IBM Cloud Object Storage System™
Version 3.15.1
Accesser 2100 (3409-A99), 3100 (3409-A98), Manager 2100 (3409-M99), 3100 (3409-M98), Slicestor 2100, 3100, 1440 (3409-S95/3409-S97), 2210 (3408-S98), 2440 (3409-S94/3409-S99)
Hardware Maintenance Guide



Note

Before using this information and the product it supports, read the following information:

- The general information in *Notices*
- The information in *Safety and environmental notices*
- The information in the *IBM Environmental Notices and User Guide* (provided on a DVD)

This edition applies to IBM Cloud Object Storage System and is valid until replaced by new editions.

© Copyright International Business Machines Corporation 2016, 2020.
US Government Users Restricted Rights – Use, duplication or disclosure restricted by GSA ADP Schedule Contract with IBM Corp.

Contents

Safety and environmental notices ..... **iv**
Safety notices iv

Document Information ..... **viii**

Chapter 1. Manager disk replacement **1**
Overview 1
Manager disk backup 1
Replace RAID disks 1
Replacing one RAID disk 1
Replacing two RAID disks 2
Replacing a Manager 3100 operating system disk 2

Chapter 2. Accesser and Slicestor appliance disk replacement **3**
Replacing an Accesser appliance operating system disk with SW Raid 3
Replacing an Accesser appliance operating system disk 3
Replacing a Slicestor appliance operating system disk with SW Raid 4
Replacing a Slicestor appliance operating system disk 4
Replacing a data disk 5

Chapter 3. Power supply replacement **6**
Models with power supply report capability 6
Alert messages 6
Models with hot swappable power supplies 6
Replacing a Slicestor 1440/2440 power supply unit 7
Replacing a Slicestor 2210 power supply unit 8

Chapter 4. Optical module replacement **9**
Installing an SFP+ optical module 9

Chapter 5. Fan replacement **10**
Accesser 2100, Accesser 3100, and Manager 3100 fans 10
Slicestor 1440/2440 fans 10
Replacing a front fan 10
Replacing a middle fan 12
Slicestor 2210 fans 14
Replacing a fan 14

Notices **17**
Trademarks 18
Homologation statement 19

Safety and environmental notices

Review the safety notices, environmental notices, and electronic emission notices for IBM® Cloud Object Storage System 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.

Examples of a caution and a danger notice. Numbers in parentheses refer to message numbers in the *IBM Safety Notices* publication G229-9054, which is included with your product.



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)

Safety notices

Safety notices for this product.

Familiarize yourself with the *IBM Safety Notices* publication G229-9054, which is included with your product.

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.
- Do not attempt to switch on power to the machine until all possible unsafe conditions are corrected.
- Assume that an electrical safety hazard is present. Perform all continuity, grounding, and power checks specified during the subsystem installation procedures to ensure that the machine meets safety requirements.
- Do not continue with the inspection if any unsafe conditions are present.
- 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)

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

DANGER: Professional movers are to be used for all relocation activities. Serious injury or death may occur if systems are handled and moved incorrectly. (D008)

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)

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)

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)



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

CAUTION:



or



or



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)

Document Information

Intended Purpose and Audience

This guide describes how to perform common replacement activities for disks, power supplies and appliances. The audience includes both IBM Cloud Object Storage System™ administrators and individuals responsible for hardware administration.

Note: This guide assumes that the appliances have already been installed. For instructions on installing, see the *Appliance Setup Guide* that was included in the box with the appliance. If the appliances have been installed and a more recent version of the software is available, the appliances should be upgraded to the newer version. Contact IBM for assistance with upgrades.

Note: For Cleversafe-branded Accesser 3105, Accesser 4105, Manager 3105, Slicestor 2212 and Slicestor 2448 appliances, see the respective *IBM Maintenance Manuals*. This manual applies to all other Cleversafe-branded appliances.

Chapter 1. Manager disk replacement

Overview

Regular maintenance procedures such as disk and appliance replacement differ between types (Manager, Accesser® Appliance, Slicestor® Appliance, or Fileserver pools). Disk replacement procedures for each one are described.

Attention: Disk replacement should be performed with a drive that is acquired by IBM. Using an alternative drive voids the support warranty and can potentially corrupt the data on the system.

All appliances contain an operating system disk. Slicestor® Appliance can have a separate operating system disk or the operating system that is stored on a partition of the first data disk.

Note: Appliance operating system disk failures incur appliance downtime. The requirements for replacing operating system disks are as follows.

- Recovery USB media to reinstall operating system.
- Network access to the Manager application.
- At least as much capacity on the replacement disk as the failed disk.

See the **Manager Device Monitor** page on the Manager Web Interface for drive bay layout and status.

Manager disk backup

Before you replace Manager disks, back up the data. Regular automatic backups should be scheduled. Follow the procedures in the "Backup and restore Manager" section of the *IBM Manager Administration Guide*.

Replace RAID disks

Replacing one RAID disk

About this task

The appliance can remain powered on when you replace a single disk.

Procedure

1. Acquire a replacement disk by contacting customer solutions.
2. Click the **Manager** device link.

   A warning message is displayed: `The manager device RAID disk is operating in degraded mode.`
3. Click **Configure**.
4. Make a note of the bay number that is listed as ONLINE, and replace the drive that is not listed.

   The drive that is listed is the good drive.

   Note: Event console displays a message similar to - `The drive in bay 0 has caused an array to be degraded.`. The bay number of the bad drive can be taken from that event, too.
5. Replace the failed disk.

© Copyright IBM Corp. 2016, 2020

Replacement disk rebuilds, stating **`Repairing local drive array`**. When the new drive is attached, the event console displays messages, such as: `The drive in bay 0 was attached. The local drive in bay 0 is repairing.`

Disk repair is complete when the **Event Console** displays the message **`Local drive array has been repaired`**.

Replacing two RAID disks

Procedure

If a total RAID array failure occurs, contact IBM Customer Support.

