P3AG-3752-03ENZ0

FUJITSU Storage
ETERNUS LT140 Tape Library

User's Guide -Server Connection-

FUJITSU

This page is intentionally left blank.

Preface

Fujitsu would like to thank you for purchasing our FUJITSU Storage ETERNUS LT140 Tape Library (hereinafter referred to as "LT140").

Before using the LT140, read this manual and the manuals that are provided with the server and backup software to ensure correct usage of the LT140.
This manual describes settings for the LT140, the operating system, and the backup software.
The purpose of this manual is to provide an understanding of the conditions, procedures, and operation methods for installing the LT140 prior to its use.
This manual is intended for users who have a basic knowledge of tape libraries and how they are used in computer systems.

Third Edition
December 2019

About this Manual

Organization

This manual is composed of the following five chapters:

- Chapter 1 Overview

  This chapter describes the operating environment and the setup procedure for the LT140.

- Chapter 2 Setting the LT140

  This chapter describes the settings for the Fibre Channel topology and the Mailslots.

- Chapter 3 Setting the Operating System

  This chapter describes the operating system settings that are required to use the LT140 and provides notes that are related to the settings.

- Chapter 4 Setting Backup Software

  This chapter describes the backup software settings that are required to use the LT140 and provides notes that are related to the settings.

- Chapter 5 LTFS Option

  This chapter provides notes on the LTFS option that is used with the LT140.

Additional Information

Symbols Used in This Manual

The following symbols are used throughout this manual:

Caution	This symbol alerts operators to particularly important information. Be sure to read this information.
Note	Functions and know how which can be useful when setting up or operating the LT140.

Product Names

The following abbreviations for products are used throughout this manual.

Long title	Abbreviation	
Oracle Solaris 11 Operating System	Solaris 11 OS	Solaris OS
Microsoft® Windows Server® 2008 R2 Standard (64-bit)	Windows Server 2008 R2	Windows
Microsoft® Windows Server® 2008 R2 Enterprise (64-bit)		
Microsoft® Windows Server® 2012	Windows Server 2012	
Microsoft® Windows Server® 2012 R2	Windows Server 2012 R2	
Microsoft® Windows Server® 2016	Windows Server 2016	
Microsoft® Windows Server® 2019	Windows Server 2019	
Red Hat® Enterprise Linux® 6 (for x86)	Red Hat Enterprise Linux 6	Linux
Red Hat® Enterprise Linux® 6 (for Intel64)		
Red Hat® Enterprise Linux® 7 (for Intel64)	Red Hat Enterprise Linux 7	
SUSE® Linux Enterprise Server 10	SLES 10	
SUSE® Linux Enterprise Server 11	SLES 11	
SUSE® Linux Enterprise Server 12	SLES 12	
Veritas NetBackup™	Veritas NetBackup	NetBackup
NetWorker® Power Edition	NetWorker	
NetWorker® Network Edition		
NetWorker® Workgroup Edition		
Arcserve® Backup	Arcserve Backup	
Veritas Backup Exec™	Backup Exec	
NetVault® Backup	NetVault	
Microsoft® Internet Explorer®	Internet Explorer	IE

Abbreviations Used in This Manual

- "LT140" refers to the FUJITSU Storage ETERNUS LT140 Tape Library.
- Trademark symbols such as ™ and ® are omitted in this document.

Table of Contents

Chapter 1
Overview

This chapter explains the operating systems, backup software products, and host bus adapters (HBAs) that support the LT140 and their operating environments.

Note

- Not every combination of OS version, platform, and backup software may be supported.
- For details about the functions and support status of the OSs and backup software products, refer to the relevant product manuals.

1.1 Operating Environment

1.1.1 Hardware

For hardware information, refer to our web site (https://www.fujitsu.com/global/products/computing/storage/tape/). For more details, contact a Fujitsu sales representative.

1.1.2 Operating System (OS)

For OS information, refer to our web site (https://www.fujitsu.com/global/products/computing/storage/tape/). For more details, contact a Fujitsu sales representative.

1.1.3 Host Bus Adapter (HBA)

For HBA information, refer to our web site or contact a Fujitsu sales representative.

1.1.4 FC/SAS Switches

For FC/SAS switch information, refer to our web site or contact a Fujitsu sales representative.

1.2 References for Setup

1.2.1 Solaris OS

1.2.1.1 SAS Connection for Solaris OS

The following procedure explains how to connect the LT140 to a Solaris OS server with a SAS connection.

Workflow

1

Making a Check before Starting the Procedure

Check the environment (operating system, backup software, and HBAs) of the server to be connected to the LT140. In addition, check the precautions before starting the procedure.

Refer

- "1.1 Operating Environment" (page 8)

2

Setting the LT140

Perform the settings for the LT140.

Refer

- "2.1 Settings for SAS Connections" (page 22)

3

Setting the Operating System

Make settings for the HBA driver and the device driver.

Refer

- "3.1 Solaris OS" (page 25)
- "3.1.1 SAS Connections" (page 25)
- "3.1.3.1 Getting the Server to Recognize the Device" (page 26)

4

Setting Backup Software

Apply patches, make settings for the robot driver, and set up the backup software.

Refer

- Backup software used
  - NetBackup
    - "4.1 NetBackup" (page 34)
  - NetWorker
    - "4.2 NetWorker" (page 37)
  - IBM Spectrum Protect (IBM Tivoli Storage Manager)
    - "4.3 IBM Spectrum Protect" (page 38)

1.2.1.2 Fibre Channel Connection (FC-AL Connection) for Solaris OS

The following procedure explains how to connect the LT140 to a Solaris OS server with an FC-AL connection (direct connection to a server).

Workflow

1

Making a Check before Starting the Procedure

Check the environment (operating system, backup software, and HBAs) of the server to be connected to the LT140.

Refer

- "1.1 Operating Environment" (page 8)

2

Setting the LT140

Perform the settings for the LT140.

IMPORTANT

Change the topology setting to "Fabric (N/F)" or "Loop (L)". Set fixed values for the link speed and the Loop ID/ALPA.

Refer

- "Chapter 2 Setting the LT140" (page 22)
- "2.2 Settings for Fibre Channel Connections" (page 22)
- "2.2.1 Setting the Link Speed" (page 22)
- "2.2.2 Setting the Topology and the Loop ID (for Direct Server Connections)" (page 23)

3

Setting the Operating System

Make settings for the HBA driver and the device driver.

Refer

- "3.1 Solaris OS" (page 25)
- "3.1.2 Fibre Channel Connections" (page 25)

4

Setting Backup Software

Apply patches, make settings for the robot driver, and set up the backup software.

Refer

- Backup software used
  - NetBackup
    - "4.1 NetBackup" (page 34)
  - NetWorker
    - "4.2 NetWorker" (page 37)
  - IBM Spectrum Protect (IBM Tivoli Storage Manager)
    - "4.3 IBM Spectrum Protect" (page 38)

1.2.1.3 Fibre Channel Connection (Fabric Connection) for Solaris OS

The following procedure explains how to connect the LT140 to a Solaris OS server with a fabric connection.

Workflow

1

Making a Check before Starting the Procedure

Check the FC switches and the environment (operating system, backup software, and HBAs) of the server to be connected to the LT140.

Refer

- "1.1 Operating Environment" (page 8)

2

Setting the LT140

Perform the settings for the LT140.

IMPORTANT

Change the topology setting to "Fabric". Set a fixed value for the link speed.

Refer

- "Chapter 2 Setting the LT140" (page 22)
- "2.2 Settings for Fibre Channel Connections" (page 22)
- "2.2.1 Setting the Link Speed" (page 22)
- "2.2.3 Setting the Topology (for Connections via FC Switches)" (page 23)

3

Setting the Operating System

Make settings for the HBA driver and the device driver.

Refer

- "3.1 Solaris OS" (page 25)
- "3.1.2 Fibre Channel Connections" (page 25)

4

Setting Backup Software

Apply patches, make settings for the robot driver, and set up the backup software.

