Dell EMC Tape Compatibility Matrix

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1   Overview

Dell tape solutions are tested with a wide range of platforms, backup software, and media to help ensure trouble-free, reliable performance. This matrix can help you determine if your tape backup components are compatible. See the Dell Support website at www.dell.com/support for service and warranty-related items. Some products that are listed may no longer be offered for sale; check with your Sales Representative for current portfolio offerings.

Dell has not tested or validated tape drives or tape libraries that are connected to Virtual Machines.

Note: Dell is providing the information in this matrix as a convenience to its customers. THE INFORMATION IS SUBJECT TO CHANGE WITHOUT NOTICE AND IS PROVIDED "AS IS" WITHOUT WARRANTY OF ANY KIND. The limited warranties for Dell products are set forth exclusively in the documentation accompanying such products. Nothing herein should be construed as modifying those limited warranties in any way.

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2 Dell PowerVault Tape Compatibility

2.1 PowerVault Drives Internal to Servers

Tape Drive		Supported HBAs			
Drive Model	Current Firmware	Dell ITA	Dell H330	HBA330	Onboard SATA
LTO3-080 IBM SAS V2	F991	X			
LTO4-120 HH IBM	C7QJ	X			
LTO4-120 IBM SAS	C7QH	X			
LTO4-120 HH IBM V2	G9N1	X	X		
LTO5-140 IBM SAS	H971	X	X	X	
LTO6 HH IBM SAS	KAJ9	X	X	X	
LTO7 HH IBM SAS	N4Q1	X	X	X	
LTO8 HH IBM SAS	N4Q1		X	X	
RD1000 SATA2	0056				X

X = Supported

Dell recommends using the driver that is supplied with the operating system (INBOX) for proper operation when the backup software does not provide a driver. Always consult the backup software documentation for drive requirements.

Note: LTO8 requires a HOTFIX for INBOX device driver recognition with Windows Server 2012 R2 and Windows Server 2016. Go to the LTO8 product page on https://www.dell.com/support for additional information.

2.2   PowerVault 114X and Desktop Models

Tape Drive		Supported HBAs			
Drive Model	Current Firmware	Dell 6 Gbps SAS HBA	Dell 12 Gbps SAS HBA	HBA355e	USB 2.0/3.0
LTO3-060 IBM SAS	93GQ	X			
LTO3-080 IBM SAS V2	F991	X			
LTO4-120 HH IBM	C7QH	X			
LTO4-120 HH IBM V2	G9N1	X	X		
LTO5-140 IBM SAS	H971	X	X		
LTO6 HH IBM SAS	KAJ9	X	X	X	
LTO7 HH IBM SAS	N4Q1		X	X	
LTO8 HH IBM SAS	N4Q1		X	X	
RD1000 USB 3.0	4121				X

X = Supported

Dell recommends using the driver that is supplied with the operating system (INBOX) for proper operation when the backup software does not provide a driver. Always consult the backup software documentation for drive requirements.

Note: LTO8 requires a HOTFIX for INBOX device driver recognition with Windows Server 2012 R2 and Windows Server 2016. Go to the LTO8 product page on https://www.dell.com/support for additional information.

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2.3   Dell EMC ML3/ML3E

Tape Drive	Supported HBAs								
Drive Model	Dell HBA 355e	Dell 12 Gbps SAS HBA	LPe1600x FC HBA	LPe1200x FC HBA	LPe31xxx/ 35xxx	QLE246x FC HBA	QLE256x FC HBA	QLE26xx FC HBA	BR8x5 FC HBA
LTO6 FH and HH IBM	X	X	X	X	X	X	X	X	X
LTO7 FH and HH IBM	X	X	X	X	X	X	X	X	X
LTO8 FH and HH IBM	X	X		X	X		X	X	

X = Supported

Note: Model BR815 and BR825 do not support direct attach to tape drive. LPe31002/35002 and the ML3 Drive/Set to Fabric passed testing direct connect.

Drive Firmware	
LTO6 FH and HH IBM	KAJ8/KAJ9
LTO7 FH and HH IBM	M570/M571
LTO8 FH and HH IBM	M570/M571

Library Firmware	
ML3/ML3e	1.4.1.0-A00

Dell recommends using the driver that is supplied with the operating system (INBOX) for proper operation when the backup software does not provide a driver. Always consult the backup software documentation for drive requirements. The IBM device drive is provided for failover purposes and backup applications that do not permit INBOX drive usage.

