Troubleshooting Tape Engine & Hardware Problems

Purpose

This document is intended to give guidance on how to troubleshoot hardware, and media errors, which can show themselves as E6300, E3855, E3712, E3719, E6084, E6500, E6304, or other tape engine related problems in the ARCserve activity logs.

Scope

This information in this document relates to the following versions, where the host server resides on a Windows platform:

- *BrightStor ARCserve Backup for Windows v9.x, r11.0, r11.1, and r11.5*
- *BrightStor Enterprise Backup for Windows v10.0, v10.5*

Although the main focus of this document is SCSI, the same analogies can be applied to fibre and SAN connected equipment.

Some of the information here is generic and can be used for any platform, but the document is written with the Windows Operating System in mind.

In this document the use of the word ARCserve is used to refer to both ARCserve and Enterprise Backup products unless explicitly stated otherwise.

What causes hardware or media errors?

Asides from hardware failures, or damaged/defective media there are many causes of these errors. Not all are as a direct cause of a hardware or media problem, often these can be attributed to the environment.

Ok, we have to start somewhere so let's start with a very simple question:

Did it ever work?

When troubleshooting problems like this, we should always ask this simple question, which is often overlooked. This allows us to understand whether the configuration has ever worked successfully previously.

This may indicate that we need to look to see if anything in the environment changed, and what effect this has had on how we interact with the hardware. We look for a cause, and then analyse the effect it has on the solution.

So, the next follow up question is:

If it used to work, what changed?

It is surprising what effect something you might consider irrelevant or insignificant may have on the overall operation of your backup solution.

Something as simple as replacing a faulty drive in a library with another one of the same or ***similar*** type, changing a host bus adapter, changing the SAN configuration, applying a HBA driver update, updating drive firmware, and so on.

Did you test both backup *and* restore?

This is another thing which is commonly overlooked. Any good backup strategy and/or business continuance plan should include regular restore testing, especially after any system configuration changes, for example: applying a service pack, patch, or driver update, or when installing new hardware.

Regular testing of your backups will also give you peace of mind that should the worst happen, you are first of all familiar with the recovery process, and secondly that you have previously managed to restore your backups successfully.

If a problem is found during restore testing then you have the opportunity to address it before the situation arises where you need to restore that data for real.

What can I check to try to resolve the problem myself?

1 Check the hardware you are using is on our Certified Device List (CDL)

http://supportconnectw.ca.com/public/storage/ascdls.asp

Ensure that you check the CDL specific to the Operating System and version of ARCserve you are using. Devices listed on the CDL are based on having the latest released service, cumulative, and device patches applied.

Devices listed in the CDL are assumed to be either SCSI or Fibre connected, unless a specific connection type other than this is shown for the specific device. At the time of writing support for a limited number of devices using connection types other than SCSI or Fibre is available. Check the CDL for specific information.

Devices are certified with the latest firmware available from the hardware vendor at the time of certification. In some cases this firmware might not be publicly available.

As a general guide, firmware/drivers should at least meet the version posted on our CDL. If the version posted is not available then use the latest available version from the hardware vendor. Using newer revisions of firmware than posted on our CDL should also be fine.

When checking tape libraries on the CDL ensure the combination of library and drive type is listed. If the drive type you are using/wish to use inside the library is not listed, then the library usually has to undergo re-certification for a new drive type. This often will often coincide with the library manufacturer releasing a new firmware revision for the library robotic to support the new drive type.

A sample of the CDL is shown here (please note this is only an example and may not provide current information about the Compaq ESL9000 Library):

Drives Certified for Compaq ESL9000 Series				
Model	**Media Type**	**Drive Firmware**	**Drive Capacity**	**Library Firmware**
DLT 7000	DLT	2565	35-70 GB	2.31
DLT 8000	DLT	022B, v88	40-80 GB	2.31
SDLT 220	SDLT	v75	110-220 GB	3.48
HP LTO	LTO	E30W	100-200 GB	3.31
SDLT 320	SDLT	v75	160-320 GB	3.48

We can see in the example above that this library is certified with multiple drive types, and that there is a firmware revision for both the library and drives. The library was certified originally with DLT7000 and DLT8000 drives with the library firmware at 2.31.

Over time support for HP LTO, and SDLT 220 and SDLT 320 drives were added. We can see that the library firmware that was certified for these drives was higher, and would expect these would be the minimum versions in use to provide support for that drive type. So in the example above we would expect a minimum of Library firmware 3.31 to be in use on the library for it to work correctly with HP LTO drives at a minimum firmware level of E30W.

This does not mean that we require you to have these exact firmware revisions for your library to be 'supported'. For example the library might have firmware revision 3.91 and have DLT7000 drives at firmware 2601, both of these firmware versions are more recent than the revisions they were originally certified at and therefore should work fine.

We do not require, and will never ask you to go back to an older revision of firmware, unless this is advised by your hardware vendor.

You should check that all drives in the library are at the same firmware level. You should check this if you have previously had a faulty drive replaced, and this is critical if you are using the Tape RAID option.

The tape engine provides device support dependant on the device name returned from the SCSI Inquiry. The tape engine does not check or provide any special support for specific firmware revisions, nor does it need to.

For example: Device support for a QUANTUM DLT7000 at firmware revision 2561 is no different to device support for a QUANTUM DLT7000 at firmware revision 2565. As far as ARCserve is concerned we will send exactly the same commands to either of these drives.

If you are using two different drive technologies in the same library (EG DLT and Ultrium), then ARCserve can work with this sort of configuration, but you will need to use the Virtual Library Option (VLO) with is included with Tape Library Option to partition your library.

You will need to have VLO configure your library so that each media type/set of drives has a pre-defined range of slots assigned to it. VLO will make your library appear as 2 or more separate libraries dependant upon the configuration you choose.

If you experience difficulty locating your specific make or model of equipment in the CDL, please bear in mind that some hardware vendors have merged with others, so if you can't find a Compaq library under the Compaq listing, check the HP listing too. Similarly for Seagate, check the Certance, or Quantum listings.

If you would like to provide feedback on information contained in the CDL, you can do so here:

http://supportconnectw.ca.com/public/ca_common_docs/cdlfeedback.asp

Please note: The feedback address should not be used for technical support requests.

As a general rule we are unable to perform certifications on equipment that is no longer available/being sold from the manufacturer.

2 Check the Cabling & Termination

Although this might not be the first thing you think of, check the cabling between the host server and the tape library:

- Ensure that the drive and the SCSI card technologies are compatible and you are not for example mixing HVD and LVD SCSI, this can often physically damage equipment.
- Check the physical condition of the cable to make sure it is not damaged
- Check the cable connectors to ensure there are no bent pins
- Check the cable length conforms to manufacturer recommendation and do not exceed maximum length

- Check to see that the SCSI chain is correctly terminated. Some cards use auto-termination, some require a physical terminator, some tape drives will by default be self-terminating so adding more than 1 drive to the same SCSI chain may result in only one drive being seen. Check the drive documentation for further information in these cases.
- Ensure the equipment is not connected to a RAID card. A limited number of RAID cards are certified on our CDL, these are exceptions to the general rule, and usually have a separate external SCSI port which is not related to an actual RAID array or logical drive.

