Note

Before using this information and the product it supports, read the general information in "Notices" on page 35, the information in the "Safety and environmental notices" on page iii, as well as the information in the IBM Environmental Notices and User Guide, which is provided on a DVD.

This edition applies to IBM System Storage(r) SAN Volume Controller, and to all subsequent releases and modifications until otherwise indicated in new editions.

This edition replaces GC27-2290-04.

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US Government Users Restricted Rights – Use, duplication or disclosure restricted by GSA ADP Schedule Contract with IBM Corp.
Safety and environmental notices

Review the safety notices, environmental notices, and electronic emission notices for IBM® Storwize® V7000 before you install and use the product.

Here are examples of a caution and a danger notice:

**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)

To find the translated text for a caution or danger notice:
1. Look for the identification number at the end of each caution notice or each danger notice. In the preceding examples, the numbers (C001) and (D002) are the identification numbers.
2. Locate *IBM Storwize V7000 Safety Notices* with the user publications that were provided with the Storwize V7000 hardware.
3. Find the matching identification number in the *IBM Storwize V7000 Safety Notices*. Then review the topics concerning the safety notices to ensure that you are in compliance.
4. Optionally, read the multilingual safety instructions on the Storwize V7000 website. Go to [www.ibm.com/storage/support/storwize/v7000](http://www.ibm.com/storage/support/storwize/v7000) and click the documentation link.

Safety notices and labels

Review the safety notices and safety information labels before using this product.

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


**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 Systems 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.
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 emphasize a situation that is potentially lethal or extremely hazardous to people.

**Caution notice definition**
A special note that emphasize 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. Open the IBM Systems Safety Notices.
3. Under the language, find the matching identification number. Review the topics about the safety notices to ensure that you are in compliance.

**Note:** This product was designed, tested, and manufactured to comply with IEC 60950-1, and where required, to relevant national standards that are based on IEC 60950-1.

### Caution notices for the Storwize V7000

Ensure that you understand the caution notices for Storwize V7000.

Use the reference numbers in parentheses at the end of each notice, such as (C003) for example, to find the matching translated notice in IBM Storwize V7000 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:
Electrical current from power, telephone, and communication cables can be hazardous. To avoid personal injury or equipment damage, disconnect the attached power cords, telecommunication systems, networks, and modems before you open the machine covers, unless instructed otherwise in the installation and configuration procedures. (26)

CAUTION:
Use safe practices when lifting.

<table>
<thead>
<tr>
<th>Weight Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>18-32 kg (39.7-70.5 lbs)</td>
</tr>
<tr>
<td>32-55 kg (70.5-121.2 lbs)</td>
</tr>
<tr>
<td>&gt;55 kg (&gt;121.2 lbs)</td>
</tr>
</tbody>
</table>

(27)

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)

CAUTION:
- Rack is not intended to serve as an enclosure and does not provide any degrees of protection required of enclosures.
- It is intended that equipment installed within this rack will have its own enclosure. (R005).

CAUTION:
Tighten the stabilizer brackets until they are flush against the rack. (R006)

CAUTION:
Use safe practices when lifting. (R007)
CAUTION:
Do not place any object on top of a rack-mounted device unless that rack-mounted device is intended for use as a shelf. (R008)

CAUTION:
If the rack is designed to be coupled to another rack only the same model rack should be coupled together with another same model rack. (R009)

Danger notices for Storwize V7000

Ensure that you are familiar with the danger notices for Storwize V7000.

Use the reference numbers in parentheses at the end of each notice, such as (C003) for example, to find the matching translated notice in IBM Storwize V7000 Safety Notices.
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 may be present in and around the system. Use care when handling equipment to avoid cuts, scrapes and pinching.
(D005)

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

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 Storwize V7000. These notices are in addition to the standard safety notices supplied and address specific issues relevant to the equipment provided.

General safety

When you service the Storwize V7000, follow general safety guidelines.

Use the following general rules to ensure safety to yourself and others:

- Observe good housekeeping in the area where the devices are kept during and after maintenance.
- Follow the guidelines when lifting any heavy object:
  1. Ensure that you can stand safely without slipping.
  2. Distribute the weight of the object equally between your feet.
  3. Use a slow lifting force. Never move suddenly or twist when you attempt to lift.
  4. Lift by standing or by pushing up with your leg muscles; this action removes the strain from the muscles in your back. Do not attempt to lift any objects that weigh more than 18 kg (40 lb) or objects that you think are too heavy for you.
- Do not perform any action that causes a hazard or that makes the equipment unsafe.
- Before you start the device, ensure that other personnel are not in a hazardous position.
- Place removed covers and other parts in a safe place, away from all personnel, while you are servicing the unit.
- Keep your tool case away from walk areas so that other people will not trip over it.
• Do not wear loose clothing that can be trapped in the moving parts of a device. Ensure that your sleeves are fastened or rolled up above your elbows. If your hair is long, fasten it.
• Insert the ends of your necktie or scarf inside clothing or fasten it with a nonconducting clip, approximately 8 cm (3 in.) from the end.
• Do not wear jewelry, chains, metal-frame eyeglasses, or metal fasteners for your clothing.

Remember: Metal objects are good electrical conductors.

• Wear safety glasses when you are: hammering, drilling, soldering, cutting wire, attaching springs, using solvents, or working in any other conditions that might be hazardous to your eyes.
• After service, reinstall all safety shields, guards, labels, and ground wires. Replace any safety device that is worn or defective.
• Reinstall all covers correctly after you have finished servicing the unit.

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 two 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 Storwize V7000, 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 Storwize V7000 or onto a metal table.
• Take additional care when you handle devices during cold weather because heating reduces indoor humidity and increases static electricity.

Sound pressure
Attention: Depending on local conditions, the sound pressure can exceed 85 dB(A) during service operations. In such cases, wear appropriate hearing protection.

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

To view a PDF file, you need Adobe Reader. You can download it at no charge from the Adobe web site (get.adobe.com/reader/).
About this guide

This publication provides information that helps you install and initialize IBM Storwize V7000.

Who should use this guide

This guide is intended for installers of Storwize V7000.

Before configuring your system, ensure that you follow the procedures as listed. Be sure to gather IP addresses that you will need before you begin the installation.

Storwize V7000 library and related publications

Product manuals, other publications, and websites contain information that relates to Storwize V7000.

Storwize V7000 Information Center

The IBM Storwize V7000 Information Center contains all of the information that is required to install, configure, and manage the Storwize V7000. The information center is updated between Storwize V7000 product releases to provide the most current documentation. The information center is available at the following website:

publib.boulder.ibm.com/infocenter/storwize/ic/index.jsp

Storwize V7000 library

Unless otherwise noted, the publications in the Storwize V7000 library are available in Adobe portable document format (PDF) from the following website:

www.ibm.com/e-business/linkweb/publications/servlet/pbi.wss

The following table lists websites where you can find help, services, and more information:

<table>
<thead>
<tr>
<th>Website</th>
<th>Address</th>
</tr>
</thead>
<tbody>
<tr>
<td>Support for Storwize V7000 (2076)</td>
<td><a href="http://www.ibm.com/storage/support/storwize/v7000">www.ibm.com/storage/support/storwize/v7000</a></td>
</tr>
<tr>
<td>Support for IBM System Storage® and IBM TotalStorage products</td>
<td><a href="http://www.ibm.com/storage/support/">www.ibm.com/storage/support/</a></td>
</tr>
</tbody>
</table>

Each of the PDF publications in the Table 2 on page xiv is also available in the information center by clicking the number in the "Order number" column:
<table>
<thead>
<tr>
<th>Title</th>
<th>Description</th>
<th>Order number</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>IBM Storwize V7000 Quick Installation Guide</em></td>
<td>This guide provides instructions for unpacking your shipping order and installing your system. The first of three chapters describes verifying your order, becoming familiar with the hardware components, and meeting environmental requirements. The second chapter describes installing the hardware and attaching data cables and power cords. The last chapter describes accessing the management GUI to initially configure your system.</td>
<td>GC27-2290</td>
</tr>
<tr>
<td><em>IBM Storwize V7000 Expansion Enclosure Installation Guide, Machine type 2076</em></td>
<td>This guide provides instructions for unpacking your shipping order and installing the 2076 expansion enclosure for the Storwize V7000 system.</td>
<td>GC27-4234</td>
</tr>
<tr>
<td><em>IBM Storwize V7000 Troubleshooting, Recovery, and Maintenance Guide</em></td>
<td>This guide describes how to service, maintain, and troubleshoot the Storwize V7000 system.</td>
<td>GC27-2291</td>
</tr>
<tr>
<td><em>IBM Systems Safety Notices</em></td>
<td>This guide contains translated caution and danger statements. Each caution and danger statement in the Storwize V7000 documentation has a number that you can use to locate the corresponding statement in your language in the <em>IBM Systems Safety Notices</em> document.</td>
<td>G229-9054</td>
</tr>
<tr>
<td><em>IBM Storwize V7000 Read First Flyer</em></td>
<td>This document introduces the major components of the Storwize V7000 system and describes how to get started with the <em>IBM Storwize V7000 Quick Installation Guide</em>.</td>
<td>GC27-2293</td>
</tr>
<tr>
<td><em>IBM Statement of Limited Warranty (2145 and 2076)</em></td>
<td>This multilingual document provides information about the IBM warranty for machine types 2145 and 2076.</td>
<td>Part number: 4377322</td>
</tr>
<tr>
<td><em>IBM License Agreement for Machine Code</em></td>
<td>This multilingual guide contains the License Agreement for Machine Code for the Storwize V7000 product.</td>
<td>SC28-6872 (contains Z125-5468)</td>
</tr>
</tbody>
</table>
IBM documentation and related websites

Table 3 lists websites that provide publications and other information about the Storwize V7000 or related products or technologies.

Table 3. IBM documentation and related websites

<table>
<thead>
<tr>
<th>Website</th>
<th>Address</th>
</tr>
</thead>
<tbody>
<tr>
<td>IBM Storage Management Pack for Microsoft System Center Operations Manager (SCOM)</td>
<td>The IBM Storage Host Software Solutions Information Center describes how to install, configure, and use the IBM Storage Management Pack for Microsoft System Center Operations Manager.</td>
</tr>
<tr>
<td>IBM Storage Management Console for VMware vCenter</td>
<td>The IBM Storage Host Software Solutions Information Center describes how to install, configure, and use the IBM Storage Management Console for VMware vCenter, which enables Storwize V7000 and other IBM storage systems to be integrated in VMware vCenter environments.</td>
</tr>
<tr>
<td>IBM Storage Device Driver for VMware VAAI</td>
<td>IBM Storage Host Software Solutions Information Center describes how to install, configure, and use the IBM Storage Device Driver for VMware VAAI.</td>
</tr>
<tr>
<td>IBM Storwize V7000 Adapter for VMware vCenter Site Recovery Manager</td>
<td>The VMware website describes how to install, configure, and use the IBM Storwize V7000 Adapter for VMware vCenter Site Recovery Manager.</td>
</tr>
<tr>
<td>IBM Publications Center</td>
<td><a href="http://www.ibm.com/e-business/linkweb/publications/servlet/pbi.wss">www.ibm.com/e-business/linkweb/publications/servlet/pbi.wss</a></td>
</tr>
<tr>
<td>IBM Redbooks® publications</td>
<td><a href="http://www.redbooks.ibm.com/">www.redbooks.ibm.com/</a></td>
</tr>
</tbody>
</table>

Related accessibility information

To view a PDF file, you need Adobe Acrobat Reader, which can be downloaded from the Adobe website:


How to order IBM publications

The IBM Publications Center is a worldwide central repository for IBM product publications and marketing material.

The IBM Publications Center offers customized search functions to help you find the publications that you need. Some publications are available for you to view or download at no charge. You can also order publications. The publications center displays prices in your local currency. You can access the IBM Publications Center through the following website:

www.ibm.com/e-business/linkweb/publications/servlet/pbi.wss
Related websites

The following websites provide information about Storwize V7000 or related products or technologies:

<table>
<thead>
<tr>
<th>Type of information</th>
<th>Website</th>
</tr>
</thead>
<tbody>
<tr>
<td>Storwize V7000 support</td>
<td><a href="http://www.ibm.com/storage/support/storwize/v7000">www.ibm.com/storage/support/storwize/v7000</a></td>
</tr>
<tr>
<td>Technical support for IBM storage products</td>
<td><a href="http://www.ibm.com/storage/support/">www.ibm.com/storage/support/</a></td>
</tr>
<tr>
<td>IBM Electronic Support registration</td>
<td><a href="http://www.ibm.com/support/electronicsupport">www.ibm.com/support/electronicsupport</a></td>
</tr>
</tbody>
</table>

Sending your comments

Your feedback is important in helping to provide the most accurate and highest quality information.

To submit any comments about this book or any other Storwize V7000 documentation:

- Go to the feedback form on the website for the Storwize V7000 Information Center at publib.boulder.ibm.com/infocenter/storwize/ic/index.jsp?topic=/com.ibm.storwize v7000.doc/feedback.htm. You can use the form to enter and submit comments. You can browse to the topic in question and use the feedback link at the very bottom of the page to automatically identify the topic for which you have a comment.
- Send your comments by email to starpubs@us.ibm.com. Include the following information in your email:
  - Publication title
  - Publication form number
  - Page, table, or illustration numbers that you are commenting on
  - A detailed description of any information that should be changed

How to get information, help, and technical assistance

If you need help, service, technical assistance, or just want more information about IBM products, you will find a wide variety of sources available from IBM to assist you.

Information

IBM maintains pages on the web where you can get information about IBM products and fee services, product implementation and usage assistance, break and fix service support, and the latest technical information. For more information, refer to Table 4.

Table 4. IBM websites for help, services, and information

<table>
<thead>
<tr>
<th>Website</th>
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<tbody>
<tr>
<td>Support for Storwize V7000 (2076)</td>
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</tr>
<tr>
<td>Support for IBM System Storage and IBM TotalStorage products</td>
<td><a href="http://www.ibm.com/storage/support/">www.ibm.com/storage/support/</a></td>
</tr>
</tbody>
</table>
Note: Available services, telephone numbers, and web links are subject to change without notice.

**Help and service**

Before calling for support, be sure to have your IBM Customer Number available. If you are in the US or Canada, you can call 1 (800) IBM SERV for help and service. From other parts of the world, see [http://www.ibm.com/planetwide](http://www.ibm.com/planetwide) for the number that you can call.

When calling from the US or Canada, choose the storage option. The agent decides where to route your call, to either storage software or storage hardware, depending on the nature of your problem.

If you call from somewhere other than the US or Canada, you must choose the software or hardware option when calling for assistance. Choose the software option if you are uncertain if the problem involves the Storwize V7000 software or hardware. Choose the hardware option only if you are certain the problem solely involves the Storwize V7000 hardware. When calling IBM for service regarding the product, follow these guidelines for the software and hardware options:

**Software option**

Identify the Storwize V7000 product as your product and supply your customer number as proof of purchase. The customer number is a 7-digit number (0000000 to 9999999) assigned by IBM when the product is purchased. Your customer number should be located on the customer information worksheet or on the invoice from your storage purchase. If asked for an operating system, use Storage.