Replacing a Manager 3100 operating system disk

About this task

Manager 3100 has three disks: a dedicated operating system disk and two data disks that are configured as a RAID-1 array.

Procedure

1. Acquire replacement disk by contacting IBM Customer Support.
2. Turn off the appliance.
3. Replace operating system disk.
4. Insert USB installation media and power the appliance on.
5. Press the appropriate function key during the startup to enter the boot select menu.
6. Select the **USB media** from which to boot, when the boot select menu appears.
7. Wait for the **Installation** page to display.
8. Follow the next prompts and select **Automated** > **OS drive install** when presented.

   The image is installed on the replaced operating system drive and the device reboots.
9. Reconfigure the network parameters: channel port, IP, gateway, netmask, Manager IP, and system parameters.

   Manager should be reconfigured with the same IP as the previous device. Refer to *IBM Appliance Configuration Guide* for the procedure to configure a Manager device.

   Note: You do not need to restore from a system backup.

Chapter 2. Accesser and Slicestor appliance disk replacement

Replacing an Accesser appliance operating system disk with SW Raid

About this task
Upon disk failure, obtain a replacement disk by contacting IBM Customer Support.

Procedure

1. For this procedure, you do not need to turn the appliance off.
2. For an SW RAID, a single failed-drive no longer requires a full re-install of the OS. The bad drive can now be swapped out, and then the system automatically recovers the raid array while syncing up the new drive.
3. Replace disk.

Replacing an Accesser appliance operating system disk

About this task
Upon disk failure, obtain a replacement disk by contacting IBM Customer Support.

Procedure

1. Turn off the appliance.
2. Replace disk.
3. Insert USB installation media and power on the appliance.
4. Press the appropriate function key during the startup to enter the boot select menu.
5. Reconfigure the system network parameters - channel port, IP, gateway, netmask; manager IP and system parameters. See the *IBM Appliance Configuration Guide* for the procedure to configure an Accesser® Appliance.
6. Select the **USB media** from which to boot, when the boot select menu appears.

   Wait for the installation screen to appear.
7. Follow the next prompts and select **Automated** > **OS drive install** when presented.
8. Wait for installation to complete and the appliance to reboot, then remove the USB media.
9. Reconfigure the system network parameters: channel port, IP, gateway, netmask, Manager IP, and system parameters.

   See *IBM Appliance Configuration Guide* for the procedure to configure an Accesser appliance.
10. Make a note of its fingerprint after the configuration for a device is complete. Run **`system fingerprint`** to verify this information when approving devices in the Manager.
11. Consult the *Appliance Configuration Guide* for further instructions, if the disk is part of a High Availability configuration.

    The Accesser appliance is now ready for use.

    Note: Statistics data and Access logs are retained after an OS disk replacement if **Management Vault** was enabled on the Manager. Refer to “Management vaults” in *IBM Manager Administration Guide*.

© Copyright IBM Corp. 2016, 2020

Replacing a Slicestor appliance operating system disk with SW Raid

About this task

Upon disk failure on a Slicestor appliance, obtain a replacement disk by contacting IBM Customer Support.

Procedure

1. For this procedure, you do not need to turn the appliance off.
2. For an SW RAID, a single failed-drive no longer requires a full re-install of the OS. The bad drive can now be swapped out, and then the system automatically recovers the raid array while syncing up the new drive.
3. Replace disk.

Replacing a Slicestor appliance operating system disk

About this task

Upon disk failure on a Slicestor appliance, obtain a replacement disk by contacting IBM Customer Support.

Procedure

1. Turn off the appliance.
2. Replace the operating system disk (see table for drive locations).

Table 1. Operating system drive locations

Appliance	Operating system drive location
Slicestor® 2210	Operating system drive (bay 0) is internal to the box. Remove the lid, unplug the drive, unscrew the mounting bracket, and unscrew the drive from the mounting bracket.
Slicestor® 1440	Rear-mounted hot swap drive, top slot.
Slicestor® 1440v2	Rear-mounted hot swap drive, top slot.
Slicestor® 2440	Rear-mounted hot swap drive, top slot.
Slicestor® 2440v2	Rear-mounted hot swap drive, top slot.

3. Insert USB installation media.
4. Turn on the appliance and press the F11 key during the startup to enter the boot select menu.
5. Select the **USB media** to boot from, when the boot select menu appears.
6. Follow the next prompts and select **Automated** > **OS drive install** when presented.
7. Press the **Enter** key.
8. Wait for installation to complete and the appliance to reboot.
9. Remove the USB installation media after the reboot completes and the BIOS splash screen appears.
10. Reconfigure the network parameters: channel port, IP, gateway, netmask, manager IP, and system parameters. See the *IBM Appliance Configuration Guide* for the procedure to configure a Slicestor® Device.
11. After the configuration for a device is complete, make a note of its fingerprint. Run **`system fingerprint`** to verify this information when approving devices in the Manager.

The Slicestor® Appliance is ready to use.

Note: Statistics data will be retained after an OS disk replacement if Management Vault was enabled on the Manager. See the section, “Management vaults” in the *Manager Administration Guide*.

Replacing a data disk

About this task

Upon data disk failure on an appliance, obtain a replacement disk by contacting IBM Customer Support.

Procedure

1. For all Slicestor appliances, consult the Manager Web Interface for disk location and insert a new disk.
2. For configuring the replacement disk, see "Monitoring the System" in the *IBM Manager Administration Guide*.

Chapter 3. Power supply replacement

Models with power supply report capability

The Event Console reports power supply failures for the following models:

- Accesser 2100
- Accesser 3100
- Manager 2100
- Manager 3100
- Slicestor® 2100
- Slicestor® 3100
- Slicestor® 1440
- Slicestor® 1440 v2
- Slicestor® 2210
- Slicestor® 2440
- Slicestor® 2440 v2

Alert messages

Typical messages that can be reported if the power supply fails:

Table 2. Alert messages and corrective actions

Message	Corrective action
A power supply lost power or failed.	Replace the power supply. After the power supply is replaced, the event is cleared in the Event Console.

