

HP StorageWorks D2D Backup System Quick Start Tape Attach Guide with Upgrade Instructions

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1 Introduction

From September 2007, the HP D2D Backup System supports direct Tape Attach, allowing the user to connect a tape drive directly to the HP D2D Backup System for offsite storage of data. Users who have earlier versions of the HP D2D Backup System can easily upgrade to benefit from this new functionality.

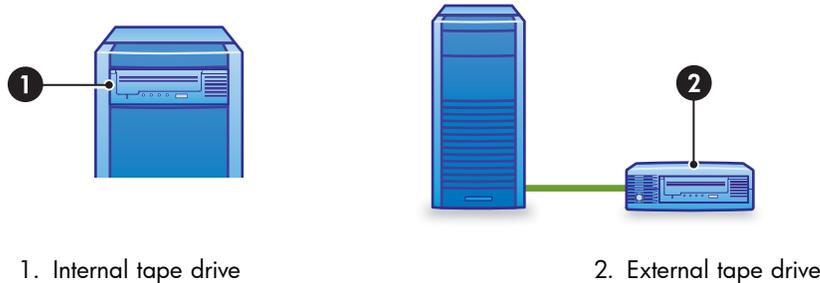


Figure 1 Tape drives attached to the HP D2D

Tape drive and HBA compatibility

Both SAS and SCSI Ultrium tape drives are supported and require installation of a host bus adapter (HBA). An internal tape drive must be half-height and is installed in the half-height bay above the LEDs. External tape drives may be half-height or full-height.

For the latest information about which Ultrium Tape Drive models and HBAs are supported, refer to www.hp.com/go/connect. The following tape drives are currently supported:

Table 1 Compatible HP StorageWorks Ultrium internal tape drives

Model number and name	Type of drive	HBA required
DW016A - Ultrium 448 Tape Drive	SCSI internal	412911-B21 - HP SC11Xe PCIe Ultra320 SCSI HBA
EH841A - Ultrium 920 Tape Drive	SCSI Internal	412911-B21 - HP SC11Xe PCIe Ultra320 SCSI HBA
EH847A - Ultrium 920 Tape Drive	SAS Internal	416096-B21 - HP SC44Ge PCIe SAS HBA

Table 2 Compatible HP StorageWorks Ultrium external tape drives

Model number and name	Type of drive	HBA required
DW017A - Ultrium 448 Tape Drive	SCSI External	412911-B21 - HP SC11Xe PCIe Ultra320 SCSI HBA
Q1520B - Ultrium 460 Tape Drive	SCSI External	412911-B21 - HP SC11Xe PCIe Ultra320 SCSI HBA
EH842A - Ultrium 920 Tape Drive	SCSI External	412911-B21 - HP SC11Xe PCIe Ultra320 SCSI HBA
EH848A - Ultrium 920 Tape Drive	SAS External (requires an additional SAS 2m Cable Kit AE466A)	416096-B21 - HP SC44Ge PCIe SAS HBA
Q1539B - Ultrium 960 Tape Drive	SCSI External	412911-B21 - HP SC11Xe PCIe Ultra320 SCSI HBA

Software compatibility

The HP D2D Backup System is compatible with the following backup applications. Always make sure that you have updated to the latest version of the software or, if using Linux, downloaded any patches.

 **NOTE:**

A patch is required in order for HP Data Protector 6 to correctly support the HP D2D Backup System. This patch will be available shortly. Check <http://www.hp.com/go/connect> for the latest information.

Table 3 Software compatibility under Microsoft Windows

	Windows Server 2003	Windows Server 2003 (x64)	Windows Server 2003 (IA64)	Windows 2000	Windows XP
Windows NT Backup	Yes for all operating systems, but supports the HP D2D Backup System in standalone tape drive mode only				
HP Data Protector Express 3.5	Yes	Yes	No	Yes	Yes
HP Data Protector 6	Yes	Yes	Yes	Yes	Yes
CA BrightStor ARC serve 11.5	Yes	Yes	Yes	Yes	Yes
Symantec Backup Exec 11.d	Yes	Yes	No	Yes	Yes
Symantec Backup Exec 10.d	Yes	No	No	Yes	Yes

 **NOTE:**

Symantec Backup Exec 10.d requires the purchase of a hardware SCSI initiator adapter for use with iSCSI devices. HP recommends the QLogic QLA4050 Host Bus Adapter, which has been fully tested and is fully supported by HP.

Table 4 Software compatibility under Linux

	Red Hat EL 5 (x86)	Red Hat EL 5 (x64)	Red Hat EL 5 (IA-64)	SUSE Linux ES 10 SP1 (x86)	SUSE Linux ES 10 SP1 (x64)
Native backup (tar, cpio, dd)	Yes	Yes	Yes	Yes	Yes
HP Data Protector Express 3.5	Yes	Yes	No	Yes	Yes
HP Data Protector 6	Yes	Yes	Yes	Yes	Yes
CA BrightStor ARC serve 11.5	Yes	Yes	Yes	Yes	Yes

2 Attaching a physical tape drive

In this chapter:

- “Tape drive installation overview” on page 9
- “Removing the access panel and bezel” on page 9
- “Installing the HBA” on page 10
- “Installing an internal tape drive” on page 12
- “Replacing the access panel and bezel” on page 14
- “Attaching an external tape drive” on page 16

No additional drivers are required for recommended HBAs and tape drives; they are included in the HP D2D Backup System firmware.