**Hardware option**

Provide the serial number and appropriate 4-digit machine type. For the Storwize V7000, the machine type is 2076.

In the US and Canada, hardware service and support can be extended to 24x7 on the same day. The base warranty is 9x5 on the next business day.

**Getting help online**

You can find information about products, solutions, partners, and support on the IBM website.

To find up-to-date information about products, services, and partners, visit the IBM website at [www.ibm.com/storage/support/storwize/v7000](http://www.ibm.com/storage/support/storwize/v7000)

**Before you call**

Make sure that you have taken steps to try to solve the problem yourself before you call.

Some suggestions for resolving the problem before calling IBM Support include:

- Check all cables to make sure that they are connected.
- Check all power switches to make sure that the system and optional devices are turned on.
- Use the troubleshooting information in your system documentation. The troubleshooting section of the information center contains procedures to help you diagnose problems.
• Go to the IBM Support website at [www.ibm.com/storage/support/storwize/v7000](http://www.ibm.com/storage/support/storwize/v7000) to check for technical information, hints, tips, and new device drivers or to submit a request for information.

**Using the documentation**

Information about your IBM storage system is available in the documentation that comes with the product.

That documentation includes printed documents, online documents, readme files, and help files in addition to the information center. See the troubleshooting information for diagnostic instructions. The troubleshooting procedure might require you to download updated device drivers or software. IBM maintains pages on the web where you can get the latest technical information and download device drivers and updates. To access these pages, go to [www.ibm.com/storage/support/storwize/v7000](http://www.ibm.com/storage/support/storwize/v7000) and follow the instructions. Also, some documents are available through the IBM Publications Center.

**Sign up for the Support Line Offering**

If you have questions about how to use the machine and how to configure the machine, sign up for the IBM Support Line offering to get a professional answer.

The maintenance supplied with the system provides support when there is a problem with a hardware component or a fault in the system machine code. At times, you might need expert advice about using a function provided by the system or about how to configure the system. Purchasing the IBM Support Line offering gives you access to this professional advice. Taking this advice while deploying your system can save issues further down the line.

Contact your local IBM Sales or IBM Support for this offering availability and to purchase it, if available in your country.

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**What's new**

New and updated information was included in this version of the book as a result of usability testing and other feedback. Read all of the steps no matter how familiar you are with the installation.
Chapter 1. Before you begin the installation

This topic contains a set of instructions to help you plan your installation, unpack the order you have received, and install your system. The first steps involve planning the installation.

The Quick Installation Guide contains a set of instructions to help you unpack and install your system. The guide is divided into three chapters. The steps in the first chapter involve verifying your order, becoming familiar with the hardware component terminology, and ensuring that you have met the environmental requirements. The steps in the second chapter involve installing the hardware and attaching the data cables and power cords. The final chapter helps you create your configuration file and access the management GUI. The management GUI guides you through the initial configuration process.

If you are installing a new IBM Storwize V7000 Unified system, which includes the IBM Storwize V7000 file module and the IBM Storwize V7000 storage system, follow the installation instructions in the IBM Storwize V7000 Unified Quick Installation Guide to install the hardware for both machine types 2073 and 2076. The IBM Storwize V7000 Unified Quick Installation Guide is shipped with the Storwize V7000 file module hardware. You should use these instructions to add a new IBM Storwize V7000 expansion enclosure to an existing IBM Storwize V7000 Unified system.

See the following website for the available translated versions of the Quick Installation Guide:

www.ibm.com/storage/support/storwize/v7000

Occasionally you are referred to topics in the Storwize V7000 Information Center. A copy of the Storwize V7000 Information Center is on the CD that is included in the order you have received.

Important information:
1. You must first work through the planning information regarding your physical environment and logical network in the Storwize V7000 Information Center.
2. Ensure that you have available any cables that you are supplying.
   • Setting up a new system that consists of installing a control enclosure only. In this case, you are not installing any expansion enclosures.
   • Setting up a new system that consists of installing a control enclosure and installing one or more expansion enclosures.
   • Adding an expansion enclosure to an existing system. In this case, you initially installed a control enclosure or installed a control enclosure and one or more expansion enclosures. You want to add an expansion enclosure to your existing system. If you are adding an expansion enclosure to an existing system, you do not need to power off the system. You can add an expansion enclosure while the system is operational.
   • Adding another control enclosure either by itself or with one or more expansion enclosures to an existing system. If you are adding another control enclosure to an existing system, you do not need to power off the system. You can add another control enclosure while the system is operational.
**Note:** Support for multiple control enclosures in a single system requires a software level of 6.2.0 or later. You must upgrade to the most current level of software after installing the Storwize V7000. The management GUI can be used to apply software updates. Refer to the IBM Storwize V7000 support website for the latest information on software upgrades.

- Setting up a new system that consists of more than one control enclosure. You install the first control enclosure and then the required expansion enclosures. For other control enclosures, do the setup as if you were adding it to an existing system.

Table 5 identifies the order of the steps that you take for each of the different scenarios.

*Table 5. Steps for the different scenarios*

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1 These steps are performed for each control enclosure and expansion enclosure that you add.
2 These steps are performed for each expansion enclosure that you add.

Be familiar with the following information

- Where it is applicable, a CAUTION notice indicates situations that can be potentially hazardous to you. Before doing a step that contains a caution notice, read and understand the statement that accompanies it.
- **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.
- **Fixed drawers**: Any fixed drawer (like the V7000) must not be removed 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.
- Use safe practices when lifting. The fully populated enclosure weighs about 57.2 lbs (26 kg). At least two people are required to lift and install the enclosure into the rack or to remove an enclosure from the rack.
Do not use rack-mounted devices as a shelf or workspace. Do not place any object on top of rack-mounted devices.

Tools needed

A Phillips screwdriver is the only tool needed for the system installation.

Limits and restrictions

For current supported functions and limitations, such as network protocols, authentications, and so forth, refer to IBM Storwize V7000 Unified Support. Go to http://www.ibm.com/storage/support/storwize/v7000/unified and search for Limits and restrictions.

Release notes

For the latest release notes go to http://www-01.ibm.com/support/docview.wss?uid=ssg1S1003906.

Step 1. Reviewing your packing slip

After you open your box or boxes, locate your packing slip. Ensure that the items that are listed in your packing slip match what is in the box. Ensure that any optional items that you ordered are included in the list. Your shipment might contain additional items depending on the order.

Standard ship group contents:

- Control enclosure (models 2076-112, 2076-124, 2076-312, or 2076-324) or expansion enclosure (models 2076-212 or 2076-224). The last two digits of the model number identify the number of drive slots, either 12 or 24.
- Rack-mounting hardware kit, including:
  - Two rails (right and left assembly)
  - Two M5 x 15 Hex Phillips screws per rail (two rails)
  - Two M5 x 15 Hex Phillips screws per chassis

  Note: Two parts of the rail kit are attached to each side of the enclosure.
- Two power cords
- Drive assemblies or blank carriers (installed in the enclosure).
  Verify the number of drives and the size of the drives.

Other shipped items:

- Environmental Notices flyer
- Limited Warranty information
- Software CD that contains the environmental notices, the publication PDFs, and the information center content. One CD is shipped per enclosure.
- License Function authorization document
- IBM Storwize V7000 Quick Installation Guide, GC27-2290

Additional components for control enclosure:

- Fibre Channel cables, if ordered
- Small form-factor pluggable (SFP) transceivers that are preinstalled in the enclosure
Longwave SFP transceivers, if ordered

Additional components for expansion enclosures:
• Two SAS cables for each expansion enclosure

Step 2. Identifying the hardware components

The following graphics and descriptions identify the various hardware components and port locations for the control enclosure and the expansion enclosure. Each enclosure takes up the full 2U height in the rack.

See the IBM Storwize V7000 Troubleshooting, Recovery, and Maintenance Guide PDF on the CD for the full descriptions of the hardware components.

Each enclosure has drives that are located on the front. Figure 1 and Figure 2 show the front of an enclosure that has space for up to 12 or 24 drives, depending on the model, and a left end cap and a right end cap.

![Figure 1. 24 drives and two end caps](image1)

![Figure 2. 12 drives and two end caps](image2)

Control enclosure components

Figure 3 on page shows the rear view of a control enclosure and identifies the location of the power supply units and the canisters.
Power supply units are located on the left and right of the canisters. Each unit contains a battery. Power supply /SF5800001/SF590000 is located on the left. Power supply /SF5800002/SF590000 is located on the right. Power supply /SF5800001/SF590000 is inserted top side up, and power supply /SF5800002/SF590000 is inverted, or top side down.

**Important:** The power supply units for the control enclosure and expansion enclosure are not interchangeable.

Two canisters are housed in the middle of the enclosure. Each canister is known as an expansion canister. The upper canister, as shown in Figure 3 is canister /SF5800003/SF590000, and the lower canister is canister /SF5800004/SF590000. Canister /SF5800003/SF590000 is top side up, and canister /SF5800004/SF590000 is inverted, or top side down.

Figure 4 on page 7 shows the rear view of a model 2076-112 or a model 2076-124 control enclosure and identifies the location of the ports.
• **1** Fibre Channel ports. Each canister has four Fibre Channel ports. They are in a block of four in two rows of two connectors. The ports are numbered 1 - 4 from left to right, top to bottom. Their use is optional.

• **2** USB ports. Each canister has two USB ports. The ports are side by side on the canister and are numbered 1 on the left and 2 on the right. One port is used during installation.

• **3** Ethernet ports. Each canister has two Ethernet ports. The ports are side by side on the canister. They are numbered 1 on the left and 2 on the right. Port 1 must be connected first; the use of port 2 is optional.

• **4** Serial-attached SCSI (SAS) ports. Each canister has two SAS ports. The ports are side by side on the canister. They are numbered 1 on the left and 2 on the right. Port 1 must be connected first if you are adding one expansion enclosure. Port 2 must be connected if you are adding a second expansion enclosure.

**Note:** The reference to the left and right locations applies to canister 1, which is the upper canister. The port locations are inverted for canister 2, which is the lower canister.

Figure 5 on page 8 shows the rear view of a model 2076-312 or a model 2076-324 control enclosure with the optional 10 Gbps Ethernet ports installed. All other ports remain the same.
10 Gbps Ethernet port 3 which is the left port.
2 10 Gbps Ethernet port 4 which is the right port.

**Expansion enclosure components**

Figure 6 shows the rear view of an expansion enclosure and identifies the location of the power supply units and the canisters. The ports and their use are described later in this section.

- Power supply units are on the left and right of the canisters. Power supply 1 is located on the left. Power supply 2 is located on the right. Power supply 1 is inserted top side up, and power supply 2 is inverted, or top side down.

**Important:** The power supply units for the control enclosure and expansion enclosure are not interchangeable.
- Two canisters are housed in the middle of the enclosure. Each canister is known as an expansion canister. The upper canister, as shown in Figure 6, is canister 3, and the lower canister is canister 4. Canister 3 is top side up, and canister 4 is inverted, or top side down.

Figure 7 on page 9 shows the rear view of an expansion enclosure and identifies the SAS port locations.
Each canister has two SAS ports that are numbered 1 on the left and 2 on the right. Port 1 must be connected if you are adding one expansion enclosure. Port 2 must be connected if you are adding a second expansion enclosure.

**Note:** The reference to the left and right locations applies to canister 1, which is the upper canister. The port locations are inverted for canister 2, which is the lower canister.

**Miscellaneous hardware**

The USB flash drive is packaged with the publications and contains the initialization tool for performing the initial system configuration.

**Step 3. Verifying environmental requirements**

Certain requirements for the physical site must be met to ensure that your system works reliably.

This step includes verifying that adequate space in a suitable rack is available and that requirements for power and environmental conditions are met. This documentation assumes that you have completed the physical planning for the environment of your system.

If you have not done the environmental planning for your system, see *Planning>Planning for hardware>Storwize V7000 physical installation planning* topic in the Storwize V7000 Information Center.

If your system contains more than one control enclosure, you must configure the Fibre Channel switch for correct zoning between the control enclosures. See the configuring topics in the Storwize V7000 Information Center that contain information about zoning rules and zoning details.

You must use a supported web browser. Verify that you are using a supported web browser from the following website:
Certain requirements for the physical site must be met to ensure that your system works reliably. This step includes verifying that adequate space in a suitable rack is available and that requirements for power and environmental conditions are met. This documentation assumes that you have completed the physical planning for the environment of your system.

If your system contains more than one control enclosure, you must configure the Fibre Channel switch for correct zoning between the control enclosures. See the configuring topics in the Storwize V7000 Information Center that contain information about zoning rules and zoning details.

1. From the **Search support** input field, type browser.
   
   You are shown a search result for “IBM Storwize V7000 Supported Hardware List, Device Driver, Firmware and Recommended Software Levels.” Click the search entry.
   
   2. Scroll down to the **Other Hardware and Software** section.
   
   3. Find and select **Management GUI**.

### Step 4. Reviewing enclosure location guidelines

Follow these guidelines to create a plan that identifies an appropriate location in the rack for the enclosure or enclosures that you are installing now or in the future. An enclosure requires two standard rack units of space in a rack. See Figure 9 on page 14 for a sample template of two rack units.

#### If you are installing a control enclosure only, follow these guidelines:

Position the enclosure in the rack so that you can easily view it and access it for servicing. This action helps the rack to remain stable and provides a way for two or more people to install and remove the enclosure.

#### If you are installing a control enclosure plus one or more expansion enclosures, follow these guidelines:

If you have one or more expansion enclosures, position the control enclosure in the middle of the expansion enclosures. Balance the expansion enclosures above and below the control enclosure.

For example, position the control enclosure in the middle of the enclosures for ease of cabling.

- You can have no more than five expansion enclosures attached to SAS port 1 of the control enclosure.
- You can have no more than four expansion enclosures attached to SAS port 2 of the control enclosure.
- Position the enclosures together; avoid adding other equipment between enclosures.
- When you add the first expansion enclosure to a control enclosure, 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. For each additional expansion enclosure that you add, alternately add it below or above the control enclosure.
Position the enclosures in the rack so that you can easily view them and access them for servicing. This action helps the rack to remain stable and provides a way for two or more people to install and remove the enclosures.

**If you are installing an expansion enclosure to an existing system, follow these guidelines:**

When you add the first expansion enclosure to a control enclosure, 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. For each expansion enclosure that you add, alternately add it below or above the control enclosure.

If you are adding an expansion enclosure to an existing system, you do not need to power off the system. You can add an expansion enclosure while the system is operational.

**If you are installing more than one control enclosure, follow these guidelines:**

If you plan to add more than one set of a control enclosure and expansion enclosures, put the second set of enclosures above the first set of enclosures. Review the guidelines for “If you are installing a control enclosure plus one or more expansion enclosures.” You can also add the second set of enclosures in a different rack.

