Replacement Procedure: DS2405 Disk Drive, 18GB-36GB-72GB

You can add or replace disks to increase storage capacity or eliminate faults. (See Chapter 4 of the HP StorageWorks Disk System 2405 User's Guide for troubleshooting procedures.)

Disks must be Fibre Channel (FC) and 3.5 inches wide but can vary in capacity.

For current information about supported disks, consult an HP sales representative.

You do not need to turn off the disk system to replace a disk or filler.

Caution Do not remove hot-pluggable components until you have the replacement parts and are ready to install them. An empty slot will cause uneven cooling and eventual overheating.

Preparation (HP-UX 11.XX)

Removing or replacing a disk has consequences for the file systems and logical volumes located on the disk. Before removing or replacing a disk, complete the appropriate system administration for your environment and configuration.

Instructions for determining physical volume status and reducing and recreating mirrored extents follow. For additional information, refer to your HP-UX guide, *How HP-UX Works: Concepts for the System Administrator.*

The LVM commands in the following instructions assume the following:
   - All of the extents of the disk in use belong to mirrored logical volumes created with the strict (-s) option.
   - The replacement disk is of the same or greater capacity as the disk being replaced.

The correct set of instructions depends on whether the mirrored volume is active and attached, or unattached.

First, follow the instructions to determine the volume status; then follow the instructions to replace the volume depending on whether the volume is attached or unattached.

Shortcuts:
    To Determine If a Volume Group or Physical Volume Group is Active
    To Determine If the Physical Volume is Attached
To Replace Attached Physical Volumes
To Replace Unattached Physical Volumes
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To Determine If a Volume Group or Physical Volume Group is Active

At the host console, enter:
    # vgdisplay <VG name>

    For example: #vgdisplay /dev/vg00

If the volume group is not active, the host will display:
    # vgdisplay: volume group not activated.
    # vgdisplay: cannot display volume group /dev/vg00

Note *The following messages will appear if the disk is defective:*

    VGDISPLAY: WARNING: COULDN'T QUERY PHYSICAL VOLUME"/dev/dsk/c2t4d0"

    THE SPECIFIED PATH DOES NOT CORRESPOND TO PHYSICAL VOLUME ATTACHED TO THE VOLUME GROUP

    VGDISPLAY: WARNING: COULDN'T QUERY ALL OF THE PHYSICAL VOLUMES

If either of the above messages appears, follow the replacement instructions for
    Unattached Physical Volumes.

Otherwise, follow the instructions to determine if the physical volume is attached.

To Determine If the Physical Volume is Attached

At the host console, enter:

   # vgchange -a y <volume group name> *to activate the volume group.*

   For example: # vgchange -a y /dev/vg00

The physical volume is unattached if a message similar to the following appears:

   VGCHANGE: WARNING: COULDN'T ATTACH TO THE VOLUME GROUP PHYSICAL VOLUME "/dev/dsk/c2t4d0"

   THE PATH OF THE PHYSICAL VOLUME REFERS TO A DEVICE THAT DOES NOT EXIST, OR IS NOT CONFIGURED INTO THE KERNEL.

Continue with the appropriate replacement instructions as follows:

   If the physical volume is unattached, follow the instructions for replacing <u>Unattached Physical Volumes</u>.

   If the physical volume is attached, follow the instructions for replacing <u>Attached Physical Volumes</u>.

To Replace Attached Physical Volumes

Use the following commands to reduce any logical volumes that have mirror copies on the faulty disk and to recreate the mirror extents once the disk has been replaced. Commands to recover from a host failure are included with most steps.

Note *The way that mirrors span several disks may not be duplicated exactly. For cases where the original mirror layout must be preserved, consider deactivating the volume group with the vgchange command and using the procedure for replacing unattached physical volumes.*

Step 1

Enter the following command to reduce the mirror:
        # lvreduce -m *<mirror_copie*s> -A n <LV name> <physical volume path>

       For example, to reduce a two-way mirror:
           # lvreduce -m 0 -A n /dev/vg00/lvol4 /dev/dsk/c2t4d0

       For a three-way mirror:
           # lvreduce -m 1 -A n /dev/vg00/lvol5 /dev/dsk/c2t4d0

If the host fails during this step, execute an lvdisplay command to determine if the lvreduce command succeeded. If the command did not succeed, execute the command again. Perform any other lvreduce commands that were not executed before the system failed. Then proceed.

Note *An important effect of the lvreduce command is that the LVM configuration backup file used by the vgcfgrestore command is updated. If this replacement procedure is being performed now on another host system and there is no need to execute any lvreduce commands, then the configuration file is not updated. The LVM configuration is correct on the physical volumes, however, so the configuration file can be updated with the vgcfbackup command.*

Step 2

Physically replace the disk.