Tape drive installation overview

Before connecting either an internal or external tape drive, you must install an HBA. All necessary cables for connecting to the HBA are supplied with the tape drive. The instructions in this chapter provide the following information that is specific to the HP D2D Backup System:

1. If you have already powered up the HP D2D Backup System, power it down and disconnect the cables before you start.
2. Remove the access panel from the HP D2D Backup System.
3. Install the HBA.
4. If installing an internal tape drive, connect it to the internal port on the HBA.
5. Replace the access panel on the HP D2D Backup System.
6. If installing an external tape drive, connect it to the external port on the HBA.

Please refer to the “User Guide” that is supplied with the tape drive for more detailed information about tape drive cabling and LED troubleshooting.

Removing the access panel and bezel

1. If you are installing the tape drive as part of the initial installation, go to step 3. If you have already powered on the HP D2D Backup System, it must be shut down before you start. Make sure there are no backup or restore jobs in progress and that no future jobs are scheduled to start whilst the system is shut down. Select **Shutdown** on the Web Management interface and click **Power Off** to power down the HP D2D Backup System safely.

Shutdown



2. Disconnect the network cable and the power cord from the HP D2D Backup System.
3. Loosen the captive thumbscrew (1) located on the rear edge of the access panel and slide (2) the panel back about 2.5 cm (1.0 in). Remove the access panel.

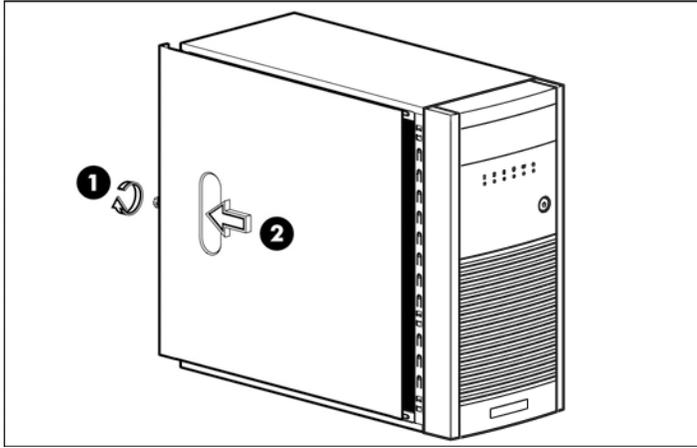


Figure 2 Removing the access panel

4. Press in on the two bottom tabs (1) on the side of the bezel so that they release from the chassis. Press in on the upper tab on the side of the bezel so that it releases from the chassis. The bezel will rotate out slightly (2). Pull the bezel away from the front panel (3).

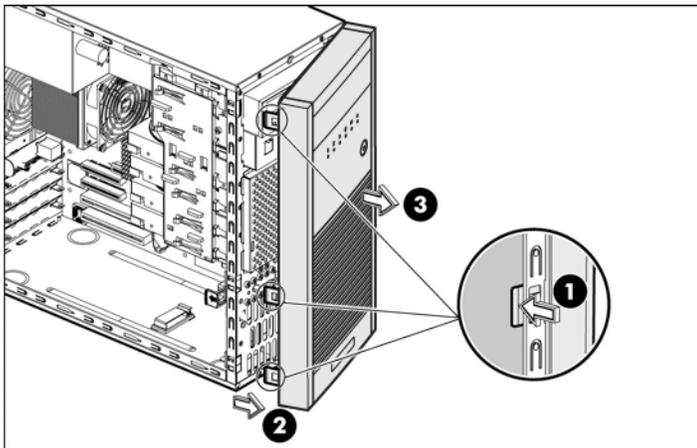


Figure 3 Removing the front bezel

Installing the HBA

△ CAUTION:

Static electricity can damage electronic components. Always wear an antistatic wriststrap if one is available. If not, after you have disconnected power from the server and removed the cover, touch a bare metal part of the chassis. Similarly, touch a bare metal part of the drive before installing it.

The supported PCI-Express HBA should be installed in the top PCI slot. Please refer to www.hp.com/go/connect for a list of all supported host bus adapters and tape drives. No additional drivers are required for recommended HBAs and tape drives; they are included in the HP D2D Backup System firmware.