Models with hot swappable power supplies

The models in this table have hot-swappable power supplies and can be replaced without powering down the appliance. LED indicators are available on both units.

Table 3. Appliances with hot-swappable power supplies

Model	Functional	Nonfunctional
Accesser 2100/3100	Green LED	Red / Orange LED or not lit, Audible alarm.
Manager 2100/3100	Green LED	Red / Orange LED or not lit, Audible alarm.
Slicestor 2100/3100	Green LED	Red / Orange LED or not lit, Audible alarm.
Slicestor 2200/2210	Green LED	Red / Orange LED or not lit, Audible alarm.
Slicestor 1440/1440v2; Slicestor 2440/2440v2	Green LED	LED not lit, Audible alarm.

Replacing a Slicestor 1440/2440 power supply unit

Replacing a power supply unit in Slicestor 1440 and 2440 systems.

About this task

Do the following procedure to replace a power supply unit in Slicestor 1440 and 2440 systems. The power supply is hot pluggable; therefore, the system does not need to be powered down.



Figure 1. Slicestor 1440 and 2440 - Front Panel

Procedure

1. Identify the power supply unit (PSU) that needs to be replaced.

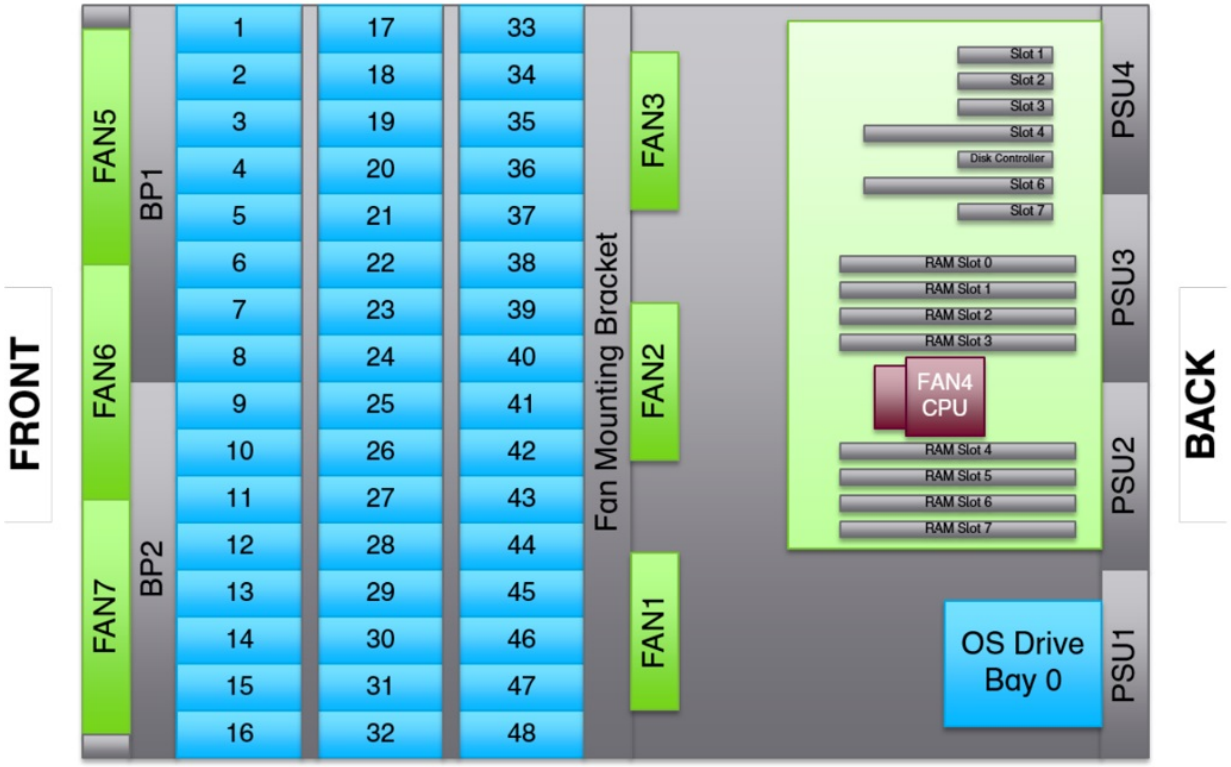


Figure 2. Slicestor 1440 and 2440 - Layout

2. Disconnect the power supply unit's power cable.
3. Loosen the thumbnail screw on the removal clip.
4. Pinch the clip at the end of the power supply at the rear of the system and slide the power cable out.
5. Insert the new power supply until it clicks into place.
6. Reconnect the power supply unit's power cable.
7. Contact your Customer Success Engineer to verify that the system is functioning correctly.

Replacing a Slicestor 2210 power supply unit

Replacing a power supply unit in a Slicestor 2210 system.

About this task

Do the following procedure to replace a power supply unit in the Slicestor 2210 system. The power supply is hot pluggable; therefore, the system does not need to be powered down.

