive area on the frame and the ground pin on the plug of the main power cable of the redundant AC-power switch. If the test is successful, test the grounding continuity between a conductive area on the frame and the ground pin on the plug of the backup power cable of the redundant AC-power switch. Both tests must be successful.
6. Initiate one of the following procedures after you complete testing the grounding continuity, depending on the outcome of the test.

- If the test is successful, reconnect any cables that were removed.
- If the test was not successful, ensure that all cables are securely connected. If the test still fails, test the individual system components. Before you test the individual components, remove all cables from the components. If any component test fails, replace the component. After you test each component and replace any failing ones, repeat the complete system test by returning to step “1” on [page xv](#).

Test the components in the following order:

- a. The node, from the frame to the ground pin of the input power receptacle
- b. The redundant AC-power switch, if used, from the ground pin of the main input power receptacle to the ground conductor of the output power receptacle, and from the ground pin of the backup input power receptacle to the ground conductor of the output power receptacle
- c. The redundant AC-power switch main input-power cable, if used, between the two ground conductors of the cable
- d. The redundant AC-power switch backup input-power cable, if used, between the two ground conductors of the cable

Handling static-sensitive devices

Ensure that you understand how to handle devices that are sensitive to static electricity.



Attention: Static electricity can damage electronic devices and your system. To avoid damage, keep static-sensitive devices in their static-protective bags until you are ready to install them.

To reduce the possibility of electrostatic discharge, observe the following precautions:

- Limit your movement. Movement can cause static electricity to build up around you.
- Handle the device carefully, holding it by its edges or frame.
- Do not touch solder joints, pins, or exposed printed circuitry.
- Do not leave the device where others can handle and possibly damage the device.
- While the device is still in its antistatic bag, touch it to an unpainted metal part of the system unit for at least 2 seconds. (This action removes static electricity from the package and from your body).
- Remove the device from its package and install it directly into your system, without putting it down. If it is necessary to put the device down, place it onto its static-protective bag. (If your device is an adapter, place it component-side up.) Do not place the device onto the cover of the system or onto a metal table.
- Take additional care when you handle devices during cold weather. Indoor humidity tends to decrease in cold weather, causing an increase in static electricity.

Environmental notices

This information contains all the required environmental notices for IBM Systems products in English and other languages.

The [IBM Systems Environmental Notices](#) information includes statements on limitations, product information, product recycling and disposal, battery information, flat panel display, refrigeration and water-cooling systems, external power supplies, and safety data sheets.

Electromagnetic compatibility Class A notices

The following Class A statements apply to IBM products and their features unless designated as electromagnetic compatibility (EMC) Class B in the feature information.

When attaching a monitor to the equipment, you must use the designated monitor cable and any interference suppression devices that are supplied with the monitor.

Canada Notice

CAN ICES-3 (A)/NMB-3(A)

European Community and Morocco Notice

This product is in conformity with the protection requirements of Directive 2014/30/EU of the European Parliament and of the Council on the harmonization of the laws of the Member States relating to electromagnetic compatibility. IBM cannot accept responsibility for any failure to satisfy the protection requirements resulting from a non-recommended modification of the product, including the fitting of non-IBM option cards.

This product may cause interference if used in residential areas. Such use must be avoided unless the user takes special measures to reduce electromagnetic emissions to prevent interference to the reception of radio and television broadcasts.

Warning: This equipment is compliant with Class A of CISPR 32. In a residential environment this equipment may cause radio interference.

Germany Notice

Deutschsprachiger EU Hinweis: Hinweis für Geräte der Klasse A EU-Richtlinie zur Elektromagnetischen Verträglichkeit

Dieses Produkt entspricht den Schutzanforderungen der EU-Richtlinie 2014/30/EU zur Angleichung der Rechtsvorschriften über die elektromagnetische Verträglichkeit in den EU-Mitgliedsstaaten und hält die Grenzwerte der EN 55032 Klasse A ein.

Um dieses sicherzustellen, sind die Geräte wie in den Handbüchern beschrieben zu installieren und zu betreiben. Des Weiteren dürfen auch nur von der IBM empfohlene Kabel angeschlossen werden. IBM übernimmt keine Verantwortung für die Einhaltung der Schutzanforderungen, wenn das Produkt ohne Zustimmung von IBM verändert bzw. wenn Erweiterungskomponenten von Fremdherstellern ohne Empfehlung von IBM gesteckt/eingebaut werden.

EN 55032 Klasse A Geräte müssen mit folgendem Warnhinweis versehen werden:

"Warnung: Dieses ist eine Einrichtung der Klasse A. Diese Einrichtung kann im Wohnbereich Funkstörungen verursachen; in diesem Fall kann vom Betreiber verlangt werden, angemessene Maßnahmen zu ergreifen und dafür aufzukommen."

Deutschland: Einhaltung des Gesetzes über die elektromagnetische Verträglichkeit von Geräten

Dieses Produkt entspricht dem "Gesetz über die elektromagnetische Verträglichkeit von Geräten (EMVG)". Dies ist die Umsetzung der EU-Richtlinie 2014/30/EU in der Bundesrepublik Deutschland.

Zulassungsbescheinigung laut dem Deutschen Gesetz über die elektromagnetische Verträglichkeit von Geräten (EMVG) (bzw. der EMC Richtlinie 2014/30/EU) für Geräte der Klasse A

Dieses Gerät ist berechtigt, in Übereinstimmung mit dem Deutschen EMVG das EG-Konformitätszeichen - CE - zu führen.

Verantwortlich für die Einhaltung der EMV-Vorschriften ist der Hersteller:

International Business Machines Corp.
New Orchard Road
Armonk, New York 10504
Tel: 914-499-1900

Der verantwortliche Ansprechpartner des Herstellers in der EU ist:

IBM Deutschland GmbH
Technical Relations Europe, Abteilung M456
IBM-Allee 1, 71139 Ehningen, Germany
Tel: +49 800 225 5426
e-mail: Halloibm@de.ibm.com

Generelle Informationen:

Das Gerät erfüllt die Schutzanforderungen nach EN 55024 und EN 55032 Klasse A.

Japan Electronics and Information Technology Industries Association (JEITA) Notice

(一社) 電子情報技術産業協会 高調波電流抑制対策実施
要領に基づく定格入力電力値 : IBM Documentationの各製品
の仕様ページ参照

This statement applies to products less than or equal to 20 A per phase.

高調波電流規格 JIS C 61000-3-2 適合品

This statement applies to products greater than 20 A, single phase.

高調波電流規格 JIS C 61000-3-2 準用品

本装置は、「高圧又は特別高圧で受電する需要家の高調波抑制対策ガイドライン」対象機器（高調波発生機器）です。

- 回路分類 : 6 (単相、P F C回路付)
- 換算係数 : 0

This statement applies to products greater than 20 A per phase, three-phase.