1. Undo the retaining screw (1) and remove the slot cover retainer (2).

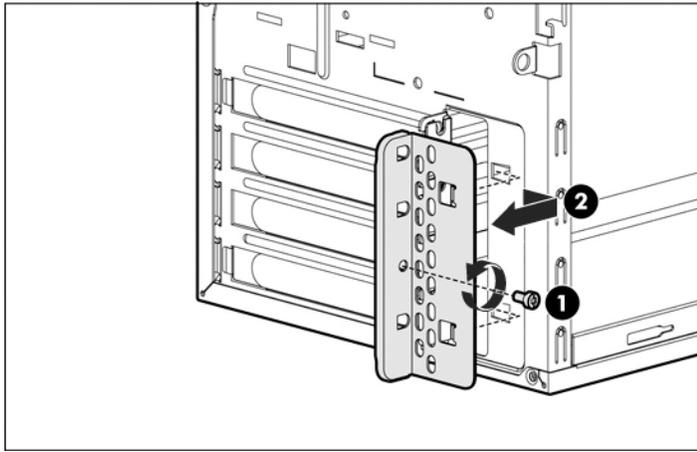


Figure 4 Removing the slot cover retainer

2. Remove the cover from the top expansion slot.

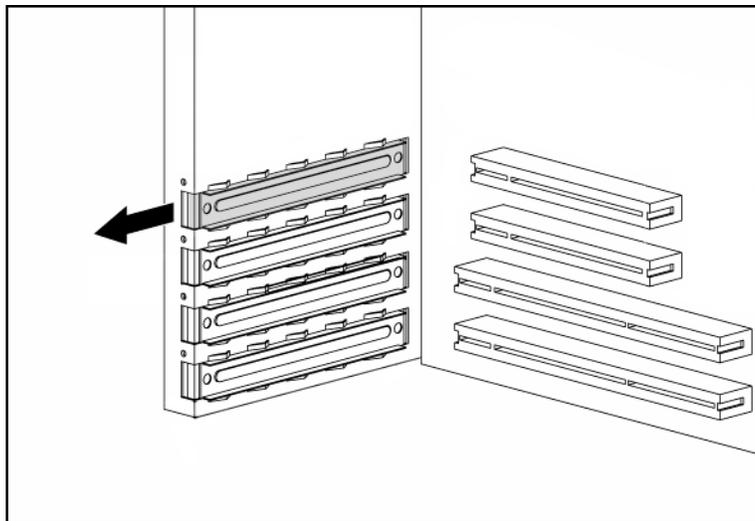


Figure 5 Removing the top expansion slot cover

 **IMPORTANT:**

It may be necessary to temporarily remove the slot cover next to the slot in which you are installing the HBA.

3. Install the new HBA in the top slot.

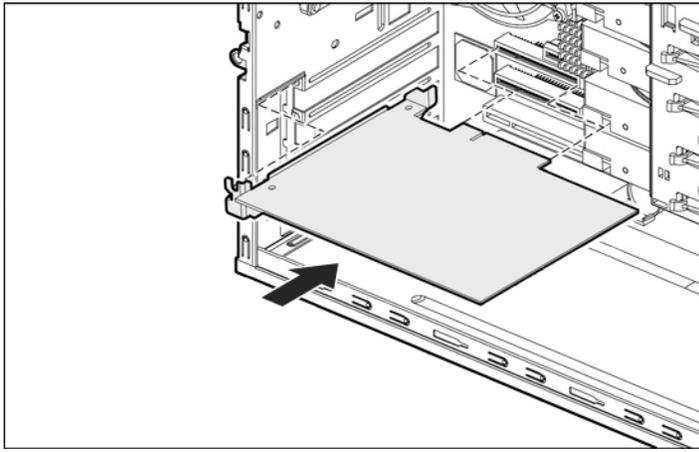


Figure 6 Installing the HBA

4. Reinstall the slot cover retainer (1) and secure it with the screw that you removed earlier (2).

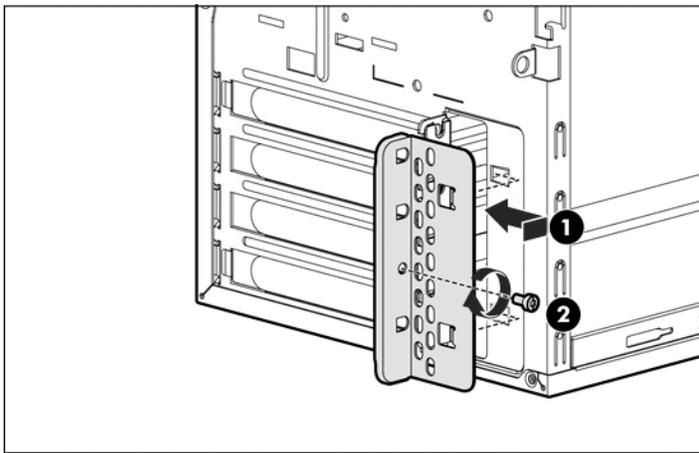


Figure 7 Replacing the PCI slot cover

Installing an internal tape drive

Read this section if you are installing an internal tape drive. If you are connecting an external tape drive, go to [“Replacing the access panel and bezel”](#) on page 14.

⚠ WARNING!

To avoid personal injury or damage to the server or tape drive, ensure that the server is disconnected from the mains power supply while you install the drive.

⚠ CAUTION:

Static electricity can damage electronic components. Always wear an antistatic wriststrap if one is available. If not, after you have disconnected power from the server and removed the cover, touch a bare metal part of the chassis. Similarly, touch a bare metal part of the drive before installing it.

1. Access the removable media cage (1) and remove the filler panel (2).

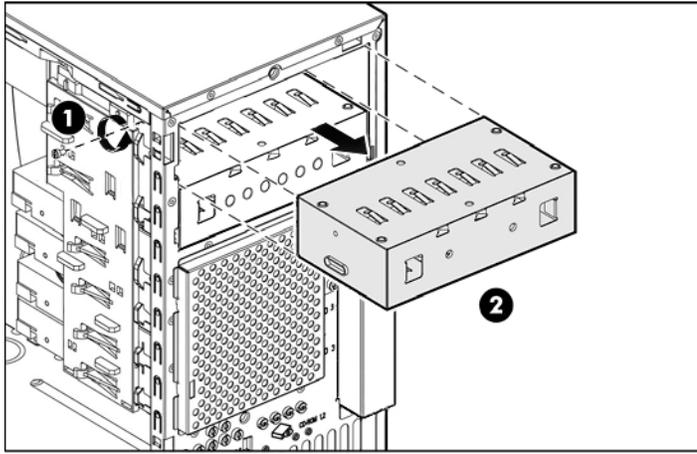


Figure 8 Removing the filler panel

2. Mounting screws and shims are provided in the Mounting Hardware pack, which is supplied with the tape drive. Locate the pack of short, cylindrical-headed screws and shims.