2.4   PowerVault TL1000

Tape Drive	Supported HBAs		
Drive Model	Dell 6 Gbps SAS HBA	Dell 12 Gbps SAS HBA	HBA355e
PowerVault LTO4-120 HH IBM V2	X	X	
PowerVault LTO5-140 IBM	X	X	
PowerVault LTO6 HH IBM	X	X	X
PowerVault LTO7 HH IBM	X	X	X
PowerVault LTO8 HH IBM		X	X

X = Supported

Drive Firmware	
PowerVault LTO4-120 HH IBM V2	G9N1
PowerVault LTO5-140 IBM	H971
PowerVault LTO6 HH IBM	KAJ9
PowerVault LTO7 HH IBM	M571
PowerVault LTO8 HH IBM	M571

Library Firmware	
TL1000	0109-3000

Dell recommends using the driver that is supplied with the operating system (INBOX) for proper operation when the backup software does not provide a driver. Always consult the backup software documentation for drive requirements. The IBM device drive is provided for failover purposes and backup applications that do not permit INBOX drive usage.

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2.5   PowerVault TL2000/4000

Tape Drive	Supported HBAs									
Drive Model	iSCSI Bridge	Dell 6 Gbps SAS HBA	Dell 12 Gbps SAS HBA	LPe1200x FC HBA	LPe1600x FC HBA	LPe31xxx	QLE246x FC HBA	QLE256x FC HBA	QLE26xx FC HBA	BR8x5 FC HBA
PowerVault LTO3-060 IBM	X	X		X		X	X	X		X
PowerVault LTO3-060 IBM V2	X	X		X		X	X	X		X
PowerVault LTO4-120 IBM	X	X	X	X	X	X	X	X	X	X
PowerVault LTO4-120 HH IBM	X	X	X	X	X	X	X	X	X	X
PowerVault LTO4-120 HH IBM V2	X	X	X	X	X	X	X	X	X	X
PowerVault LTO5-140 IBM	X	X	X	X	X	X	X	X	X	X
PowerVault LTO6 HH IBM	X	X	X	X	X	X	X	X	X	X
PowerVault LTO7 HH IBM		X	X	X	X	X	X	X	X	X
PowerVault LTO8 HH IBM			X	X		X		X	X	

X = Supported

Note: Model BR815, BR825, and LPe31xxx do not support direct attach to tape drive.

Drive Firmware	
PowerVault LTO3-060 IBM	93GQ
PowerVault LTO3-060 IBM V2	F991
PowerVault LTO4-120 IBM	C7QH
PowerVault LTO4-120 HH IBM	C7QJ
PowerVault LTO4-120 HH IBM V2	G9N1
PowerVault LTO5-140 IBM	H971
PowerVault LTO6 HH IBM	JAX1
PowerVault LTO7 HH IBM	JAYD
PowerVault LTO8 HH IBM	JAYD

Library Firmware	
TL2000/TL4000	F.11/3.20e

Dell recommends using the driver that is supplied with the operating system (INBOX) for proper operation when the backup software does not provide a driver. Always consult the backup software documentation for drive requirements. The IBM device drive is provided for failover purposes and backup applications that do not permit INBOX drive usage.

2.5   ML6000

Tape Drive	Supported HBAs								
Drive Model	Dell 6 Gbps SAS HBA	Dell 12 Gbps SAS HBA	LPE1200x FC HBA	LPe1600x FC HBA	LPe31xxx	QLE246x FC HBA	QLE256x FC HBA	QLE26xx FC HBA	BR8x5 FC HBA
PowerVault LTO4-120 IBM	X	X	X	X		X	X	X	X
PowerVault LTO5-140 IBM FH	X	X	X	X	X	X	X	X	X
PowerVault LTO6 IBM	X	X	X	X	X	X	X	X	X
PowerVault LTO7 IBM – FC Only			X	X	X	X	X	X	X
PowerVault LTO8 IBM – FC Only			X		X		X	X	

X = Supported

Note: Model BR815, BR825, and LPe31xxx do not support direct attach to tape drive.