Procedure

1. Identify the power supply unit (PSU) that needs to be replaced.

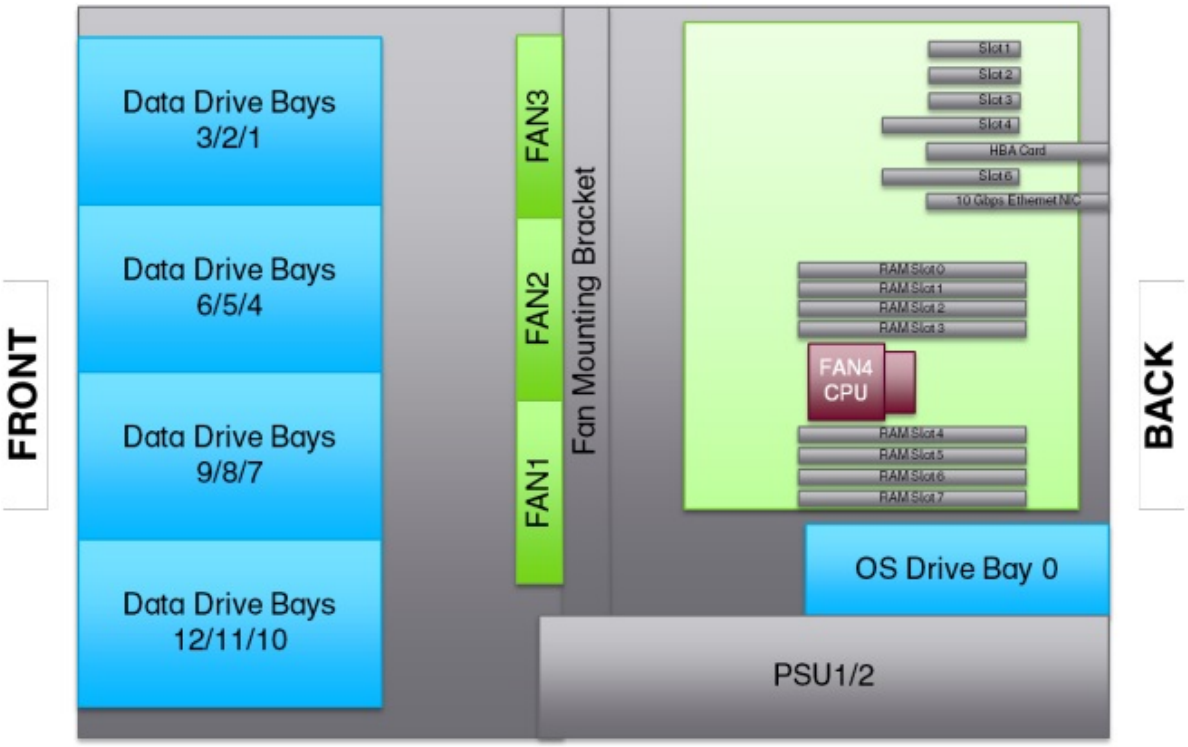


Figure 3. Slicestor 2210 - Layout

2. Disconnect the power supply unit's power cable.
3. Pinch the clip at the end of the power supply at the rear of the system and slide the power cable out.
4. Insert the new power supply until it clicks into place.
5. Reconnect the power supply unit's power cable.
6. Contact your Customer Success Engineer to verify that the system is functioning correctly.

Chapter 4. Optical module replacement

Installing an SFP+ optical module

Procedure

1. Log in to the device as **localadmin**.
2. Enter **poweroff** at the command line.
3. Remove the SFP+ module from the packaging.
4. Remove the black plastic cap from the optical side of the module.
5. Insert the module into the network card until it clicks into place.
6. Insert the fiber optic cable into the SFP+ module.
7. Restart the system and configure the network interface (see *Appliance Configuration Guide*).

© Copyright IBM Corp. 2016, 2020

Chapter 5. Fan replacement

Accesser 2100, Accesser 3100, and Manager 3100 fans

For the procedures to replace fans see the respective Appliance Maintenance Manuals.

Slicestor 1440/2440 fans

The system has six fans. Three fans are at the front of the system and three fans are in the middle of the system.

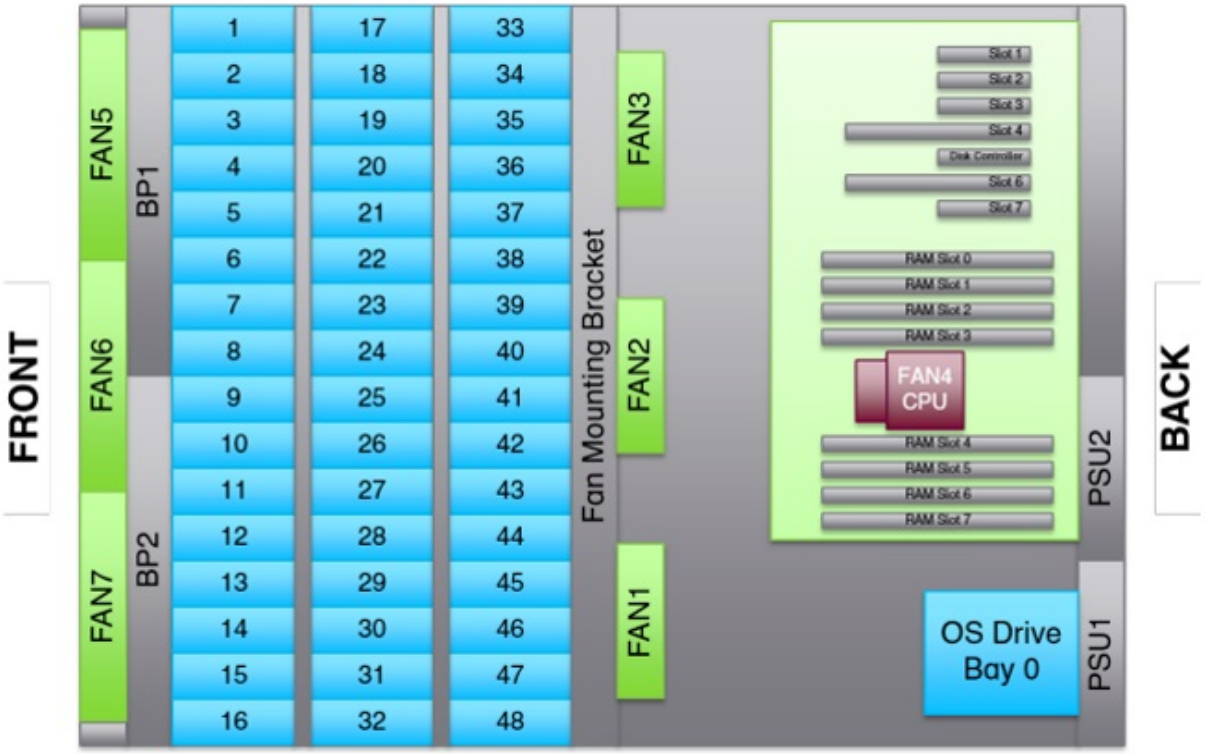


Figure 4. Slicestor 1440/2440 - fan locations

Note:

Replacing a front fan

Replacing the front fans in the IBM Slicestor 1440 and 2440 systems.