△ CAUTION:

The Ultrium half-height tape drive allows only 3 mm engagement of the screw into the tape drive. To avoid damage to the tape drive, it is important to use the correct screws, which have a slightly thicker head than general mounting screws, and the metal shims. The shims prevent overtightening of the screws which may cause the drive mounts to shear.

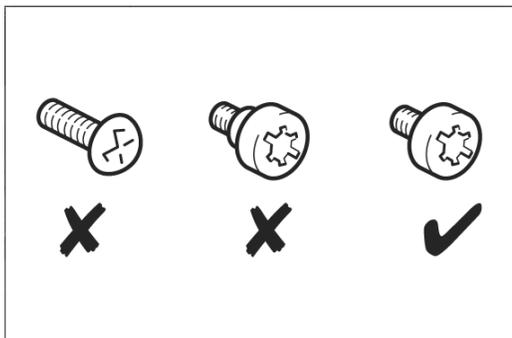


Figure 9 Selecting the correct screws

3. Attach the screws and shims to the tape drive as illustrated (1).

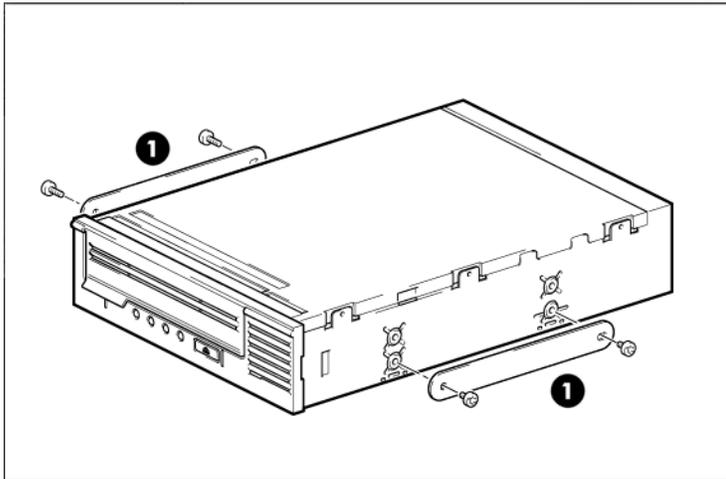


Figure 10 Attaching the screws and metal shims

4. Slide the half-height tape drive most of the way into the bay (1) and attach a spare power cable from the server's internal power supply to the power connector on the tape drive. Connect the device cable (SCSI or SAS) to the appropriate ports on the HBA and tape drive (2).



NOTE:

Please refer to the documentation supplied with your tape drive for more information about cabling.

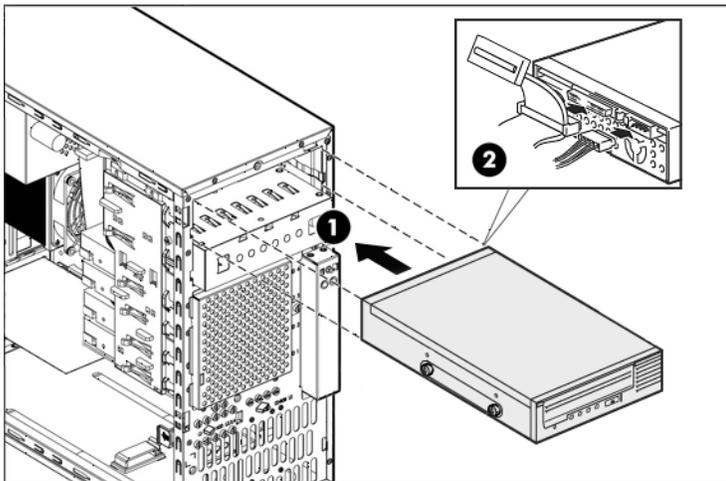


Figure 11 Installing the internal tape drive (example shows a SCSI tape drive)

5. Slide the tape drive fully into the bay until it is seated securely.

Replacing the access panel and bezel

1. Remove the blank plate (1) at the top of the bezel.

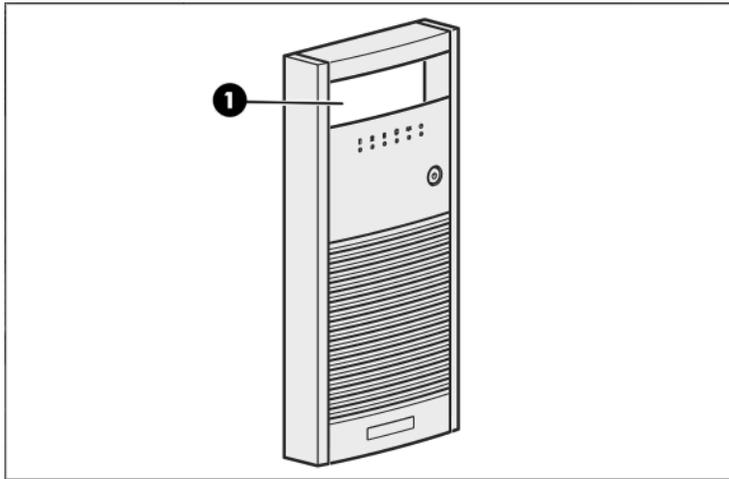


Figure 12 Removing the blank plate in the bezel

2. Insert the two hooks (1) on the right side of the bezel into the rectangular holes on the chassis. Rotate (2) the bezel into place so that the three tabs on the left side of the bezel snap into the slots on the chassis.

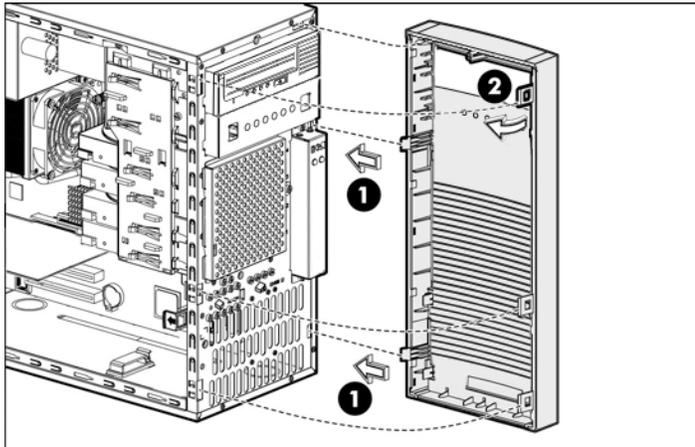


Figure 13 Replacing the bezel

3. Use two hands to place the access panel flat against the chassis (1), the back of the access panel extending about 2.5 cm (1.0 in) behind the back of the server. Make sure the hooks on the access panel align with the holes on the edges of the chassis. Slide (2) the access panel toward the front of the chassis to position it into place. Tighten the captive thumbscrew (3) to secure the access panel.

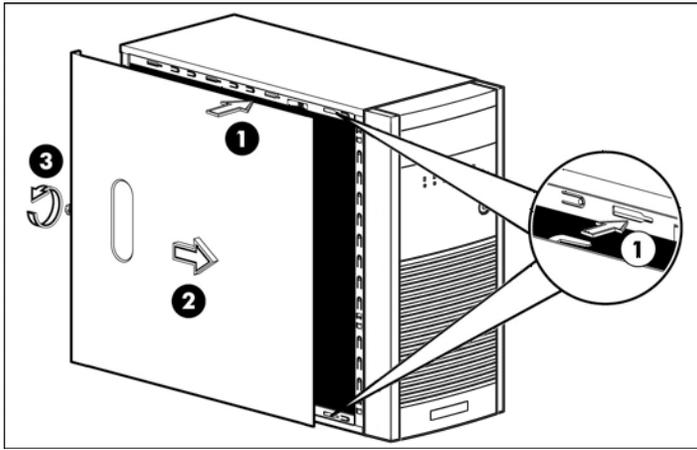


Figure 14 Replacing the access panel

4. Reconnect the network cable and the power cord.

Connecting an external tape drive

Read this section if you are connecting an external tape drive.



NOTE:

You can only connect an external tape drive, if you have already installed a recommended HBA.

1. Connect the device cable (SCSI or SAS) to the appropriate ports on the HBA and tape drive. The example shows a SCSI tape drive.
2. Plug the power cable (1) securely into the socket on the rear panel of the drive and plug the other end of the power cable into the power outlet. The power on/off switch (2) is on the front panel.

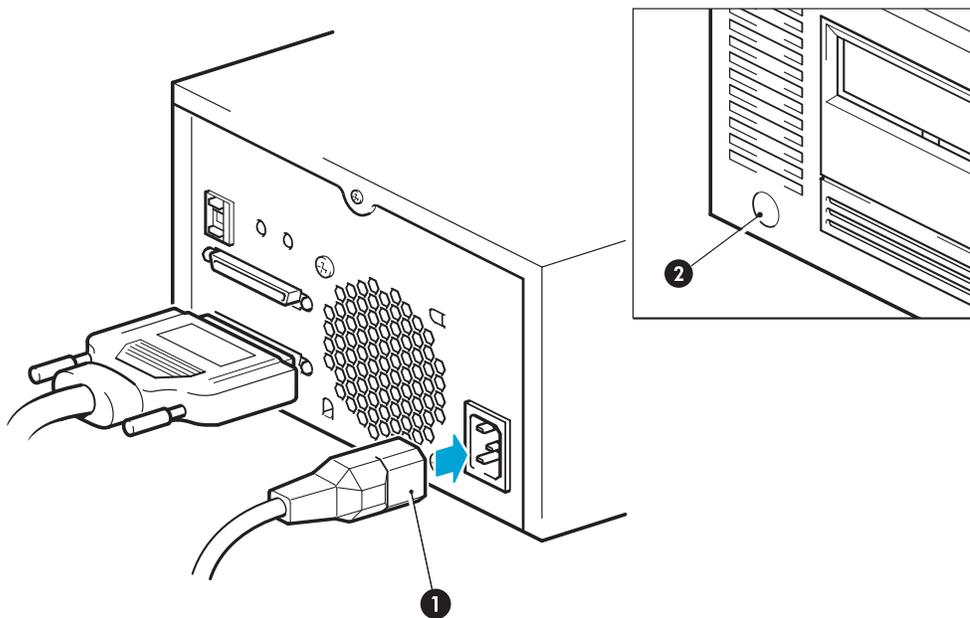


Figure 15 Connecting the cables (SCSI tape drive)

3 Upgrading the firmware

In order to transfer data to and from the attached tape drive, you must download the latest firmware from the HP web site and then run the **Upgrade** option from the Web Management Interface.

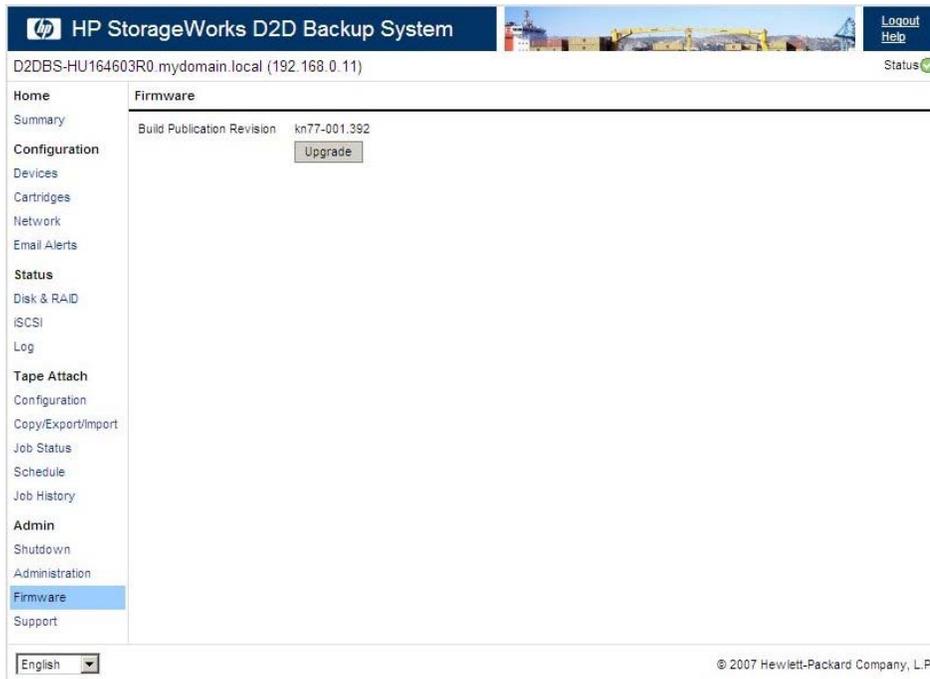
Downloading the firmware

Check www.hp.com/support for the latest firmware and download it to your hard disk. There are many methods of navigating the HP web site, for example:

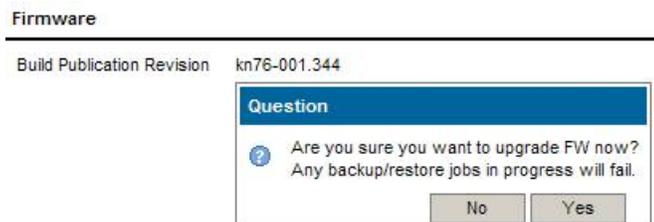
- Go to www.hp.com/support/storage and navigate to **Disk Storage Systems -> Disk-to-Disk -> HP StorageWorks D2D Backup System -> Download Drivers and Software.**
- Select your product followed by **Cross operating system (BIOS, Firmware, Diagnostics, etc.).**

Upgrading the firmware from the Web Management Interface

1. Select **Firmware** from the Web Management Interface and click **Upgrade**.



2. Make sure that there are no backup or restore jobs in progress and that no future jobs are scheduled to start whilst the firmware is upgrading. Click **Yes**.



3. Click **Browse...** and locate the upload file that you have just downloaded.

Firmware

Build Publication Revision kn76-001.344

4. Click **Upload** to upgrade the firmware. A progress meter is displayed while the upgrade takes place. All LEDs apart from the Power LED flash with an alternate green and orange. The system will reboot once it has been updated. Configuration information and data are unaffected by this process.

⚠ WARNING!

Once you have started to upgrade the firmware, it is important that you allow it to complete. Do not attempt to cancel the upgrade process, or power off the machine.

4 Guidelines on using Tape Attach

Two methods are provided for archiving data to the directly attached tape device, these are Copy and Export.

- **Copy** retains the data cartridge on the HP D2D Backup system and creates an exact copy onto a physical cartridge in the attached tape drive.
- **Export** removes the data cartridge from the autoloader on the HP D2D Backup System once data has been successfully copied to the physical cartridge in the attached tape drive.

 **NOTE:**

As a general recommendation, **Copy** is the easier of the two options to use because it does not remove the data from the HP D2D Backup system and can be managed completely from the Web Management Interface. Only use the **Export** option, if you need to free up some disk space. **Export** (and **Import**) require additional steps in the backup application.

Each method has advantages and disadvantages, as summarized below.

 **IMPORTANT:**

For a more detailed discussion of these archiving methods and instructions on using the Web Management Interface to copy, import and export cartridges, please refer to the "*HP StorageWorks D2D Backup System User Guide*".

Tape spanning

Spanning of multiple physical cartridges from a single cartridge in the HP D2D Backup System is not supported. The data from the cartridge on the HP D2D Backup System must not exceed the capacity of the physical cartridge on the attached tape drive. Data from only one cartridge on the HP D2D Backup System can be copied or exported at a time; it is not possible to select multiple slots and copy them to a single physical cartridge.

Cartridge copy

Copy creates two instances of the same cartridge; one stored on the HP D2D, the other on physical tape. Logically these are the same cartridge and the backup application has no awareness that there are two copies. If data from this cartridge is required for restore, the backup application will always restore the data from the HP D2D, if it is available. The physical cartridge is, therefore, an additional copy that will be required only if the HP D2D is not available.

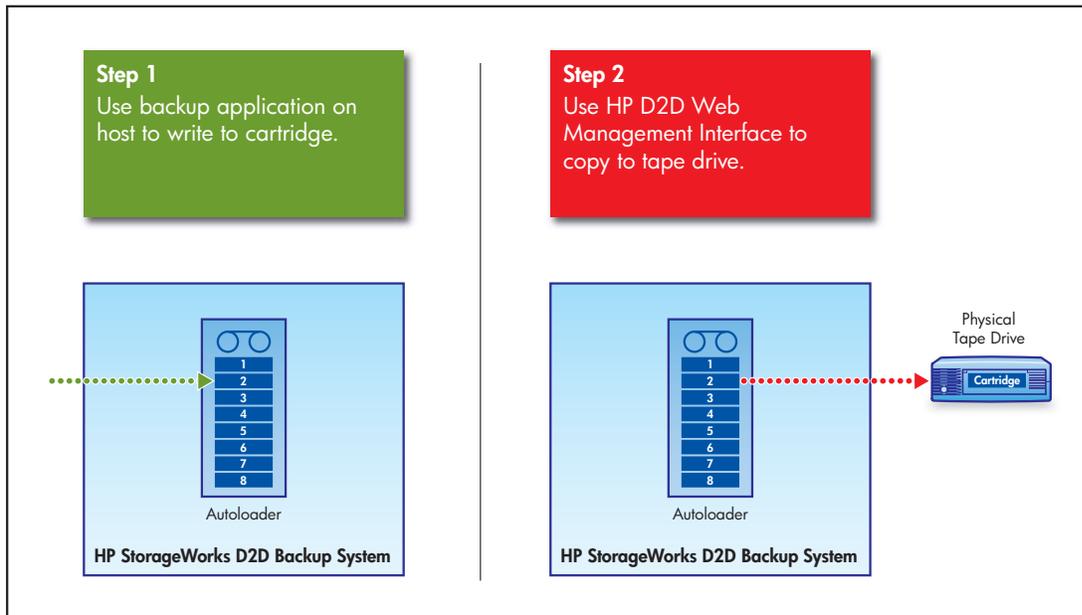


Figure 16 Cartridge copy

When would Copy be used?

Cartridge copies are likely to be appropriate when the user wishes to use the HP D2D Backup System for all foreseeable restore processes but requires an additional offsite copy for insurance or data security purposes. Clear labeling of the cartridges is essential because the backup application may overwrite the cartridge on the HP D2D Backup System and, therefore, lose any knowledge of the existence of the physical tape cartridge.

When is it necessary to restore from a copied cartridge?

There are three situations where it may be necessary to restore from the copied cartridge:

- The cartridge stored in the autoloader device on the HP D2D is overwritten (accidentally) by the backup application.
- The whole HP D2D Backup System or a complete autoloader on the HP D2D is accidentally removed from the Web Management interface.
- Both the D2D system and the host are lost.

Disadvantages of Copy

1. Data is left on the HP D2D Backup System; no disk space is freed by copying to physical cartridge.
2. It is possible for the backup application to overwrite the cartridge on the HP D2D Backup System and thus become unaware of the data that has been copied to the physical cartridge.

Cartridge export

Export is directly analogous to moving a cartridge in a physical autoloader to a mail slot (import/export element) so that the backup administrator can take it offsite or put it into a firesafe. Only a single copy of the cartridge exists. It is on physical tape and no longer on the cartridge in the HP D2D Backup System. The backup application is fully aware that the cartridge location is now offsite, so cannot overwrite it without explicitly asking for the cartridge to be moved back into the autoloader.

△ **CAUTION:**

Do not export cartridges that the backup application uses on a frequent basis as part of a rotation strategy because it will not be able to write to the moved cartridge.

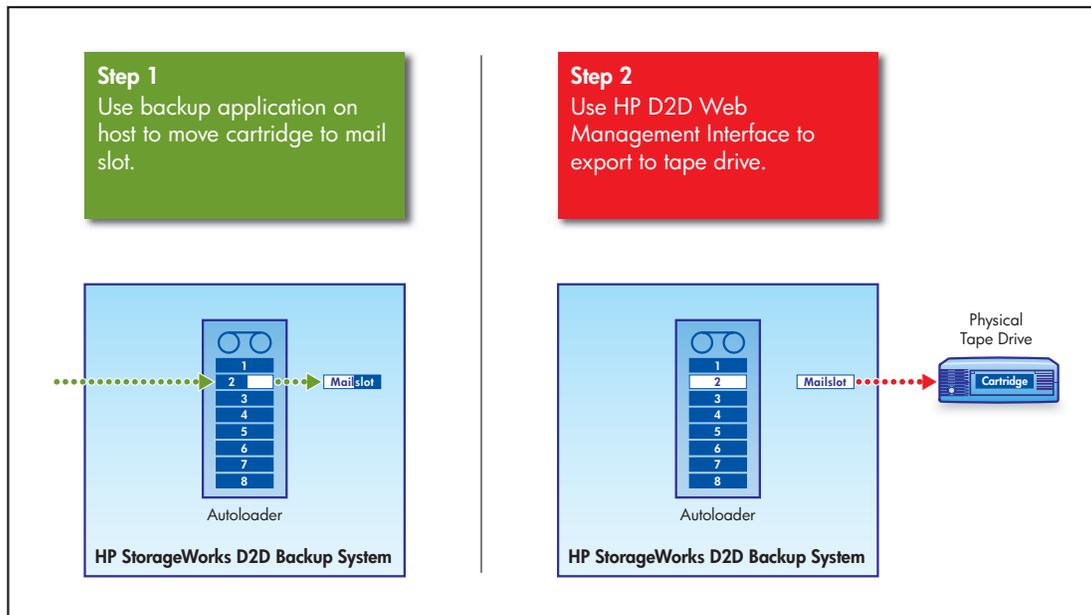


Figure 17 Cartridge export

When would Export be used?

The main reason for using **Export** is to create more space on the HP D2D Backup System by exporting to physical tape a cartridge that is used infrequently. For example, if a rotation scheme uses twelve monthly tapes, it is safe to export a monthly tape from two months ago because it will not now be required (except for infrequent restores) for another ten months. The same applies to yearly tapes which may never be required again as they are kept forever.

If space is not an issue, **Copy** is the recommended method for creating offsite backups, because it is controlled solely from the Web Management Interface and will not impact any tape rotation strategy.

When would I restore from an exported cartridge?

Restoring from an "exported" cartridge has a higher likelihood than from a copied cartridge, because the data no longer resides on the HP D2D Backup System. If a restore from an "exported" cartridge is required, the backup application will ask for the cartridge to be re-imported into the HP D2D before it can be used for restore. Exported cartridges may also be used for disaster recovery, as with copied cartridges.

Disadvantages of Export

1. Restores may take longer if a physical cartridge is required for the restore.
2. Backup applications may require the exported cartridge for the next job in their rotation scheme.

Cartridge import

The Web interface on the HP D2D is used to **Import** cartridge data from the attached tape drive to the mail slot on the HP D2D Backup System. The backup application on the host is used to move the data from the mail slot back into one of the autoloader slots.

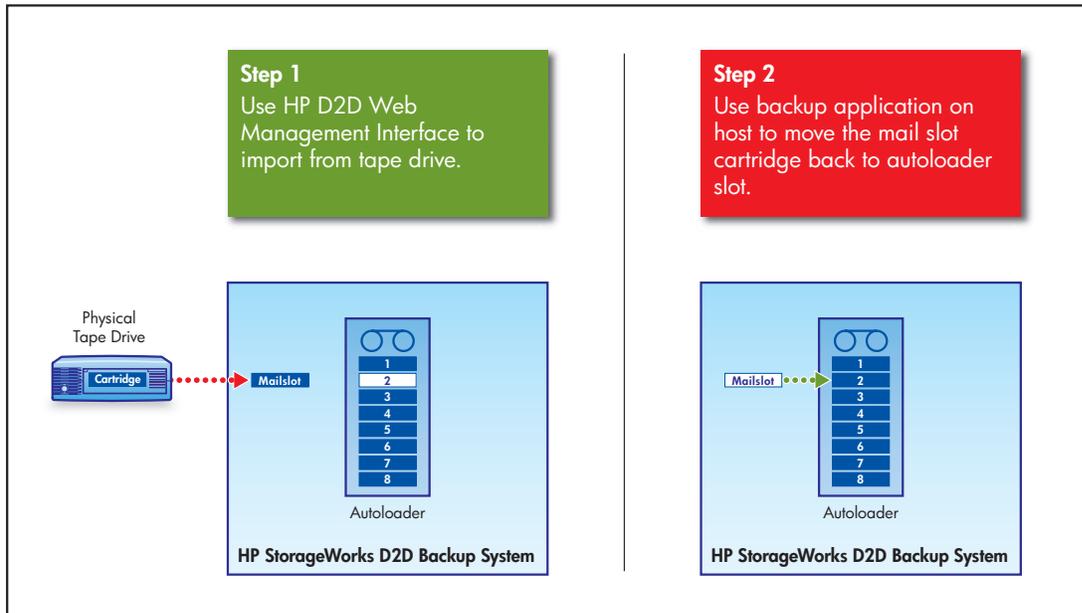


Figure 18 Cartridge import

When you import a cartridge:

- If it is less than 200 GB, the cartridge **Max Size** is set to 200 GB.
- If it is over 200 GB, the cartridge **Max Size** is set to 400 GB.
- If it is over 400 GB, the cartridge **Max Size** is set to 400 GB. Cartridges over 400 GB are not writable.

The **Used Size** is always reported correctly.

5 Troubleshooting

An attached tape drive does not appear on the Web interface

Check that the cables and HBA are installed correctly. See “Attaching a physical tape drive” on page 9.

Make sure that you are using a supported HBA and tape drive. See <http://www.hp.com/go/connect> for the most up-to-date information.

If you still cannot access it, try connecting the tape drive to a host server to ascertain if there is a tape drive problem. The HP diagnostic software for tape drivers, Library & Tape Tools, is not available when the tape drive is connected to the HP D2D, but can be used when the tape drive is attached to a server.

Call HP Support if you are unable to resolve the problem.

Cartridge copy or export fails

Check the media. Is the cartridge large enough to accommodate the data? Is it WORM media? HP Ultrium tape drives support WORM media, which can only be written to once (Write Once, Read Many). Once you have written to the media, subsequent export and copy operations will fail.

Try again, using new media.

Check the tape drive LEDs, it may need cleaning. (See the documentation supplied with the tape drive for instructions.)

Cartridge import fails

If import fails, try connecting the tape drive to the host server. You can then use Library & Tape Tools to run diagnostic tests on the tape drive.

It is possible to import cartridges that have not been exported from the HP D2D Backup System. However, you will only be able to read these cartridges, if they were created by the same backup application that you are using on the host.