Drive Firmware	
PowerVault LTO4-120 IBM	C7QH
PowerVault LTO5-140 IBM FH	H970
PowerVault LTO6 IBM	J450
PowerVault LTO7 IBM – FC Only	J4D0
PowerVault LTO8 IBM – FC Only	J4D0

Library Firmware	
ML6000	710G.GS007

Dell recommends using the driver that is supplied with the operating system (INBOX) for proper operation when the backup software does not provide a driver. Always consult the backup software documentation for drive requirements. The IBM device drive is provided for failover purposes and backup applications that do not permit INBOX drive usage.

Note: LTO8 requires a HOTFIX for INBOX device driver recognition with Windows Server 2012 R2 and Windows Server 2016. Go to the LTO8 product page on https://www.dell.com/support for additional information.

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2.6   Dell PowerEdge Server to HBA Compatibility

Generation	12G			13G			14G		
Model	T320	T420	T620	T430	T430	T630	T340	T440	T640
Adapter	ITA			H330			HBA330		

External SAS Adapters												
Generation	13G											
Model	R230	R330	R430	R530	R630	R730	R830	R930	T330	T430	T630	FX2	VRTX
Adapter	12 Gbps SAS											
Generation	14G											
Model	R240	R340	R440	R540	R640	R740	R840	R940	T340	T440	T640	FX2	VRTX
	NX3240	NX3340										
Adapter	12 Gbps SAS											
Generation	15G											
Model	R650	R750	R6515	R6525	R7515	R7525	R750XA					
Adapter	HBA355e SAS											

Note: 6 Gbps and 12 Gbps cards are not interchangeable between the server generations. 13G and 14G servers only support 12 Gbps SAS adapters.

Note: IBM support for a SAS interposer/fan-out cable is mentioned in the ML3 users guide; Chapter 3 Page 51. As a convenience we are including the comment from that section as well as the part numbers here.

The fan out cables are sold by ATTO and are available through our S&P org.

CBL-8079-EX1 (1M)   AA837909

 CBL-8078-EX1 (3M)   AA837910

Excerpt from ML3 users guide: If you are using a SAS fanout / Interposer cable, the end of the cable with only one connector must be plugged into the HBA.

Fibre Channel Host Bus Adapters												
Generation	**13G and 14G**											
Model	R9x0	R8x0	R7x0	R7x0XD	R6x0	R5x0	R4x0	R3x0	R2x0	T6x0	T4x0	T3x0
QLE256x	X	X	X	X	X	X	X	X		X	X	X
QLE266x	X	X	X	X	X	X	X			X		
QLE269x	X	X	X	X	X	X	X			X		
QLE274x	X	X	X	X	X	X	X			X		
LPE1200x	X	X	X	X	X	X	X	X		X	X	X
LPE31002	X	X	X	X	X	X	X			X		

X = Supported

Note: Model BR815 and BR825 do not support direct attach to tape drive. The LPE31002 with ML3 Drives set to Fabric have passed ISV testing with Direct Connections. For more information, see your Server Specific Supported HBA list.

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3   Operating System Compatibility

Dell EMC tape products are tested with various operating systems (OS). Compatibility of test tools and general operability has been validated in the following operating systems:

- Windows Server 2012R2
- Windows Server 2016
- Windows Server 2019
- Red Hat Enterprise Linux 6.x/7.x/8.x
- SUSE Linux Enterprise Server 12.x/15.x

Always consult with your ISV application for specific operating system version compatibility.

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4   Backup Software Compatibility

Dell EMC tape products are tested using various Independent Software Vendor (ISV) applications. Dell tape products are compatible if they are listed in the hardware compatibility list and the ISV is running on a supported operating system that is called out in the Software Compatibility list. For other solutions not listed, contact the ISV for compatibility.

Vendor	Application	Version
Dell EMC	NetWorker	All
Veritas	Backup Exec	All
	NetBackup	
CommVault	Simpana	All
Computer Associates	Arcserve	1.75
Microsoft	*Data Protection Manager	2010/2007
		2012/2016
Quest	NetVault	8, 9, 10, and 11
IBM	Spectrum Protect (formerly TSM)	8.1.0 and later
Veeam	Availability Suite	9.x - 11.x
Retrospect	Retrospect	All
Acronis	Backup	11.5, 11.7, and 12.5
Dell EMC	CloudLink	All

*All Dell tape drives supported in Data Protection Manager 2007 are also supported in Data Protection Manager 2010.