Note *The procedure is detailed below in the* <u>Disk Replacement Procedure</u> *section, as well as on the* Disk Replacement Sheet *provided with the replacement drive.*

Step 3

Execute IOSCAN to verify that the new disk drive is accessible and a proper replacement.

Step 4

Enter the following command to restore the LVM configuration/headers to the replaced disks from the backup of the LVM configuration:
        # vgcfgrestore -n <volume group name> <physical volume path>

       For example: # vgcfgrestore -n /dev/vg00 /dev/rdsk/c2t4d0

If the host fails, repeat the step to ensure all configuration data is written to the new disk.

Note   If this replacement procedure is being performed now on another host system and there is no need to execute any lvreduce commands, then the configuration file can be updated with thevgcfbackup command.

Step 5

Enter the following command to attach the replaced disk to the active volume group:
        # vgchange -a y <volume group name>

        For example: # vgchange -a y /dev/vg00

Step 6

Enter the lvextend command to transfer the mirrors onto the replaced disk. It will take time to copy all of the original data to the mirrored extents. The logical volumes are accessible to users' applications for two-way mirroring during this command.
        # lvextend -m *<mirror_copie*s> <LV name> physical volume path

        For example, for two-way mirroring:
                # lvextend -m 1 /dev/vg00/lvol4 /dev/dsk/c2t4d0

        For three-way mirroring:
                # lvextend -m 2 /dev/vg00/lvol5 /dev/dsk/c2t4d0

If the host fails during this step, execute an lvdisplay command to determine if the lvextend command was successful. If the command did not successfully execute, reissue the command. Perform any other lvextend commands that were not executed before the system failed.

At this point, the system should be fully functioning.

Procedure Completed!

Congratulations!

To Replace Unattached Physical Volumes

Follow these instructions if the volume group is not active or if the physical volume is unattached.

Step 1

Physically replace the disk.

Note *The procedure is detailed below in the* <u>*Disk Replacement Procedure*</u> *section, as well as on the* Disk Replacement Sheet *provided with the replacement drive.*

Step 2

Execute IOSCAN to verify that the new disk drive is accessible and a proper replacement.

Step 3

Enter the following command to restore the LVM configuration/headers to the replaced disks from the backup of the LVM configuration:
>   # vgcfgrestore -n <volume group name> character device file

>   *For example: # vgcfgrestore -n /dev/vg00 /dev/rdsk/c2t4d0*

If the host fails, repeat the step to ensure that all configuration data is written to the new disk.

Step 4

Enter the following command to attach the replaced disk to the active volume group:
>   # vgchange -a y <volume group name>

>   *For example: # vgchange -a y /dev/vg00*

If necessary:

Enter the lvextend command to transfer the mirrors onto the replaced disk. It will take time to copy all of the original data to the mirrored extents. The logical volumes are accessible to users' applications for two-way mirroring during this command.

>   # lvextend -m *<mirror_copie*s> <LV name> physical volume path

>   *For example, for two-way mirroring:*
>   *# lvextend -m 1 /dev/vg00/lvol4 /dev/dsk/c2t4d0*

>   *For three-way mirroring:*
>   *# lvextend -m 2 /dev/vg00/lvol5 /dev/dsk/c2t4d0*

If the host fails during this step, execute an lvdisplay command to determine if the lvextend command was successful. If the command did not successfully execute, reissue the command. Perform any other lvextend commands that were not executed before the system failed.

At this point, the system should be fully functioning.

Procedure Completed!

Congratulations!

NT

Follow these instructions for NT systems.

Physically replace the disk.

Note *The procedure is detailed below in the* <u>*Disk Replacement Procedure*</u> *section, as well as on the* Disk Replacement Sheet *provided with the replacement drive.*

Step 1

After installing the disk module, execute the Disk Administrator utility to configure the new disk module.

Step 2

To execute select Start -> Programs -> Administrative Tools -> Disk Administrator.

Step 3

The new drive detection wizard will detect the new devices and will write a signature to each device. Choose yes at the prompts questioning these actions.

Step 4

From the list of drives, choose the first unconfigured drive by right clicking on the free space. Choose create to create a new volume, then choose to use the entire available disk space.

Step 5

Then right-click on the unformatted volumes and select commit changes now and press OK to the update emergency repair disk notice.

Step 6

Right-click once again and choose format. Select to format using NTFS and give the volume a name. Choose quick format and press OK to continue.

Step 7

Once formatted, repeat the process for each of the remaining drives.

At this point, the system should be fully functioning.

Procedure Completed!

Congratulations!