  Support for RAID cards may be limited to specific Operating Systems. Additionally, support is normally limited to a number of named drives (and normally does not include tape libraries or auto-loaders) and this list is usually provided by the RAID card vendor
- If your server is on a UPS to ensure a clean power supply, is your tape drive/library as well? This ensures your equipment is not affected by spikes or troughs in the power supply which might disrupt the regular operation of your equipment.

3 Check/Update HBA Device Drivers

In order to communicate with the library and tape drives ARCserve needs the Operating System to be able to see the Tape Drives and/or Library via the SCSI or Fibre card. To do this we need to ensure we have the SCSI Miniport or StorPort driver loaded for the SCSI or Fibre HBA you are using with your equipment.

(Using ACSLS or IBM 3494 options still requires vendor software/drivers. See the relevant option manual for details).

If you are using SCSI or Fibre HBAs which are embedded on the motherboard of the server, updated drivers and support for these is normally handled by the server vendor. Drivers are normally provided by the server vendor, and you should use them unless advised otherwise by the server vendor.

Should a problem with the driver be identified then the server vendor should work with the OEM to resolve the issue and provide updated drivers to address the issue.

4 Check Operating System Service Pack Level

Whilst updated HBA drivers can sometimes help with a problem, system level components which work with the manufacturer supplied drivers may also need to be updated. For NT4 we recommend that you have SP6a installed as a minimum. With Windows 2000 we recommend SP4 or above.

If you are using StorPort drivers, be sure to check for any Microsoft Operating System patch pre-requisites that the StorPort drivers may require.

5 Check the ARCserve Service/Cumulative/Device Patch Level

We recommend that if you experience a device support problem that you apply the latest Service Pack, and/or cumulative and/or device patch specific to your version of BrightStor ARCserve or Enterprise Backup. These patches contain fixes and updated device support and may help resolve your issue.

Important Note for SAN users: If applying device support patches to your SAN configuration, you need to ensure all servers in the SAN are updated at the same time, else distributed Tape engines will fail to connect to the primary SAN server. This is to ensure the same tape engine modules are in use across the SAN and to avoid consistency or compatibility problems with different versions of the modules.

6 Check the system event log

Sometimes you may see critical errors or warnings logged around the same time/date that you experience problems communicating with the tape drive or library. These may show as errors for the HBA driver or drivers that are loaded for the tape library or drive.

7 Disable Operating System tape drive and/or library drivers

ARCserve uses its own tape engine to communicate and provides device specific support for certified Tape Libraries and Drives. ARCserve does not require operating system drivers to be loaded for anything other than the SCSI HBA itself (an exception to this is ACSLS and IBM 3494 Options). Operating System level drivers for tape drives and or libraries can interfere with how ARCserve communicates with the tape drive and/or library hardware.

For NT4 the drivers will interfere with the communication between ARCserve and the tape library/drive hardware. To prevent problems you should always remove any drivers that are loaded and reboot.

If you have been using the built in NT/Win2000/WinXP/Win2003 Backup program to backup your server previously then you will have had an OS level driver loaded for your tape drive/library for this to work at all

To check if drivers are loaded for the drive/library:

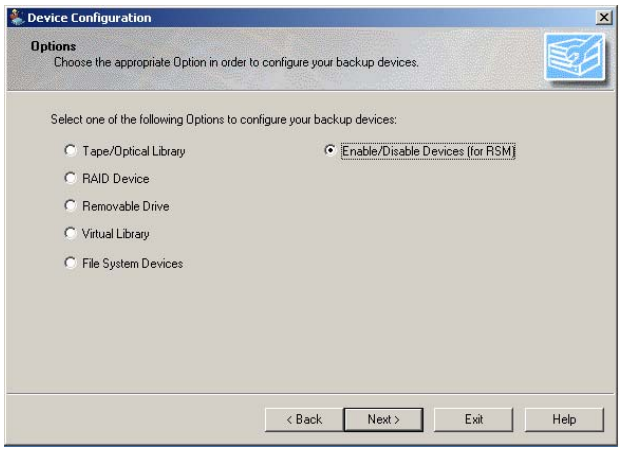
- Open up NT Control Panel and select 'Tape Devices'.
- The first screen shown should show the tape drive/library attached to your machine.
- Click on the 'drivers' tab and check if any drivers are loaded.
- If no drivers are loaded this is fine. If a pop up appears asking to install drivers click no.
- If drivers are loaded – highlight them and click remove.
- If any drivers are removed, you will need to reboot your server for this to take effect. You will be prompted to do this, and can choose to reboot later if required.

For Windows 2000/XP/Windows 2003 the procedure is slightly different. The way driver support is architected in Windows 2000 and later versions of Windows differs. This means that if you remove the drivers they will automatically be re-installed when the server is rebooted.

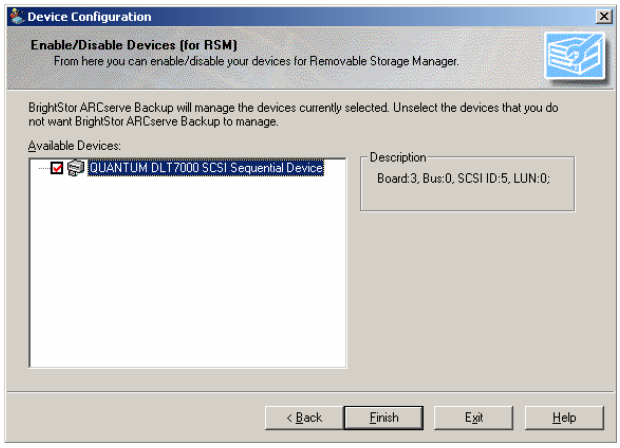
There are several ways to make sure that loaded OS level drivers do not disrupt communication between the ARCserve and the Tape Drive/Library:

(a) Use enable/disable drives for RSM

Running ARCserve device configuration provides an option to allow Windows to give control of the tape drive and/or library to ARCserve:

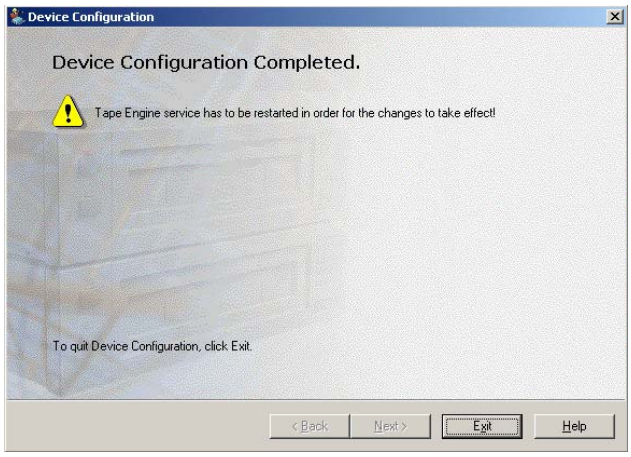


If Operating System level drivers are loaded for your tape drive or library then you will see a screen similar to the following (if you have no device drivers loaded for your drive there will be no devices listed here):



In the example above we can see that we have an Operating System level driver loaded for a Quantum DLT7000 tape drive. The important thing to ensure here is that the red tick-box next to the drive is checked so that ARCserve can control the tape drive.