**Note:** When you perform the installation of the enclosures, load the rack from the bottom to ensure rack stability. Empty the rack from the top down.

If you are adding another control enclosure to an existing system, you do not need to power off the system. You can add the control enclosure while the system is operational.
Chapter 2. Performing the hardware installation

You have completed the initial steps of verifying the shipping contents and becoming familiar with the hardware components. You have verified that the power and environmental requirements are met and have planned the location of the enclosures.

You are now ready to begin installing the hardware components and connecting the data cables and power cords.

Step 5. Installing the support rails

About this task

To install the support rails, do the following steps:

1. Locate the rack mounting rails and screws.
   The rail assembly is made up of two sets of rails. One set of rails is already installed, or preinstalled, on the sides of the enclosures. The other set of rails must be installed in the rack cabinet. The rails on the sides of the enclosures slide into the rails that are installed in the rack cabinet.

2. Working at the front of the rack cabinet, identify the two standard rack units of space in the rack into which you want to install the support rails.
   [Figure 8] shows two rack units with the front mounting holes identified.

   ![Diagram of rack units with hole locations]

   - [1] Bottom rail location pin hole
   - [2] Enclosure mounting screw hole. Do not insert the screw until the enclosure is installed.
3. Align the bottom of the rail with the bottom of the two rack units. Insert the rail location pins 1 and 4 through the holes in the rack cabinet.

4. Insert a clamping screw into the rack mounting hole 3 between the rail location pins.

5. Tighten the screw to secure the rail to the rack.

6. Working from the rear of the rack cabinet, extend the rail that you secured to the front to align the bottom of the rail with the bottom of the two rack units.

**Note:** Ensure that the rail is level between the front and the back. Figure 9 shows two rack units with the back mounting holes identified.

7. Insert the rail location pins through the holes 1 and 3 in the rack cabinet.

8. Insert a clamping screw into the rack mounting hole 2 between the rail location pins.

9. Tighten the screw to secure the rail to the rack from the back side.

10. Repeat the steps to secure the opposite rail to the rack cabinet.

11. Repeat the procedure for each additional enclosure.
Step 6. Installing the enclosures

About this task

CAUTION:
1. To lift and install the enclosure into the rack requires at least two people.
2. Load the rack from the bottom to ensure rack stability. Empty the rack from the top down.

Following your enclosure location plan, install the correct type of enclosure starting from the bottom.
1. On either side of the drive assemblies, remove the enclosure end caps by squeezing the middle of the cap and pulling it away from the front of the enclosure. Figure 10 shows how to remove the enclosure end cap.

Figure 10. Removing the enclosure end cap

2. Align the enclosure with the front of the rack cabinet.
3. Carefully slide the enclosure into the rack along the rails until the enclosure is fully inserted.

Notes:
   a. The preinstalled rails on the sides of the enclosure must fit into the rack-mounted rails that you previously installed.
   b. The rails are not designed to hold an enclosure that is partially inserted. The enclosure must always be in a fully inserted position.
   c. Do not have more than one enclosure extended out of the rack at the same time to avoid the danger of the rack toppling over.
4. Insert a screw into the hole behind each enclosure end cap and tighten the screw.
5. After matching each end cap’s serial number to the serial number found on the rear of each enclosure, push the end caps back into position.
6. Repeat this procedure for each additional enclosure that you install.

Step 7. Connecting the SAS cables to the expansion enclosures

Use these instructions to connect SAS cables to the expansion controllers.

About this task

This task applies if you are installing one or more expansion enclosures.

Note: The enclosure terminology that is used in this topic is described fully in “Step 2. Identifying the hardware components” on page 5.

Be aware of these guidelines when you begin to attach the cables to the SAS ports:
- No more than five expansion enclosures can be chained to port 1 (below the control enclosure). The connecting sequence from port 1 of the node canister is called chain 1.
- No more than four expansion enclosures can be chained to port 2 (above the control enclosure). The connecting sequence from port 2 of the node canister is called chain 2.
- No cable can be connected between a port on an upper canister and a port on a lower canister.
- Attach cables serially between enclosures; do not skip an enclosure.
- The last enclosure in a chain must not have cables in port 2 of canister 1 and port 2 of canister 2.
- Ensure that cables are installed in an orderly way to reduce the risk of cable damage when replaceable units are removed or inserted.
- Arrange your cables to provide access to:
  - USB ports. USB port access is required when you use a USB flash drive to configure the system.
The enclosures themselves. Access is required to the hardware for servicing and for safely removing and replacing components using two or more people.

- Ensure that each SAS cable is fully inserted. A click is heard when the cable is successfully inserted.

**Note:** If you make a mistake during cabling and must unplug a SAS cable, pull the blue tag to release the cable.

**Procedure**

1. Review [Cabling guide](#) and the following figures before attaching the SAS cables.

   **Table 6. Cabling guide**

<table>
<thead>
<tr>
<th>From:</th>
<th>To:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Port 1 of upper canister, control enclosure</td>
<td>Port 1 of upper canister, expansion enclosure 1</td>
</tr>
<tr>
<td>Port 1 of lower canister, control enclosure</td>
<td>Port 1 of lower canister, expansion enclosure 1</td>
</tr>
<tr>
<td>Port 2 of upper canister, control enclosure</td>
<td>Port 1 of upper canister, expansion enclosure 2</td>
</tr>
<tr>
<td>Port 2 of lower canister, control enclosure</td>
<td>Port 1 of lower canister, expansion enclosure 2</td>
</tr>
<tr>
<td>Port 2 of upper canister, expansion enclosure 1</td>
<td>Port 1 of upper canister, expansion enclosure 3</td>
</tr>
<tr>
<td>Port 2 of lower canister, expansion enclosure 1</td>
<td>Port 1 of lower canister, expansion enclosure 3</td>
</tr>
</tbody>
</table>

2. Attach the SAS cables from the control enclosure to the first expansion enclosure as shown in Figure 12. Remove the protective end covers, if necessary. The first expansion enclosure is below the control enclosure.

   **Figure 12. Attaching an expansion enclosure to the control enclosure**

   a. Port 1 **1** of the upper canister, control enclosure, attaches to Port 1 **2** of the upper canister, expansion enclosure 1.
b. Port 1 of the lower canister, control enclosure, attaches to Port 1 of the lower canister, expansion enclosure 1. The port locations on the lower canister are inverted from the port locations on the upper canister. Port 1 on the lower canister is opposite port 1 on the upper canister.

Note: The connecting sequence from port 1 of the node canister is called chain 1.

3. Attach the SAS cables from the control enclosure to the second expansion enclosure as shown in Figure 13. The second expansion enclosure is above the control enclosure.

a. Port 2 of the upper canister, control enclosure, attaches to Port 1 of the upper canister, expansion enclosure 2.

b. Port 2 of the lower canister, control enclosure, attaches to Port 1 of the lower canister, expansion enclosure 2. The port locations on the lower canister are inverted from the port locations on the upper canister. Port 1 on the lower canister is opposite port 1 on the upper canister.

Note: The connecting sequence from port 2 of the node canister is called chain 2.

4. Attach the SAS cables from the first expansion enclosure to the third expansion enclosure. See Figure 14 on page 19.


   a. Add the enclosures alternately to chain 1, and then chain 2.
   b. Use port 2 on the canisters that are already connected to attach to port 1 on the canisters of the enclosures that you want to add.
   c. Connect the SAS cables from canister 1 to canister 1.
   d. Connect the SAS cables from canister 2 to canister 2.

6. Verify your cabling.
Step 8. Attaching the Ethernet cables

About this task

This task applies if you are installing a control enclosure only or a control enclosure plus one or more expansion enclosures.