Disk Replacement Procedure

Disks must be Fibre Channel (FC) and 3.5 inches wide but can vary in capacity.

For current information about supported disks, consult an HP sales representative.

You do not need to turn off the array to replace a disk or filler.

Caution Do not remove hot-pluggable components until you have the replacement parts and are ready to install them. An empty slot will cause uneven cooling and eventual overheating.

Caution Parts can be damaged by electrostatic discharge. Please ensure that ESD measures are in place.

Step 1

Open the Disk Replacement Kit and inspect the contents per the first step of the Disk Replacement Sheet included with the replacement drive.

Step 2

Caution Touching exposed electrical circuitry on the disk can damage the disk. Be sure you are grounded and be careful not to touch exposed circuits.

Disk modules are fragile and ESD sensitive. Dropping one end of the disk just two inches is enough to cause permanent damage. In addition, static electricity can damage the disc. Grasp disks only by their handles (A in Figure 1) and carriers (D), and follow strict ESD procedures.

Figure 1: Disk Module Installation

A extraction handle	C LEDs
B cam latch	D carrier

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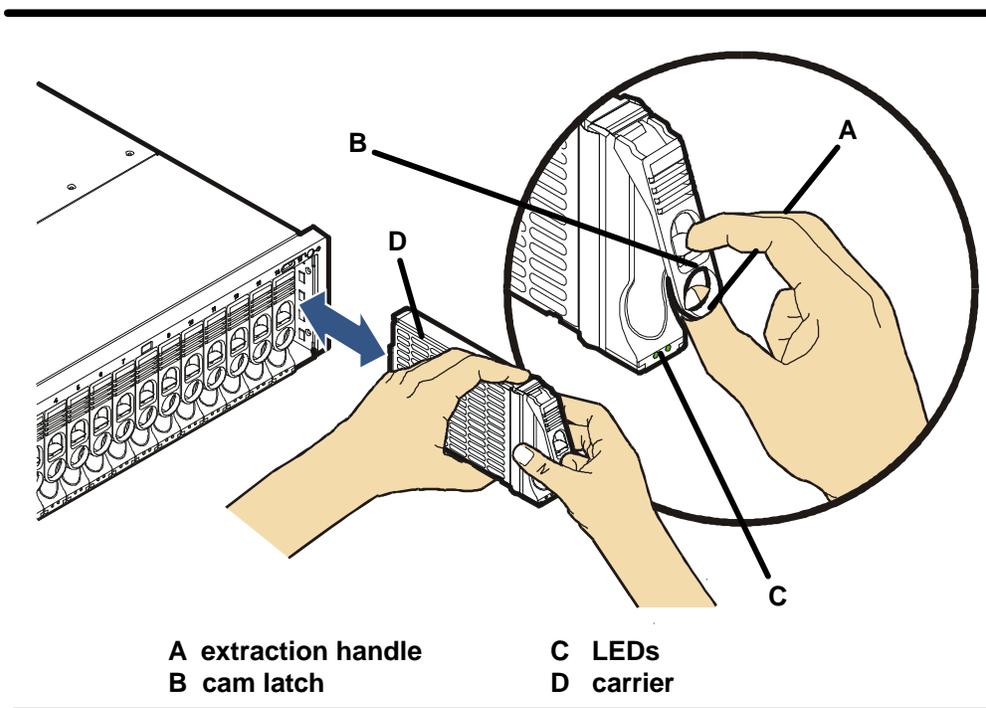
Step 3

Push down release tab (B in Figure 1), pull up the lever (A) on disk to be replaced.

Step 4

Caution Wait 15 seconds for the disk to spin down. There is a danger of damage to the disk if it is dropped due to gyroscopic effects. Wait for a spinning disk to stop spinning prior to removing it from the product.

Step 5

Pull the disk to be replaced from the slot.

Step 6

Caution DO NOT leave the disk slot empty for more than 5 minutes, as proper cooling/airflow depends on all slots being full.

Step 7

Verify that the disk module extraction handle (A in Figure 1) is open . Place your thumb behind the extraction handle and with your finger, push the latch tab (B) toward your thumb.

Note It is important that the new disk is of the same capacity (in GB) or larger than the disk being replaced.

Step 8

Push the replacement disk module, capacity label up, into the empty slot.

Step 9

Push down the lever (A in Figure 1) on the disk. It will click into place.

Step 10

Monitor the LED,

Note The LED should be on while the disk spins up and then turn off. The LED will blink with I/O activity to the disk. If you observe different results, further Troubleshooting may need to be carried out. (See Chapter 4 of the HP StorageWorks Disk System 2405 User's Guide *for troubleshooting procedures.)*

Procedure Completed!

Congratulations!