Refer

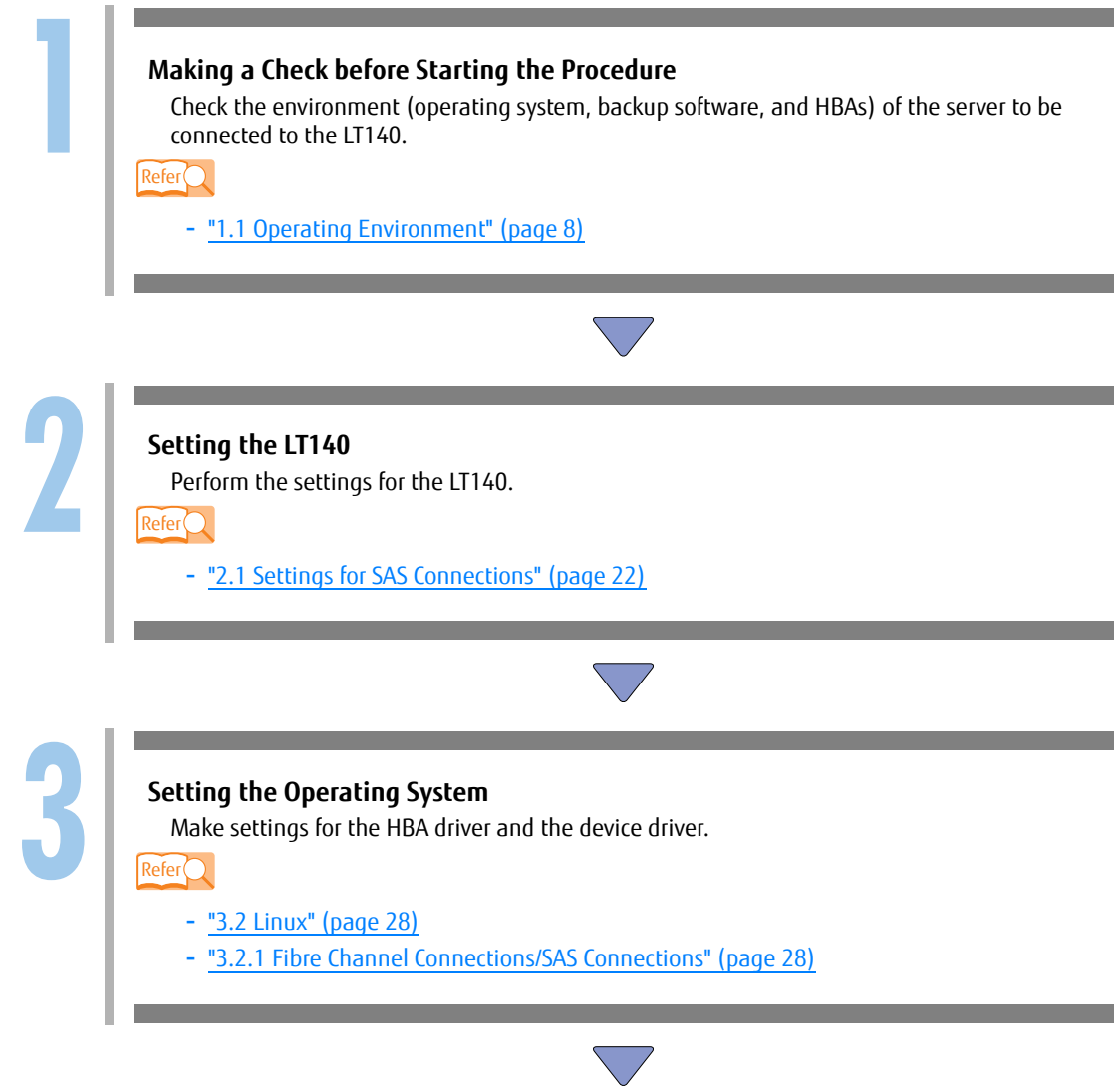
- Backup software used
  - NetBackup
    - "4.1 NetBackup" (page 34)
  - NetWorker
    - "4.2 NetWorker" (page 37)
  - IBM Spectrum Protect (IBM Tivoli Storage Manager)
    - "4.3 IBM Spectrum Protect" (page 38)

1.2.2 Linux

1.2.2.1 SAS Connection for Linux

The following procedure explains how to connect the LT140 to a Linux server with a SAS connection.

Workflow



4

Setting Backup Software

Apply patches, make settings for the robot driver, and set up the backup software.

Refer

- Backup software used
  - NetBackup
    - "4.1 NetBackup" (page 34)
  - NetWorker
    - "4.2 NetWorker" (page 37)
  - IBM Spectrum Protect (IBM Tivoli Storage Manager)
    - "4.3 IBM Spectrum Protect" (page 38)
  - NetVault
    - "4.5 NetVault" (page 40)

1.2.2.2 Fibre Channel Connection (FC-AL Connection) for Linux

The following procedure explains how to connect the LT140 to a Linux server with an FC-AL connection (direct connection to a server).

Workflow

1

Making a Check before Starting the Procedure

Check the environment (operating system, backup software, and HBAs) of the server to be connected to the LT140.

Refer

- "1.1 Operating Environment" (page 8)

2

Setting the LT140

Perform the settings for the LT140.

IMPORTANT

Change the topology setting to "Fabric (N/F)" or "Loop (L)". Set fixed values for the link speed and the Loop ID/ALPA.

Refer

- "Chapter 2 Setting the LT140" (page 22)
- "2.2 Settings for Fibre Channel Connections" (page 22)
- "2.2.1 Setting the Link Speed" (page 22)
- "2.2.2 Setting the Topology and the Loop ID (for Direct Server Connections)" (page 23)

3

Setting the Operating System

Make settings for the HBA driver and the device driver.

Refer

- "3.2 Linux" (page 28)
- "3.2.1 Fibre Channel Connections/SAS Connections" (page 28)

4

Setting Backup Software

Apply patches, make settings for the robot driver, and set up the backup software.

Refer

- Backup software used
  - NetBackup
    - "4.1 NetBackup" (page 34)
  - NetWorker
    - "4.2 NetWorker" (page 37)
  - IBM Spectrum Protect (IBM Tivoli Storage Manager)
    - "4.3 IBM Spectrum Protect" (page 38)
  - NetVault
    - "4.5 NetVault" (page 40)

1.2.2.3 Fibre Channel Connection (Fabric Connection) for Linux

The following procedure explains how to connect the LT140 to a Linux server with a fabric connection.

Workflow

1

Making a Check before Starting the Procedure

Check the FC switches and the environment (operating system, backup software, and HBAs) of the server to be connected to the LT140.

Refer

- "1.1 Operating Environment" (page 8)

2

Setting the LT140

Perform the settings for the LT140.

IMPORTANT

Change the topology setting to "Fabric". Set a fixed value for the link speed.

Refer

- "Chapter 2 Setting the LT140" (page 22)
- "2.2 Settings for Fibre Channel Connections" (page 22)
- "2.2.1 Setting the Link Speed" (page 22)
- "2.2.3 Setting the Topology (for Connections via FC Switches)" (page 23)

3

Setting the Operating System

Make settings for the HBA driver and the device driver.

Refer

- "3.2 Linux" (page 28)
- "3.2.1 Fibre Channel Connections/SAS Connections" (page 28)

4

Setting Backup Software

Apply patches, make settings for the robot driver, and set up the backup software.

- Backup software used
  - NetBackup
    - "4.1 NetBackup" (page 34)
  - NetWorker
    - "4.2 NetWorker" (page 37)
  - IBM Spectrum Protect (IBM Tivoli Storage Manager)
    - "4.3 IBM Spectrum Protect" (page 38)
  - NetVault
    - "4.5 NetVault" (page 40)

1.2.3 Windows

1.2.3.1 SAS Connection for Windows

The following procedure explains how to connect the LT140 to a Windows server with a SAS connection.

Workflow

1

Making a Check before Starting the Procedure

Check the environment (operating system, backup software, and HBAs) of the server to be connected to the LT140.

- "1.1 Operating Environment" (page 8)

2

Setting the LT140

Perform the settings for the LT140.

- "2.1 Settings for SAS Connections" (page 22)

3

Setting the Operating System

Make settings for the HBA driver and the device driver.

Refer

- "3.3 Windows" (page 29)
- "3.3.1 SAS Connections" (page 29)

4

Setting Backup Software

Apply patches, make settings for the robot driver, and set up the backup software.

Refer

- Backup software used
  - NetBackup
    - "4.1 NetBackup" (page 34)
  - IBM Spectrum Protect (IBM Tivoli Storage Manager)
    - "4.3 IBM Spectrum Protect" (page 38)
  - Backup Exec
    - "4.4 Backup Exec" (page 39)
  - NetVault
    - "4.5 NetVault" (page 40)
  - Arcserve Backup
    - "4.6 Arcserve Backup" (page 50)
  - Veeam Backup & Replication
    - "4.7 Veeam Backup & Replication" (page 50)

1.2.3.2 Fibre Channel Connection (FC-AL Connection) for Windows

The following procedure explains how to connect the LT140 to a Windows server with an FC-AL connection (direct connection to a server).

Workflow

1

Making a Check before Starting the Procedure

Check the environment (operating system, backup software, and HBAs) of the server to be connected to the LT140.

Refer

- "1.1 Operating Environment" (page 8)

2

Setting the LT140

Perform the settings for the LT140.

IMPORTANT

Change the topology setting to "Fabric (N/F)" or "Loop (L)". Set fixed values for the link speed and the Loop ID/ALPA.

Refer

- "Chapter 2 Setting the LT140" (page 22)
- "2.2 Settings for Fibre Channel Connections" (page 22)
- "2.2.1 Setting the Link Speed" (page 22)
- "2.2.2 Setting the Topology and the Loop ID (for Direct Server Connections)" (page 23)

3

Setting the Operating System

Make settings for the HBA driver and the device driver.

Refer

- "3.3 Windows" (page 29)
- "3.3.2 Fibre Channel Connections" (page 30)

4

Setting Backup Software

Apply patches, make settings for the robot driver, and set up the backup software.

Refer

- Backup software used
  - NetBackup
    - "4.1 NetBackup" (page 34)
  - NetWorker
    - "4.2 NetWorker" (page 37)
  - IBM Spectrum Protect (IBM Tivoli Storage Manager)
    - "4.3 IBM Spectrum Protect" (page 38)
  - Backup Exec
    - "4.4 Backup Exec" (page 39)
  - NetVault
    - "4.5 NetVault" (page 40)
  - Arcserve Backup
    - "4.6 Arcserve Backup" (page 50)
  - Veeam Backup & Replication
    - "4.7 Veeam Backup & Replication" (page 50)

1.2.3.3 Fibre Channel Connection (Fabric Connection) for Windows

The following procedure explains how to connect the LT140 to a Windows server with a fabric connection.

Workflow

1

Making a Check before Starting the Procedure

Check the FC switches and the environment (operating system, backup software, and HBAs) of the server to be connected to the LT140.

Refer

- "1.1 Operating Environment" (page 8)

2

Setting the LT140

Perform the settings for the LT140.

IMPORTANT

Change the topology setting to "Fabric". Set a fixed value for the link speed.

Refer

- "Chapter 2 Setting the LT140" (page 22)
- "2.2 Settings for Fibre Channel Connections" (page 22)
- "2.2.1 Setting the Link Speed" (page 22)
- "2.2.3 Setting the Topology (for Connections via FC Switches)" (page 23)

3

Setting the Operating System

Make settings for the HBA driver and the device driver.