This task assumes that your initial planning has determined where the Ethernet cables are to be located.

Attention: The default service IP addresses on your new Storwize V7000 control enclosures might conflict with existing devices that are attached to the network or with other new Storwize V7000 control enclosures that you are installing. The service IP address 192.168.70.121 subnet mask 255.255.255.0 is preconfigured on Ethernet port 1 of the upper canister, canister 1. The service IP address 192.168.70.122 subnet mask 255.255.255.0 is preconfigured on Ethernet port 1 of the lower canister, canister 2.

If you encounter this situation, change the service IP addresses on the new nodes before connecting the Ethernet cables. For details, see Information required before initializing your system. Also refer to the IBM Storwize V7000 Troubleshooting, Recovery, and Maintenance Guide PDF on the DVD for further information about setting service IP addresses, using a USB flash drive.

When you install multiple control enclosures, you increase the chance of conflicts in IP addresses.

To attach the Ethernet cables, do the following steps:

1. For each node canister in the control enclosure, connect an Ethernet cable between Ethernet port 1 of the canister and an enabled port on your Ethernet switch or router. Port 1 can be used for management, service, and iSCSI.

   Note: Ethernet cables are not supplied as part of your order. A CAT 5 unshielded twisted pair (UTP) is the minimum requirement for an Ethernet cable.

   Ensure that cables are installed in an orderly way to reduce the risk of cable damage when replaceable units are removed or inserted.

2. Optionally attach Ethernet cables between Ethernet port 2 on each node canister and your Ethernet network. Port 2 can be used for management and iSCSI.

Step 9. Attaching the Fibre Channel longwave SFP transceivers

About this task

This task applies if you ordered Fibre Channel longwave SFP transceivers.

Attention: The shortwave SFP transceivers are preinstalled in the control enclosure. No further action is required if you are using the shortwave SFP transceivers.

To attach the SFP transceivers, do the following steps:
Procedure
1. For both node canisters in the control enclosure, identify which of the four shortwave SFP transceivers must be replaced with longwave SFP transceivers.
2. Remove the shortwave SFP transceivers.
3. Plug the longwave SFP transceivers into ports 1-4, as needed.

For more information about removing and replacing hardware components, see the “Removing and replacing parts” topics in the Storwize V7000 Information Center to find out how to do these procedures.

Step 10. Attaching the Fibre Channel cables

About this task
This task applies if you are installing a control enclosure and are connecting it to your Fibre Channel network or connecting hosts using direct Fibre Channel connections.

This task assumes that your initial planning has determined where the Fibre Channel cables are to be located.

To attach the Fibre Channel cables, do the following steps:

Procedure
1. Remove any protective end covers from the cables or the SFP transceivers.
2. Attach the Fibre Channel cables to a Fibre Channel switch or directly to a host HBA port.
   Ensure that cables are installed in an orderly way to reduce the risk of cable damage when replaceable units are removed or inserted.
3. Attach the other ends of the Fibre Channel cables to the Fibre Channel ports on the node canisters.

Note: If you use fewer than eight Fibre Channel cables, it does not matter which Fibre Channel ports you use. Ensure that you attach the Fibre Channel cables evenly between the two node canisters.

What to do next
After you have started your system, be sure to configure your Fibre Channel zoning to match the guidelines in the “Zoning details” topic in the Storwize V7000 Information Center.

Notes:
1. Ensure that Storwize V7000 ports with shortwave SFP transceivers are connected to shortwave SFP transceivers on the Fibre Channel switch.
2. Ensure that Storwize V7000 ports with longwave SFP transceivers are connected to longwave SFP transceivers on the Fibre Channel switch.
3. The cable types are different between longwave and shortwave connections. Ensure that the correct cable type is used.
Step 11. Attaching the 10 Gbps Ethernet cables

About this task

This task applies if you are installing a model type 2076-312 or a model type 2076-324 that has the 10 Gbps Ethernet ports.

This task assumes that your initial planning has determined where the Ethernet optical cables are to be located.

To attach the optical cables, do the following steps:
1. Remove any protective end covers from the cables or the SFP transceivers.
2. Attach the Ethernet optical cables to ports on a 10 Gbps Ethernet switch.
   Ensure that cables are installed in an orderly way to reduce the risk of cable damage when replaceable units are removed or inserted.
3. Attach the other ends of the Ethernet optical cables to the 10 Gbps Ethernet ports on the node canisters.
   See Figure 5 on page 8 for the port locations.

   Important: For each set of canisters, connect the Ethernet ports with the same numbers to the same subnets so that the failover of system management and iSCSI IP addresses can occur between canisters. For example, canister 1, port 3, must be on the same subnet as canister 2, port 3, and canister 1, port 4, must be on the same subnet as canister 2, port 4.

Step 12. Connecting the power cords

About this task

Two power supply units are located in each enclosure. Ensure that the power switches for each power supply unit are off.

Note: Each power supply unit comes with an attached cable retention bracket that fastens around the power cord to prevent the cord from being removed accidentally.

Do the following steps when you attach the power cord to each power supply unit:
1. Straighten the cable tie on the cable retention bracket. The cable retention bracket is attached to the power supply unit.
2. Open the cable retention bracket, refer to Figure 15 on page 23.
3. Slide the cable retention bracket away from the power supply unit until there is enough room to attach the cable retention bracket to the cable. When sliding the bracket away from the cable plug-in, pull the lever on the bracket that controls the cable tie slightly towards the center of the canister. You do not need to pull the lever to slide the bracket towards the cable plug-in.

4. Attach a power cord to each of the two power supply units in each enclosure. Ensure that cables are installed in an orderly way to reduce the risk of cable damage when replaceable units are removed or inserted.

5. Place the cable retention bracket around the end of the cable that plugs into the power supply unit.

6. Slide the cable retention bracket along the cord until it fits snugly against the plug end of the cable. Refer to Figure 16 on page 24.
7. Tighten the fastener around the plug.
8. Repeat the steps for each additional power cord.
9. Plug the power cords into a properly grounded electrical outlet. To provide power failure redundancy, plug the power cords for the individual power supply units for each enclosure into separate power distribution units, if possible.

**Step 13. Powering on the system**

**About this task**

*Attention:* Do not operate the system when the drive assemblies are missing. Drive assemblies that are missing disrupt the airflow; the drives do not receive sufficient cooling. You must insert blank carriers into unused drive bays.

This topic is divided into two procedures; the first one, powering on an expansion enclosure; the second one, powering on a control enclosure.

**Powering on an expansion enclosure:**

1. Power on the newly installed enclosures. Use the power switch on each of the two power supply units in the back of the expansion enclosure.
2. Use the information in Table 7 on page 25 to verify the state of the light emitting diodes (LEDs) on the system. Verify that no faults are detected. See the IBM Storwize V7000 Troubleshooting, Recovery, and Maintenance Guide PDF on the CD if problems are encountered.