If this is ok, press 'Finish' to save the configuration:



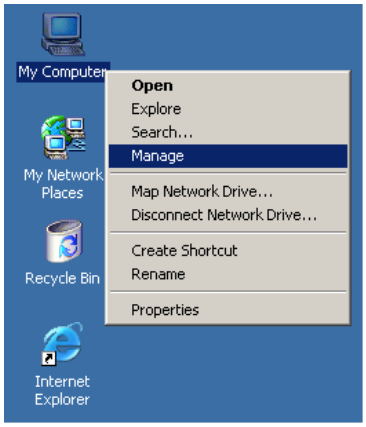
Using this method the OS or any other application using similar technology can still technically take back control of the drives/library. If you wish to prevent this from happening altogether, then you can disable the drivers in Windows Device Manager.

If you choose to use this method instead of disabling the drivers, and the installation is hosted on a Windows 2003 Operating System as part of a SAN configuration, we also suggest that you follow the recommendations in Microsoft Article 842411 to disable Test Unit Ready (TUR) polling in Windows:

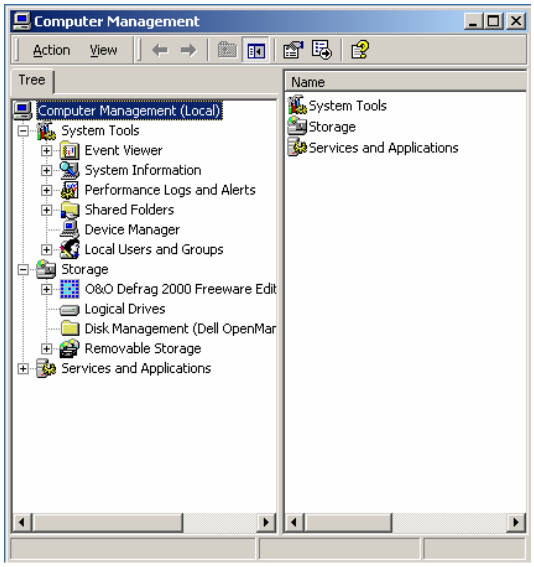
http://support.microsoft.com/default.aspx?scid=kb;EN-US;842411

(b) Disabling the drivers in Windows Device Manager

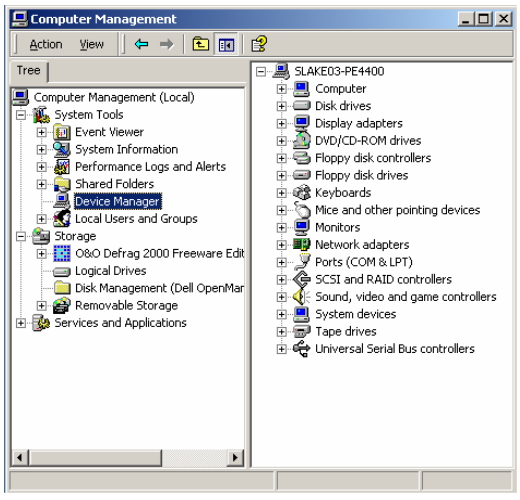
For Windows 2000/XP/2003 right-click over 'My Computer' and select 'Manage'



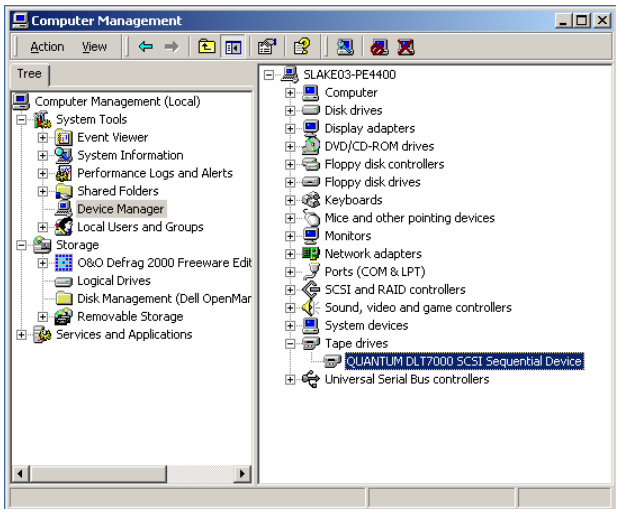
After a few seconds a window will open giving access to Computer Management



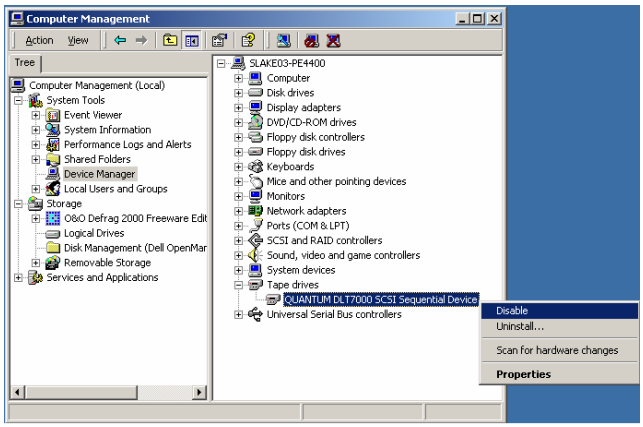
From this screen select Device Manager:



From the right-hand panel click the '+' sign next to Tape Drives to expand the selection:



Right-click over the tape drive listed, and a pop-up menu appears:



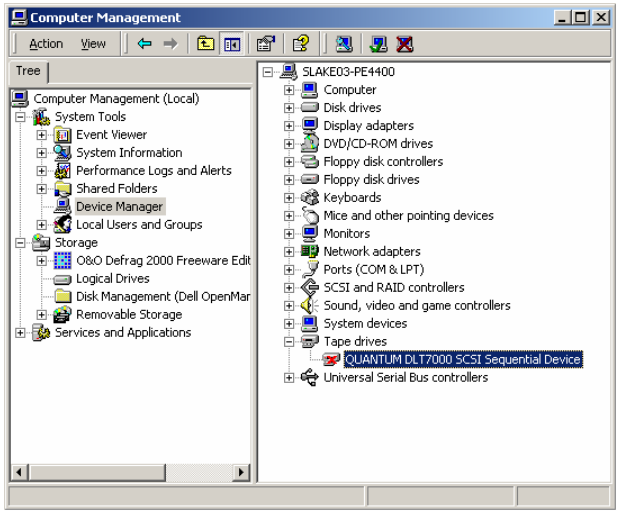
From this menu you should select 'Disable' as you can see highlighted above. If you choose Uninstall the drivers will be reloaded each time the server is rebooted.