Refer

- "3.3 Windows" (page 29)
- "3.3.2 Fibre Channel Connections" (page 30)

4

Setting Backup Software

Apply patches, make settings for the robot driver, and set up the backup software.

Refer

- Backup software used
  - NetBackup
    - "4.1 NetBackup" (page 34)
  - NetWorker
    - "4.2 NetWorker" (page 37)
  - IBM Spectrum Protect (IBM Tivoli Storage Manager)
    - "4.3 IBM Spectrum Protect" (page 38)
  - Backup Exec
    - "4.4 Backup Exec" (page 39)
  - NetVault
    - "4.5 NetVault" (page 40)
  - Arcserve Backup
    - "4.6 Arcserve Backup" (page 50)
  - Veeam Backup & Replication
    - "4.7 Veeam Backup & Replication" (page 50)

Chapter 2
Setting the LT140

This chapter describes the necessary LT140 settings to use the LT140 from backup software.
Use the operator panel to perform the settings that are described below. For more details about how to use the operator panel, refer to "FUJITSU Storage ETERNUS LT140 Tape Library User's Guide -Panel Operation-" and "FUJITSU Storage ETERNUS LT140 Tape Library User's Guide -Installation & Operation-".

Check whether the LT140 supports your server environment by referring to our web site (https://www.fujitsu.com/global/products/computing/storage/tape/).

2.1 Settings for SAS Connections

No setting is required for SAS models.

2.2 Settings for Fibre Channel Connections

This section explains how to set up the drives for Fibre Channel connections.

2.2.1 Setting the Link Speed

For the link speed of a drive path, 2Gbit/s, 4Gbit/s, or 8Gbit/s can be selected.
For more details about the settings, refer to "FUJITSU Storage ETERNUS LT140 Tape Library User's Guide -Panel Operation-".

Note

Although the "Auto" setting can be selected, select one of the fixed values according to the FC switch or the HBA of the connection destination that is used.

Caution

When connecting the LT140 to a Brocade 16G FC switch (BR65xx/EBRDC8x) with a link speed of 8Gbit/s, apply firmware version v7.3.0c or later to the FC switch and perform the following settings.

- FC switch

  (1) For the port to which the LT140 tape drive is connected, fix the speed to 8Gbit/s with the "portcfg-speed" command.

  (2) For the port to which the LT140 tape drive is connected, disable the DFE function (*1) with the "portcfgnondfe" command.

  *1: The Decision Feedback Equalization (DFE) function corrects signal noises on the receiver. Disable this function because it may prevent the port connected to the LTO drive from correctly recognizing the signal.

- LT140

  (3) Fix the link speed of the LT140 tape drive to 8Gbit/s.

These settings are not required if the LT140 is connected to a Brocade 32G FC switch (Brocade G610/G620/G630/X6-4/X6-8) because the LT140 automatically recognizes the link speed.

2.2.2 Setting the Topology and the Loop ID (for Direct Server Connections)

The following settings are required for direct server connections:

- If the Fibre Channel card of the server is an LPe3xxxx series, a PY-FC33x/PY-FC35x series, an MC-0JFCFx/MC-0JFCGx/MC-0JFCMx/MC-0JFCNx series, or an SP1X7FBC2F

  Port Type: Fabric (N/F)

- If the Fibre Channel card of the server is a series other than the above

  Port Type: Loop(L)
  Addressing mode: Hard
  Loop ID/ALPA: Any value

For more details about the settings, refer to "FUJITSU Storage ETERNUS LT140 Tape Library User's Guide -Panel Operation-".

2.2.3 Setting the Topology (for Connections via FC Switches)

The following settings are required for connections via FC switches.
For more details about the settings, refer to "FUJITSU Storage ETERNUS LT140 Tape Library User's Guide -Panel Operation-".

Port Type: Fabric(N/F)

Caution

Although the "Auto" setting can be selected, select one of the fixed values described above.

2.3 Setting the Mailslot

The LT140 has Mailslots that allow tape cartridges to be inserted into or ejected from the library while the library is online.
For more details about how to enable the Mailslots, refer to "FUJITSU Storage ETERNUS LT140 Tape Library User's Guide -Panel Operation-".

Chapter 3

Setting the Operating System

This chapter describes the operating system settings that are required to use the LT140 and provides notes that are related to the settings.

Note

- Refer to the manual of the applicable operating system for information about how to perform operations in that operating system.
- Special setting for the LT140 is not required for the operating system unless it is noted in this manual.

3.1 Solaris OS

This section provides notes on Solaris OS settings.

3.1.1 SAS Connections

When the LT140 is used with a SAS connection, operations are performed with the OS standard device driver.

3.1.2 Fibre Channel Connections

When the LT140 is used with a Fibre Channel connection, operations are performed with the OS standard device driver.

3.1.3 Device Drivers

3.1.3.1 Getting the Server to Recognize the Device

(1) Check the settings.

Add the descriptions of the device to the st driver setting file (/kernel/drv/st.conf) by using a text editor (such as vi).

- Example

```
#
# Copyright 2004 Sun Microsystems, Inc.  All rights reserved.
#  Use is subject to license terms.
#

#
#pragma ident   "@(#)st.conf    1.34    04/06/24 SMI"
#
name="st" class="scsi" target=0 lun=0;
name="st" class="scsi" target=1 lun=0;
name="st" class="scsi" target=2 lun=0;
name="st" class="scsi" target=3 lun=0;
name="st" class="scsi" target=4 lun=0;
name="st" class="scsi" target=5 lun=0;
name="st" class="scsi" target=6 lun=0;

#
# In case there are wide tape drives, one can use these targets
#
#name="st" class="scsi" target=8 lun=0;
#name="st" class="scsi" target=9 lun=0;
#name="st" class="scsi" target=10 lun=0;
#name="st" class="scsi" target=11 lun=0;
#name="st" class="scsi" target=12 lun=0;
#name="st" class="scsi" target=13 lun=0;
#name="st" class="scsi" target=14 lun=0;
#name="st" class="scsi" target=15 lun=0;

# This line adds support for Fibre Channel Tapes
name="st" parent="fp" target=0;
```

- FC-AL connection
  For "target=", specify the Loop-ID that is set in the LT140.
- Fabric connection (for SE0X7F11X or SE0X7F12X only)
  For "target=", specify the target ID of the "fcp-bind-target" parameter that is described in the setting file of the HBA device driver (/kernel/drv/fjpfca.conf).

Note

The setting file does not need to be edited for SE0X7F21X, SE0X7F22X, SE0X7F31X, and SE0X7F32X.

(2) Restart the server.

Reconfigure and restart the server to make the server recognize the registered device. Execute the following command.

```
# touch /reconfigure
# /usr/sbin/shutdown -y -g0 -i6
```

(3) Check the device files.

Check the device files after the server reboots.

```
# ls /dev/rmt
```

- Example

The following example shows the device files when a 2-drive model LT140 is connected to a server (with only internal DAT devices installed) that is not connected to any other tape libraries.

```
# ls /dev/rmt

0      0cb    0hb    0lb    0mb    0u     1      1cb    1hb    1lb    1mb    1u     2      2cb    2hb    2lb    2mb    2u
0b     0cbn   0hbn   0lbn   0mbn   0ub    1b     1cbn   1hbn   1lbn   1mbn   1ub    2b     2cbn   2hbn   2lbn   2mbn   2ub
0bn    0cn    0hn    0ln    0mn    0ubn   1bn    1cn    1hn    1ln    1mn    1ubn   2bn    2cn    2hn    2ln    2mn    2ubn
0c     0h     0l     0m     0n     0un    1c     1h     1l     1m     1n     1un    2c     2h     2l     2m     2n     2un
#
```

In this example, "0xxx" are device files for the internal DAT devices and "1xxx" and "2xxx" are device files for the drives in the LT140.

3.1.4 File System Performance Tuning

UFS performance may be reduced in an environment that uses ZFS.
If performance is reduced, set an appropriate value for the "zfs_arc_max" parameter in order to increase the performance.
Refer to "Oracle Solaris ZFS Tunable Parameters" in "Oracle Solaris Tunable Parameters Reference Manual" for details.

3.2 Linux

This section provides notes on Linux settings.

3.2.1 Fibre Channel Connections/SAS Connections

This section provides notes on using a Fibre Channel connection or SAS connection to connect the LT140.

(1) Checking the devices

Perform the following procedure to check whether the devices (tape drives) are correctly connected to the server.

Procedure

1. Log in to the server with the root privilege.
2. Execute the "cat /proc/scsi/scsi" command to display a list of the connected devices.
   - Example of an LT140 FC model with a single drive configuration

```
# cat /proc/scsi/scsi
Host: scsi5 Channel: 00 Id: 00 Lun: 00
  Vendor: IBM      Model: Ultrium 6-SCSI   Rev: Y67B
  Type:   Sequential-Access                ANSI SCSI revision: 05
Host: scsi5 Channel: 00 Id: 00 Lun: 01
  Vendor: FUJITSU  Model: ETERNUS LT140    Rev: 4.41
  Type:   Medium Changer                   ANSI SCSI revision: 05
```

Note

- "Vendor: IBM Model: Ultrium6-SCSI" indicates an Ultrium6 drive.
- "Vendor: FUJITSU Model: ETERNUS LT140" indicates an LT140 library controller.

From the above contents, check whether the LT140 controller and drives are recognized in correct paths and whether the values of the recognized target ID and LUN match those of the LT140 drives.

End of procedure

(2) Setting fixed device file names

When a Fibre Channel connection or SAS connection is used to connect the LT140, the device file name that is assigned to a device must be associated with a physical device. This association is a fixed setting.