Before you begin

Note: This procedure can be done by one person.

Note: The system must be shut down before any cables are disconnected and any maintenance is done. If the system is not shut down, the lights on the power supply units are green. When the system is shut down, the lights on the power supply units are orange.

Procedure

1. Contact the STG assigned contact so that the system can be shut down before cables are disconnected.

   When the system is shut down, the lights on the power supply units are orange.
2. Remove the two screws that are located below the handles on each side of the front of the system.

   The screws secure the system to the rack.

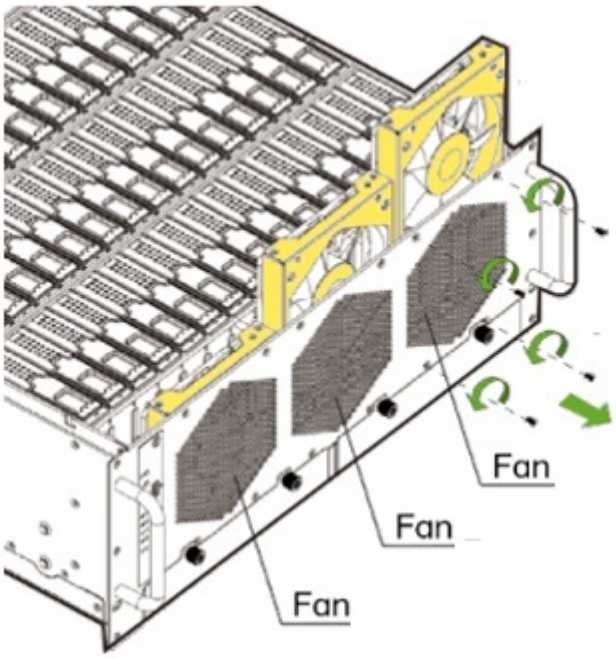


Figure 5. Slicestor 1440/2440 - front panel

3. Disconnect the power cables and the network cables.

   When the power cables are disconnected, the lights on the power supply units are off.
4. Pull the system from the front, or push from the rear, so that the system is halfway out of the rack.
5. Remove the four screws from the front lid. The top panel has two lids.

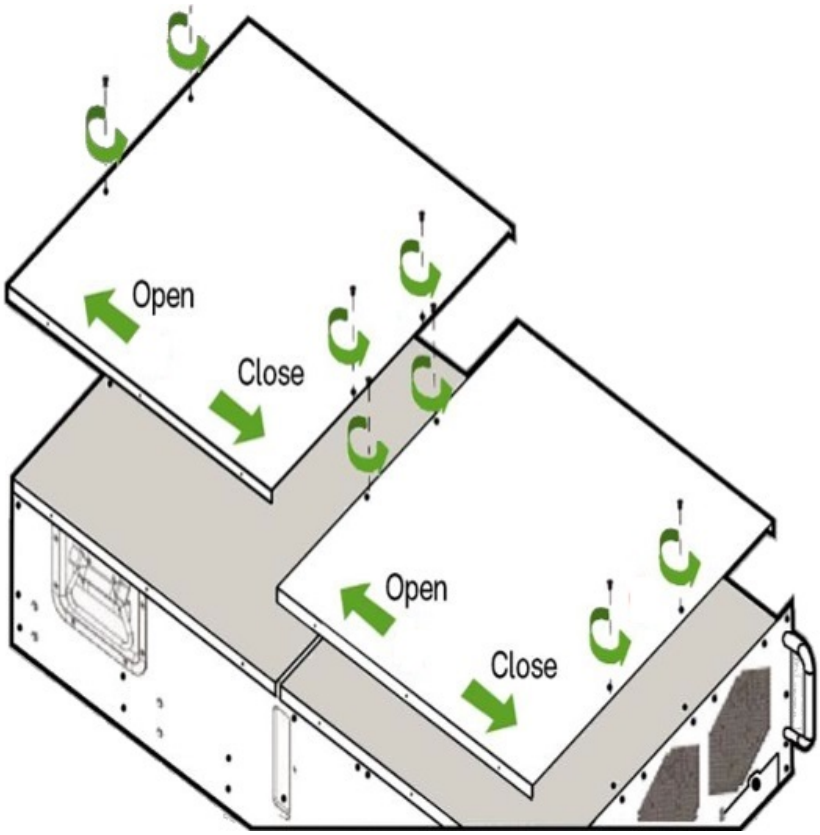


Figure 6. Slicestor 1440/2440 - top panel

6. Remove the front lid.
7. Identify the fan that needs to be replaced by using either the Figure 4 on page 10diagram or the diagram on the underside of the front lid.
8. Cut away the cable ties, making sure not to cut any of the fan power cables.
9. Remove the faulty fan by lifting it up, while pushing down the catch on top.
10. Remove the fan's power cable carefully.
11. Insert the new fan and connect the power cable to the power connector on the far left.
12. Dress the cables so that the lid will sit flat when replaced.
13. Replace the lid and reinsert the four lid screws.
14. Push the system back into the rack. Reconnect the network cables and then reconnect the power cables.
15. Insert the two screws under the handles on the front panel.
16. Contact STG to verify with that the system is back up and functioning.

    Booting up the system up might take ten minutes to complete.

Replacing a middle fan

Replacing the middle fans in the IBM Slicestor 1440 and 2440 systems.

Before you begin

Note: This procedure must be done by two people, due to the weight of the system. The system must be removed from the rack.

Note: The system must be shut down before any cables are disconnected and any maintenance is done. If the system is not shut down, the lights on the power supply units are green. When the system is shut down, the lights on the power supply units are orange.

Procedure

1. Contact the STG assigned contact so that the system can be powered down before cables are disconnected.

   When the system is shut down, the lights on the power supply units are orange.
2. Remove the two screws that are located below the handles on each side of the front of the system.

   The screws secure the system to the rack.

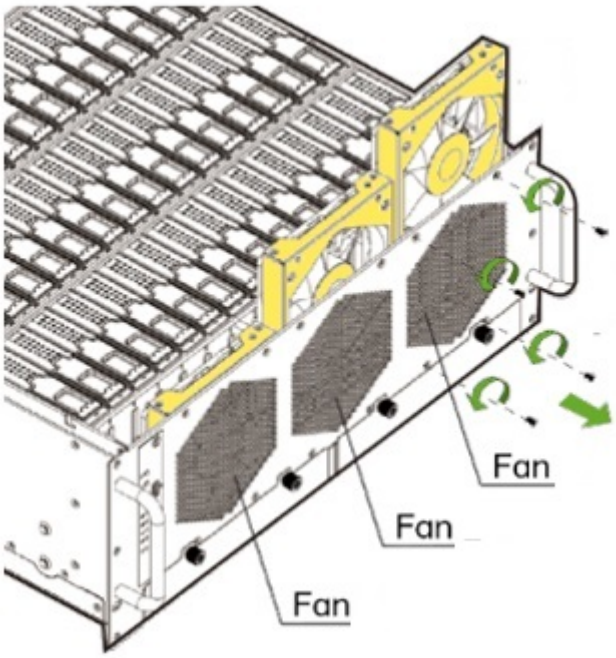


Figure 7. Slicestor 1440/2440 - front panel

3. Disconnect the power cables and the network cables.

   When the power cables are disconnected, the lights on the power supply units are off.
4. Slide the system out of the rack by pressing the left and right levers to release the system from the rail kit.

   Two people are needed to lift the system to the floor.
5. When the system is on the floor or a flat surface, remove the front and rear lids, by removing the four screws from each lid.

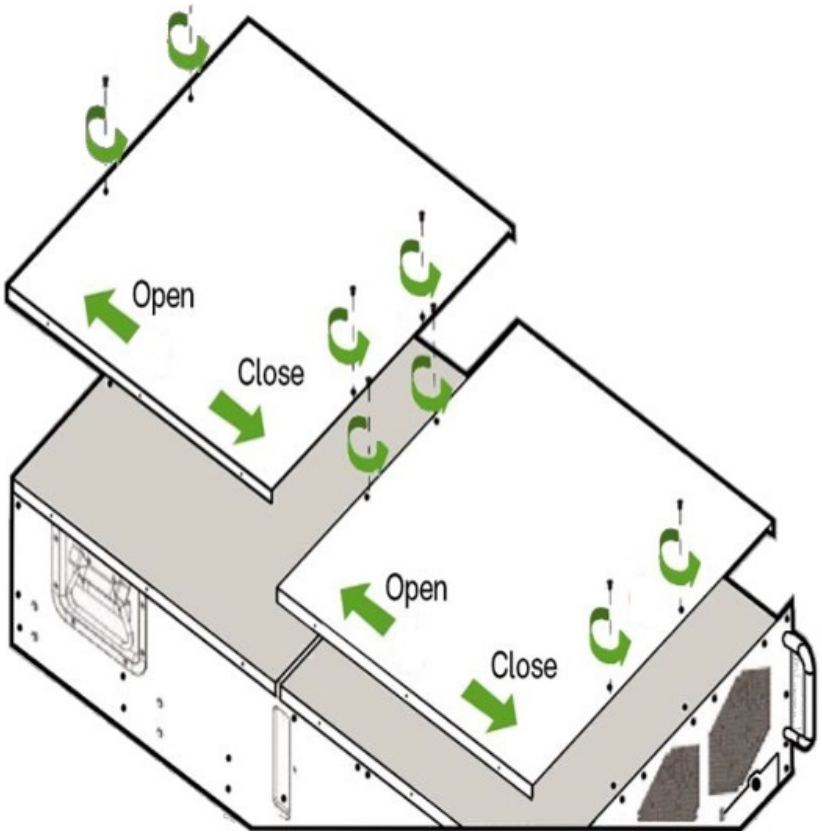


Figure 8. Slicestor 1440/2440 - top panel

6. Identify the fan that needs to be replaced by using either the Figure 4 on page 10diagram or the diagram on the underside of the front lid.
7. Locate the fan's power cable on the system board and disconnect it.
8. Release the clip, holding the fan down, and pull upwards carefully removing the fan's power cable.
9. Thread the new fan's power cable and insert the fan firmly into the chassis. Connect to the Fan's power cable to the system board connector.
10. Replace the rear lid and then the front lid by using the lid screws.
11. Place the Slicestor back into the rail kit and slide it into the rack.
12. Secure the system with the two front rack screws that were removed earlier.
13. Reconnect the network cables first then the power cables.
14. Contact STG to verify with that the system is back up and functioning.

    Booting up the system up might take ten minutes to complete.

Slicestor 2210 fans

Replacing a fan

Slicestor 2210 fan replacement

About this task

The fans are different in the 2210 and the 2212. Make sure that the correct part is being fitted.

Procedure

1. Contact the STG assigned contact so that the system can be shut down before cables are disconnected.

   When the system is shut down, the lights on the power supply units are orange.
2. Remove the power cables and network cables.
3. Slide the system out of the rack completely and place on a stable surface.
4. Remove the two small screws (1) on the left and right of the system.

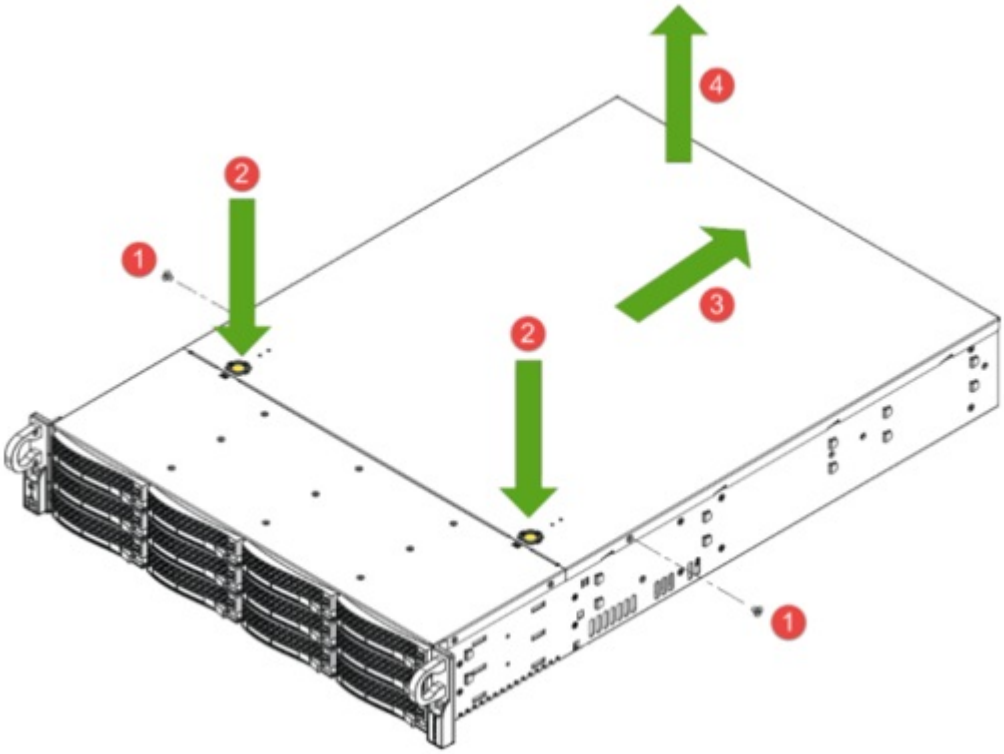


Figure 9. Slicestor 2210 - top panel

5. Press the two finger tabs (2) on the top panel and slide the top panel back (3). Then lift the top panel (4).
6. Identify the failed fan.
7. Remove the fan by pinching the Release Tab at the top of the fan and removing it.

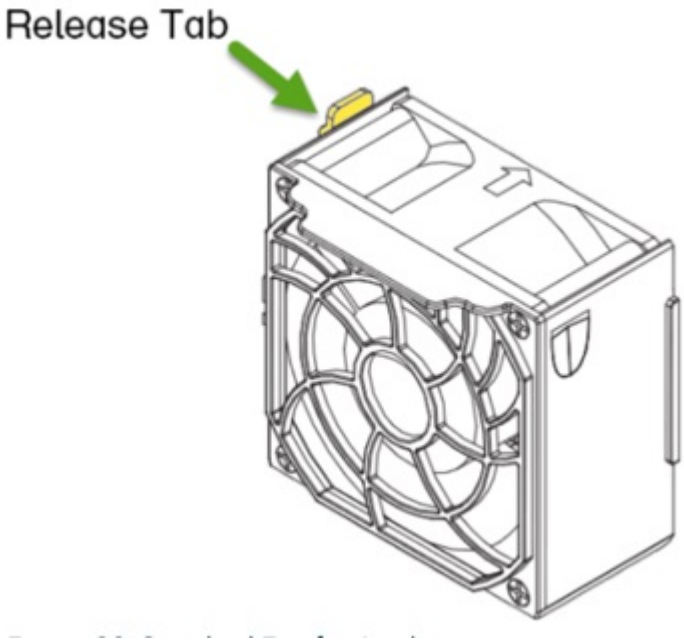


Figure 10. Slicestor 2210 - fan release tab

8. Replace the Fan by pushing it in until the tab secures.

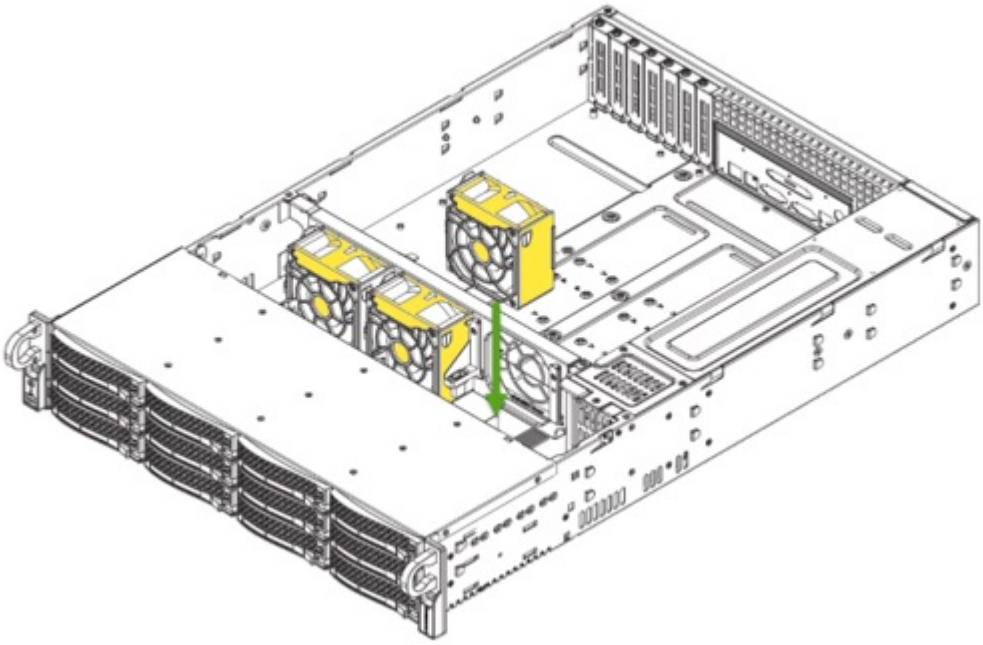


Figure 11. Slicestor 2210 - fan replacement

9. Replace the top panel and replace the screws.
10. Slide the system back into the rack. Reconnect the network cables and then reconnect the power cables.
11. Contact STG to verify that the system is back up and functioning

    Booting up the system up might take ten minutes to complete.