When choosing 'Disable' the following dialog box will pop-up with a warning:

Whilst this might seem alarming, we need to select 'yes' here. What this means is that Windows will be unable to control this as a device. This will not prevent ARCserve from working with your tape drive or library, as our own tape engine will manage communication between the program and the tape devices.

Depending on whether or not a system level driver needs to be removed, you may be prompted for a reboot to completely remove the driver at this point (if you have more than one tape drive you can select no if this question is asked for the moment).

After you have selected 'Yes' to disable the device, you will see a red cross (x) next to the tape drive:



If you have more than one drive, you should repeat the process for each drive you are using with ARCserve.

If this is a SAN configuration, you should ensure you make the same changes on each server participating in the SAN configuration.

If you are using IBM Ultrium TD1, TD2, or TD3 Drives you should also check this document:

http://supportconnect.ca.com/sc/solcenter/sol_detail.jsp?product=AXWBAS&release=11.0&number=0000001&type=&os=WINDOWS

If you have disabled the drivers using the procedures above this should not be necessary.

If no drivers are loaded for the drives we suggest that you load them before disabling the drive.

This might seem a strange recommendation as ARCserve doesn't require them. The reason we suggest this is that should updated drivers be installed through Windows Update or by applying an Operating System patch this may cause the tape library, or tape drive drivers to become active and cause communication issues between your hardware and ARCserve.

After you have disabled all drives you wish to use with ARCserve, if you were prompted to reboot the server when you disabled any of the drives, you should schedule in time to reboot the server for your changes to take effect before proceeding.

Disabling Medium Changer Drivers

If you are using a library or autoloader you may also choose to disable the medium changer which controls the library robotic arm in the same way. Again, ARCserve does not require the OS level driver to operate the Library robotic. However we do not recommend disabling this unless you are experiencing problems.

We have come across some instances where third-party hardware management software can cause a Bug Check and may blue-screen your server if the medium changer driver is disabled.

Whilst this is not caused by ARCserve, or in our power to control, we have included this information in this document so you are aware of this potential issue.

Issues related specifically to operating system level drivers being loaded for medium changers are far less common than those for tape drivers being loaded.

8 Run Device Configuration to ensure your Library is correctly set up

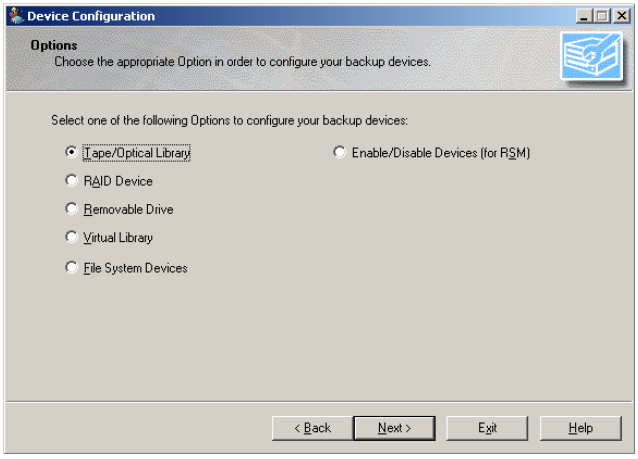
This is especially important in a library which has multiple drives, or is SAN connected.

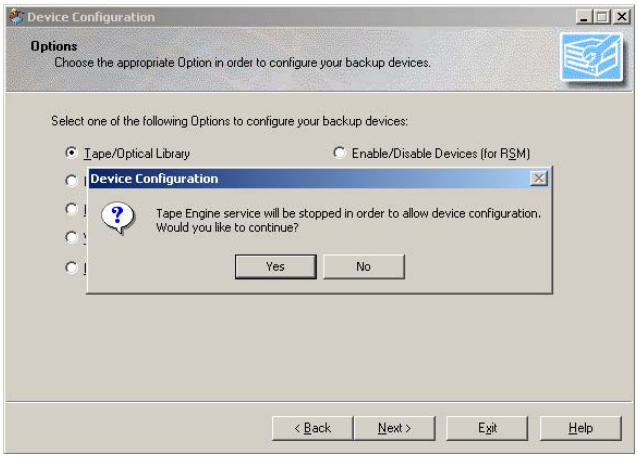
If you are running ARCserve in a SAN configuration, Device Configuration only needs to be run from the SAN Primary server. Device configuration does not need to be run, and should not be run on any distributed SAN servers.

Distributed SAN servers automatically receive the device configuration from the primary server once they are assigned to the SAN Primary using the BrightStor SAN configuration Utility.

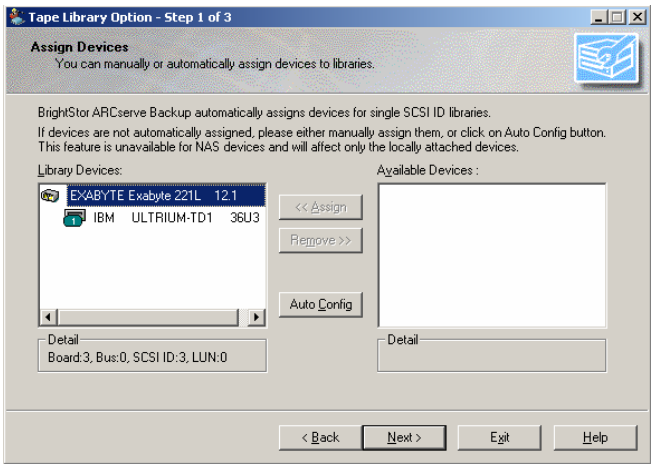
Run ARCserve Device configuration, and select Tape and Optical Library setup.

Continuing past this point will prompt whether you want to continue as the process will stop the tape engine. Ensure no active jobs are running before continuing:

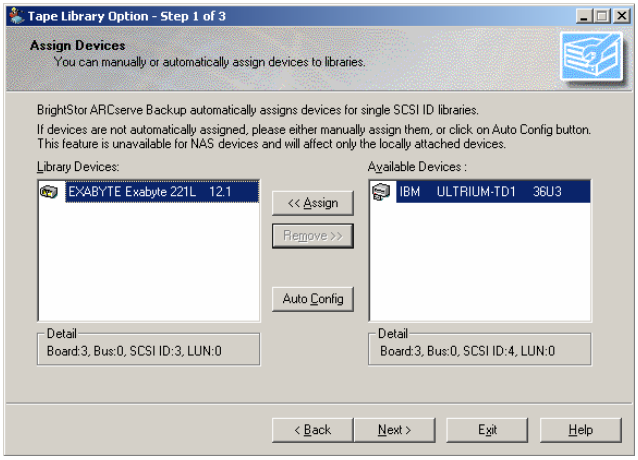




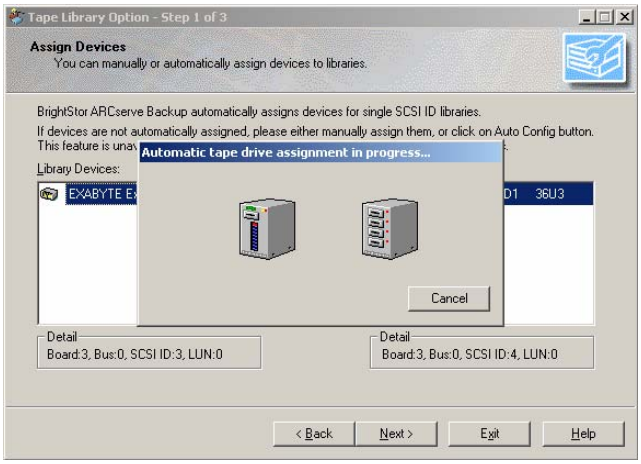
If all devices are automatically assigned on the left-hand side of the screen as shown in the example below, you can press 'Next' to continue:



If devices are not automatically assigned in the left-hand pane of the device configuration window as below, then press the 'Auto Config' button:



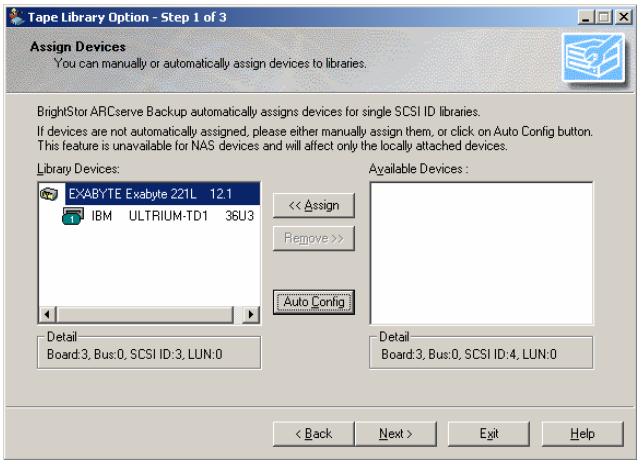
Auto Config will send an inquiry to the library asking for its exact configuration:



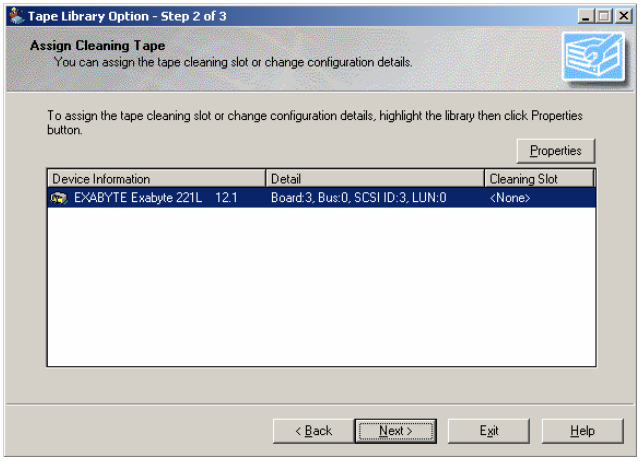
This information includes configuration details such as number of drives, number of slots, number of addressable import/export elements, and serial numbers assigned to each component, and the physical locations of the drives in the library.

This might take some time with multiple drive libraries, as a tape will be loaded into each drive to confirm the physical location of each drive tallies with the information being provided by the library. Device configuration then uses this information to ensure your library is setup correctly and optimally supported.

During device configuration you should see/hear activity on the library such as the robotic arm removing tapes from slots, and loading tapes into the tape drive. This is only to confirm the location of the drives and will not erase or alter the information on the tapes in any way. If device configuration completes successfully, you will be presented with a screen similar to the following:

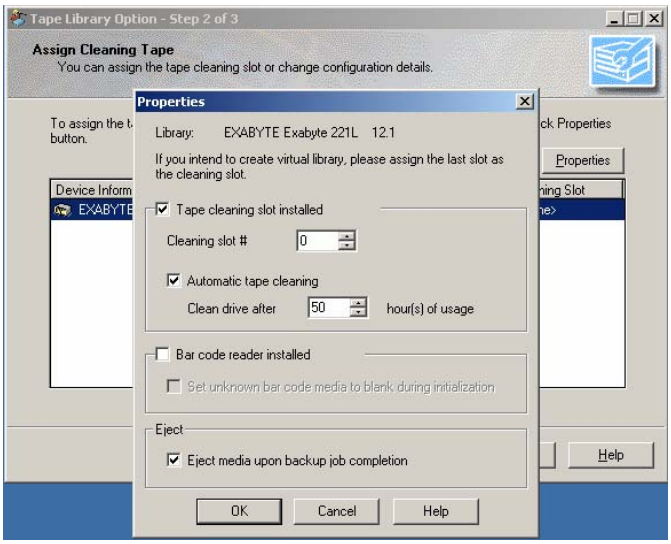


From here, pressing 'Next' will allow you to configure additional options relating to your tape library hardware:

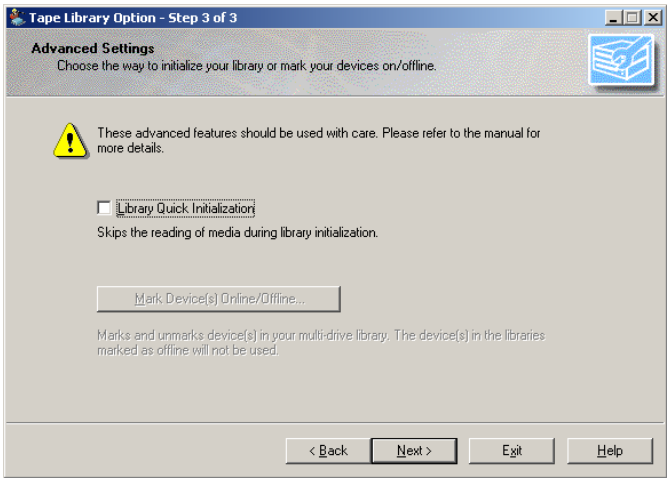


You can click the 'Properties' button to configure options relating to barcode, cleaning slot assignment, automatic drive cleaning, and handling of blank media.

If you are running ARCserve r11.0 or later then you can also configure automatic ejecting of media from the library tape drives after a backup is complete:



Select the options you need for your library, and press 'OK' to save the settings, and 'Next' to continue:

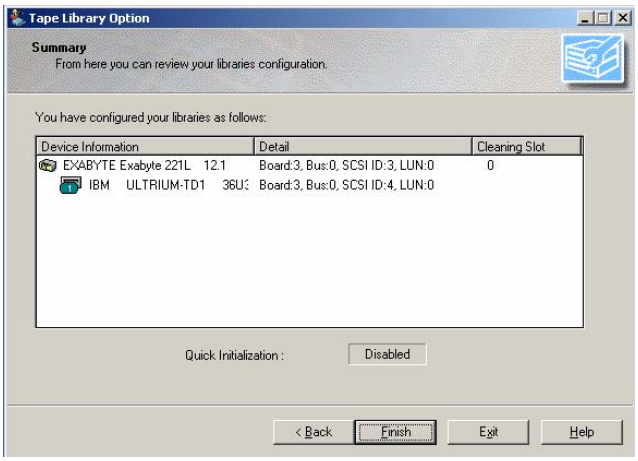


Here, you can configure quick initialization. By default, each time the tape engine is stopped or started, or the tape library door is open/closed whilst the tape engine is operational this will trigger an automatic inventory of all tapes in the library. If you have a large library this may be undesirable.