Note that this setting is not required when the device that is being used can be associated by the backup software, such as NetBackup, NetVault, or IBM Spectrum Protect. For information on whether the backup software supports associations and for version information, contact your sales representative or maintenance engineer.

3.3 Windows

This section provides notes on Windows settings.

3.3.1 SAS Connections

This section provides notes on using a SAS connection to connect the LT140.

(1) Install the driver.
For more details about how to obtain and install the driver, refer to the manual that is provided with each SAS HBA.

(2) Check the devices.
Reboot the server, and then perform the following procedure to check that the devices are properly connected:

Procedure

1. Open [Device Manager] from [Control Panel].
2. Change [View] of [Device Manager] to [Device (by Connection)].
3. Confirm that "IBM UltriumX SCSI Sequential Device" or "Unknown Medium Changer Device" (controller) are displayed for the HBA that is connected to the LT140.
"UltriumX" shows the drive type. For example, "Ultrium7" is displayed for LTO7 drives and "Ultrium8" is displayed for LTO8 drives.

Note

The "?" icon may be displayed for "HP UltriumX SCSI Sequential Device" or "IBM UltriumX SCSI Sequential Device". In this situation, the LTO drive is not recognized due to the backup software or the version of the backup software used. To solve this problem, reinstall the driver using the procedure indicated in "3.3.4 Installing a Driver" (page 33).

End of procedure

After the contents in Step 3 are checked in the Device Manager, the connection test is complete.

IMPORTANT

If the above contents cannot be checked, check again whether the HBA driver has been successfully installed. If no problem is found with the installation of the HBA driver, a powered-off LT140 or loose connection can be assumed. Check the settings and reboot the server before considering the contents.

3.3.2 Fibre Channel Connections

This section explains how to set up the server to connect the tape library by using a Fibre Channel connection.

(1) Install the driver and set up the Fibre Channel card.

For details about how to install the driver and set up the Fibre Channel card, refer to the manual that is provided with each Fibre Channel card.

Caution

Fixing the target ID
The target ID is assigned to a device which connects to the Fibre Channel card. By default, the target ID is automatically set by the driver. Therefore, the assigned target ID of the device may be changed when adding or removing devices. It may also be changed based on the state in which the device is recognized. If the target ID is different before and after rebooting the server, depending on the OS and application, the device may go off-line and become unavailable. To avoid this, setting the fixed target ID to each device is recommended.

(2) Check the devices.

Procedure

1. Open [Device Manager] from [Control Panel].
2. Change [View] of [Device Manager] to [Device (by Connection)].
3. Confirm that "IBM UltriumX SCSI Sequential Device" or "Unknown Medium Changer Device" (controller) are displayed for the HBA that is connected to the LT140.
"UltriumX" shows the drive type. For example, "Ultrium7" is displayed for LTO7 drives and "Ultrium8" is displayed for LTO8 drives.

Note

The "?" icon may be displayed for "HP UltriumX SCSI Sequential Device" or "IBM UltriumX SCSI Sequential Device". In this situation, the LTO drive is not recognized due to the backup software or the version of the backup software used. To solve this problem, reinstall the driver using the procedure indicated in "3.3.4 Installing a Driver" (page 33).

End of procedure

After the contents in Step 3 are checked in the Device Manager, the connection test is complete.

IMPORTANT

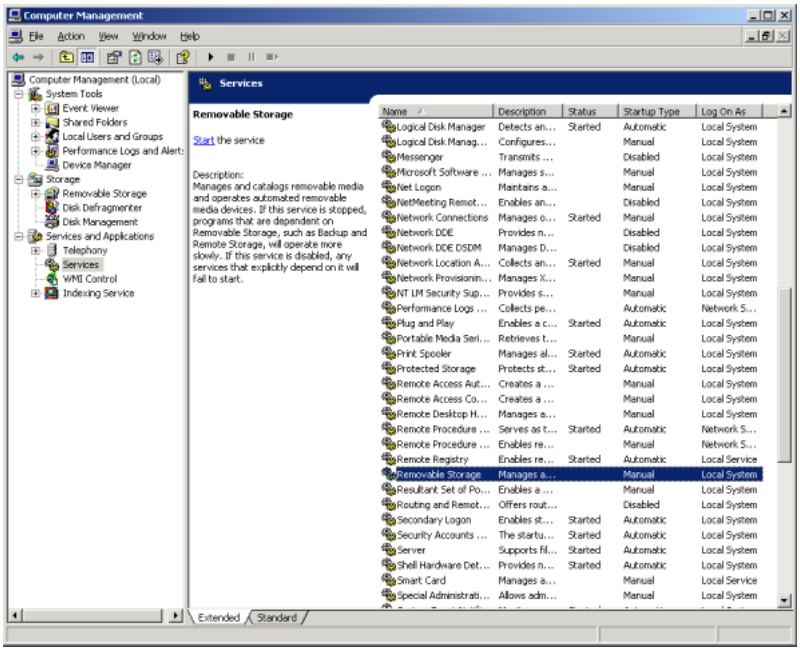
If the above contents cannot be checked, check again whether the HBA driver has been successfully installed. If no problem is found with the installation of the HBA driver, a powered-off LT140, loose connection, or a setting error of topology/Loop ID can be assumed. Check the settings and reboot the server before considering the contents.

3.3.3 Removable Storage Manager (RSM)

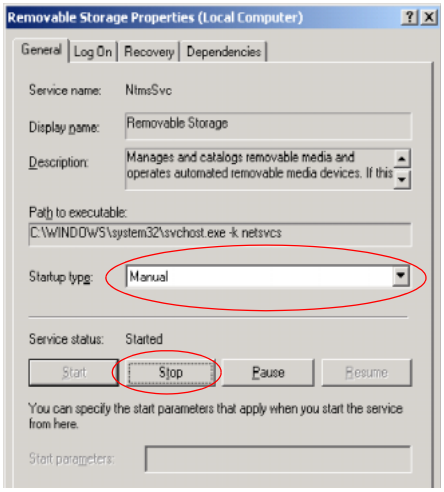
If the Removable Storage Manager (RSM) service is enabled, backup software operations may be affected. RSM must be stopped.
Perform the following procedure to stop RSM.

Procedure

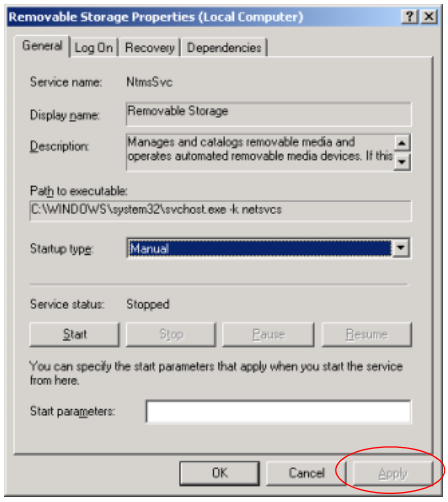
1 Open [Services] and double-click [Removable Storage].



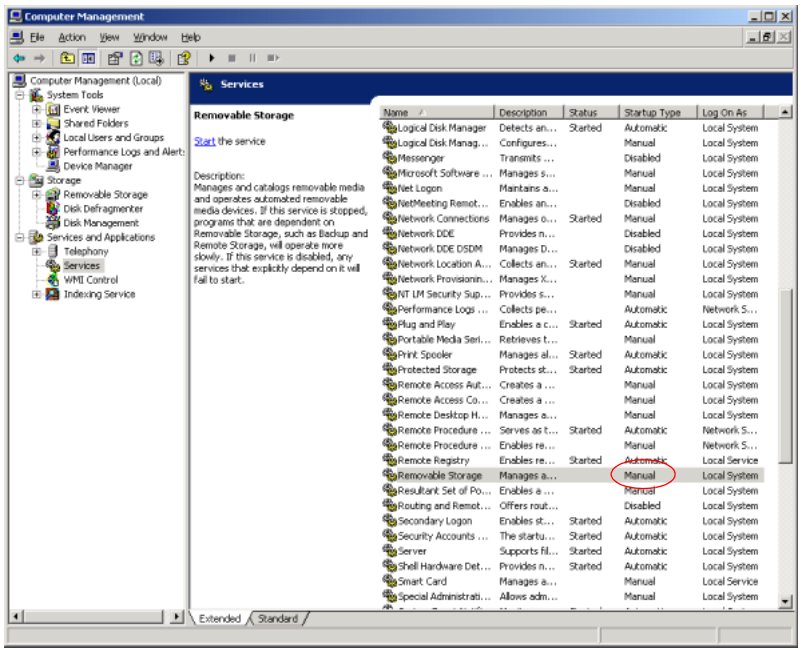
2 Set [Startup type] to [Manual]. Click the [Stop] button in [Service status] to stop the service.



3 Click the [Apply] button to enable the setting.



4 Close the window after checking that [Manual] is displayed for [Startup Type].



End of procedure

3.3.4 Installing a Driver

When a server is configured or an LTO drive is replaced, the LTO drive may not be recognized by the backup software used. In this case, the LTO drive may not be recognized properly by the device manager. Therefore, reinstall the driver using the following procedure.

Procedure

1. Open [Device Manager] from [Control Panel] and right-click on the tape drive displayed with the "?" icon.
2. Select [Update Driver Software].
3. Select [Browse my computer for driver software].
4. Select [Let me pick from a list of device drivers on my computer].
5. Select [Tape drives] from [Common hardware types].
6. Select the following driver to install it.
   Manufacturer: LTO
   Model: LTO Tape drive
7. Click the [Next] button and then click the [Yes] button for [Update Driver Warning].
8. Close the driver installation completion window.

End of procedure

Chapter 4
Setting Backup Software

This chapter provides information on the backup software settings that are required to use the LT140 and notes that are related to the settings.