*Figure 17 on page 25* shows the location of the LEDs on the power supply units in the rear of the expansion enclosure.
Table 7. LED status when expansion enclosures are powered on

<table>
<thead>
<tr>
<th>Hardware component</th>
<th>LED name and symbol</th>
<th>If power on and no fault is detected</th>
</tr>
</thead>
<tbody>
<tr>
<td>Left enclosure end cap, front of enclosure</td>
<td>Power, top</td>
<td>LED is on.</td>
</tr>
<tr>
<td></td>
<td>Fault, middle</td>
<td>LED is off.</td>
</tr>
<tr>
<td></td>
<td>Identify, bottom</td>
<td>LED is off.</td>
</tr>
<tr>
<td>Expansion canister, rear. The reference to the top and</td>
<td>Canister status, top</td>
<td>LED is on.</td>
</tr>
<tr>
<td>bottom locations applies to canister 1, which is the</td>
<td>Fault status, bottom</td>
<td>LED is off.</td>
</tr>
<tr>
<td>upper canister. The LED locations are inverted for</td>
<td></td>
<td></td>
</tr>
<tr>
<td>canister 2, which is the lower canister.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Power supply unit, expansion enclosure. The reference</td>
<td>Power supply, upper right</td>
<td>LED is on.</td>
</tr>
<tr>
<td>to the left and right locations applies to power supply</td>
<td>Fan failure</td>
<td>LED is off.</td>
</tr>
<tr>
<td>unit 1, which is the left power supply. The LED locations</td>
<td>dc power failure</td>
<td>LED is off.</td>
</tr>
<tr>
<td>are inverted for power supply unit 2, which is the right</td>
<td>ac power failure</td>
<td>LED is off.</td>
</tr>
<tr>
<td>power supply.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Powering on a control enclosure:

Figure 17. LEDs on the power supply units of the expansion enclosure
1. Power on the control enclosure, if it is not already powered on and configured. Use the power switch on each of the two power supply units, located in the back of the enclosure.

2. Use Table 8 to verify the state of the LEDs on the system. Verify that no faults are detected.

Figure 18 shows the location of the LEDs on the power supply units in the rear of the control enclosure.

<table>
<thead>
<tr>
<th>Hardware component</th>
<th>LED name</th>
<th>If power on and no fault is detected</th>
</tr>
</thead>
<tbody>
<tr>
<td>Left enclosure end cap, front of enclosure</td>
<td>Power, top LED is on.</td>
<td>LED is on.</td>
</tr>
<tr>
<td></td>
<td>Fault, middle LED is off.</td>
<td>LED is off.</td>
</tr>
<tr>
<td></td>
<td>Identify, bottom LED is off.</td>
<td>LED is off.</td>
</tr>
</tbody>
</table>
Table 8. LED status when control enclosure is powered on (continued)

<table>
<thead>
<tr>
<th>Hardware component</th>
<th>LED name</th>
<th>If power on and no fault is detected</th>
</tr>
</thead>
<tbody>
<tr>
<td>Node canister, rear. The reference to the top and bottom locations applies to canister 1, which is the upper canister. The LED locations are inverted for canister 2, which is the lower canister.</td>
<td>Fibre Channel port</td>
<td>If the Fibre Channel port is used: One or more LEDs are on or flashing per port. The LEDs are located between the Fibre Channel ports. The arrow-shaped LEDs point toward the affected port.</td>
</tr>
<tr>
<td>Ethernet port, if used</td>
<td>One or more LEDs are on per port.</td>
<td></td>
</tr>
<tr>
<td>SAS ports</td>
<td>When a SAS port is functioning correctly, all four green LEDs above the port are on. If no cable is plugged into the port, or if the canister at either end of the cable is not yet fully started, the LEDs are not on.</td>
<td></td>
</tr>
<tr>
<td>System status, left</td>
<td>LED is flashing or on. The status is on if the node canister is an active member of a clustered system. The LED is flashing if the node canister is in service or candidate state. If the LED is off, the node canister might still be booting up. Wait up to 5 minutes for the node canister to complete booting up.</td>
<td></td>
</tr>
<tr>
<td>Fault status, middle</td>
<td>LED is off.</td>
<td></td>
</tr>
<tr>
<td>Power status, right</td>
<td>LED is on.</td>
<td></td>
</tr>
<tr>
<td>Power supply unit, control enclosure. The reference to the left and right locations applies to power supply unit 1, which is the left power supply. The LED locations are inverted for power supply unit 2, which is the right power supply.</td>
<td>Power supply, upper right</td>
<td>LED is on.</td>
</tr>
<tr>
<td></td>
<td>ac power failure</td>
<td>LED is off.</td>
</tr>
<tr>
<td></td>
<td>dc power failure</td>
<td>LED is off.</td>
</tr>
<tr>
<td></td>
<td>Fan failure</td>
<td>LED is off.</td>
</tr>
<tr>
<td></td>
<td>Battery failure</td>
<td>LED is off.</td>
</tr>
<tr>
<td></td>
<td>Battery good, lower right</td>
<td>LED is on or flashing.</td>
</tr>
</tbody>
</table>

**Attention:** Do not go to the next section until the LEDs are in the required states.

See the *IBM Storwize V7000 Troubleshooting, Recovery, and Maintenance Guide* PDF on the CD if problems are encountered.
Chapter 3. Configuring the system

This document helps you set up your system for the first time.

About this task

In the previous steps, you installed the enclosures in the rack, connected all cables, powered the system on, and checked the LED status for the system. When you have completed all these steps, continue with the last step to configure the system.

The last step for configuring your system provides instructions for several scenarios:

- Setting up your system for the first time.
- Adding one or more expansion enclosures to an existing system.
- Adding another control enclosure to an existing system.
- Using IBM Flex System Manager to upgrade SAN Volume Controller.

If you are installing a new IBM Storwize V7000 Unified system, which includes the IBM Storwize V7000 file module and the IBM Storwize V7000 storage system, follow the installation instructions in the IBM Storwize V7000 Unified Quick Installation Guide to install the hardware for both machine types 2073 and 2076. The IBM Storwize V7000 Unified Quick Installation Guide is shipped with the Storwize V7000 file module hardware.

Setting up your system for the first time with a control enclosure or a control enclosure and one or more expansion enclosures

This document guides you through setting up the control enclosure.

About this task

To complete this step, you must use a supported web browser. Verify that you are using a supported web browser from the following website:

www.ibm.com/storage/support/storwize/v7000

Note: You must upgrade to the most current level of software after installing the Storwize V7000. The management GUI can be used to apply code updates. Refer to the IBM Storwize V7000 support website for the latest information about upgrade packages.

You must initialize the system by creating a clustered system and configuring it. The first stage is to create the clustered system using the initialization tool and the USB flash drive. You must know the required IP management address that is assigned to the system before continuing.

Procedure

1. Locate the USB flash drive that was shipped with your order in the documentation package.
Note: You might encounter a problem where the code cannot be run if you use your own USB flash drive. The USB flash drive that you use must:

- Contain a FAT32 formatted file system on its first partition. NTFS and other file system types are not supported.
- Contain a copy of the Microsoft Windows USB flash drive InitTool.exe executable that is located in the root directory of the file system.
- Be write enabled.

The latest InitTool.exe is available from [www.ibm.com/storage/support/storwize/v7000](http://www.ibm.com/storage/support/storwize/v7000) under [Fixes (downloads)].

2. Insert the USB flash drive into a USB port in a personal computer that is running Microsoft Windows XP Professional or higher.

If the system is configured to autorun for USB flash drives, the initialization tool starts automatically. Otherwise, open the USB flash drive from My Computer and double-click the InitTool.exe.

If you are running a non-Windows operating system, you must create the files manually on the USB flash drive. See the IBM Storwize V7000 Troubleshooting, Recovery, and Maintenance Guide PDF on the DVD to learn more about using the USB flash drive to manage or service the system.

3. Select the Initialize a new Storwize V7000 option from the Welcome panel of the initialization tool. Click Next. Use the initialization tool to complete the following steps:

a. Enter the management IP address, the default Gateway IP address and change the subnet mask if required. Click Next.

b. Transferring the USB flash drive to the powered-on control enclosure to create the clustered system. Do not insert the USB flash drive until the node canister has completed booting up.