高調波電流規格 JIS C 61000-3-2 準用品

本装置は、「高圧又は特別高圧で受電する需要家の高調波抑制対策ガイドライン」対象機器（高調波発生機器）です。

- 回路分類 : 5 (3相、P F C回路付)
- 換算係数 : 0

Japan Voluntary Control Council for Interference (VCCI) Notice

この装置は、クラスA機器です。この装置を住宅環境で使用すると電波妨害を引き起こすことがあります。この場合には使用者が適切な対策を講ずるよう要求されることがあります。

VCCI — A

Korea Notice

이 기기는 업무용 환경에서 사용할 목적으로 적합성평가를 받은 기기로서 가정용 환경에서 사용하는 경우 전파간섭의 우려가 있습니다.

People's Republic of China Notice

警告:在居住环境中,运行此设备可能会造成无线电干扰。

Russia Notice

ВНИМАНИЕ! Настоящее изделие относится к классу А.
В жилых помещениях оно может создавать
радиопомехи, для снижения которых необходимы
дополнительные меры

01252011

Taiwan Notice

CNS 13438

警告使用者：
此為甲類資訊技術設備，
於居住環境中使用時，可
能會造成射頻擾動，在此
種情況下，使用者會被要
求採取某些適當的對策。

CNS 15936

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IBM Taiwan Contact Information:

台灣IBM 產品服務聯絡方式：
台灣國際商業機器股份有限公司
台北市松仁路7號3樓
電話：0800-016-888

12c00790

United Kingdom Notice

This product may cause interference if used in residential areas. Such use must be avoided unless the user takes special measures to reduce electromagnetic emissions to prevent interference to the reception of radio and television broadcasts.

United States Federal Communications Commission (FCC) Notice

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at his own expense.

Properly shielded and grounded cables and connectors must be used in order to meet FCC emission limits. IBM is not responsible for any radio or television interference caused by using other than recommended cables and connectors, or by unauthorized changes or modifications to this equipment. Unauthorized changes or modifications could void the user's authority to operate the equipment.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

(1) this device might not cause harmful interference, and (2) this device must accept any interference received, including interference that might cause undesired operation.

Responsible Party:

International Business Machines Corporation

New Orchard Road

Armonk, NY 10504

Contact for FCC compliance information only: fccinfo@us.ibm.com

Electromagnetic compatibility Class B notices

The following Class B statements apply to features designated as electromagnetic compatibility (EMC) Class B in the feature installation information.

When attaching a monitor to the equipment, you must use the designated monitor cable and any interference suppression devices supplied with the monitor.

Canada Notice

CAN ICES-3 (B)/NMB-3(B)

European Community and Morocco Notice

This product is in conformity with the protection requirements of Directive 2014/30/EU of the European Parliament and of the Council on the harmonization of the laws of the Member States relating to electromagnetic compatibility. IBM cannot accept responsibility for any failure to satisfy the protection requirements resulting from a non-recommended modification of the product, including the fitting of non-IBM option cards.

Germany Notice

Deutschsprachiger EU Hinweis: Hinweis für Geräte der Klasse B EU-Richtlinie zur Elektromagnetischen Verträglichkeit

Dieses Produkt entspricht den Schutzanforderungen der EU-Richtlinie 2014/30/EU zur Angleichung der Rechtsvorschriften über die elektromagnetische Verträglichkeit in den EU-Mitgliedsstaaten und hält die Grenzwerte der EN 55022/ EN 55032 Klasse B ein.

Um dieses sicherzustellen, sind die Geräte wie in den Handbüchern beschrieben zu installieren und zu betreiben. Des Weiteren dürfen auch nur von der IBM empfohlene Kabel angeschlossen werden. IBM übernimmt keine Verantwortung für die Einhaltung der Schutzanforderungen, wenn das Produkt ohne Zustimmung von IBM verändert bzw. wenn Erweiterungskomponenten von Fremdherstellern ohne Empfehlung von IBM gesteckt/eingebaut werden.

Deutschland: Einhaltung des Gesetzes über die elektromagnetische Verträglichkeit von Geräten

Dieses Produkt entspricht dem "Gesetz über die elektromagnetische Verträglichkeit von Geräten (EMVG)". Dies ist die Umsetzung der EU-Richtlinie 2014/30/EU in der Bundesrepublik Deutschland.

Zulassungsbescheinigung laut dem Deutschen Gesetz über die elektromagnetische Verträglichkeit von Geräten (EMVG) (bzw. der EMC Richtlinie 2014/30/EU) für Geräte der Klasse B

Dieses Gerät ist berechtigt, in Übereinstimmung mit dem Deutschen EMVG das EG-Konformitätszeichen - CE - zu führen.

Verantwortlich für die Einhaltung der EMV Vorschriften ist der Hersteller:

International Business Machines Corp.

New Orchard Road

Armonk, New York 10504

Tel: 914-499-1900

Der verantwortliche Ansprechpartner des Herstellers in der EU ist:

IBM Deutschland GmbH

Technical Relations Europe, Abteilung M456

IBM-Allee 1, 71139 Ehningen, Germany

Tel: +49 (0) 800 225 5426

email: HalloIBM@de.ibm.com

Generelle Informationen:

Das Gerät erfüllt die Schutzanforderungen nach EN 55024 und EN 55032 Klasse B

Japan Electronics and Information Technology Industries Association (JEITA) Notice

(一社) 電子情報技術産業協会 高調波電流抑制対策実施
要領に基づく定格入力電力値 : IBM Documentationの各製品
の仕様ページ参照

This statement applies to products less than or equal to 20 A per phase.

高調波電流規格 JIS C 61000-3-2 適合品

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- 回路分類 : 5 (3相、P F C回路付)
- 換算係数 : 0

Japan Voluntary Control Council for Interference (VCCI) Notice

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VCCI — B

Taiwan Notice

IBM Taiwan Contact Information:

台灣IBM 產品服務聯絡方式：
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台北市松仁路7號3樓
電話：0800-016-888

f2c00790

United States Federal Communications Commission (FCC) Notice

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

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult an IBM-authorized dealer or service representative for help.

Properly shielded and grounded cables and connectors must be used in order to meet FCC emission limits. Proper cables and connectors are available from IBM-authorized dealers. IBM is not responsible for any radio or television interference caused by using other than recommended cables and connectors or by unauthorized changes or modifications to this equipment. Unauthorized changes or modifications could void the user's authority to operate the equipment.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device might not cause harmful interference, and (2) this device must accept any interference received, including interference that might cause undesired operation.

Responsible Party:

International Business Machines Corporation

New Orchard Road

Armonk, NY 10504

Contact for FCC compliance information only: fccinfo@us.ibm.com

Chapter 1. Planning

Planning involves considering the physical configuration, the initial data configuration, and the necessary software prerequisites to include your system in your storage area network.

System overview

The SAN Volume Controller family of systems combines software and hardware into a comprehensive, modular appliance that provides symmetric virtualization.

SAN Volume Controller SA2 and SV2 node features

The system has the following features.

- A 19-inch rack-mounted node
- Two 8-core (SA2) or 16-core (SV2) processors
- 128 GB base memory per canister (256 GB per node). Optionally, by adding 32 GB memory modules, each node can support up to 768 GB (SA2) or 1,443 GB (SV2) of memory.
- Support for up to three optional host adapters, including:
 - 4-port 16 Gbps and 4-port 32 Gbps Fibre Channel over NVMe adapters
 - 2-port 25 Gbps iSCSI/iWARP/NVMe over Ethernet adapters
 - 2-port 25 Gbps iSCSI/RoCE/NVMe over Ethernet adapters
- Dual redundant power supplies
- A dedicated technician port to initialize or service the system

Physical configuration planning of the system

Before you install the system, plan the physical configuration and the initial data configuration. Certain physical site specifications must be met before you can set up your system. This activity includes verifying that adequate space is available, and that requirements for power and environmental conditions are met.