Note

- Refer to the manual supplied with each type of backup software for information about standard settings and operating procedures for that backup software.
- Displayed windows and operations may vary depending on the backup software version. If differences exist, perform the operation according to the manual supplied with the backup software.
- If the backup software can specify whether to return a tape cartridge from a tape drive to the slot in a library after a backup or restore processing is complete, set the backup software to return the tape cartridge to the slot. A tape is left exposed from a tape cartridge that is left unremoved from a tape drive. If a tape is left exposed for a long time, dust may accumulate on the surface of the tape on which the data is recorded. This may cause a data read/write error.

Caution

"ETERNUS LT260" is displayed as the inquiry information in the device management window. This is the identification information as a device and does not indicate the library's name.
The item name that indicates the inquiry information differs depending on the backup software. Replace the item name according to the manual supplied with the backup software to check the inquiry information.

4.1 NetBackup

This section provides notes about the settings that are performed for NetBackup.

4.1.1 Notes on Operation

Cleaning tape drives

NetBackup has a function to automatically clean tape drives. When automatically cleaning tape drives, use the NetBackup's automatic cleaning function.

4.1.2 Applying Patches

Before using NetBackup for the LT140, contact the seller of NetBackup to download the latest Release Updates and latest Device Mappings Package.

4.1.3 Notes on Using Solaris OS

For Solaris 11 OS, only the global zone is supported by NetBackup.
When using NetBackup on Solaris 11.4 OS, perform the following actions.

(1) Apply SRU19061 or later to Solaris 11.4 OS.

(2) Disable the shared memory on the NetBackup master server with the following procedure.

Note

- This procedure must be performed on the Solaris NetBackup master server.
- This procedure does not need to be performed on the Solaris NetBackup media server or client.

Procedure

1. Stop the NetBackup service.
2. Copy "server.conf" to back it up.
   Example:

```
# cd /usr/openv/var/global
# cp -rp server.conf server.conf-orig
```

3. Add "-hs" to the options specified in the "server.conf" file.
   In the following example, "-hs" is added before "-k".
   Example:

```
# cat /usr/openv/var/global/server.conf
-c 200M -ch 32768M -cl 200M -gd DBA -gk DBA -gl DBA -gna 1 -gp 4096 -hs -k -m
-n NB_bk_server
-o /usr/openv/db//log/server.log -os 1M -ti 0 -ud -wc- -x
tcpip(LocalOnly=YES;ServerPort=13785)
```

4. Start the NetBackup service.
5. Check "/usr/openv/db/log/server.log" after starting the NetBackup service.
   Make sure the following messages are not output when NetBackup is started.

```
I. 02/05 08:37:56. Trying to start SharedMemory link ...
I. 02/05 08:37:56. SharedMemory link started successfully
```

End of procedure

4.1.4 Notes on Using Windows

If NetBackup 7 or later is used, download and install the driver corresponding to the Windows OS version and CPU on the IBM web site "Fix Central".

4.1.5 Setting the Media Mount Timeout

- For details on how to set the media mount timeout for NetBackup, refer to the manual supplied with NetBackup.
  For UNIX or Linux, refer to "Symantec NetBackup X.X Administrator's Guide for UNIX and Linux, Volume I".
  For Windows, refer to "Symantec NetBackup X.X Administrator's Guide for Windows, Volume I".
- Use the following formula to determine what media mount timeout value should be set for the LT140:

Media mount timeout (in minutes) = 4 × Number of installed tape drives + 43

  For example, the media mount timeout value is 75 minutes for the LT140 in which eight tape drives are installed.
  When the media mount timeout is set to "0", the LT140 can be operated with an infinite timeout value. However, using an infinite timeout value may prevent a backup/restore failure from being detected. Setting a media mount timeout value that is based upon the configuration is recommended.
- The media mount timeout value is a minute-based value for Windows and a second-based value for Solaris or Linux.

Caution

"NetBackup X.X" shows the software name and version for example "NetBackup 7.5". Please refer the appropriate manual to the software version.

4.1.6 Notes on Using Batch Files or Shell Scripts

When multiple backup/restore operations are executed at the same time by using batch files or shell scripts, the LT140 may become busy due to multiple NetBackup robot operations. This may cause any backup/restore operations to fail. Use of the NetBackup Administration Console is recommended for multiple backup/restore execution.
To execute multiple backup/restore operations at the same time by using batch files or shell scripts, set an interval after a mount operation or an unmount operation is complete. The recommended guideline for the time to set as the interval after a mount operation or an unmount operation is the total number of tape drives multiplied by 120 (in seconds). To set the interval, use the sleep operation or another operation.
In addition, perform the settings that are described in "4.1.5 Setting the Media Mount Timeout" (page 36).

4.2 NetWorker

This section provides notes about the settings that are performed for NetWorker.

4.2.1 Notes on Operation

Cleaning tape drives

- NetWorker has a function to automatically clean tape drives. When automatically cleaning tape drives, use the NetWorker's automatic cleaning function.
- To use the NetWorker cleaning function, set the cleaning delay to 300 or more. For details, refer to the manual supplied with NetWorker. When the automatic cleaning setting is enabled for the library type setting or the drive type setting of Networker, the slot with the last slot number is used as a cleaning slot by default. However, any slot can be set as the cleaning slot. For more details, refer to the manual supplied with NetWorker.

Name resolution

When the name resolution of the server IP address and the server name fails, NetWorker may not be able to recognize the LT140. For correct name resolution, check the server settings. For more details, refer to the manual supplied with NetWorker.

4.2.2 Notes on Using Solaris OS

For Solaris 11 OS 11/11 or later, only the global zone is supported by NetWorker.
A tape library (jukebox) may not be automatically detected with the "jbconfig" command when Solaris 11 OS 11/11 or later is used. If this occurs, the tape library must be manually specified. For details, refer to the manual supplied with NetWorker.

4.2.3 Notes on Using Windows

If NetWorker is used, download and install the driver corresponding to the Windows OS version and CPU on the IBM web site "Fix Central".

If the LT140 has multiple tape drives, a restart of the Windows OS may change the recognition order of the tape drives during the system startup.
If NetWorker uses the LT140, the changed recognition order of the tape drives becomes inconsistent with the recognition order in NetWorker and prevents NetWorker from using the LT140. To prevent this problem, configure the registry so that NetWorker uses the unique identification information (such as serial numbers) that is specified for the tape drive.

Refer to the user's guide of the IBM driver for details.

4.3 IBM Spectrum Protect

This section provides notes on the settings that are performed for IBM Spectrum Protect.

4.3.1 Notes on Operation

Cleaning tape drives

IBM Spectrum Protect has a function to automatically clean tape drives. When automatically cleaning tape drives, use the IBM Spectrum Protect's automatic cleaning function.

4.3.2 Device Drivers

When using IBM Spectrum Protect for the LT140, use the IBM Spectrum Protect device driver. The IBM Spectrum Protect device driver is supplied with IBM Spectrum Protect. For details, refer to the manual supplied with your software.

4.3.3 Notes on Using Solaris OS

For Solaris 11 OS, only the global zone is supported by IBM Spectrum Protect.
In case that the Solaris 11 OS is used, only IBM Spectrum Protect agent can connect to the LT140 library.

4.4 Backup Exec

This section provides notes on the settings that are performed for Backup Exec.

4.4.1 Notes on Operation

Cleaning tape drives

Backup Exec has a function to automatically clean tape drives. When automatically cleaning tape drives, use the Backup Exec's automatic cleaning function.

4.4.2 Device Drivers

A Veritas Technologies LLC tape device driver is required to use the LT140 if the OS is Windows Server 2008 R2 or earlier. Windows Server 2012 or later doesn't require a driver.
To download the latest tape device driver, contact the seller of the software.

4.5 NetVault

This section provides notes about the settings that are performed for NetVault.

4.5.1 Notes on Operation

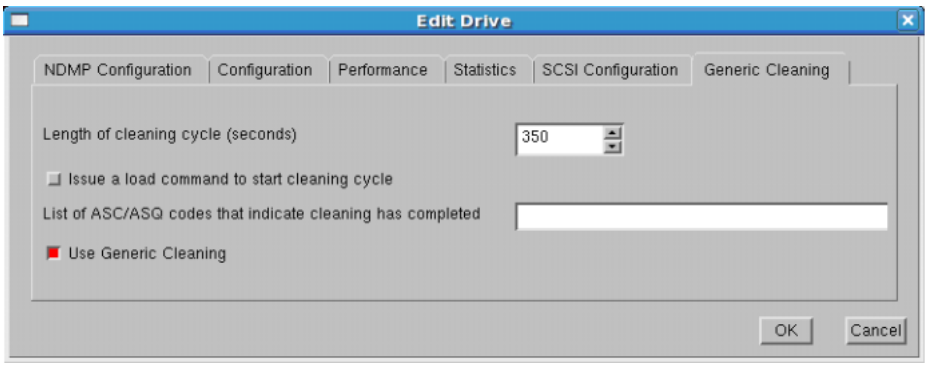
Cleaning tape drives

- NetVault has a function to automatically clean tape drives. When automatically cleaning tape drives, use the NetVault's automatic cleaning function.
- To use the NetVault cleaning function, make settings as follows.
  - For NetVault Backup 9 and earlier
    To use the cleaning function for NetVault Backup 9 or earlier, perform the following settings.

Procedure

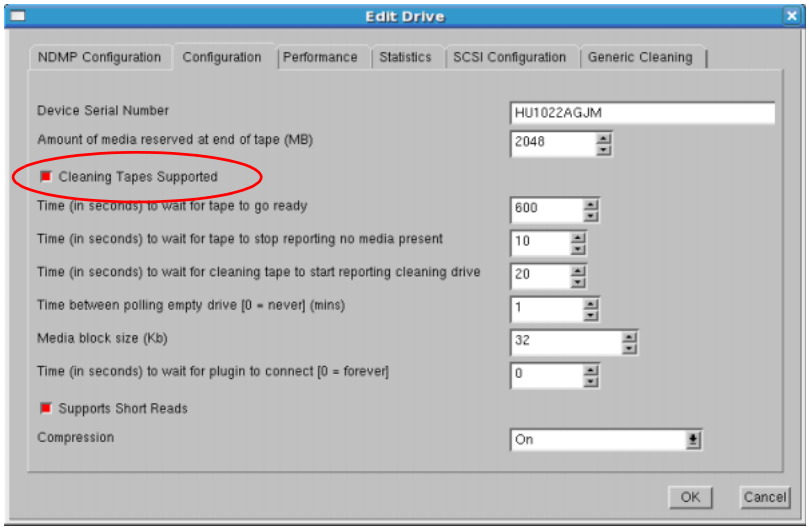
1 Specify the Generic Cleaning items of the drive as follows:
- Issue a load command to start cleaning cycle: off (the default setting is "on")
- Use Generic Cleaning: on (the default setting is "off")

The following shows an example configuration in which "Issue a load command to start cleaning cycle" is set to "off" and "Use Generic Cleaning" is set to "on".



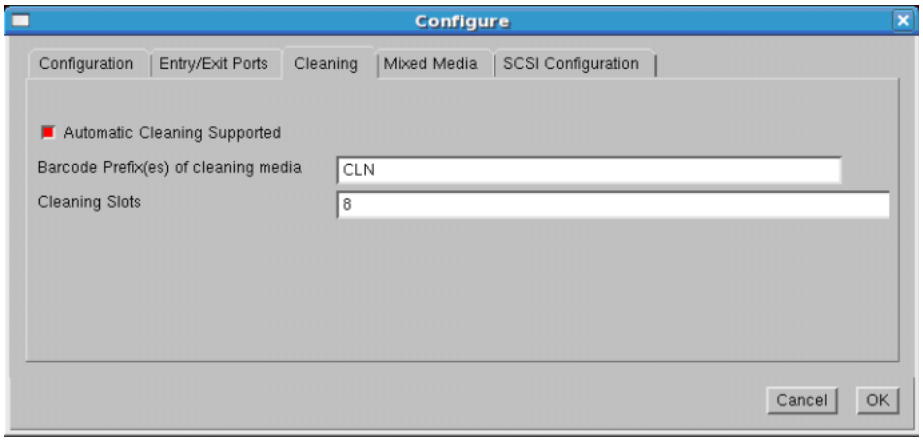
2 Specify the Configuration item of the drive as follows:

- Cleaning Tapes Supported: on



3 Specify the Cleaning items of the drive as follows:

- Automatic Cleaning Supported: on
- Barcode Prefix(es) of cleaning media: Set with the character string that is on the label of the cleaning cartridge.
- Cleaning Slots: Slot number where a cleaning cartridge is stored.



End of procedure

- For NetVault Backup 10 and later
To use the cleaning function for NetVault Backup 10 or later, perform the following settings using the "deviceconfig" command.

Note

If NetVault Backup 11.2 or later is used, the settings can be performed with the WebUI. For details, refer to "- When WebUI is used with NetVault Backup 11.2 or later" (page 46).

Procedure

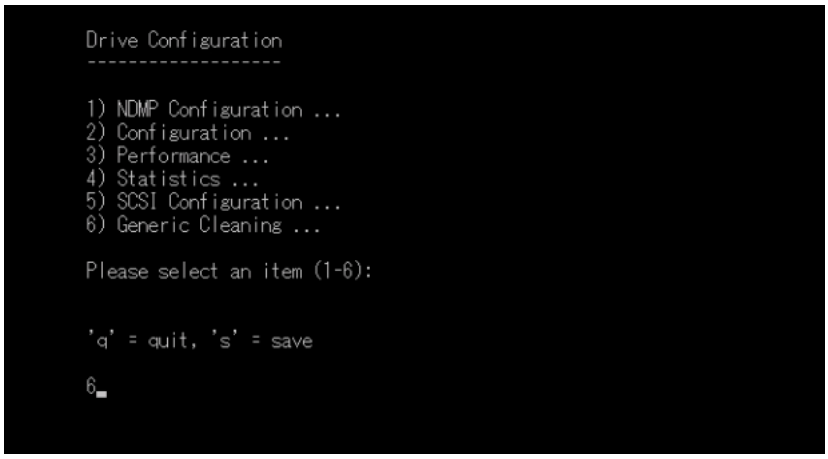
1 Start the command prompt and change directory to the following location.
<Installation folder for NetVault>\bin

2 Execute the "deviceconfig" command to perform the drive cleaning settings.

```
deviceconfig.exe -username <user_name_for_NetVault> -password <password>
-drivemachine <NetVault_machine_name_where_the_drive_is_connected>
-drivepath <drive_name_or_path_to_the_drive>
```

The Drive Configuration screen appears.

3 Enter "6" and then press the [Enter] key.

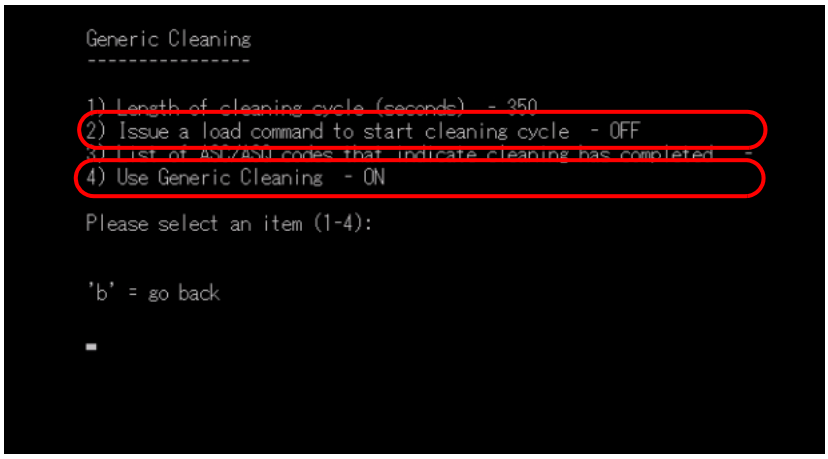


"6) Generic Cleaning..." is selected. The Generic Cleaning screen appears.

4 Specify the Generic Cleaning items as follows:

- Issue a load command to start cleaning cycle: OFF (the default setting is "ON")
- Use Generic Cleaning: ON (the default setting is "OFF")

The following shows an example configuration in which "Issue a load command to start cleaning cycle" is set to "OFF" and "Use Generic Cleaning" is set to "ON".

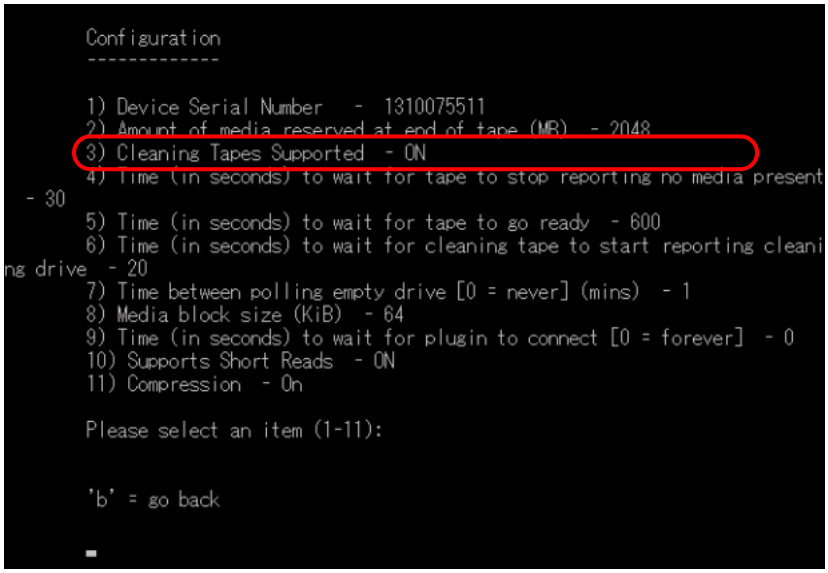


5 Enter "b" and then press the [Enter] key.
The Device Configuration screen appears again.

6 Enter "2" and then press the [Enter] key.
"2) Configuration..." is selected. The Configuration screen appears.

7 Confirm that the item described below is set to "ON".
Change to "ON" if this item is currently set to "OFF".

- Cleaning Tapes Supported



8 Enter "b" and then press the [Enter] key.
Return to the Drive Configuration screen.

9 In the Device Configuration screen, enter "s" to save the settings.

The drive setting is complete.

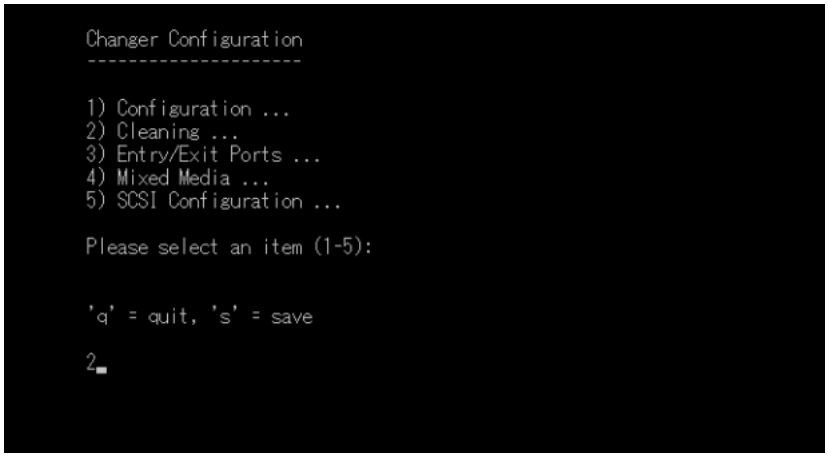
10 Enter "q" to quit the Drive Configuration screen.