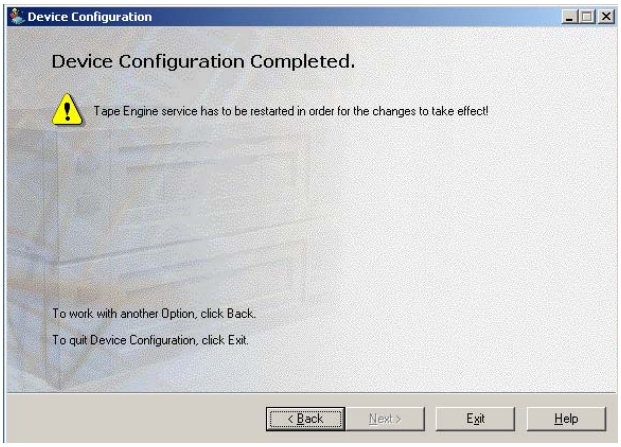
By checking this box, this means that the library will not automatically inventory tapes after a tape engine stop/start or on a door close condition.

Please remember that if you change tapes in this way with quick initialisation set, you should perform a manual inventory of the slots that have changed to update the tape information. Failure to do this will result in unpredictable results and false errors being reported. Other than using inventory ARCserve has no way of knowing that you changed or moved tapes whilst the tape engine was stopped or the library door open.

Once you have completed the configuration click 'Next' to continue. You will be presented with a summary of the configuration:



If you are happy with the configuration then press 'Finish' to save it:



Press 'Exit' to close the device configuration GUI, and restart the tape engine.

If device configuration should fail for any reason we would suggest:

- The device is on our CDL.
- The drivers for the tape drives are disabled.
- Check/update the drivers for the HBA.
- The library has serialisation enabled

  This means that each device in the library (library robotic arm, drive) reports its serial number. This is used to identify each unique component in the library, and is critical for SAN configurations. This is a feature usually supported in the device firmware.
- The changer is in 'Random' mode

  That is to say it is under software control, and that the library does not control the allocation/use of tapes itself (sometimes known as stacker mode).
- You have the tape library option installed and licensed

  You need to have the Tape Library Option installed and licensed if you have a tape library with more than 1 drive. Libraries with a single drive are automatically supported with the built in auto-loader support in the base product. You should not install the Tape Library option for single drive auto-loaders.

- Check the library control panel (if it has one)

  See if any errors are logged in the hardware logs for the library or drives. Your library manufacturer sometimes provides software to allow you to view this information.

- Check that Windows Device Manager sees the same number of devices as you are expecting.

  If windows does not see the device (disabled or not) ARCserve will be unable to see or work with it either.

  Similarly, if Windows sees 4 drives and you only have 2 in the library, then this needs to be addressed before ARCserve can be set up to work correctly.

- If you added or removed a drive from the library

  This often requires an internal reconfiguration on the library itself to process the change. How this is actioned will depend on the library you have. Refer to the library documentation or hardware vendor for further information.

  Some libraries will 'expect' the first drive in a library always to be in a certain location. If you have removed one drive from a two drive library sometimes it will not auto configure correctly, even with the advice above. Check to see if the drive works if it is put in the other 'empty' slot you removed the other drive from.

- Check the SCSI ID's

  Ensure that the robotic and each drive are at SCSI ID 2 or higher, and ensure the ID of the robotic precedes the ID of the drives. For example a 2 drive optical library set the robotic with at least SCSI ID 2, drive 1 as ID 3, and Drive 2 as ID 4.

  For single drive auto-loaders we recommend ID 5 for the changer and ID 6 for the drive. Most hardware vendors normally ship auto-loaders with this configuration set as default.

- Emulation

  If the library has an emulation mode, which allows it to emulate another drive or library type, we would generally recommend disabling this, or setting this so it works in 'native' mode. This means when we interrogate the library it reports the actual device it is, and not the emulated device. This also applies to some older DAT and TRAVAN drives where you can set emulation using a DIP switch setting on the drive itself.

If you are unable to resolve the problem, Technical Support will ask for the log file generated when device configuration is run 'libsetup.log' which will give us more information on what the cause of the problem might be.

9 Does the problem seem to be specific to one or more tapes?

Q Does the problem affect all tapes?

It is unlikely this is a media defect.

Q Does the problem affect a brand new tape?

It is more likely to be an environmental configuration issue, compatibility, or hardware problem.

Q Does the problem affect a particular brand of tape and not others?

This is rare, but faulty batches of tapes or minor incompatibilities have been seen from time to time. Check with your hardware vendor for recommended media for use with your drive.

Q If you run a quick-erase plus on a tape, does the problem still occur?

This ensures that the tape header is re-written, and should ensure that if, the tape header was written by another application, or for whatever reason was incorrectly written previously due to a configuration problem you may have addressed above, that subsequent backups that you now make on the tape after the quick-erase plus should not experience a problem due to an invalid tape header for example.

Q Does the problem only happen since a faulty drive was replaced in this library?

Dependant upon the severity of the hardware defect that caused the drive to be replaced you may be entering what is sometimes termed as a '*vicious cycle*'.

What this can sometimes result in is that a tape that was damaged by the previous faulty drive, by subsequently using it on the new replacement drive, it damaged the replacement drive as well, which might result in damaging other tapes which you subsequently tried to use to verify it wasn't a media defect.

These cases although rare, are notoriously difficult to pinpoint, and extra care should be taken to minimise damage to other tapes if you suspect you may have this problem. Using what you suspect is a damaged tape on another drive may damage that drive too.

We would recommend you quarantine any tapes which you suspect that may be causing the damage, and discontinue use of drives you suspect may have been inadvertently damaged in the process until you have sought advice from your equipment vendor who may be able to help you analyse which tapes may be causing the problem.

Q Was the tape you are trying to restore backed up by this machine or another one?

If it was backed up by a different machine/drive, compare the two systems, and check that the drive/library you used exactly the same manufacturer, model and firmware revision in case this is compatibility issue.

Check that the tape is readable on the originating machine. If it is readable by the machine it was originally backed up on, it is more likely to be a configuration problem on either the original machine or the machine you are trying to restore to.

Q How old are the tapes? Are they used daily, weekly, monthly?

This may seem straightforward, but tapes do not last forever. If you are for example running a rotation where you use a set of Monday to Thursday weekly tape on average 4 times in a month, these are more likely to need replacing more often than tapes that are used to store weekly or monthly backups (as they are potentially being used 4 times as much as a weekly tape).

'Cartridge life' as it is sometimes referred to is commonly specified in 'number of passes' or number of 'full backups'.

Q Are the manufacturers recommended operating guidelines being adhered to?

Look at where and how you store your tapes physically when they are not in use, are they stored in conditions in accordance with the manufacturers guidelines (for example storage, and operating temperature & humidity) ? This also applies the environment in which your server and tape drive/library is located.

Use common sense, if transporting from an off-site location for example, where the temperature is significantly warmer to a cooler location (or vice-versa), did you allow time for the equipment to acclimatise to the temperature changes (to avoid condensation and damage to the tapes or drive)?

It goes without saying that dropping a tape can physically damage it.

Q Are you using tapes supported by the drive? Are there limitations on use of specific types of tapes?

An example of this would be trying to use a DDS4 tape with a DDS3 drive. Whilst they might appear similar, they are not compatible, and will often reject the cartridge immediately.

Check the information on the tape cartridge itself. Do not rely on the sticky labels that are applied to a tape to indicate its name or other tracking information. This might not reflect the true type, density, or length of tape being used.

Other common examples:

(a) *Using DLT tapes in SDLT drives.*

These are read compatible only, and an SDLT tape drive will not write to a standard DLT cartridge.

(b) Trying to re-use previously used DLT Type IV cartridges which have been used with a DLT7000 or DLT8000 with a DLT1 Drive.

The DLT1 drive cannot use or read tapes previously formatted in a DLT7000 or DLT8000 drive. In order to degauss DLTtape IV, a bulk eraser must have at least an Oersted rating of greater than 1850. Ideally, the bulk eraser should have two or three times that rating. For these reasons, tapes previously used in a DLT7000 or DLT8000 drive, unless degaussed professionally, will cause cleaning errors on a DLT1 drive.

If you are unsure which cartridges you can use with your hardware, consult the product documentation for more information. Often, compatibility information can be found on the hardware vendors' website. If you are still unsure, contact your hardware vendor for further assistance.

10 Does the problem seem specific to one or more tape drives?

If you have more than one drive in the library – does the problem only seem to occur with one particular drive?

You can check this by looking at the E6300 error and looking for the ABSL numbers which follow it.

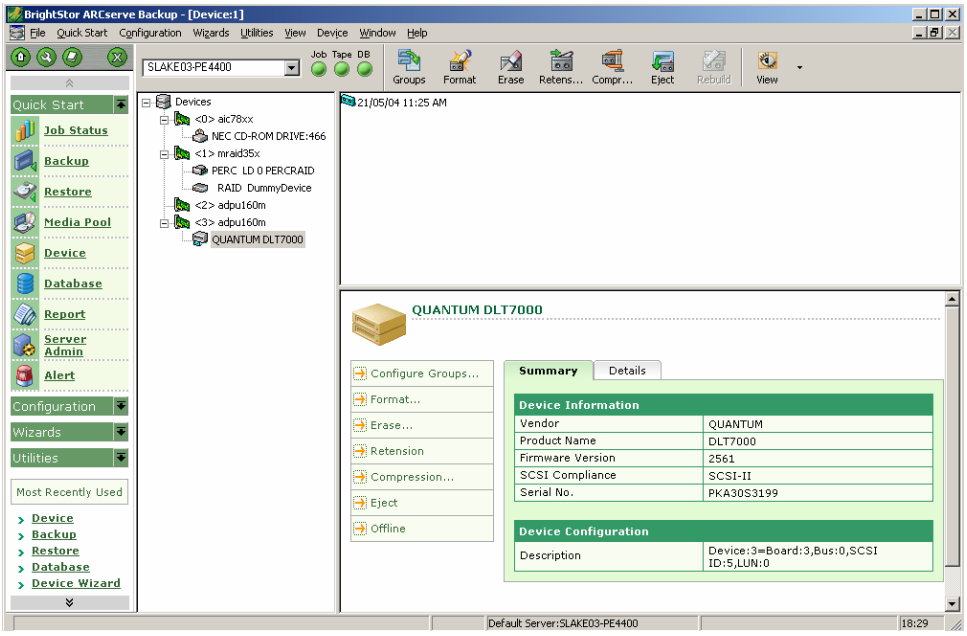
What Does ABSL mean?

A dapter
B us
S CSI
L UN

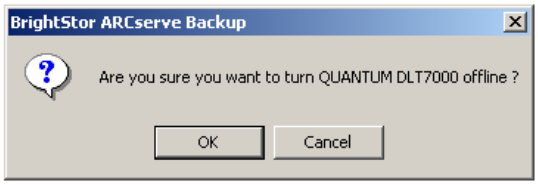
NB for SAN configurations the ABSL number reported on each server in the SAN may differ, dependant on the configuration or order of other adapters installed in each individual server. In these cases you can check the device serial number to confirm if the same device is consistently reporting the error (See the screenshot below).

If you find that the problem seems to affect only one specific drive in a library with more than one drive, you can mark the suspect drive offline in the Device Manager GUI (with Enterprise Backup 10.5 SP1 and ARCserve r11.0 and later. For previous versions you need to run BrightStor Device Configuration to mark the drive offline).

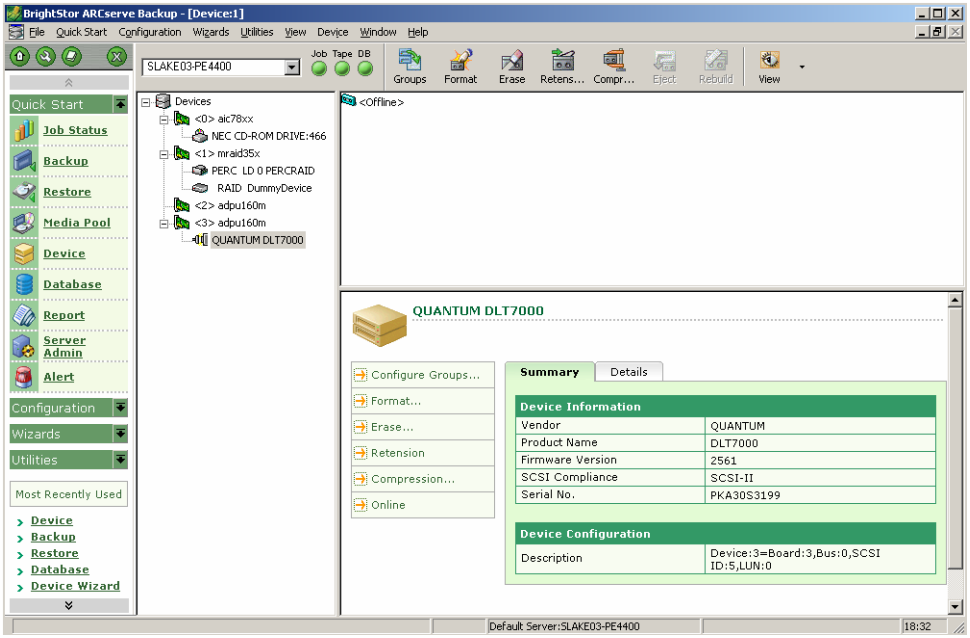
Begin by opening up device manager and selection the drive you want to mark offline. You can see the device highlighted in the image below has the ABSL of 3050 (in the Green Box in the bottom right-hand corner of the screen labelled 'Device Configuration - Description'):



Next, click the Offline option in the bottom right pane of device manager – you will be asked if you want to disable this device.



In the example here, we selected 'yes' and the device is now marked offline and cannot/will not be used until it is marked back online again.



Please note you cannot mark the changer robotic, or the last available drive in a library offline.

You can now try running your backup operation again. Be sure to check the backup job to ensure that the destination device group or device if you selected a specific tape drive does not point to the device you just disabled, or the backup operation will fail.

If there are no errors reported using an alternate drive, then it is likely the drive you have disabled may have a hardware defect.

11 Are any other devices on the same controller/channel?

What we are looking at here specifically is hard-disks, CD-ROM or other types of devices on the same channel as the tape drive and/or library. We would suggest that the tape drive/library resides on its own dedicated controller. Please take into account that if you are using other devices on the same controller/channel:

- 'Noise' may be generated by devices like CD-ROMs which may cause interruptions to data transfer.
- The available bandwidth is effectively shared between all of the devices on the same channel.
- If running two or more tape drives on the same HBA, check that the controller has sufficient bandwidth to host both of the drives, else this might result in reduced performance for both drives.
- Information on recommended HBAs or a recommended HBA technology for you tape drive or library hardware can usually be found in the documentation for your tape drive/library.
- In a heavily utilised system where there is heavy disk utilisation, or virtual memory/swap file usage, and the SCSI controller hosts both the hard disks and the tape drive, slow throughput or SCSI communication errors maybe experienced. In this instance we would strongly recommend you address the system resource problem and/or move the tape drive to its own dedicated controller.

If you suspect this may be a problem in your configuration try swapping to a separate card, or if you have the option to remove the possible problematic device (eg the CD-ROM), then remove it and try the operation again.

12 Slots are stuck 'Updating'

This can be caused by either having a device driver loaded for the tape drive or library you are trying to use with ARCserve. We would recommend you also check the library set up and run through the recommendations in point 8 of this document. This will resolve a majority of these issues.

13 You ran a device management command which completed or failed immediately but did nothing

If this has been working previously this might occur for a number of different reasons, sometimes there will be activity on the drive or library, sometimes not.

(a) *The library is offline*

Check the Library control panel to make sure the library door is closed, and the library is marked as on-line and able to be controlled by ARCserve. In this case there will be no activity in the library.

(b) *The library flagged an error performing the operation*

Check the front control panel of the library (if it has one) for more information

(c) *Tapes were added/removed without performing an inventory*

Older versions of ARCserve (including ARCserve v9, and Enterprise Backup 10.0) have no way of knowing if you opened the library and added or removed tapes manually, or moved/removed tapes using the library control panel.

If you wish to add/remove tapes either use the mail slot (also known as Import/Export Slots) if your library has this ability, and use the ARCserve GUI to import/export the tapes this way, or perform a re-inventory after changing the tapes.

Beginning with Enterprise Backup v10.5 SP1 and ARCserve Backup r11.0 support for door open/closed conditions was added, and an automatic inventory should take place if you have quick initialization disabled, or if you have a barcode reader installed and configured with the library.

If these guidelines are not followed then you may get a condition where because ARCserve becomes out of sync with what the library has in it, and does not know that the tapes have changed, it may try to move a tape into a slot which is already occupied, but fail because the library recognises that the slot already has a tape in it.

If this happens you may receive errors similar to the following:

E8003: Media manually ejected from Drive….
E8004: Media manually inserted in Drive….
E8006: Slot full, can't move media to home slot….
E8020: Failed to inventory slot(s) (EC=SLOT ALREADY IN USE)….
E8027: Failed to import media to slot (EC=SLOT IS OCCUPIED)…..

(d) *There is a problem with the ARCserve Database*

As strange as it may seem, if there is a problem with the BrightStor Database (whether this is VLDB or SQL), then this may cause problems with things like moving tapes in the library, check the activity log (brightstor.log) to see whether there are any errors (eg E4101) relating to the BrightStor Database. If it is you should run a check and fix on the BrightStor Database.

For further information on maintaining the ARCserve Database please see TEC376895 if you are using the VLDB Database:

http://supportconnect.ca.com/sc/redir.jsp?reqPage=search&searchID=TEC376895

or TEC353603 if you are using SQL to host the ARCserve database:

http://supportconnect.ca.com/sc/redir.jsp?reqPage=search&searchID=TEC353603

(e) *Are the drives/library still seen in Windows device manager?*

Sometimes, for whatever reason there may be an interruption to the connection between the server and the tape drives and/or library.

Remember that although we do not require the device drivers to be loaded for the tape library/drives, we still need to ensure that the operating system can see the library robotic and each drive present in the library.

If the Operating System cannot see the device, ARCserve will also be unable to see or communicate with it. You may see entries in the system event log indicating that the device disappeared or was removed from the system unsafely in these cases.

(f) *Did you issue the command from the device manager GUI, or from the command line?*

If you used the command line and it failed, does it work if you use the GUI, or vice-versa?

14 Use Manufacturer supplied test tools to test for hardware defects

Your hardware vendor may provide software test tools which allow you to test your hardware for physical defects. Examples include, but are not limited to:

ADIC	:	ADIC Management Console
Compaq/HP	:	Library & Tape Tools (L&TT)
IBM	:	IBM TotalStorage Tape Diagnostic Tool (ITDT)
Overland	:	LibCenter/NeoCenter/Neo8000Center
Quantum	:	DLTSage xTalk
Sony	:	Lib Tool
StorageTek	:	SCSI Toolbox

15 Delete or export the Tape Engine key

Sometimes for whatever reason the tape engine configuration information held in the registry may become corrupt. Sometimes the only way to flush this out is to delete it.

Please note: You will lose any existing device group configuration by carrying out this procedure. You may wish to export a copy of the key before deleting it so that you can import the relevant parts of the key containing the device groups afterwards.

To do this:

(a) Stop the ARCserve/Enterprise Backup services (run CSTOP from the product home directory)
(b) Open up regedit or regedt32
(c) Browse to the following hive :

ARCserve v9.0 → r11.5

HKLM \ SOFTWARE \ ComputerAssociates \ BrightStor ARCserve Backup \Base

Enterprise Backup v10.0

HKLM \ SOFTWARE \ ComputerAssociates \ Cheetah \ Base

Enterprise Backup v10.5

HKLM \ SOFTWARE \ ComputerAssociates \ BrightStor Enterprise Backup \ Base

(d) Highlight the TapeEngine key and delete it.
(e) Restart the ARCserve/Enterprise Backup services (CSTART)

The Tape Engine key will be recreated when the tape engine is started. You should re-run device configuration to ensure the library is set up correctly, and will need to recreate any custom device groups you had previously using the ARCserve Manager, or import the relevant portion of key you exported previously.