Procedure

1. Use the hardware location chart to record the physical configuration of your system.
2. Use the cable connection tables to plan and record all connections between your system units.
3. Use the configuration data tables to record the data required before the initial installation.

Results

Once the physical configuration is complete, plan for the physical installation.

Completing the hardware location chart

Planning for the physical location of the system hardware includes documenting the rack locations of the enclosures and other devices. To determine the rack location, review the requirements and specification of each device.

The hardware location chart represents the rack into which the enclosures are installed. Each row of the chart represents one Electronic Industries Alliance (EIA) 19-inch wide by 1.75-inch tall rack space or unit, each of which is commonly referred to as *1U* of the rack. As you design your rack for your system, use [Table 1 on page 2](#) to record the physical configuration of the enclosures and other devices in your system.

Table 1. Hardware locations of enclosures and other devices	
Rack unit	Component
EIA 42	
EIA 41	
EIA 40	
EIA 39	
EIA 38	
EIA 37	
EIA 36	
EIA 35	
EIA 34	
EIA 33	
EIA 32	
EIA 31	
EIA 30	
EIA 29	
EIA 28	
EIA 27	
EIA 26	
EIA 25	
EIA 24	
EIA 23	
EIA 22	
EIA 21	
EIA 20	
EIA 19	
EIA 18	
EIA 17	
EIA 16	
EIA 15	
EIA 14	
EIA 13	
EIA 12	
EIA 11	
EIA 10	
EIA 9	
EIA 8	
EIA 7	
EIA 6	

Table 1. Hardware locations of enclosures and other devices (continued)	
Rack unit	Component
EIA 5	
EIA 4	
EIA 3	
EIA 2	
EIA 1	

Reviewing enclosure location guidelines

Consult these guidelines when you plan the location of a control enclosure and the expansion enclosures that are to be attached to it.

Each control enclosure contains two node canisters, forming an I/O group. The guidelines apply on an I/O group by I/O group basis.

Plan for one of these installations:

- Control enclosure only

The control enclosure requires two standard rack units of space in a rack. If you plan to add expansion enclosures in the future, follow the guidelines for a control enclosure plus one or more expansion enclosures.

- Control enclosure plus one or more expansion enclosures

- Each control enclosure requires two standard rack units of space in a rack.

Important: The control enclosure must have a 12 Gb SAS adapter installed (feature code AHBA) to use expansion enclosures, as the SAS enclosures are connected to port 1 and port 3 of the adapter.

- Position the control enclosure in the center of the rack to make cabling easier. Balance the number of expansion enclosures above and below the control enclosure
- Position the enclosures together. Avoid adding other equipment between enclosures.
- Position the enclosures in the rack so that you can easily view them and access them for servicing. This action also allows the rack to remain stable and allows two or more people to install and remove the enclosures.
- A maximal configuration spans multiple racks. If multiple racks are required, locate the racks next to one another.
- Attach no more than 10 2U or 4 5U expansion enclosures to port 1 and port 3 of the control enclosure.

Your system supports specific combinations of SAS expansion enclosures, based on the capacity of each of the enclosures.

To limit contention for bandwidth on a chain of SAS enclosures, a maximum of four high-density expansion enclosures (2147-92F) can be installed in the chain. High-density enclosures and standard-density enclosures (2145-12F and 2145-24F) can be mixed within a chain, based on the following rules:

- A chain is allowed to have expansions with a total “weight” of 10.
- Standard-density enclosures are assigned a weight of 1.
- A high-density expansion enclosure is assigned a weight of 2.5.

The following table shows examples of expansion enclosure configurations based on these guidelines:

<i>Table 2. Sample configurations of expansion enclosures per control enclosure</i>	
Expansion enclosures per node	Allowable configurations per control enclosure
10	10 standard-density expansion enclosures
8	One high-density expansion enclosure, seven standard-density expansion enclosures or Eight standard-density expansion enclosures
7	Two high-density expansion enclosures, five standard-density expansion enclosures or Seven standard-density expansion enclosures
5	Three high-density expansion enclosures, two standard-density expansion enclosures or Five standard-density expansion enclosures
4	Four high-density expansion enclosures

- Expansion enclosure only

Each 2U enclosure requires two standard rack units of space in a rack. Identify the appropriate location for each enclosure by using the numbers on the front of the rack. When you add a single expansion enclosure to an existing network, it is preferable to add the enclosure directly below the control enclosure. When you add a second expansion enclosure, it is preferable to add the enclosure directly above the control enclosure. As more expansion enclosures are added, alternate adding them above and below the control enclosure.

Network cable connections worksheet

During the planning process, complete the cable-connection tables with the locations of the cable connections for each control enclosure in the system.

Ethernet connections

Each node canister in the control enclosure connects over an Ethernet cable from Ethernet port 1 of the canister to an enabled port on your Ethernet switch or router. Ethernet port 1 is for accessing the management GUI, for accessing the service assistant GUI for the node canister, and for iSCSI host attachment. You can attach an Ethernet cable from Ethernet port 2 on the canister to your Ethernet network. Port 2 can be used for the management GUI and for iSCSI host attachment. Ports 3 and 4 are for iSCSI attachment only.

Note: The ports on the upper node canister (canister 1) are numbered from right to left. However, the ports on the lower node canister (canister 2) are numbered from left to right.

Ethernet cable standards

The following table provides a list of Ethernet cable standards.

Table 3. Ethernet cable standards			
Ethernet port type	Cable type	Minimum standard	Connector
1 Gbps Ethernet technician port	TP	Cat 5e	RJ45
10 Gbps onboard Ethernet ports	TP	Cat 6 (up to 55 m); Cat 6a or Cat 7 (up to 100 m) at 10 Gbps; Cat 5e at 1 Gbps	RJ45
25 Gbps Ethernet host interface adapter (must be ordered)	Optical	OM3 (up to 70 m); OM4 (up to 100 m)	LC

Ethernet onboard ports

Record the node canister onboard Ethernet port connections in the following table.

Table 4. Node canister onboard Ethernet port connections					
Node canister 1 (upper)					
Component	Ethernet port 4	Ethernet port 3	Ethernet port 2	Ethernet port 1	Technician port
Switch					None
Port					None
Speed (10 Gbps or 1 Gbps)					1 Gbps
Node canister 2 (lower)					
Component	Ethernet port 1	Ethernet port 2	Ethernet port 3	Ethernet port 4	Technician port
Switch					None
Port					None
Speed (10 Gbps or 1 Gbps)					1 Gbps

Ethernet networking adapter ports

The following guidelines must be followed if 25 Gbps Ethernet adapters are installed.

- iWARP and RoCE Ethernet adapters cannot be mixed within a node canister.

Use the following table to record the node IP address that you intend to add to any port that is used for node-to-node RDMA communication. The node IP, subnet mask, gateway, and VLAN ID are used for node-to-node communications

Physical installation planning

Before you set up your system environment, you must verify that the prerequisite conditions for the system are met.

About this task

This information applies to the supported hardware components. Answer the following questions before you start the installation process.

1. Does your physical site meet the environment requirements for your system?

2. Do you have adequate rack space for your hardware? Ensure that you have the following rack space for your components:
 - The SAN Volume Controller 2145-DH8 : Two EIA units high.
3. Do the power circuits that you are planning to use have sufficient capacity and the correct sockets for your installation?
 - A clearly visible and accessible emergency power off switch is required.
4. Have you provided appropriate connectivity by preparing your environment?
5. Do you have a keyboard and display available in the unusual event that a service action requires them?

Contamination information

Contamination information that pertains to the system is included in this topic.

Airborne particulates (including metal flakes or particles) and reactive gases, acting alone or in combination with other environmental factors such as humidity or temperature, might pose a risk to the system hardware. Risks that are posed by the presence of excessive particulate levels or concentrations of harmful gases include damage that might cause the system hardware to malfunction or cease functioning altogether. This specification specifies limits for particulates and gases that are intended to avoid such damage. The limits must not be viewed or used as definitive limits because numerous other factors, such as temperature or moisture content of the air, can influence the impact of particulates or environmental corrosives and gaseous contaminant transfer.

In the absence of specific limits that are specified in this document, you must implement practices that maintain particulate or gas levels that are consistent with the protection of human health and safety. If IBM determines that the levels of particulates or gases in your environment caused damage to the system hardware, IBM might require remedial measures to mitigate such environmental contamination. Implementation of appropriate remedial measures might be necessary before IBM provides repair or replacement of the system hardware. Implementation of such remedial measures is a customer responsibility.

The following criteria must be met:

Gaseous contamination

Severity level G1 as per ANSI/ISA 71.04-1985¹, which states that the reactivity rate of copper coupons shall be less than 300 Angstroms per month ($\text{\AA}/\text{month}$, $\approx 0.0039 \mu\text{g}/\text{cm}^2\text{-hour weight gain}$)². In addition, the reactivity rate of silver coupons shall be less than $300\text{\AA}/\text{month}$ ($\approx 0.0035 \mu\text{g}/\text{cm}^2\text{-hour weight gain}$)³. The reactive monitoring of gaseous corrosivity should be conducted approximately 2 inches (5 cm) in front of the rack on the air inlet side at one-quarter and three-quarter frame height off the floor, or where the air velocity is much higher.

Particulate contamination

Data centers must meet the cleanliness level of ISO 14644-1 class 8. For data centers without airside economizers, the ISO 14644-1 class 8 cleanliness can be met by choosing one of the following filtration methods:

- The room air can be continuously filtered with MERV 8 filters.
- Air entering a data center can be filtered with MERV 11, or preferably MERV 13 filters.

For data centers with airside economizers, the choice of filters to achieve ISO class 8 cleanliness depends on the specific conditions present at that data center. The deliquescent relative humidity of the particulate contamination should be more than 60% RH⁴. Data centers must be free of zinc whiskers⁵.

1. ANSI/ISA-71.04.1985. *Environmental conditions for process measurement and control systems: Airborne contaminants*. Instrument Society of America, Research Triangle Park, NC, 1985.
2. The derivation of the equivalence between the rate of copper corrosion product thickness growth in $\text{\AA}/\text{month}$ and the rate of weight gain assumes that Cu_2S and Cu_2O grow in equal proportions.
3. The derivation of the equivalence between the rate of silver corrosion product thickness growth in $\text{\AA}/\text{month}$ and the rate of weight gain assumes that Ag_2S is the only corrosion product.

4. The deliquescent relative humidity of particulate contamination is the relative humidity at which the dust absorbs enough water to become wet and promote corrosion, ion migration, or both.
5. Surface debris is randomly collected from 10 areas of the data center on a 1.5 cm diameter disk of sticky, electrically conductive tape on a metal stub. If examination of the sticky tape in a scanning electron microscope reveals no zinc whiskers, the data center is considered free of zinc whiskers.

Operating environment

To use the system, the minimum hardware and software requirements must be met.

Supported hosts

In a storage area network (SAN) environment, host systems are application servers that access data from the storage controllers that are connected to the SAN. Hosts that are running in a number of operating environments can connect to storage by using the control enclosure.

For a list of the supported host operating systems, refer to the following website: <http://www-03.ibm.com/systems/support/storage/ssic/interoperability.wss>

Multipathing software

For the most current information, refer to the following website: <http://www-03.ibm.com/systems/support/storage/ssic/interoperability.wss>

Application programming interfaces

The system provides an application programming interface that is called the Common Information Model (CIM) agent, which supports the Storage Management Initiative Specification (SMI-S) of the Storage Network Industry Association.

Environmental requirements

Before you install a system, your physical environment must meet certain requirements. This includes verifying that adequate space is available and that requirements for power and environmental conditions are met.

Safety notices

Use the following general safety information for all rack-mounted devices.

DANGER:

Observe the following precautions when working on or around your IT rack system:

- **Heavy equipment—personal injury or equipment damage might result if mishandled.**
- **Always lower the leveling pads on the rack cabinet.**
- **Always install stabilizer brackets on the rack cabinet.**
- **To avoid hazardous conditions due to uneven mechanical loading, always install the heaviest devices in the bottom of the rack cabinet. Always install servers and optional devices starting from the bottom of the rack cabinet.**
- **Rack-mounted devices are not to be used as shelves or work spaces. Do not place objects on top of rack-mounted devices.**



- **Each rack cabinet might have more than one power cord. Be sure to disconnect all power cords in the rack cabinet when directed to disconnect power during servicing.**
- **Connect all devices installed in a rack cabinet to power devices installed in the same rack cabinet. Do not plug a power cord from a device installed in one rack cabinet into a power device installed in a different rack cabinet.**
- **An electrical outlet that is not correctly wired could place hazardous voltage on the metal parts of the system or the devices that attach to the system. It is the responsibility of the customer to ensure that the outlet is correctly wired and grounded to prevent an electrical shock. (R001 part 1 of 2)**



CAUTION:

- Do not install a unit in a rack where the internal rack ambient temperatures will exceed the manufacturer's recommended ambient temperature for all your rack-mounted devices.
- Do not install a unit in a rack where the air flow is compromised. Ensure that air flow is not blocked or reduced on any side, front, or back of a unit used for air flow through the unit.
- Consideration should be given to the connection of the equipment to the supply circuit so that overloading of the circuits does not compromise the supply wiring or overcurrent protection. To provide the correct power connection to a rack, refer to the rating labels located on the equipment in the rack to determine the total power requirement of the supply circuit.
- (For sliding drawers) Do not pull out or install any drawer or feature if the rack stabilizer brackets are not attached to the rack. Do not pull out more than one drawer at a time. The rack might become unstable if you pull out more than one drawer at a time.
- (For fixed drawers) This drawer is a fixed drawer and must not be moved for servicing unless specified by the manufacturer. Attempting to move the drawer partially or completely out of the rack might cause the rack to become unstable or cause the drawer to fall out of the rack. (R001 part 2 of 2)

Important: In addition, remember:

- The rack design must support the total weight of the installed enclosures and incorporate stabilizing features suitable to prevent the rack from tipping or being pushed over during installation or normal use.
- The rack must not exceed the maximum enclosure operating ambient temperature of 35-degrees C (95-degrees Fahrenheit). Air is drawn through the control enclosure by fans in each node canister and each power supply.

In particular, the rack front and rear doors must be at least 60% perforated to enable sufficient airflow through the enclosure. If there is less airflow, additional mechanisms are required to cool the enclosure. An appropriate IBM rack configuration would be the 7014-T42 IBM Rack Model T42, with standard rear door and feature code 6069 Front Door For 2.0 Meter Rack (High Perforation).

- The rack must have a safe electrical distribution system. It must provide overcurrent protection for the enclosure and must not be overloaded by the total number of enclosures installed. The electrical power consumption rating that is shown on the nameplate should be observed.

- The electrical distribution system must provide a reliable ground for each enclosure in the rack.

Power requirements for each power supply (two per enclosure)

Ensure that your environment meets the following power requirements. To aid in power and cooling requirements planning, [Table 5 on page 9](#) lists the rating of each power supply unit (PSU) by enclosure.

The power that is used by the system depends on various factors, including the number of enclosures and drives in the system and the ambient temperature.

<i>Table 5. Power specifications per power supply</i>				
Model and type	PSU	Input power requirements	Maximum input current	Maximum power output
control enclosure	2000 W	200 V to 240 V single phase AC At a frequency of 50 Hz or 60 Hz IEC C14 standardized	10 A	2000 W

The power and thermal measurements that are shown in [Table 6 on page 9](#) were obtained in the specific operating environment and under the conditions described. These measurements are presented as an illustration; measurements that are obtained in other operating environments might vary. Conduct your own testing to determine specific measurements for your environment.

Each enclosure contains two PSUs for redundancy. The total power consumption values represent the total power that is drawn by both PSUs.

Environmental requirements

System airflow is from the front to the rear of each enclosure:

- Airflow passes between drive carriers and through each enclosure.
- The combined power and cooling module exhausts air from the rear of each canister.

Ensure that your environment falls within the ranges that are shown in [Table 7 on page 9](#).

<i>Table 7. Temperature requirements</i>				
Environment	Ambient temperature	Altitude	Relative humidity	Maximum wet bulb temperature
Operating	5°C to 35°C (41°F to 95°F)	0 - 3048 m (0 - 10000 ft)	8% to 80% noncondensing	23°C (73°F)
Non-operating	1°C to 50°C (34°F to 122°F)	-305 to 12192 m (-1000 to 40000 ft)	8% to 80% noncondensing	27°C (80°F)
Storage	1°C to 60°C (34°F to 140°F)		5% to 80% noncondensing	29°C (84°F)
Shipping	-40°C to 60°C (-40°F to 140°F)		5% to 100% condensing, but not precipitating	

Dimensions and weight requirements for rack installation

Ensure that space is available in a standard 19" rack that is capable of supporting the enclosure. The rack rail kit supports racks with either threaded round or square rail mounting holes. The following table lists the dimensions and weights of the enclosures.

The following table shows the rack space requirements for the control enclosure in tabular form.

Table 9. Rack space requirements for the control enclosure	
Minimum rail length	Maximum rail depth
670 mm (26.38 in.)	870 mm (34.25 in.)

Additional space requirements

Ensure that these additional space requirements, as shown in [Table 10 on page 10](#), are available around the enclosures.

Table 10. Clearances		
Location	Additional space requirements	Reason
Left and right sides	50 mm (2 in.)	Cooling air flow
Back	Minimum: 100 mm (4 in.)	Cable exit

Supported drives

Acoustical Declaration with Noise Hazard Notice

Shock and vibration specifications for enclosures

[Table 11 on page 10](#) and [Table 12 on page 10](#) provide the shock and vibration testing results for your system.

Table 11. Shock testing results		
Shock categories	Test level	Performance
Operational	5 g 10 ms 1/2 Sine	<= 25 g 10 ms
Non-operational	30 g 10 ms 1/2 Sine	<= 75 g 11 ms

Table 12. Vibration testing results		
Vibration categories	Test level	Performance
Operational	0.21 grms 5-500 Hz Random	Throughput loss <= 10% FCAL <= 0.68 grms
Non-operational	1.04 grms 2-200 Hz Random	<= 3.12 grms
Shipping	0.3 g 2-200 Hz Sine	<= 5 g
Rotational vibration	Normal operation performance measurements in enclosure with no external vibration.	Throughput loss for all drives of the same type within performance profile.

Chapter 2. Installation

Learn about installation procedures for your system.

Installation overview

The installation and initial configuration of your system is carried out by an IBM Service Support Representative (SSR), following the plan you provide to them.

Hardware installation tasks that an IBM SSR completes

To install the hardware, an IBM SSR must complete the following tasks:

Important: You must complete the planning tasks and provide completed worksheets to the IBM SSR before they can proceed with installing and initializing your system.

1. An IBM SSR unpacks and installs the control enclosures and any optional SAS expansion enclosures in the rack.
2. Referring to the worksheets that you completed, the IBM SSR completes the cabling.

Note:

If the IBM SSR is aware of your intent to add the to an existing system, the IBM SSR installs the control enclosure for you, but does not initialize a system on it.

Initial setup tasks that an IBM SSR completes

After the hardware is installed, an IBM SSR connects a workstation to the control enclosure technician port and completes the following tasks:

1. Configuring the system with a name, and management and service IP addresses.

Note: If you are planning on adding control enclosure to an existing Storwize® V7000 system, inform the IBM SSR of this intention. In this case, the IBM SSR installs the control enclosure for you, but does not initialize a system on it, because the Storwize V7000 system is already initialized .

2. Logging in to the control enclosure using the management GUI, and completing the system setup wizard using information from the customer-supplied worksheets.

First customer tasks

After the IBM SSR completes the service setup process, you will log in to the control enclosure and complete the following tasks by using the customer setup wizard:

1. Changing the system password
2. Setting the date and time
3. Creating I/O groups (if applicable)
4. Confirming the Call Home settings that were entered by the IBM SSR
5. Configuring licensed functions
6. Creating storage pools

At the completion of the setup wizard, the setup wizard creates storage arrays and assigns the MDisks to the storage pools.

After the installation and initial configuration of the hardware is complete, IBM strongly recommends that you check to see whether a later level of firmware and software is available and update to that level.

Installing support rails for the control enclosure

Before you install the control enclosure, you must first install the support rails for it.

Procedure

To install the support rails for the control enclosure, complete the following steps.

1. Locate the control enclosure rails ([Figure 1 on page 12](#)).

The rail assembly consists of two rails that must be installed in the rack cabinet.

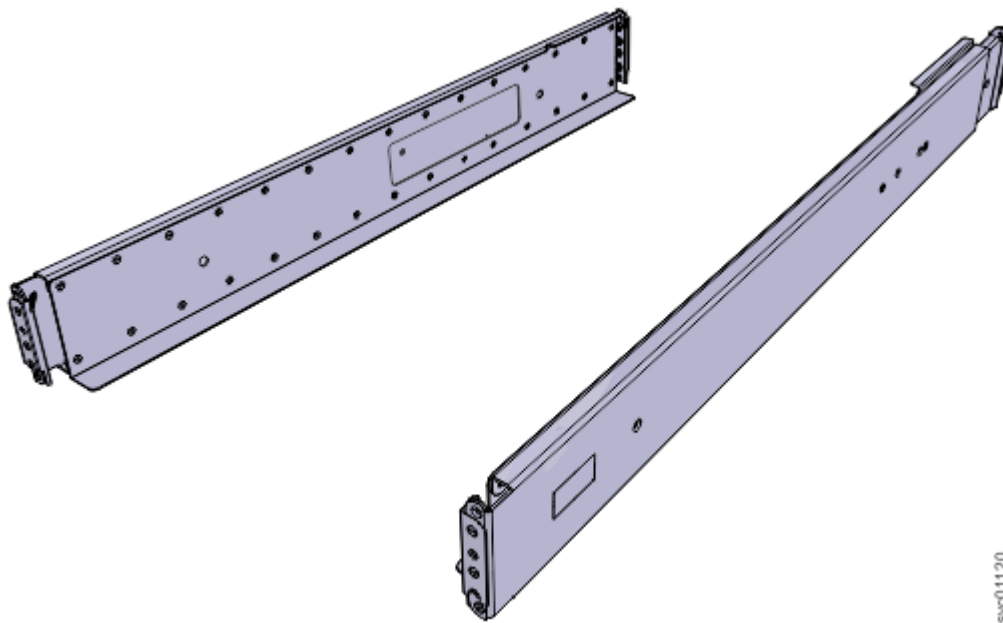


Figure 1. Control enclosure support rails

2. Working at the front of the rack cabinet, identify the two standard rack units (2U) of space in the rack into which you want to install the support rails.

[Figure 2 on page 13](#) shows two rack units with the front mounting holes identified.

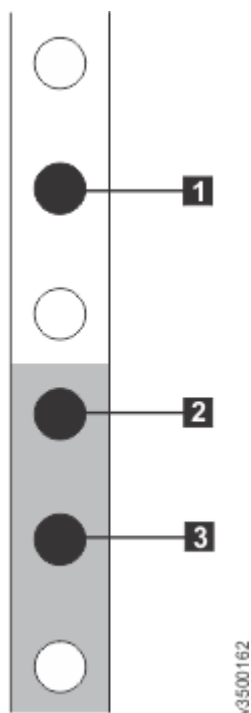


Figure 2. Hole locations in the front of the rack

- **1** Upper rail-mounting bracket pin
 - **2** Lower rail-mounting bracket pin
 - **3** Rack mounting screw hole
3. Ensure that the appropriate bracket pins are installed in the front and rear bracket of each rail. Each rail comes with four medium pins preinstalled (two in the front bracket and two in the rear bracket). Large pins are provided separately. Use the pins that are appropriate for the mounting holes in your rack (see [Table 13 on page 13](#)).

Table 13. Selecting bracket pins for your rack	
Mounting holes	Bracket pins
Round, unthreaded	Use the preinstalled medium pins.
Square	Unscrew the medium pins and replace with the large pins that are supplied with the rails.

4. At each end of the rail, grasp the tab **1** and pull *firmly* to open the hinge bracket. (See [Figure 3 on page 14](#).)

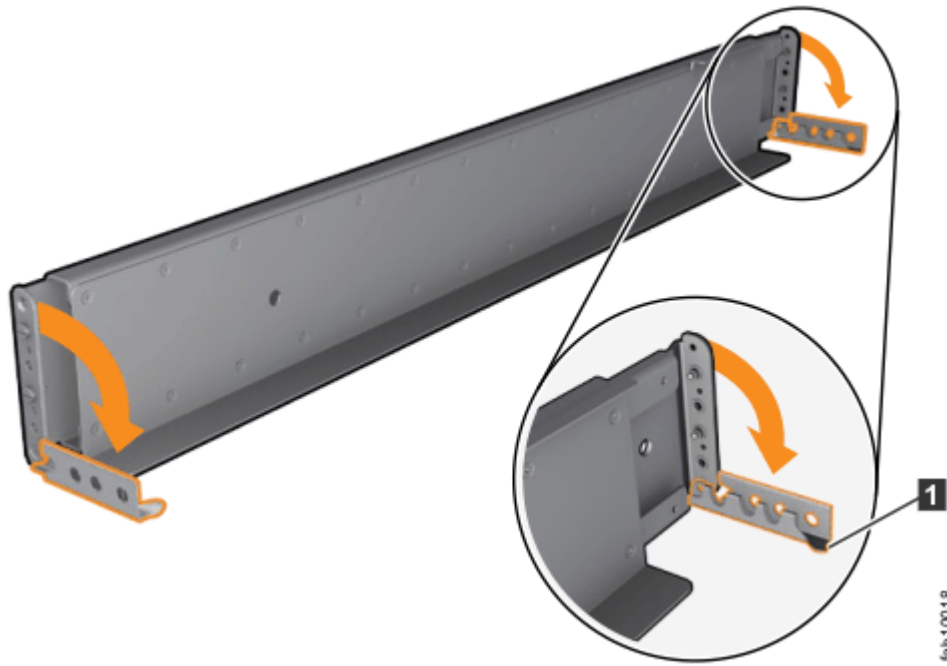


Figure 3. Opening the hinge brackets

5. Align the holes in the rail bracket with the holes on the front and rear rack cabinet flanges. Ensure that the rails are aligned on the inside of the rack cabinet.
6. On the rear of the rail, press the two bracket pins into the holes in the rack flanges.
7. Close the rear hinge bracket to secure the rail to the rack cabinet flange.
(See [Figure 4 on page 14.](#))

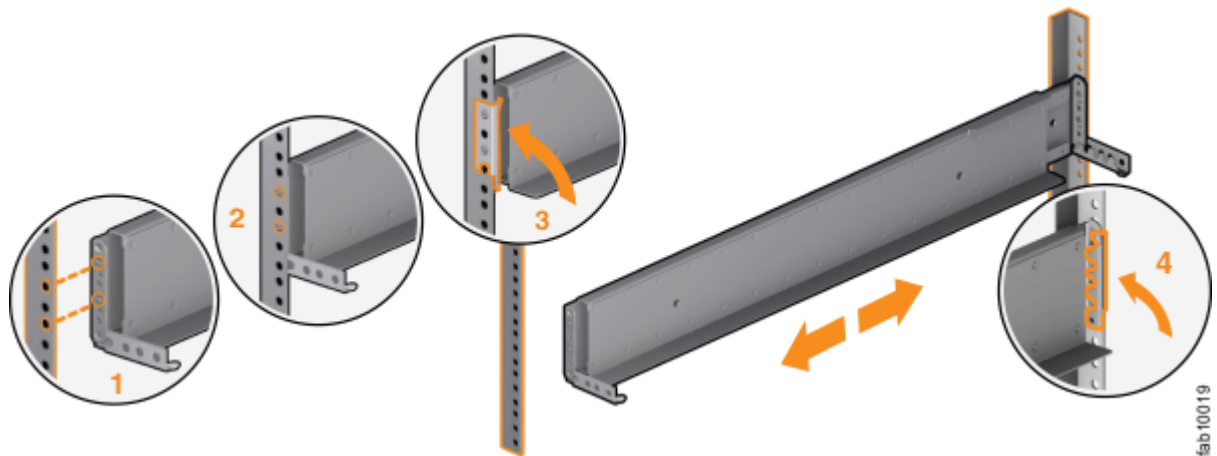


Figure 4. Closing the hinge brackets

8. On the front of the rail, press the two bracket pins into the holes in the rack flanges.
9. Close the front hinge bracket to secure the rail to the rack cabinet flange.
(See [Figure 4 on page 14.](#))
10. Secure the rear of the rail to the rear rack flange with two black M5 screws.
11. Repeat the steps to secure the opposite rail to the rack cabinet.
12. Repeat the procedure to install rails for each additional control enclosure.