11 Execute the following command to perform the library cleaning settings.

```
deviceconfig.exe -username <user_name_for_NetVault> -password <password>
-librarymachine <NetVault_machine name_where_the_library_is_connected>
-libraryname <library_name>
```

The Changer Configuration screen appears.

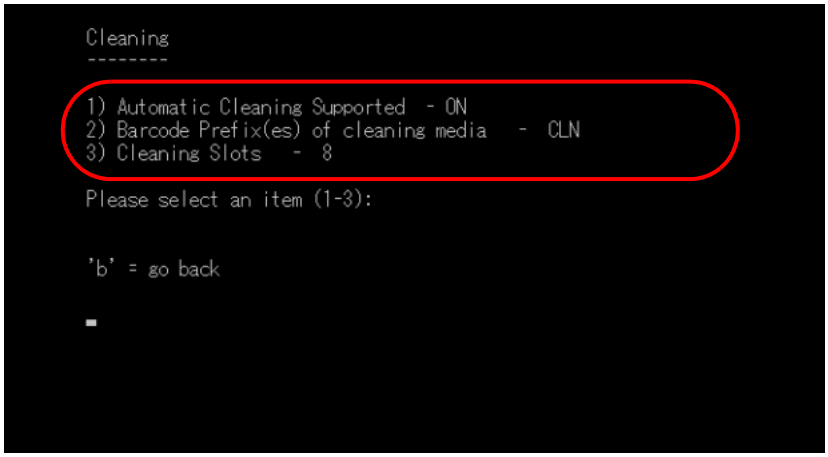
12 Enter "2" and then press the [Enter] key.



"2) Cleaning..." is selected. The Cleaning screen appears.

13 Set the Cleaning items as shown below.

- Automatic Cleaning Supported
  ON (the default setting is "ON")
- Barcode Prefix(es) of cleaning media
  Set with the character string that is on the label of the cleaning cartridge.
- Cleaning Slots
  The slot numbers where the cleaning cartridges are to be stored.



14 Enter "b" and then press the [Enter] key.
The Changer Configuration screen appears again.

15 In the Changer Configuration screen, enter "s" to save the settings.

16 Enter "q" to quit the Drive Configuration screen.

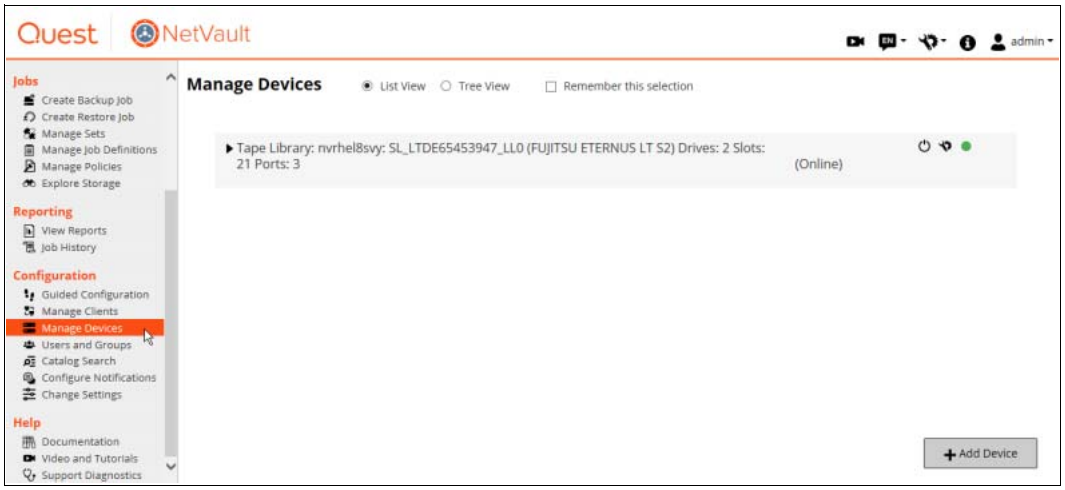
17 In [Manage Devices] of NetVault WebUI, click the [Manage Library] button of the target library to switch to the Tape Library Management screen.
Reboot the library by clicking the [Restart] button at the lower right.
The new settings are applied after the library is rebooted.

End of procedure

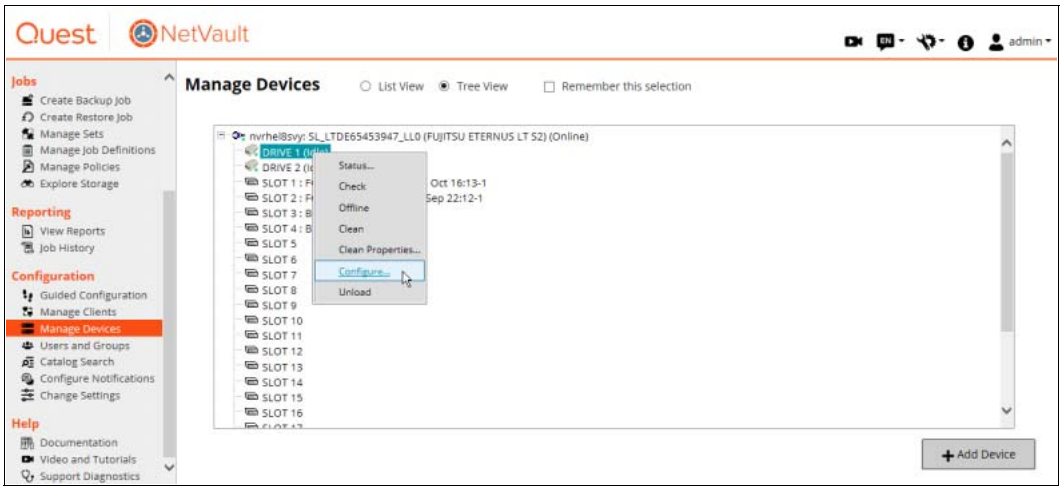
- When WebUI is used with NetVault Backup 11.2 or later
  When using the cleaning function for NetVault Backup 11.2 or later, use WebUI to perform the following settings.

Procedure

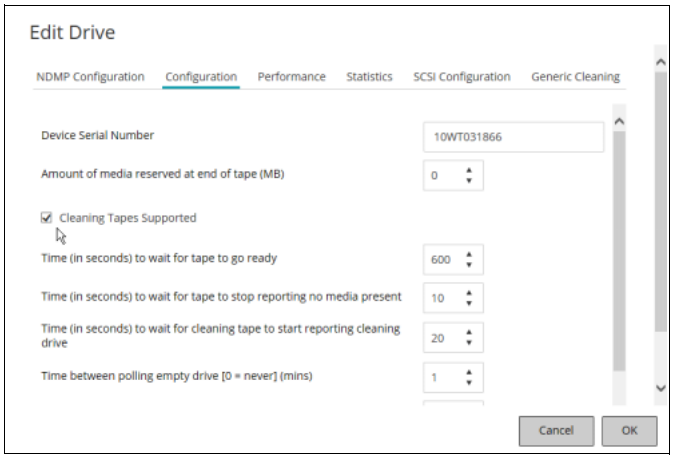
1 In the WebUI menu, click [Manage Devices] to open the [Manage Devices] page.



2 Select [Tree View] to switch the view to the tree view mode.
Click the name of the drive and select [Configure] from the menu that appears.



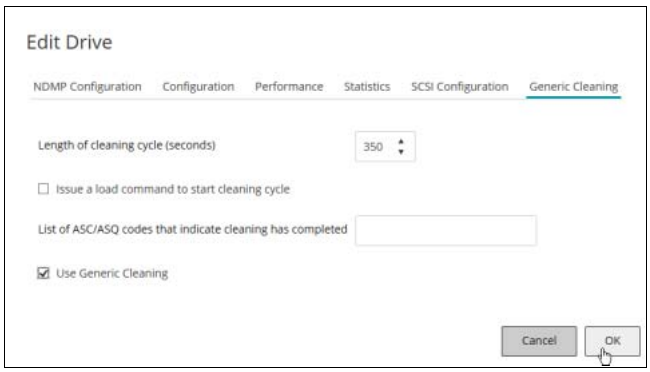
3 In the [Edit Drive] page that appears, click the [Configuration] tab and check that the [Cleaning Tapes Supported] checkbox is selected. If cleared, select it.



4 Click the [OK] button to go back to the [Manage Devices] page in the tree view mode.
When the drive becomes idle, click the name of the same drive again and select [Configure].

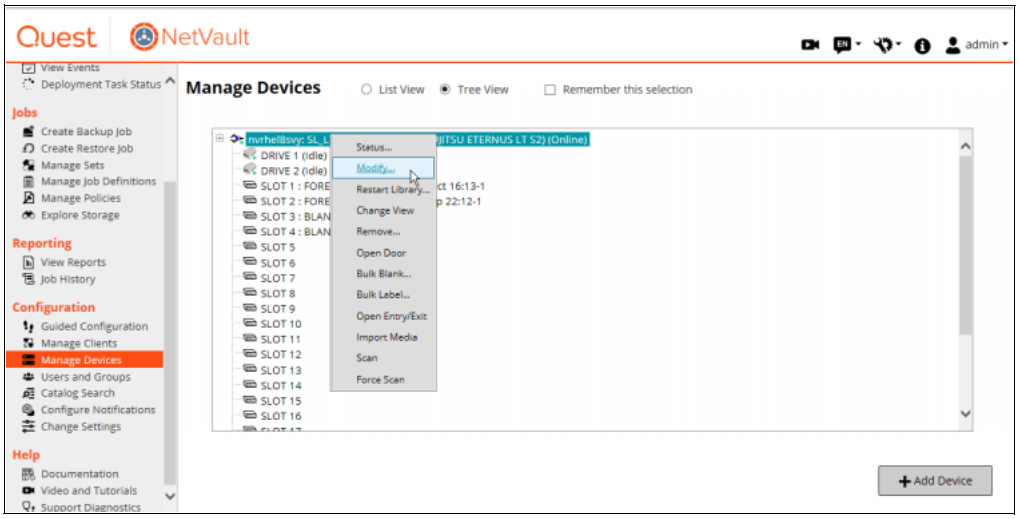
5 In the [Edit Drive] page that appears, click the [Generic Cleaning] tab and set the following Generic Cleaning items.