   While the clustered system is being created, the amber fault LED blinks on the node canister. When the amber fault LED stops blinking, remove the USB flash drive and reinsert it in your personal computer to restart the initialization tool. The results of the create clustered system operation are shown. Check that the create operation succeeded.

   The system cannot become active until there is sufficient battery power to safeguard the system in the event of a power failure. If the batteries do not have sufficient charge, the system cannot start immediately. An estimated time for when the system is available is shown. When you receive the batteries, they normally contain sufficient power for the system to start.

   The LED status on the node canisters in the control enclosure change when a clustered system starts. The status LED on the node canister that you created the clustered system on changes from blinking to fully on when the clustered system is created and there is sufficient battery power to safeguard the system. After a short wait, the status LED on the other node canister changes from blinking to fully on. For information about the LEDs, see "Step 13. Powering on the system" on page 24.

   If necessary, wait until the system has started.

   If you are unable to create the clustered system, see the IBM Storwize V7000 Troubleshooting, Recovery, and Maintenance Guide PDF on the DVD that is shipped with the system. Remove hardware components only when directed to do so by the fix procedures. Failure to follow the procedures can result in loss of access to data or loss of data.
4. If the personal computer from which you are using the initialization tool has a supported browser and an Ethernet connection to the management IP address that is assigned to the system, click Launch the management GUI on the results window. Otherwise, go to a personal computer that has an Ethernet connection to the management IP address and point a supported browser to the management IP address to start the management GUI. You see the management GUI logon panel.

If you are unable to start the management GUI or encounter other problems, see the IBM Storwize V7000 Troubleshooting, Recovery, and Maintenance Guide PDF on the DVD that is shipped with the system.

5. Log in as superuser. Use passw0rd for the password.

6. Review the International Program License Agreement (IPLA). You must accept the agreement before you can continue to use the product.

7. The Setup wizard starts and guides you through the initial configuration and verification of the system. If you are not ready to complete any of the configuration steps now, use the configuration tasks in the management GUI to complete the configuration at a later time.

8. When you are finished using the USB flash drive, store it in a safe location. You can use it to do other tasks.

**What to do next**

This step completes the quick installation procedures. If you are setting up for the first time, see the configuring topics in the Storwize V7000 Information Center and continue to follow the tasks available in Getting Started from the management GUI.

---

**Adding an expansion enclosure into an existing system**

**About this task**

To complete this step, you must use a supported web browser. Verify that you are using a supported web browser from the following website:

[www.ibm.com/storage/support/storwize/v7000](http://www.ibm.com/storage/support/storwize/v7000)

To add an expansion enclosure into an existing system, perform the following steps:

**Procedure**

1. Install the enclosure in the rack.
2. Attach the power and SAS cables.
3. Power on the enclosure and wait for the SAS LEDs to turn on.
4. Start the management GUI.
5. Go to Monitoring > System Details.
6. Select the system name in the tree.
7. Go to Actions > Add Enclosures > Expansion only.
8. Continue to follow the on-screen instructions.
What to do next

This step completes the quick installation procedures. Now that you have added an expansion enclosure into an existing system, continue to perform your standard tasks.

Adding another control enclosure into an existing system

About this task

To complete this step, you must use a supported web browser. Verify that you are using a supported web browser from the following website:

www.ibm.com/storage/support/storwize/v7000

Note: When you add another control enclosure, you do not use the initialization tool or the USB flash drive.

To add another control enclosure into an existing system, do the following steps:

Procedure

1. Configure the Fibre Channel switch to allow for correct zoning between the control enclosures.
   The correct zoning provides a way for the Fibre Channel ports to connect to each other. See the configuring topics in the Storwize V7000 Information Center that contain information about zoning rules and zoning details.
   If the configuration tool for the Fibre Channel switch does not provide details of the world wide port names (WWPNs), use the service assistant to find them or use the USB flash drive to find the status of the node. For information about the status of the node, see the IBM Storwize V7000 Troubleshooting, Recovery, and Maintenance Guide PDF on the CD that is shipped with the system.

2. Start the management GUI.
3. Go to Monitoring > System Details.
4. Select the system name in the tree.
5. Go to Actions > Add Enclosures > Control and Expansions.
6. Continue to follow the on-screen instructions.

What to do next

This step completes the quick installation procedures. If you are setting up for the first time, see the configuring topics in the Storwize V7000 Information Center and continue to follow the tasks available in Getting Started from the management GUI. If you added an expansion enclosure into an existing system, continue to do your standard tasks.
Appendix. Accessibility features for IBM Storwize V7000

Accessibility features help users who have a disability, such as restricted mobility or limited vision, to use information technology products successfully.

Accessibility features

These are the major accessibility features in Storwize V7000:

- You can use screen-reader software and a digital speech synthesizer to hear what is displayed on the screen. PDF documents have been tested using Adobe Reader version 7.0. HTML documents have been tested using JAWS version 9.0.
- This product uses standard Windows navigation keys.
- Interfaces are commonly used by screen readers.
- Keys are discernible by touch, but do not activate just by touching them.
- Industry-standard devices, ports, and connectors.
- You can attach alternative input and output devices.

The Storwize V7000 Information Center and its related publications are accessibility-enabled. The accessibility features of the Information Center are described in Viewing information in the information center in the Information Center.

Keyboard navigation

You can use keys or key combinations to perform operations and initiate menu actions that can also be done through mouse actions. You can navigate the Storwize V7000 Information Center from the keyboard by using the shortcut keys for your browser or screen-reader software. See your browser or screen-reader software Help for a list of shortcut keys that it supports.

IBM and accessibility

See the IBM Human Ability and Accessibility Center for more information about the commitment that IBM has to accessibility.
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This explains the Federal Communications Commission’s (FCC’s) statement.

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, might 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.

**Industry Canada compliance statement**

This Class A digital apparatus complies with Canadian ICES-003.

Cet appareil numérique de la classe A est conforme à la norme NMB-003 du Canada.

**Australia and New Zealand Class A Statement**

**Attention:** This is a Class A product. In a domestic environment this product might cause radio interference in which case the user might be required to take adequate measures.

**European Union Electromagnetic Compatibility Directive**

This product is in conformity with the protection requirements of European Union (EU) Council Directive 2004/108/EC on the approximation 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.

**Attention:** This is an EN 55022 Class A product. In a domestic environment this product might cause radio interference in which case the user might be required to take adequate measures.

Responsible Manufacturer:

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Armonk, New York 10504  
914-499-1900

European community contact:

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Technical Regulations, Department M372  
IBM-Allee 1, 71139 Ehningen, Germany  
Tele: +49 7032 15-2941  
Email: lugi@de.ibm.com

**Germany Electromagnetic Compatibility Directive**

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


EN 55022 Klasse A Geräte müssen mit folgendem Warnhinweis versehen werden:

“Warnung: Dieses ist eine Einrichtung der Klasse A. Diese Einrichtung kann im Wohnbereich Funk-Störungen 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 2004/108/EG in der Bundesrepublik Deutschland.

Zulassungsbescheinigung laut dem Deutschen Gesetz über die elektromagnetische Verträglichkeit von Geräten (EMVG) (bzw. der EMC EG Richtlinie 2004/108/EG) 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:

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Taiwan Contact Information
This topic contains the product service contact information for Taiwan.
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This explains the Japan Voluntary Control Council for Interference (VCCI) statement.

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This explains the Japan Electronics and Information Technology Industries Association (JEITA) statement for less than or equal to 20 A per phase.
This explains the JEITA statement for greater than 20 A per phase.

Korean Communications Commission Class A Statement
This explains the Korean Communications Commission (KCC) statement.

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This statement explains the Russia Electromagnetic Interference (EMI) statement.

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