Installing the enclosure in a rack

After you install the support rails, you can install the enclosure in the rack.

Before you begin



CAUTION: To avoid any hazard from the rack tipping forward when devices are installed, observe all safety precautions for the rack into which you are installing the device.



CAUTION: The weight of this part or unit is between 18 and 32 kg (39.7 and 70.5 lb). It takes two persons to safely lift this part or unit. (C009)

Procedure

To install the enclosure in the rack, complete the following steps.

1. Fully extend the middle section of the rail from the outer section on both sides and lock it in place.

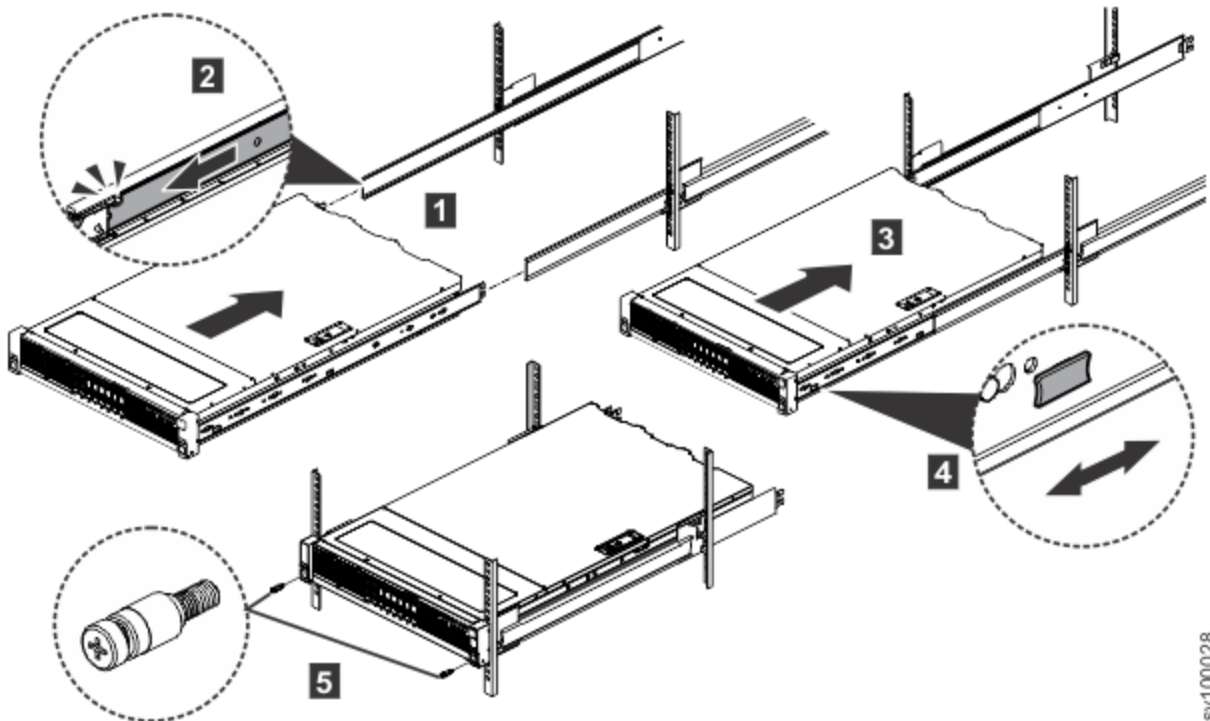


Figure 5. Insert the chassis into the rack

2. Make sure that the ball bearing retainer is located at the front of the middle section of the rail.
3. With the help of multiple persons, lift the chassis until the inner section of the rail (attached to the chassis) is aligned with the middle section (1).
4. Insert the chassis and inner member into the middle section of the rail until it stops (2, 3).
5. Pull or push the release tab to unlock (4), and then retract the chassis into the rack.
6. If you ship the rack with the chassis attached, tighten the shipping screws in the front of the chassis before you ship the rack (5).

Connecting Ethernet cables to the node canisters

Procedure

To install the Ethernet cables, complete the following steps.

1. Connect Ethernet port 1 of each node canister in the system to the IP network that will provide connection to the system management interfaces, as shown in [Figure 6 on page 16](#).

This port can also be used for iSCSI connectivity to the system by hosts on the network. Where more than one control enclosure is present in the system, ensure port 1 of every node canister is connected to the same network to provide access if the configuration node fails.

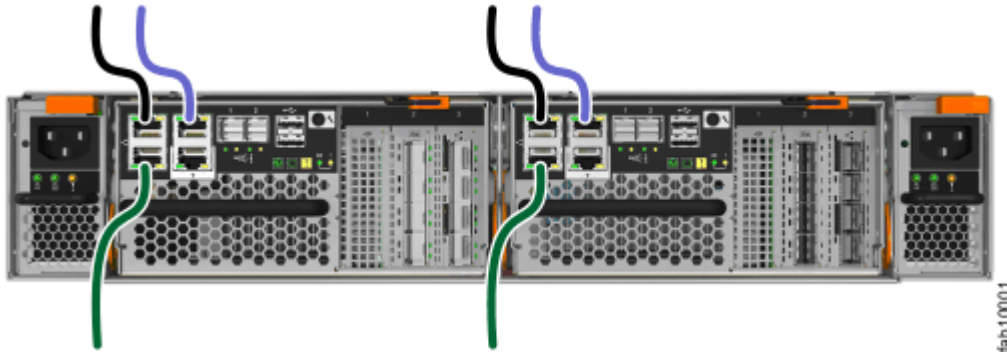


Figure 6. Connecting the Ethernet cables

2. Optionally, connect Ethernet port 2 of each node canister in the system to a second IP network that will provide redundant connection to the system management interfaces, as shown by the lighter cable connection in [Figure 6 on page 16](#).

This port can also be used for iSCSI connectivity to the system by hosts on the network. If there is more than one control enclosure in the system, ensure that port 2 of every node canister is connected to the same network to provide access if the configuration node fails.

If your system has one or more 4-port 16 Gbps Fibre Channel adapters installed, use Fibre Channel cables to connect the two node canisters in the enclosure to the switches in the Fibre Channel SAN.

Procedure

To install the cables, complete the following steps.

Initializing the system with the technician port

To initialize the system, you connect a computer to a technician port of the node canister by using an Ethernet cable, and then open a wizard in a supported web browser.

Before you begin

Important:

- Browser security features might prompt the user before it accepts the self-signed certificate that the system issues.
- It might be necessary to remove old certificates that are stored in the browser before the browser accepts the request.
- The web browser might display a warning about a potential security risk. It is safe to accept the risk and continue.
- After the technician port physical connection is completed (that is, connected both ends), it can take up to 45 seconds before the port is fully up and able to process requests. Submitting requests before this interval might result in 404 error responses.
- If the `http://service` request in the browser causes a 404 error, or fails to produce a response, it might be necessary to use the url `https://192.168.0.1` in the browser request to connect to the system.

If you are unable to connect to the system by using the technician port, you can use a monitor and keyboard that are connected to the VGA and USB ports on the system to initialize the system. Complete the following steps.

1. Access the command line by using the superuser credentials.
2. Issue the CLI command **mkcluster -clusterip x.x.x.x -mask m.m.m.m -gw g.g.g.g -name name** to create the system.

Procedure

1. Locate the technician ports, as shown in the following figure:

Figure 7. Technician ports

- 1 Node canister 1 technician port
 - 2 Node canister 2 technician port
2. Configure an Ethernet port on the personal computer to enable Dynamic Host Configuration Protocol (DHCP) configuration of its IP address and DNS settings.

If you do not have DHCP, you must manually configure the personal computer. Specify the static IPv4 address 192.168.0.2, subnet mask 255.255.255.0, gateway 192.168.0.1, and DNS 192.168.0.1.
3. Connect an Ethernet cable between the port of the personal computer that is configured in step “2” on page 17 and the technician port that is shown in Figure 7 on page 17.

After the connection is made, the system will automatically configure the IP and DNS settings for the personal computer if DHCP is available. If it is not available, the system uses the values that you provided in step “2” on page 17.
4. After the Ethernet port of the personal computer is connected, open a supported browser and browse to address `http://service`. (If you do not have DHCP, open a supported browser and go to the following static IP address 192.168.0.1.)

The browser is automatically directed to the initialization tool.

Note: If the system cannot be initialized, you are directed to the service assistant interface.
5. If the node canisters communicate with each other by using RDMA over Ethernet, then browse to address `http://service` and press the wrench icon on the initialization page to access the Service Assistant Tool. Use the **Change node IP** tab of the Service Assistant Tool to configure the node IP settings for the node as provided by the customer on the worksheet. Repeat this step for each node canister that is in the system.
- 6.

Completing the hardware installation (IBM lab based services or IBM SSR task)

After installing and connecting the hardware components, IBM lab based services or the IBM SSR completes the hardware installation of the system.

Powering on the system

After you install all hardware components, you must power on the system and check its status.

About this task



Attention: Do not power on the system with any open bays or slots. Open bays or slots disrupt the internal air flow, causing the drives to receive insufficient cooling.

- Every unused drive bay must be occupied by a filler panel.
- Filler panels must be installed in all empty host interface adapter slots.

Procedure

To power on the system, complete the following steps.

1. Wait for all expansion enclosures to finish powering on.
2. Power on the control enclosure. Use the supplied power cords to connect both power supply units of the enclosure to their power sources.

If the power sources have circuit breakers or switches, ensure that they are turned on. The enclosure does not have power switches.

Notes:

- Each enclosure has two power supply units. To provide power failure redundancy, connect the two power cords to separate power circuits.
- Ensure that each power cable is secured to each PSU on the back of the enclosure.

What to do next

Next, you connect an Ethernet cable to the technician port on the control enclosure, and initialize the system.

Completing the initial system setup (customer task)

After the service setup of the new system is complete, use the management GUI to do the initial system setup.

Before you begin

Have the following information on hand:

- The management IP address of the system
- Licensed key information
- The worksheets that were completed during the system planning process

Procedure

To do the initial setup of your system, use the management GUI to complete the following high-level tasks.

1. Use a web browser to open: `https://your_management_IP`
2. Log in to the management GUI for the first time by using ID `superuser` and password `passw0rd`.

After you log in, the initial setup wizard helps you get started.

Use the information on your worksheets to inform your inputs.

- a) Choose and create a new password.
- b) Configure licensed functions.
 - If encryption was purchased, you can activate it now or later by opening the management GUI and selecting **Settings > Security > Encryption**.
 - The base license entitles to all licensed functions such as Virtualization, FlashCopy®, Global Mirroring, and Metro Mirroring.

You need an External Virtualization license for storage that is not . This license is based on a per capacity unit of metric. Because subcapacity licensing applies, the amount of storage FlashCopy or Remote Mirror licenses does not always match the quantity of externally virtualized storage licenses.
- c) If you already use IBM Storage Insights, log in to Storage Insights, select **Add Storage System** and register the new system by using the IP address.

Important: If you do not use IBM Storage Insights, you were registered during the initial system setup. When your Storage Insights interface is ready to use, you receive an email notification. IBM® Storage Insights is an *IBM Cloud[®] software as a service* offering that can help you monitor and optimize the storage resources in the system and across your data center.

- d) If errors exist, you are prompted to resolve them.
- e) Review the system summary page, then click **Finish**.

The Initial Setup Wizard closes.

3. If there is more than one control enclosure for your system, go to **Monitoring > System > System--Overview** and click **Add Enclosure**.

Add Enclosure is shown only when a candidate control enclosure exists.

4. Use the **System update** page of the management GUI to check whether software updates are available for this system. Use the management GUI to help you install any updates.

During the automatic update process, each node canister in the system is updated one at a time. After all the nodes in the system are successfully restarted with the new code level, the new level is automatically committed.

5. Start the wizard to configure drives and pools.
6. Referring to the Call Home and Storage Insights configuration worksheet, use the following URL to register the new system:

<https://call-home.w3ibm.mybluemix.net/activate>

7. If you activated an encryption license, click **Enable Encryption** to complete the encryption setup wizard.
8. If exactly two control enclosures are in the system, you must set up a quorum disk or application outside of the system. If the two control enclosures lose communication with each other, the quorum disk prevents both I/O groups from going offline. For more information, see the "Configuring quorum" topic in the IBM Knowledge Center.

Results

You completed the initial setup of your system as the final part of installation.

What to do next

You are ready to migrate data from another system and configure your system.

Appendix A. Information for Russian users

Contact information

Address

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Moscow, Russia, 123317

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+7 (495) 775-8800

Fax

+7 (495) 258-63-63

Email

info@ry.ibm.com

Web

www.ibm.com/ru-ru/

Support

Technical support

Electronic service requests can be submitted for hardware or software under warranty or with a support contract.

Open Service Request (<http://www.ibm.com/support/electronic/uprtransition.wss?category=2>)

24/7 phone numbers for all products support

From all Russian regions

+7-800-200-6300

From Moscow

+7-495-258-6300

Customer support

Contracts, orders status, delivery, inventory, invoices and payments. (<http://www.ibm.com/support/operations/ru/>)

Identifying country of origin and date of manufacture

Use the agency label on storage systems to identify information about the country of origin and date of manufacture. In the following example, this information is highlighted in red.



Note: This Agency Label is an example and subject to change, including changes in model information, based off of your specific machine and model information.



Part Number: 03GH323

(1P) P/N: 03GH323