- Issue a load command to start cleaning cycle: off (the default setting is "on")
- Use Generic Cleaning: on (the default setting is "off")

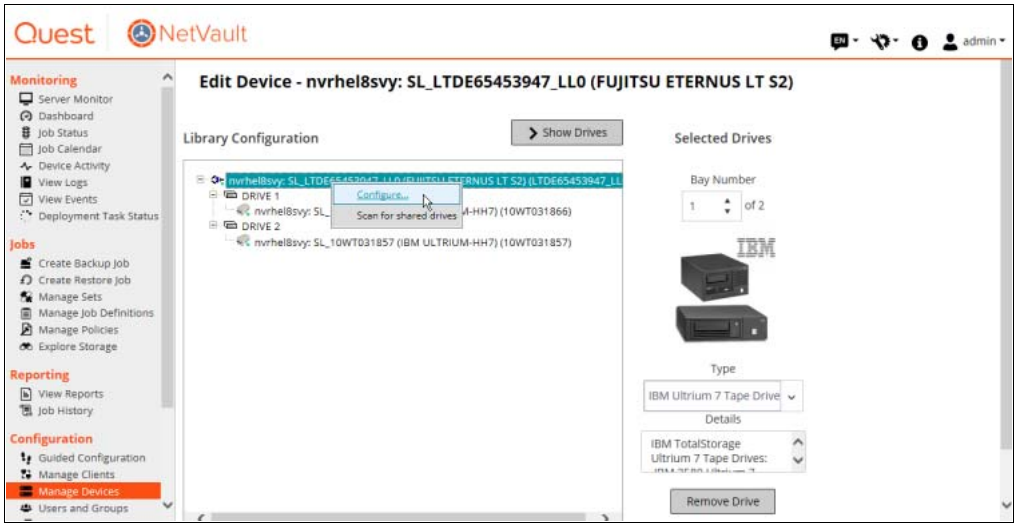


6 After confirming that the checkboxes are set correctly, click the [OK] button to go back to the [Manage Devices] page in the tree view mode.
The setting of one drive is now complete. When using multiple drives, set the other drives in the same way.
After setting all the drives, proceed to the library setting.

7 In the [Manage Devices] page, switch the page view to the tree view mode, click the name of the library, and select [Modify] from the menu that appears.



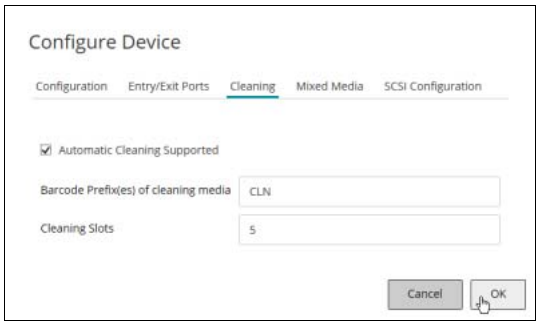
8 Click the library name that appears under [Library Configuration] and click [Configure] from the menu that appears.



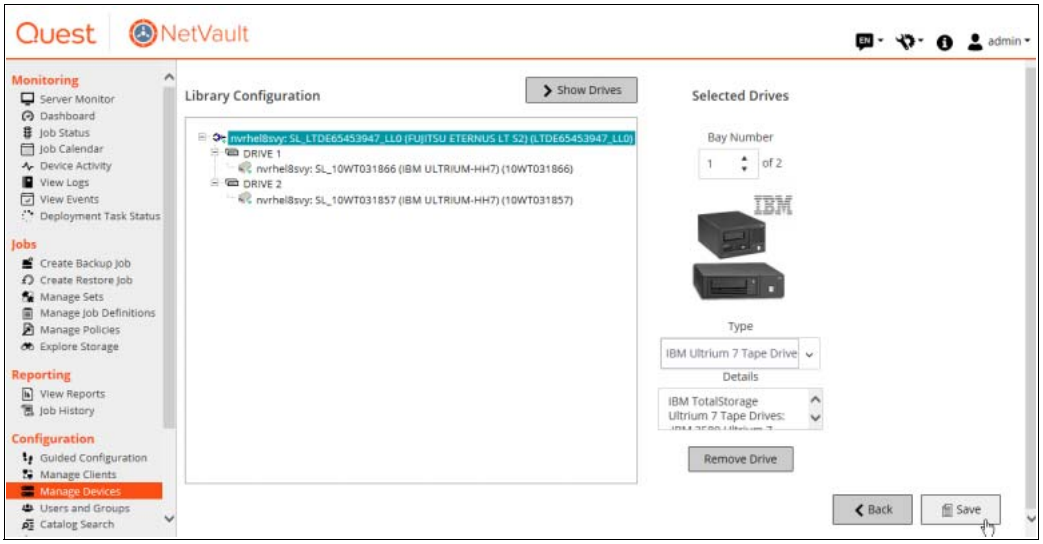
9 Click the [Cleaning] tab in the [Configure Device] page that appears, set the following Cleaning items, and click the [OK] button.

- Automatic Cleaning Supported: on (the default setting is "on")
- Barcode Prefix(es) of cleaning media: Set with the character string that is on the label of the cleaning cartridge.
- Cleaning Slots: Slot number where a cleaning cartridge is stored.

The following is a settings example with a label string of "CLN" and a slot number of "5".



10 Click the [OK] button to go back to the [Edit Device] page and then click the [Save] button at the bottom right of the page.



11 In the [Manage Devices] page of the WebUI, click the [Manage Library] button of the target library to switch to the [Tape Library Management] page.
Reboot the LT140 by clicking the [Restart] button at the bottom right of the page.
The new settings are applied after the LT140 is rebooted.

End of procedure

4.5.2 Notes on Using Windows Server 2019

To use NetVault on Windows Server 2019, ETERNUS LT series Tape Library Driver is required.
Install the Windows Server 2016 device driver (w2k16) in Windows Server 2019.
For the download and the installation procedure of the Tape Library Driver, refer to the following website.
https://www.fujitsu.com/global/support/products/computing/storage/download/

4.6 Arcserve Backup

This section provides notes about the settings that are performed for Arcserve Backup.

4.6.1 Notes on Operation

Cleaning tape drives

- Arcserve Backup has a function to automatically clean tape drives. When automatically cleaning tape drives, use the Arcserve Backup's automatic cleaning function.
- Arcserve Backup can display the number of times each drive has been cleaned. It cannot display the number of times each cleaning cartridge has been used.

4.6.2 Notes on Using Windows

A dedicated driver is used (this driver is automatically installed during installation of Arcserve Backup). Do not use an IBM tape driver.

4.7 Veeam Backup & Replication

This section provides notes about the settings that are performed for Veeam Backup & Replication.

4.7.1 Notes on Operation

Cleaning tape drives

Veeam Backup & Replication does not have a function to manually clean tape drives. Use the tape library to manually clean the tape drives.

Label of a data cartridge

Veeam recognizes any media with a barcode label whose first three letters are "CLN" or "CLR" as cleaning media. Therefore, if the first three letters of the barcode label of a data cartridge are set to "CLN" or "CLR", that data cartridge becomes unavailable.

Automatically cleaning the tape library

If the tape library's automatic cleaning function conflicts with a Veeam backup or restore operation, a drive error occurs in Veeam. Therefore, do not use the tape library's automatic cleaning function.

4.7.2 Notes on Using Windows Server 2019

To use Veeam Backup & Replication on Windows Server 2019, ETERNUS LT series Tape Library Driver is required.
Install the Windows Server 2016 device driver (w2k16) in Windows Server 2019.

For the download and the installation procedure of the Tape Library Driver, refer to the following website.

https://www.fujitsu.com/global/support/products/computing/storage/download/

4.8 Tuning Backup Performance

The LT140 backup performance may improve by changing the block size.
For details on the procedure for changing the block size and any additional notes that are required, contact your sales representative or maintenance engineer.
The upper limit of the block size must be 128KB.

Chapter 5
LTFS Option

This chapter provides notes on the LTFS option that is used with the LT140.

5.1 Notes on Operation

Cleaning tape drives

The LTFS option has a command used to clean the tape drives. When cleaning tape drives, use the LT140's automatic cleaning function (Auto Cleaning) or the LTFS option's cleaning command.
For more details, refer to "3.7 Cleaning the Tape Drive" in "FUJITSU Storage ETERNUS LT series Tape Libraries LTFS Option User's Guide".

Caution

When LTFS is running, performing a manual cleaning of the LT140 may cause a device usage conflict or an inconsistent status for the tape cartridges or tape drives. This conflict or inconsistency may cause an error. Do not perform a manual cleaning while LTFS is running.

5.2 Notes on the LTFS Option Installation

5.2.1 LTFS Server OS

For stable operation of the LT140, always applying the latest OS security patches for the LTFS server is recommended.

FUJITSU Storage ETERNUS LT140 Tape Library
User's Guide -Server Connection-

P3AG-3752-03ENZ0

Date of issuance: December 2019
Issuance responsibility: FUJITSU LIMITED


FUJITSU