Notices

This information was developed for products and services offered in the US. This material might be available from IBM in other languages. However, you may be required to own a copy of the product or product version in that language in order to access it.

IBM may not offer the products, services, or features discussed in this document in other countries. Consult your local IBM representative for information on the products and services currently available in your area. Any reference to an IBM product, program, or service is not intended to state or imply that only that IBM product, program, or service may be used. Any functionally equivalent product, program, or service that does not infringe any IBM intellectual property right may be used instead. However, it is the user's responsibility to evaluate and verify the operation of any non-IBM product, program, or service.

IBM may have patents or pending patent applications covering subject matter described in this document. The furnishing of this document does not grant you any license to these patents. You can send license inquiries, in writing, to:

IBM Director of Licensing
IBM Corporation
North Castle Drive
Armonk, NY 10504-1785
U.S.A.

For license inquiries regarding double-byte character set (DBCS) information, contact the IBM Intellectual Property Department in your country or send inquiries, in writing, to:

Intellectual Property Licensing
Legal and Intellectual Property Law
IBM Japan, Ltd.
19-21, Nihonbashi-Hakozakicho, Chuo-ku
Tokyo 103-8510, Japan

INTERNATIONAL BUSINESS MACHINES CORPORATION PROVIDES THIS PUBLICATION "AS IS" WITHOUT WARRANTY OF ANY KIND, EITHER EXPRESS OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF NON-INFRINGEMENT, MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. Some jurisdictions do not allow disclaimer of express or implied warranties in certain transactions, therefore, this statement may not apply to you.

This information could include technical inaccuracies or typographical errors. Changes are periodically made to the information herein; these changes will be incorporated in new editions of the publication. IBM may make improvements and/or changes in the product(s) and/or the program(s) described in this publication at any time without notice.

Any references in this information to non-IBM websites are provided for convenience only and do not in any manner serve as an endorsement of those websites. The materials at those websites are not part of the materials for this IBM product and use of those websites is at your own risk.

IBM may use or distribute any of the information you provide in any way it believes appropriate without incurring any obligation to you.

Licensees of this program who wish to have information about it for the purpose of enabling: (i) the exchange of information between independently created programs and other programs (including this one) and (ii) the mutual use of the information which has been exchanged, should contact:

IBM Director of Licensing
IBM Corporation
North Castle Drive, MD-NC119
Armonk, NY 10504-1785

© Copyright IBM Corp. 2016, 2020

US

Such information may be available, subject to appropriate terms and conditions, including in some cases, payment of a fee.

The licensed program described in this document and all licensed material available for it are provided by IBM under terms of the IBM Customer Agreement, IBM International Program License Agreement or any equivalent agreement between us.

The performance data discussed herein is presented as derived under specific operating conditions. Actual results may vary.

Information concerning non-IBM products was obtained from the suppliers of those products, their published announcements or other publicly available sources. IBM has not tested those products and cannot confirm the accuracy of performance, compatibility or any other claims related to non-IBM products. Questions on the capabilities of non-IBM products should be addressed to the suppliers of those products.

Statements regarding IBM's future direction or intent are subject to change or withdrawal without notice, and represent goals and objectives only.

All IBM prices shown are IBM's suggested retail prices, are current and are subject to change without notice. Dealer prices may vary.

This information is for planning purposes only. The information herein is subject to change before the products described become available.

This information contains examples of data and reports used in daily business operations. To illustrate them as completely as possible, the examples include the names of individuals, companies, brands, and products. All of these names are fictitious and any similarity to the names and addresses used by an actual business enterprise is entirely coincidental.

COPYRIGHT LICENSE:

This information contains sample application programs in source language, which illustrate programming techniques on various operating platforms. You may copy, modify, and distribute these sample programs in any form without payment to IBM, for the purposes of developing, using, marketing or distributing application programs conforming to the application programming interface for the operating platform for which the sample programs are written. These examples have not been thoroughly tested under all conditions. IBM, therefore, cannot guarantee or imply reliability, serviceability, or function of these programs. The sample programs are provided "AS IS", without warranty of any kind. IBM shall not be liable for any damages arising out of your use of the sample programs.

If you are viewing this information softcopy, the photographs and color illustrations may not appear.

Trademarks

IBM, the IBM logo, and ibm.com® are trademarks or registered trademarks of International Business Machines Corp., registered in many jurisdictions worldwide. Other product and service names might be trademarks of IBM or other companies. A current list of IBM trademarks is available on the web at Copyright and trademark information at www.ibm.com/legal/copytrade.shtml.

Accesser®, Cleversafe®, ClevOS™, Dispersed Storage®, dsNet®, IBM Cloud Object Storage Accesser®, IBM Cloud Object Storage Dedicated™, IBM Cloud Object Storage Insight™, IBM Cloud Object Storage Manager™, IBM Cloud Object Storage Slicestor®, IBM Cloud Object Storage Standard™, IBM Cloud Object Storage System™, IBM Cloud Object Storage Vault™, SecureSlice™, and Slicestor® are trademarks or registered trademarks of Cleversafe, an IBM Company and/or International Business Machines Corp.

Other product and service names might be trademarks of IBM or other companies.

Homologation statement

This product may not be certified in your country for connection by any means whatsoever to interfaces of public telecommunications networks. Further certification may be required by law prior to making any such connection. Contact an IBM representative or reseller for any questions.



Printed in USA