Click on the link below for the Dell EMC NetWorker Hardware Compatibility Guide.

https://www.delltechnologies.com/asset/en-us/products/storage/technical-support/docu34173.pdf

5 Linear Tape File System Single Drive Edition (LTFS-SDE) Compatibility

The LTFS SDE software allows the media in the tape drive to be presented to the file system as a disk with a drive letter. Users can easily drag and drop data onto the tape media without the need for additional tape backup software.

	LTO3 and LTO4	LTO5, LTO6, LTO7, LTO8
PowerVault		SDE
PowerVault 114X		SDE

- Free Software Download: https://www.ibm.com/support/fixcentral

  – Use Find Product tab and enter IBM Spectrum Archive Single Drive Edition (SDE) for the Product Selector.

Note: IBM requires customer registration before download.

LTO8 requires firmware version HB8x or greater.

Internal LTO LTFS Requires HBA330. H330 not supported with LTFS.

6 Linear Tape File System Library Edition (LTFS LE) Compatibility

The IBM® LTFS LE software creates a drive letter in the file system once LTFS is mounted. Each tape cartridge in the logical library is assigned to a drive letter or mount point and shows up as a directory under the drive letter or mount point. You can drag and drop data to the directories and create directories as needed for your specific needs.

	LT03	LT04	LT05	LT06	LT07	LT08
Dell EMC ML3/ML3E				LE	LE	LE
PowerVault TL1000, TL2000, TL4000	N/A	N/A	LE	LE	LE	LE
PowerVault ML6000	N/A	N/A	LE	LE	LE	LE

- Additional Information:
  http://www.ibm.com/support/knowledgecenter/STZMZN/com.ibm.storage.hollywood.doc/ltfs_le_ichome.html

Other countries and languages can be selected from www.ibm.com. Customers must search for "LTFS LE" to locate the local link.

Dell customers must purchase the IBM LTFS LE software directly from IBM. Dell customers with existing IBM sales relationships can purchase through their IBM sales representative.

Note: LTO8 requires firmware version HB8x or greater.
LTFS LE not supported in Linux Operating System.

7 Library Encryption

Dell EMC tape libraries support both Application-Managed Encryption and Library-Managed Encryption.

Application-Managed Encryption – No additional library activation license is needed. AME licensing is handled by. Consult with your ISV User Guide for licensing information and requirements.

Library-Managed Encryption – Library encryption activation license is required for the PowerVault TL2000, TL4000 and ML60x0 libraries, contact Dell EMC sales. The PowerVault TL1000 is sold as encryption enabled or disabled at the time of purchase. TL1000 units cannot be changed from the original factory configuration of encryption disabled. The Dell EMC ML3/ML3E library has an LME feature that is enabled by Default and no further licensing is required.

Compatibility testing is ongoing to ensure that basic LME connectivity and functionality exists with commercial key management software applications. Always consult the independent software provider for full application support.

	TL1000	TL2000	TL4000	ML6000	ML3
Dell EMC CloudLink					X
IBM SKLM	X	X	X	X	X
SafeNet KeySecure					X

X = Supported

Note: LTO Tape Drives use AE256-bit encryption.

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8   Dell Encryption Key Manager 3.0 Support

The sales life of the Dell Encryption Key Manager 3.0 software has ended. Customers purchasing library-managed encryption licenses for their PowerVault tape libraries must purchase the IBM Security Key Lifecycle Manager software from IBM, Dell EMC CloudLink, or Thales KeySecure.

Dell customers using Dell Encryption Key Manager 3.0 (EKM 3.0) may use the software through the end of support life of the initial support contract of the PowerVault TL2000, TL4000, and ML6000 tape libraries with which EKM 3.0 was purchased. However, no operating system or hardware updates or fixes are available for the EKM 3.0 software. Customers needing updates (such as Microsoft Windows 2012 and LTO7) must purchase the IBM SLKM software.

Dell customers must purchase the IBM SKLM software directly from IBM. US customers can purchase the software at the following link. Non-US customers can access additional countries and languages on the upper right side of the page. These pages only list the purchase requirements for Dell customers using the supported PowerVault tape libraries.

https://www.ibm.com/products/software

For more information about the IBM SKLM software, see the IBM SKLM Knowledge Center at https://www.ibm.com/support/knowledgecenter/#!/SSWPVP/welcome.

The latest IBM Tivoli Key Lifecycle Manager Fix Pack (FP7 or greater) is required for migration from the Dell EKM 3.0 to the IBM SKLM software. This fix pack must be applied to the Dell EKM 3.0 software installation before starting the migration. This fix pack can be obtained at the IBM Fix Central at the following link: https://www.ibm.com/support/fixcentral/

Other countries and languages can be selected at the upper right of the page. A user account must be created to access Fix Central if an account does not exist.

9   Media Compatibility

LTO media compatibility can be found in the LTO Media Handbook that is in the Manuals and Documents section at the following link:

https://www.dell.com/support/home/us/en/04/product-support/product/ml3-tape-library/docs

LTO Cartridge	Tape Drive				
		LTO8	LTO7	LTO6	LTO5
	LTO8 Data	Write/Read			
	LTO8 Worm	Write/Read			
	LTO7 Type M	Write/Read			
	LTO7 Data	Write/Read	Write/Read		
	LTO7 Worm	Write/Read	Write/Read		
	LTO6 Data		Write/Read	Write/Read	
	LTO6 Worm		Write/Read	Write/Read	
	LTO5 Data		Read	Write/Read	Write/Read
	LTO5 Worm		Read	Write/Read	Write/Read
	LTO Cleaning	Supported	Supported	Supported	Supported

Note: PowerVault RD1000 is not compatible with tape cartridges that are greater than 2 TB.

10   LTO7 Type M media

The LTO consortium approved a new media format to be used with LTO8 tape drive technologies. The new LTO7 Type M media format allows an LTO8 drive within a supported Dell EMC library to format a new, unused, LTO7 tape cartridge for 9 TB of native data capacity. The media designator for the LTO7 Type M format is M8.

10.1   Using LTO7 Type M media in Dell EMC tape libraries

To use the LTO7 Type M format the LTO8 drive, library and tape cartridge must all meet minimum requirements:

- Tape Drive must be at Firmware Revision HB8x or higher.
- Library Firmware must be at Firmware Revision:

  – ML3 – 1.1.1.1-B00 or higher
  – TL1000 – 0080.3000 or higher
  – TL2000/TL4000 – F.10/3.20e or higher
  – ML6000 – 710G.GS007 or higher

- LTO7 tape cartridge:

  – Uninitialized and unformatted to LTO7 Type M:

    o   Must have an M8 designated barcode.
    o   Must be new non-formatted tape cartridge.

  – Initialized and formatted to LTO7 Type M:

    o   Must have an M8 designated barcode.

10.2   Using LTO7 Type M media in Dell EMC tape drives

Standalone LTO8 tape drives write or read to the 9TB format provided the drive is at firmware version of HB8x or higher and the tape is already formatted with the LTO7 Type M format. Standalone tape drives do not have a process to format uninitialized LTO7 media into the Type M format.

10.3   Formatting an LTO7 Type M tape in a Dell EMC library

To create Type M media from LTO7 tape cartridges in a Dell EMC tape library, users must only ensure that all hardware and tape cartridges meet the requirements from section 10.1. The remaining steps are transparent to the end user.

When a backup job begins, the backup application signals to the library to move a piece of media from a slot to a drive. The library scans the barcode, picks the media, and signals to the drive the media type before inserting it into the drive. The tape cartridge is initialized when it is first loaded into the drive and the backup application writes data at the beginning of tape. This action is sometimes called "labeling a tape" or "writing from BOT." The tape drive then establishes the density of the media. There must be a "Write from BOT" before the media can be formatted to the 9 TB capacity. Loading a tape into the drive and ejecting does not format the media.

11 Enterprise Infrastructure Planning Tool

Dell EMC provides a tool to assist customers in understanding power and cooling requirements for PowerVault tape products. The tool can be accessed at the following link:

http://dell-ui-eipt.azurewebsites.net/#/

Follow the diagram below to access the tape section: