P3AM-5322-12ENZ0

FUJITSU Storage
ETERNUS LT20 S2/LT40 S2/LT60 S2
Tape Library

User's Guide -Server Connection-

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Preface

Fujitsu would like to thank you for purchasing our FUJITSU Storage ETERNUS LT20 S2/LT40 S2/LT60 S2 Tape Library (hereinafter referred to as "LT20 S2/LT40 S2/LT60 S2" or "this product").

Before using the LT20 S2/LT40 S2/LT60 S2, read this manual and the manuals that are provided with the server and backup software to ensure correct usage of the LT20 S2/LT40 S2/LT60 S2.
This manual describes settings for the LT20 S2/LT40 S2/LT60 S2, 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 LT20 S2/LT40 S2/LT60 S2 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. The structure of the manuals related to the LT20 S2/LT40 S2/LT60 S2 and the coverage of this document are shown in "Manual Structure" (page 14). Use applicable manuals when necessary.

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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 LT20 S2/LT40 S2/LT60 S2.

- Chapter 2 Setting the LT20 S2/LT40 S2/LT60 S2

  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 LT20 S2/LT40 S2/LT60 S2 and provides notes that are related to the settings.

- Chapter 4 Setting the Backup Software

  This chapter describes the backup software settings that are required to use the LT20 S2/LT40 S2/LT60 S2 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 LT20 S2/LT40 S2/LT60 S2.

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For Safe Operation

Using this Manual

This manual contains important information regarding safe usage. Please read this manual carefully and understand the contents thoroughly before using the LT20 S2/LT40 S2/LT60 S2. Keep this manual in a safe place for future reference.
Fujitsu pays careful attention for the safe use of our products to prevent injury to users and bystanders and/or material damage. To use the LT20 S2/LT40 S2/LT60 S2 properly, please follow the instructions in the manuals.

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Additional Information

Product Names

The following abbreviations for products are used throughout this manual.

Long title	Abbreviation	
Oracle Solaris 10 Operating System	Solaris 10 OS	Solaris OS
Oracle Solaris 11 Operating System	Solaris 11 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
Microsoft® System Center 2012 Data Protection Manager	SCDPM 2012	SCDPM

Abbreviations Used in This Manual

- "LT20 S2/LT40 S2/LT60 S2" and "this product" refer to "FUJITSU Storage ETERNUS LT20 S2/LT40 S2/LT60 S2 Tape Library".
- Trademark symbols such as ™ and ® are omitted in this document.

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Safety Precautions

For your safety and that of others, read this document concerning the use of the LT20 S2/LT40 S2/LT60 S2. Use the LT20 S2/LT40 S2/LT60 S2 properly according to this document to prevent personal injury and/or property damage. Keep this manual in a safe place for future reference.
The warning symbols shown below are used throughout this manual in order to ensure safety and proper use of the LT20 S2/LT40 S2/LT60 S2. Be sure to confirm the meaning of the symbols before reading this manual.

⚠ WARNING	This symbol indicates the possibility of serious or fatal injury.
⚠ CAUTION	This symbol indicates the possibility of personal injury or property damage.

The following symbols are used throughout this manual to indicate each type of caution:

	This symbol indicates the possibility of smoke or a fire.
	This symbol indicates the possibility of an explosion or burst.
	This symbol indicates the possibility of electric shock.
	This symbol indicates the possibility of injury caused by toxic materials.
	This symbol indicates the possibility of injury to a hand or a finger when jammed or pinched.
	This symbol indicates a general prohibition.
	This symbol indicates prohibition of disassembly or modification of the LT20 S2/LT40 S2/LT60 S2.
	This indicates prohibition of contact to the LT20 S2/LT40 S2/LT60 S2.

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	This symbol indicates a general instruction on behavior.
	This symbol indicates the instruction to disconnect the power plug from the outlet and to turn off the circuit breaker on the power distribution board.

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Important Information on Handling

When Abnormal Conditions Occur



If excessive heat, smoke, odor, or an unusual noise occurs, immediately turn off the power using the power switch and disconnect the power plug from the outlet.
Then, after confirming that the LT20 S2/LT40 S2/LT60 S2 is no longer giving off smoke, contact your sales representative or a Fujitsu maintenance service center to have the unit repaired.
Continued use of the LT20 S2/LT40 S2/LT60 S2 when it is malfunctioning or operating abnormally could cause a fire and/or electric shock.
In addition, do not, under any circumstance, repair the LT20 S2/LT40 S2/LT60 S2 by yourself as doing so is dangerous.



If foreign objects (water, metal shards, liquid, etc.) enter the LT20 S2/LT40 S2/LT60 S2, immediately turn off the power using the power switch and disconnect the power plug from the outlet.
Then, contact your sales representative or a Fujitsu maintenance service center.
Continued use of the LT20 S2/LT40 S2/LT60 S2 could cause a fire and/or electric shock.

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Maintenance

Do not attempt to repair the LT20 S2/LT40 S2/LT60 S2 by yourself. Ask Fujitsu to dispatch one of our maintenance engineers or a maintenance engineer authorized by Fujitsu for maintenance work.
Note that our maintenance engineer may connect maintenance equipment (such as PCs) in order to diagnose the LT20 S2/LT40 S2/LT60 S2.
Maintenance engineers use one of the following connections for maintenance:

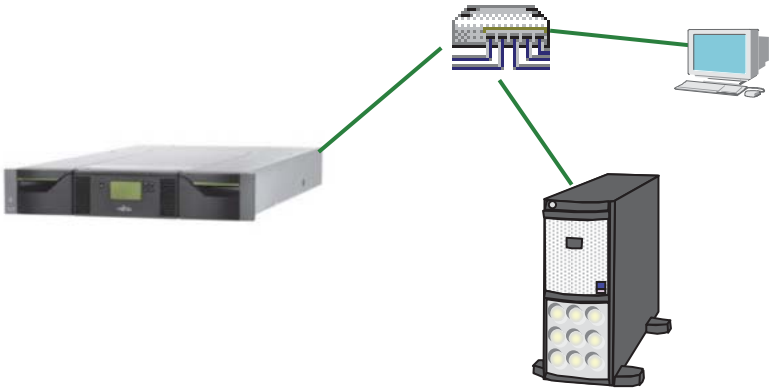
- Direct connection between the LT20 S2/LT40 S2/LT60 S2 and a management PC (FST)



- Direct connection between the LT20 S2/LT40 S2/LT60 S2 and a customer's PC



- Connection between the LT20 S2/LT40 S2/LT60 S2 and a customer's PC via a network



When a management PC cannot be connected to the LT20 S2/LT40 S2/LT60 S2, a management PC must be supplied by the customer.

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Handling the LT20 S2/LT40 S2/LT60 S2



Do not remove the cover of the LT20 S2/LT40 S2/LT60 S2 or of any slots on the LT20 S2/LT40 S2/LT60 S2, except when replacing batteries or installing an optional device, or in other cases that require removal of such covers.
The LT20 S2/LT40 S2/LT60 S2 includes high-voltage parts and such parts may cause an electric shock.

If the inside of the LT20 S2/LT40 S2/LT60 S2 needs to be checked or repaired, contact your sales representative or a Fujitsu maintenance service center to perform such work.



When there is a possibility that the LT20 S2/LT40 S2/LT60 S2 has malfunctioned, for example, when the operator panel fails to display properly, do not continue to use the LT20 S2/LT40 S2/LT60 S2. Continued use of the LT20 S2/LT40 S2/LT60 S2 when it is malfunctioning or operating abnormally could cause a fire and/or electric shock.

If the LT20 S2/LT40 S2/LT60 S2 needs to be repaired, contact your sales representative or a Fujitsu maintenance service center to perform such work.



- Prevent foreign objects including metal shards and flammable materials from being inserted in or dropped into any openings (vent holes, etc.) of the LT20 S2/LT40 S2/LT60 S2. Failure to do so may cause malfunctions, a fire, or electric shock.
- Do not put any containers containing water such as a vase, flower pot, and/or glass on or near the LT20 S2/LT40 S2/LT60 S2. Doing so may cause malfunctions, a fire, or electric shock.
- Refrain from using a blower containing a flammable spray, because it could lead to a fire.



Before attaching or detaching an optional device, turn off the power switches on the device and the LT20 S2/LT40 S2/LT60 S2, and disconnect their power plugs from outlets. Failure to do so may cause an electric shock.

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Power Cable and Power Plug



- If there is a lightning storm, disconnect the power plug of the LT20 S2/LT40 S2/LT60 S2 from the outlet. Using the LT20 S2/LT40 S2/LT60 S2 or leaving it plugged in during a lightning storm may damage the LT20 S2/LT40 S2/LT60 S2 or cause a fire.
- Do not apply voltage of a value that is not specified. Do not insert too many plugs into a single outlet. Doing so may cause a fire or electric shock.
- To prevent electric shock, do not handle a power plug or disconnect a power plug with wet hands.
- Do not damage or modify the power cable. The power cable may be damaged by placing heavy objects on it, or by pulling, forcibly bending, twisting or heating it, which could cause a fire or electric shock.
- If the power cable or power plug is damaged or the plug does not securely fit in the outlet slot, do not use the cable. Continued use of the cable when it is damaged or when the plug does not securely fit in an outlet could cause a fire and/or electric shock.
- If there is a build-up of dust on the prongs of the power cable or the outlet slots, use a dry cloth to wipe the prongs and/or outlet slots clean. Continued use of cables or outlet slots with a build-up of dust could cause a fire.
- If the LT20 S2/LT40 S2/LT60 S2 requires grounding, be sure to ground such unit, before turning the power on. If an electric leak occurs, it could lead to fire or electric shock.
  If, for some reason, it is not possible to ground the LT20 S2/LT40 S2/LT60 S2, consult your sales representative or a Fujitsu maintenance service center.
- Securely plug in the power plug so that it goes far enough into the outlet. A loose power plug may cause a fire or failure of the LT20 S2/LT40 S2/LT60 S2.
- If the LT20 S2/LT40 S2/LT60 S2 is to be moved, ensure that the power plug is disconnected from the outlet before moving it. Otherwise, the cables may be damaged, which may lead to a fire and/or electric shock.
- If the LT20 S2/LT40 S2/LT60 S2 is to be moved, before moving it, ensure that all connected cables have been disconnected. Otherwise, the cables may be entangled, which may lead to cause the LT20 S2/LT40 S2/LT60 S2 to drop or fall over, resulting in injury. Watch your footing during the move.
- When the LT20 S2/LT40 S2/LT60 S2 is not used for a long period of time, to ensure safety, be sure to disconnect the power cable of the LT20 S2/LT40 S2/LT60 S2 from the outlet. Failure to do so may cause a fire and/or electric shock.
- When removing a power plug from the outlet, do not yank on the power cable. Be sure to grasp the plug and not the cable. Yanking on the power cable may cause the core of the power cable to be exposed or broken, causing a fire and/or electric shock.

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Operating Environment



- Place the LT20 S2/LT40 S2/LT60 S2 in an appropriate environment, avoiding locations exposed to moisture, dust, or smoke, poor ventilation or fire. Failure to do so may cause malfunctions, a fire, or electric shock may result.
- Do not splash water on the LT20 S2/LT40 S2/LT60 S2. Doing so may cause malfunctions, a fire, or electric shock.
- Do not cover the openings (such as an air vent) on the LT20 S2/LT40 S2/LT60 S2. Doing so may increase the temperature inside the LT20 S2/LT40 S2/LT60 S2, resulting in a fire.
- Do not place any heavy objects on top of the LT20 S2/LT40 S2/LT60 S2. Also, do not expose the LT20 S2/LT40 S2/LT60 S2 to shock. Doing so may cause the LT20 S2/LT40 S2/LT60 S2 to become unbalanced, resulting in its falling down or dropping, causing injury.
- Do not install the LT20 S2/LT40 S2/LT60 S2 at a location subjected to strong vibration or in an unstable location such as on a slope. Doing so may cause the LT20 S2/LT40 S2/LT60 S2 to drop or fall over, leading to injury.

Disposal of the LT20 S2/LT40 S2/LT60 S2 and Packing Materials

If you need to dispose of the LT20 S2/LT40 S2/LT60 S2 and the packing materials, follow the instructions provided by the maintenance engineer.

Connectable Equipment

Only connect the equipment specified by Fujitsu to the LT20 S2/LT40 S2/LT60 S2. Connecting other equipment to the LT20 S2/LT40 S2/LT60 S2 may result in injury to users and bystanders, or property damage.

Expendable Supplies

Use Fujitsu-designated expendable supplies for the LT20 S2/LT40 S2/LT60 S2. Using other materials may result in injury to users and bystanders or damage to their property.

Modification or Renovation of the LT20 S2/LT40 S2/LT60 S2

Do not modify the LT20 S2/LT40 S2/LT60 S2 or overhaul a used LT20 S2/LT40 S2/LT60 S2. Doing so may result in injury to users and bystanders or damage to their property.

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Moving or Relocating the LT20 S2/LT40 S2/LT60 S2

Before moving or relocating the LT20 S2/LT40 S2/LT60 S2, consult with your sales representative or a Fujitsu maintenance service center.

LCD Unit (Operator Panel)



The LCD unit (operator panel) in the LT20 S2/LT40 S2/LT60 S2 contains mercury. To ensure safety, observe the precautions:

- Do not put the unit into your mouth. Mercury is extremely poisonous.
- Do not change the LCD unit into gas, powder, or liquid. Aspiration or accidental ingestion of mercury that is heated, crushed, or liquidized by chemical treatment is hazardous.
- In disposal of the unit, make sure to observe the applicable domestic laws and regulations and waste disposal rules defined by the company.
- The LT20 S2/LT40 S2/LT60 S2 must be disposed of separately from general industrial waste and household waste.

LCD of the LCD Unit

The phenomena described below may occur on the LCD of the LCD unit in the LT20 S2/LT40 S2/LT60 S2. Note that these phenomena do not result from a faulty LCD, but are due to its characteristics.

- A lattice pattern may appear on the LCD at power-on. The pattern will soon disappear and poses no problem.
- Display colors may vary slightly depending on the LCD product due to variation in the production process.
- Slight unevenness in display colors due to a characteristic of the LCD may be caused by a temperature change.
- Although the LCD is produced based on extremely precise technologies, it may have some dots that are always off or on.

Light of Barcode Reader

Do not look directly into the light of the barcode reader mounted on the LT20 S2/LT40 S2/LT60 S2. Looking directly into the laser beams or flashes of light emitted from the light source could cause eye injury.

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Manual Structure

The following table describes the contents of each manual.

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Chapter 1
Overview

This chapter explains the operating systems, backup software products, and host bus adapters (HBAs) that support the LT20 S2/LT40 S2/LT60 S2 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/).

1.1.2 Operating System (OS)

For OS information, refer to our web site (https://www.fujitsu.com/global/products/computing/storage/tape/).

1.1.3 Host Bus Adapter (HBA)

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

1.1.4 Fibre Channel Switches

For Fibre Channel switch information, refer to our web site or contact a Fujitsu sales representative.

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1.2 References for Setup

1.2.1 Solaris OS

1.2.1.1 SAS Connection for Solaris OS [SAS Model]

The following procedure explains how to connect the LT20 S2/LT40 S2/LT60 S2 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 LT20 S2/LT40 S2/LT60 S2. In addition, check the precautions before starting the procedure.

Refer

- "1.1 Operating Environment" (page 17)

2

Setting the LT20 S2/LT40 S2/LT60 S2

Perform the settings for the LT20 S2/LT40 S2/LT60 S2.

Refer

- "2.1 Settings for SAS Connections" (page 31)

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3

Setting the Operating System

Perform the settings for the HBA driver and the device driver.

Refer

- "3.1 Solaris OS" (page 35)
- "3.1.1 SAS Connections" (page 35)
- "3.1.3 Device Drivers" (page 37)

4

Setting Backup Software

Apply patches, set the robot driver, and set the backup software.

Refer

- Backup software used
  - NetBackup
    - "4.1 NetBackup" (page 47)
  - NetWorker
    - "4.2 NetWorker" (page 51)
  - IBM Spectrum Protect (IBM Tivoli Storage Manager)
    - "4.3 IBM Spectrum Protect" (page 53)

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

The following procedure explains how to connect the LT20 S2/LT40 S2/LT60 S2 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 LT20 S2/LT40 S2/LT60 S2.

Refer

- "1.1 Operating Environment" (page 17)

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2

Setting the LT20 S2/LT40 S2/LT60 S2

Perform the settings for the LT20 S2/LT40 S2/LT60 S2.

IMPORTANT

Change the topology setting to "Point to Point" or "Arbitrated Loop". Set fixed values for the link speed and the Loop ID.

Refer

- "Chapter 2 Setting the LT20 S2/LT40 S2/LT60 S2" (page 31)
- "2.2 Settings for Fibre Channel Connections" (page 31)
- "2.2.1 Setting the Link Speed" (page 31)
- "2.2.2 Setting the Topology and the Loop ID (for Direct Host Connections)" (page 32)

3

Setting the Operating System

Perform the settings for the HBA driver and the device driver.

Refer

- "3.1 Solaris OS" (page 35)
- "3.1.2 Fibre Channel Connections" (page 36)

4

Setting Backup Software

Apply patches, set the robot driver, and set the backup software.

Refer

- Backup software used
  - NetBackup
    - "4.1 NetBackup" (page 47)
  - NetWorker
    - "4.2 NetWorker" (page 51)
  - IBM Spectrum Protect (IBM Tivoli Storage Manager)
    - "4.3 IBM Spectrum Protect" (page 53)

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1.2.1.3 Fibre Channel Connection (Fabric Connection) for Solaris OS

The following procedure explains how to connect the LT20 S2/LT40 S2/LT60 S2 to a Solaris OS server with a fabric 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 LT20 S2/LT40 S2/LT60 S2.

Refer

- "1.1 Operating Environment" (page 17)

2

Setting the LT20 S2/LT40 S2/LT60 S2

Perform the settings for the LT20 S2/LT40 S2/LT60 S2.

IMPORTANT

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

Refer

- "Chapter 2 Setting the LT20 S2/LT40 S2/LT60 S2" (page 31)
- "2.2 Settings for Fibre Channel Connections" (page 31)
- "2.2.1 Setting the Link Speed" (page 31)
- "2.2.3 Setting the Topology (for Connections via FC Switches)" (page 33)

3

Setting the Operating System

Perform the settings for the HBA driver and the device driver.

Refer

- "3.1 Solaris OS" (page 35)
- "3.1.2 Fibre Channel Connections" (page 36)

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4

Setting Backup Software

Apply patches, set the robot driver, and set the backup software.

Refer

- Backup software used
  - NetBackup
    - "4.1 NetBackup" (page 47)
  - NetWorker
    - "4.2 NetWorker" (page 51)
  - IBM Spectrum Protect (IBM Tivoli Storage Manager)
    - "4.3 IBM Spectrum Protect" (page 53)

1.2.2 Linux

1.2.2.1 SAS Connection for Linux [SAS Model]

The following procedure explains how to connect the LT20 S2/LT40 S2/LT60 S2 to a Linux 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 LT20 S2/LT40 S2/LT60 S2.

Refer

- "1.1 Operating Environment" (page 17)

2

Setting the LT20 S2/LT40 S2/LT60 S2

Perform the settings for the LT20 S2/LT40 S2/LT60 S2.

Refer

- "2.1 Settings for SAS Connections" (page 31)

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3

Setting the Operating System

Perform the settings for the HBA driver and the device driver.

Refer

- "3.2 Linux" (page 40)
- "3.2.1 Fibre Channel Connections/SAS Connections" (page 40)

4

Setting Backup Software

Apply patches, set the robot driver, and set the backup software.

Refer

- Backup software used
  - NetBackup
    - "4.1 NetBackup" (page 47)
  - NetWorker
    - "4.2 NetWorker" (page 51)
  - IBM Spectrum Protect (IBM Tivoli Storage Manager)
    - "4.3 IBM Spectrum Protect" (page 53)
  - NetVault
    - "4.5 NetVault" (page 55)

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

The following procedure explains how to connect the LT20 S2/LT40 S2/LT60 S2 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 LT20 S2/LT40 S2/LT60 S2.

Refer

- "1.1 Operating Environment" (page 17)

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2

Setting the LT20 S2/LT40 S2/LT60 S2

Perform the settings for the LT20 S2/LT40 S2/LT60 S2.

IMPORTANT

Change the topology setting to "Point to Point" or "Arbitrated Loop". Set fixed values for the link speed and the Loop ID.

Refer

- "Chapter 2 Setting the LT20 S2/LT40 S2/LT60 S2" (page 31)
- "2.2 Settings for Fibre Channel Connections" (page 31)
- "2.2.1 Setting the Link Speed" (page 31)
- "2.2.2 Setting the Topology and the Loop ID (for Direct Host Connections)" (page 32)

3

Setting the Operating System

Perform the settings for the HBA driver and the tape driver.

Refer

- "3.2 Linux" (page 40)
- "3.2.1 Fibre Channel Connections/SAS Connections" (page 40)

4

Setting Backup Software

Apply patches, set the robot driver, and set the backup software.

Refer

- Backup software used
  - NetBackup
    - "4.1 NetBackup" (page 47)
  - NetWorker
    - "4.2 NetWorker" (page 51)
  - IBM Spectrum Protect (IBM Tivoli Storage Manager)
    - "4.3 IBM Spectrum Protect" (page 53)
  - NetVault
    - "4.5 NetVault" (page 55)

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1.2.2.3 Fibre Channel Connection (Fabric Connection) for Linux

The following procedure explains how to connect the LT20 S2/LT40 S2/LT60 S2 to a Linux server with a fabric 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 LT20 S2/LT40 S2/LT60 S2.

Refer

- "1.1 Operating Environment" (page 17)

2

Setting the LT20 S2/LT40 S2/LT60 S2

Perform the settings for the LT20 S2/LT40 S2/LT60 S2.

IMPORTANT

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

Refer

- "Chapter 2 Setting the LT20 S2/LT40 S2/LT60 S2" (page 31)
- "2.2 Settings for Fibre Channel Connections" (page 31)
- "2.2.1 Setting the Link Speed" (page 31)
- "2.2.3 Setting the Topology (for Connections via FC Switches)" (page 33)

3

Setting the Operating System

Perform the settings for the HBA driver and the tape driver.

Refer

- "3.2 Linux" (page 40)
- "3.2.1 Fibre Channel Connections/SAS Connections" (page 40)

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4

Setting Backup Software

Apply patches, set the robot driver, and set the backup software.



- Backup software used
  - NetBackup
    - "4.1 NetBackup" (page 47)
  - NetWorker
    - "4.2 NetWorker" (page 51)
  - IBM Spectrum Protect (IBM Tivoli Storage Manager)
    - "4.3 IBM Spectrum Protect" (page 53)
  - NetVault
    - "4.5 NetVault" (page 55)

1.2.3 Windows

1.2.3.1 SAS Connection for Windows [SAS Model]

The following procedure explains how to connect the LT20 S2/LT40 S2/LT60 S2 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 LT20 S2/LT40 S2/LT60 S2.



- "1.1 Operating Environment" (page 17)



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2

Setting the LT20 S2/LT40 S2/LT60 S2

Perform the settings for the LT20 S2/LT40 S2/LT60 S2.

Refer

- "2.1 Settings for SAS Connections" (page 31)

3

Setting the Operating System

Perform the settings for the HBA driver and the tape driver.

Refer

- "3.3 Windows" (page 41)
- "3.3.1 SAS Connections" (page 41)

4

Setting Backup Software

Apply patches, set the robot driver, and set the backup software.

Refer

- Backup software used
  - NetBackup
    - "4.1 NetBackup" (page 47)
  - IBM Spectrum Protect (IBM Tivoli Storage Manager)
    - "4.3 IBM Spectrum Protect" (page 53)
  - Backup Exec
    - "4.4 Backup Exec" (page 54)
  - NetVault
    - "4.5 NetVault" (page 55)
  - ARCserve Backup
    - "4.6 ARCserve Backup" (page 65)
  - Veeam Backup & Replication
    - "4.7 Veeam Backup & Replication" (page 66)

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

The following procedure explains how to connect the LT20 S2/LT40 S2/LT60 S2 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 LT20 S2/LT40 S2/LT60 S2.

Refer

- "1.1 Operating Environment" (page 17)

2

Setting the LT20 S2/LT40 S2/LT60 S2

Perform the settings for the LT20 S2/LT40 S2/LT60 S2.

IMPORTANT

Change the topology setting to "Point to Point" or "Arbitrated Loop". Set fixed values for the link speed and the Loop ID.

Refer

- "Chapter 2 Setting the LT20 S2/LT40 S2/LT60 S2" (page 31)
- "2.2 Settings for Fibre Channel Connections" (page 31)
- "2.2.1 Setting the Link Speed" (page 31)
- "2.2.2 Setting the Topology and the Loop ID (for Direct Host Connections)" (page 32)

3

Setting the Operating System

Perform the settings for the HBA driver and the tape driver.

Refer

- "3.3 Windows" (page 41)
- "3.3.2 Fibre Channel Connections" (page 42)

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4

Setting Backup Software

Apply patches, set the robot driver, and set the backup software.

Refer

- Backup software used
  - NetBackup
    - "4.1 NetBackup" (page 47)
  - IBM Spectrum Protect (IBM Tivoli Storage Manager)
    - "4.3 IBM Spectrum Protect" (page 53)
  - Backup Exec
    - "4.4 Backup Exec" (page 54)
  - NetVault
    - "4.5 NetVault" (page 55)
  - ARCserve Backup
    - "4.6 ARCserve Backup" (page 65)
  - Veeam Backup & Replication
    - "4.7 Veeam Backup & Replication" (page 66)

1.2.3.3 Fibre Channel Connection (Fabric Connection) for Windows

The following procedure explains how to connect the LT20 S2/LT40 S2/LT60 S2 to a Windows server with a fabric 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 LT20 S2/LT40 S2/LT60 S2.

Refer

- "1.1 Operating Environment" (page 17)

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2

Setting the LT20 S2/LT40 S2/LT60 S2

Perform the settings for the LT20 S2/LT40 S2/LT60 S2.

IMPORTANT

Change the topology setting to "Point to Point". Set fixed values for the link speed and the Loop ID.

Refer

- "Chapter 2 Setting the LT20 S2/LT40 S2/LT60 S2" (page 31)
- "2.2 Settings for Fibre Channel Connections" (page 31)
- "2.2.1 Setting the Link Speed" (page 31)
- "2.2.3 Setting the Topology (for Connections via FC Switches)" (page 33)



3

Setting the Operating System

Perform the settings for the HBA driver and the tape driver.

Refer

- "3.3 Windows" (page 41)
- "3.3.2 Fibre Channel Connections" (page 42)



4

Setting Backup Software

Apply patches, set the robot driver, and set the backup software.

Refer

- Backup software used
  - NetBackup
    - "4.1 NetBackup" (page 47)
  - IBM Spectrum Protect (IBM Tivoli Storage Manager)
    - "4.3 IBM Spectrum Protect" (page 53)
  - Backup Exec
    - "4.4 Backup Exec" (page 54)
  - NetVault
    - "4.5 NetVault" (page 55)
  - ARCserve Backup
    - "4.6 ARCserve Backup" (page 65)
  - Veeam Backup & Replication
    - "4.7 Veeam Backup & Replication" (page 66)

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Chapter 2

Setting the LT20 S2/LT40 S2/LT60 S2

This chapter describes the necessary LT20 S2/LT40 S2/LT60 S2 settings to use the LT20 S2/LT40 S2/LT60 S2 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 LT20 S2 LTO Library Installing, Starting Up and Maintaining" or "FUJITSU Storage ETERNUS LT40 S2/LT60 S2 LTO Library Installing, Starting Up and Maintaining".

To check the server environment that is used, refer 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 LT20 S2 LTO Library Installing, Starting Up and Maintaining" or "FUJITSU Storage ETERNUS LT40 S2/LT60 S2 LTO Library Installing, Starting Up and Maintaining".

Note

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

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Caution

When connecting the LT20 S2/LT40 S2/LT60 S2 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 LT20 S2/LT40 S2/LT60 S2 tape drive is connected, fix the speed to 8Gbit/s with the "portcfgspeed" command.

  (2) For the port to which the LT20 S2/LT40 S2/LT60 S2 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.

- LT20 S2/LT40 S2/LT60 S2

  (3) Fix the link speed of the LT20 S2/LT40 S2/LT60 S2 tape drive to 8Gbit/s.

These settings are not required if the LT20 S2/LT40 S2/LT60 S2 is connected to a Brocade 32G FC switch (Brocade G610/G620/G630/X6-4/X6-8) because the LT20 S2/LT40 S2/LT60 S2 automatically recognizes the link speed.

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

The following settings are required for direct host connections.

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

Topology	Point to Point

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

Topology	Arbitrated Loop
Addressing mode	Hard Addressed (*1)
Loop ID	Any value ("1" is recommended)

*1: The Addressing mode setting may not available for some models. In this case, select a fixed value since "Automatic" cannot be selected for Loop ID.

Though "Automatic" can be selected for Topology, Addressing mode, and Loop ID, set the fixed values shown above.
For more details about the settings, refer to "FUJITSU Storage ETERNUS LT20 S2 LTO Library Installing, Starting Up and Maintaining" or "FUJITSU Storage ETERNUS LT40 S2/LT60 S2 LTO Library Installing, Starting Up and Maintaining".

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2.2.3 Setting the Topology (for Connections via FC Switches)

The following settings are required for connections via FC switches.

Topology	Point to Point

Though "Automatic" can be selected for Topology, set the fixed value shown above.
For more details about the settings, refer to "FUJITSU Storage ETERNUS LT20 S2 LTO Library Installing, Starting Up and Maintaining" or "FUJITSU Storage ETERNUS LT40 S2/LT60 S2 LTO Library Installing, Starting Up and Maintaining".

2.2.4 Setting the Host (When Using FC Host Bus Adapters)

To connect the LT20 S2/LT40 S2/LT60 S2 to an FC host bus adapter, fixing the values of the host-side link speed and topology settings as shown below is recommended.

Link speed	Same as the LT20 S2/LT40 S2/LT60 S2
Topology	• For connections via an FC switch Fabric Point to Point • For direct connections to the host bus adapter FC-AL

2.3 Setting the Mailslot

The LT20 S2/LT40 S2/LT60 S2 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 Mailslot, refer to "FUJITSU Storage ETERNUS LT20 S2 LTO Library Installing, Starting Up and Maintaining" or "FUJITSU Storage ETERNUS LT40 S2/LT60 S2 LTO Library Installing, Starting Up and Maintaining".

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Chapter 3

Setting the Operating System

This chapter describes the operating system settings that are required to use the LT20 S2/LT40 S2/LT60 S2 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 LT20 S2/LT40 S2/LT60 S2 is not required for the operating system unless it is noted in this manual.

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3.1 Solaris OS

This section provides notes on Solaris OS settings.

3.1.1 SAS Connections

When using the LT20 S2/LT40 S2/LT60 S2 with a SAS connection, note the following items:

3.1.1.1 For 6Gbit/s SAS Cards

When the LT20 S2/LT40 S2/LT60 S2 is used with a Fujitsu 6Gbit/s SAS card, Oracle 6Gbit/s SAS card, or LSI Logic 6Gbit/s SAS card, the OS needs to be made aware of the changer device by executing the following command after the OS starts up:

```
# update_drv -a -i '"scsiclass,08"' sgen
```

After executing the command, check the device file.

```
# ls -l /dev/scsi/changer
```

The changer device is recognized if the following output or an output similar to it appears.

```
...
lrwxrwxrwx   1 root     root         103  May 27  17:45 c25t500110A001389F60d1 ->
../../../devices/pci@400/pci@1/pci@0/pci@4/LSI,sas@0/iport@8/medium-changer@
w500110a001389f60,1:changer
...
```

Caution

Executing the command may result in the output shown below. This output is not an error if the OS recognizes the changer device properly.

```
# update_drv -a -i '"scsiclass,08"' sgen
("scsiclass,08") already in use as a driver or alias.
```


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3.1.2 Fibre Channel Connections

Before using the LT20 S2/LT40 S2/LT60 S2 with a Fibre Channel connection, note the following items:

3.1.2.1 For SE0X7F11X or SE0X7F12X

The following Fibre Channel card driver patch must be applied to use the single-channel 4Gbit/s Fibre Channel card (SE0X7F11X) or the dual-channel 4Gbit/s Fibre Channel card (SE0X7F12X) for the LT20 S2/LT40 S2/LT60 S2.

- Required patches
  - 914583-13 or later
- Download URL
  https://www.fujitsu.com/global/products/computing/servers/unix/sparc-enterprise/downloads/

3.1.2.1.1 Setting the HBA drivers

Two connection methods (topologies) are available for SE0X7F11X and SE0X7F12X; a direct Fibre Channel connection (FC-AL connection) method and a Fibre Channel switch connection method. Perform each setting in the driver setting file (/kernel/drv/fjpfca.conf).
The following sections explain how to set the direct connection (FC-AL connection) and the Fibre Channel switch connection.

- For direct server connections

  To establish a direct connection between the LT20 S2/LT40 S2/LT60 S2 and the server, the driver setting file (/kernel/drv/fjpfca.conf) does not need to be changed from the default setting.

- For connections via Fibre Channel switches (fabric connections)

  To establish the fabric connection between the LT20 S2/LT40 S2/LT60 S2 and the server, a topology setting and a target binding setting must be described in the driver setting file (/kernel/drv/fjpfca.conf). Target binding is a method to determine the target ID of the device from the driver side. To set the target binding, information such as the instance name of the HBA, the WWPN of the LT20 S2/LT40 S2/LT60 S2, and the target ID that is to be assigned is required.

  Note

  To establish the Fibre Channel switch connection, set the zoning for the Fibre Channel switch. The zoning range depends on the type of connection. The LT20 S2/LT40 S2/LT60 S2 cannot be recognized if the zoning is set incorrectly. Always perform zoning that is appropriate for the operating mode.

  For more details about how to edit the driver setting file, refer to the manuals of the HBAs.

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3.1.2.2 For SE0X7F21X or SE0X7F22X

When the LT20 S2/LT40 S2/LT60 S2 is used with single-channel 8Gbit/s Fibre Channel cards (SE0X7F21X) or dual-channel 8Gbit/s Fibre Channel cards (SE0X7F22X), operations are performed with the OS standard device driver.

3.1.2.3 For SE0X7F31X or SE0X7F32X

When the LT20 S2/LT40 S2/LT60 S2 is used with single-channel 8Gbit/s Fibre Channel cards (SE0X7F31X) or dual-channel 8Gbit/s Fibre Channel cards (SE0X7F32X), operations are performed with the OS standard device driver.

3.1.2.4 For SP1X7FAA2F or SP1X7FBA2F

When the LT20 S2/LT40 S2/LT60 S2 is used with dual-channel 16Gbit/s Fibre Channel cards (SP1X7FAA2F or SP1X7FBA2F), operations are performed with the OS standard device driver.

3.1.3 Device Drivers

3.1.3.1 Driver Patches

Before using the LT20 S2/LT40 S2/LT60 S2, make sure to apply the following st driver patches. Note that the Solaris 11 OS does not require st driver patches.

- Solaris 10 OS st driver patch No.
  120011-14 or later patch

Caution

To use IBM Spectrum Protect as the backup software, use the IBM Spectrum Protect device driver (TSM device driver) instead of the st driver. For more details about how to install and set up the driver, refer to the relevant software manuals.

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3.1.3.2 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 LT20 S2/LT40 S2/LT60 S2.
- 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, or 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
```


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(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 LT20 S2/LT40 S2/LT60 S2 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 LT20 S2/LT40 S2/LT60 S2.

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.

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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 LT20 S2/LT40 S2/LT60 S2.

(1) Check 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 LT20 S2/LT40 S2/LT60 S2 FC model with a single drive configuration

```
# cat /proc/scsi/scsi
Host:  scsi5 Channel:  00 Id:  00 Lun:  00
  Vendor:  HP       Model:  Ultrium 4-SCSI   Rev:  A51B
  Type:    Sequential-Access                 ANSI SCSI revision:  05
Host:  scsi5 Channel:  00 Id:  00 Lun:  01
  Vendor:  FSC      Model:  FibreCAT-TX48 S2 Rev:  4.41
  Type:    Medium Changer                    ANSI SCSI revision:  05
```

Note

- Vendor : HP Model : Ultrium4-SCSI
  Indicates an Ultrium4.
- Vender: FSC Model: FibreCAT-TX48 S2
  Indicates an LT60 S2 library controller.

From the above contents, check whether the LT20 S2/LT40 S2/LT60 S2 controller and drives are recognized in correct paths and whether the values of the recognized target ID and LUN match those of the LT20 S2/LT40 S2/LT60 S2 drives.

End of procedure

(2) Set the fixed device file names.

Associating the name of the device file that is assigned to a device and the physical device must be fixed. 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 the person in charge of the backup software.

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3.3 Windows

This section provides notes on Windows settings.

3.3.1 SAS Connections

This section explains the settings for using SAS connection.

(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 "HP UltriumX SCSI Sequential Device" (tape drive) or "IBM UltriumX SCSI Sequential Device", and "Unknown Medium Changer Device" (controller) are displayed for the HBA that is connected to the LT20 S2/LT40 S2/LT60 S2.
"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 46).

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 LT20 S2/LT40 S2/LT60 S2 or loose connection can be assumed. Check the settings and reboot the server before considering the contents.

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3.3.2 Fibre Channel Connections

This section explains the settings for using 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 "HP UltriumX SCSI Sequential Device" (tape drive) or "IBM UltriumX SCSI Sequential Device", and "Unknown Medium Changer Device" (controller) are displayed for the HBA that is connected to the LT20 S2/LT40 S2/LT60 S2.
"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 46).

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 LT20 S2/LT40 S2/LT60 S2 or loose connection can be assumed. Check the settings and reboot the server before considering the contents.

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3.3.3 Removable Storage Manager (RSM)

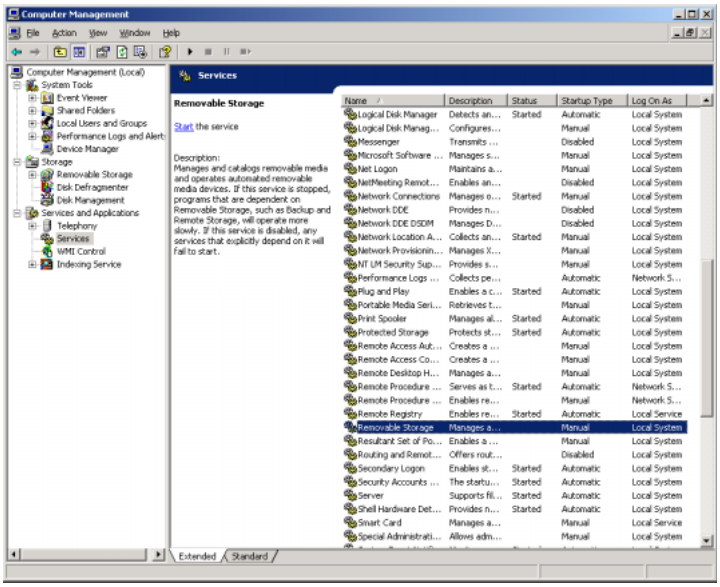
If the Removable Storage Manager (RSM) service is enabled, backup software operations may be affected. RSM must be stopped.
Perform the following procedure to stop RSM.

Caution

Because the RSM service is not supported in Windows 7 and later, or in Windows Server 2008 R2 and later, the setting to stop the RSM is not necessary.

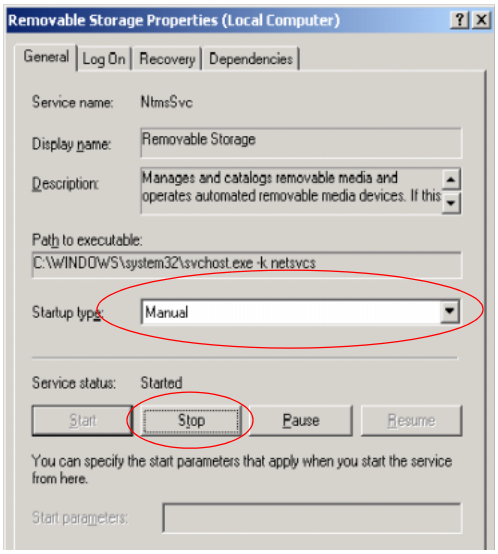
Procedure

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

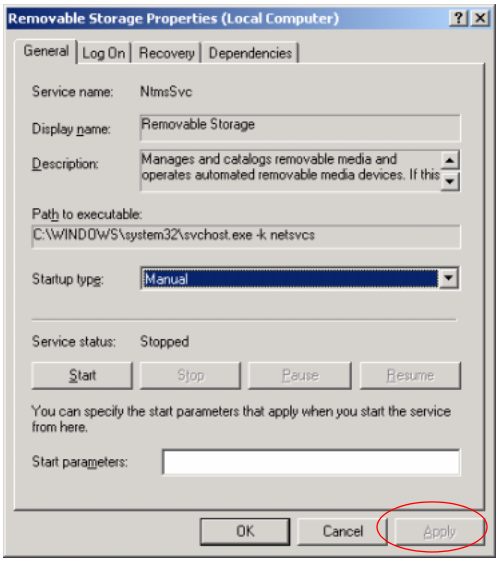


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2 Set [Startup type] to [Manual]. Click the [Stop] button in [Service status] to stop the service.

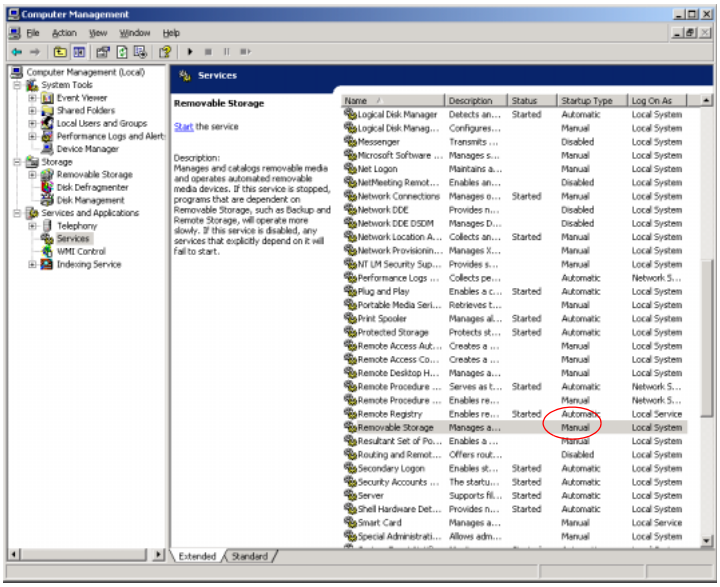


3 Click the [Apply] button to enable the setting.



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



End of procedure

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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

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Chapter 4
Setting the Backup Software

This chapter provides information on the backup software settings that are required to use the LT20 S2/LT40 S2/LT60 S2 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.

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 LT20 S2/LT40 S2/LT60 S2, contact the NetBackup vendor to download the latest Release Updates and latest Device Mappings Package.

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4.1.3 Notes on Using Solaris OS

- For Solaris 10 OS or 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".

```
# 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 displayed 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

- When NetBackup is installed on a Solaris OS server, system IPC resources must be added for NetBackup interprocess communication. For details, refer to the manual supplied with your backup software.

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4.1.4 Notes on Using Windows

When NetBackup 7 or later is used as the backup software, a tape driver is required.

- When an LTO5 drive is used (model name: LTS2Z125E, LTS2Z135E, LTS2Z225E, LTS2Z235E, LTS2Z125L, LTS2Z135L, LTS2Z225L, LTS2Z235L)
  On the web site for Hewlett Packard Enterprise (HPE) support center, search for the appropriate HP tape driver using the following product names to download and install the driver.

Tape drive type	Search model name
LTO5 Half Height Drive	Ultrium 3000
LTO5 Full Height Drive	Ultrium 3280
LTO6 Half Height Drive	Ultrium 6250

- When an LTO6, LTO7, or LTO8 drive is used (model name: LTS2Z246E, LTS2Z247E, LTS2Z248E, LTS2Z256E, LTS2Z257E, LTS2Z258E, LTS2Z246L, LTS2Z247L, LTS2Z248L, LTS2Z256L, LTS2Z257L, LTS2Z258L)
  Download and install the driver that corresponds to the Windows OS version and CPU from the IBM Fix Central website.

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".

Caution

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

- Use the following formula to determine what media mount timeout value should be set for the LT20 S2/LT40 S2/LT60 S2:

Media mount timeout (in seconds) = 4 × Number of installed tape drives + 2,580

For example, the media mount timeout value is 4,500 seconds for an LT20 S2/LT40 S2/LT60 S2 in which eight tape drives are installed.
When the media mount timeout is set to "0", the LT20 S2/LT40 S2/LT60 S2 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.

Caution

Although the media mount timeout value is in seconds, there are cases when it is in minutes for Windows.

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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 LT20 S2/LT40 S2/LT60 S2 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 49).

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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.

4.2.2 Notes on Using Solaris OS

For Solaris 10 OS or Solaris 11 OS 11/11 later, only the global zone is supported by NetWorker.
A tape library (jukebox) may not be automatically detected with the "jbconfig" command when Solaris 10 OS or Solaris 11 OS 11/11 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

Installing a device driver

Because the driver to use the LT20 S2/LT40 S2/LT60 S2 is not included in NetWorker, perform the following action if a tape drive is not recognized with the OS standard driver.

- When an LTO5 drive is used (model name: LT20SSH1, LT40SSH1, LT20SFH1, LT40SFH1, LT60SSG1, LT60SFG1)
  On the web site for Hewlett Packard Enterprise (HPE) support center, search for the appropriate HP tape driver using the following product names to download and install the driver.

Tape drive type	Search model name
LTO5 Half Height Drive	Ultrium 3000
LTO5 Full Height Drive	Ultrium 3280
LTO6 Half Height Drive	Ultrium 6250

- When an LTO6, LTO7, or LTO8 drive is used (model name: LT20SSK1, LT40SSK1, LT60SSK1, LT20SFK1, LT40SFK1, LT60SFK1, LT20SSM1, LT40SSM1, LT60SSM1, LT20SFM1, LT40SFM1, LT60SFM1, LT20SSN1, LT40SSN1, LT60SSN1, LT20SFN1, LT40SFN1, LT60SFN1)
  Download and install the driver that corresponds to the Windows OS version and CPU from the IBM Fix Central website.

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Configuring the registry

If the LT20 S2/LT40 S2/LT60 S2 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 LT20 S2/LT40 S2/LT60 S2, the changed recognition order of the tape drives becomes inconsistent with the recognition order in NetWorker and prevents NetWorker from using the LT20 S2/LT40 S2/LT60 S2. 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.

Caution

Set the registry of the tape drives before configuring the library such as by executing NetWorker's "jbconfig" command.

Example: Device name of the tape drive

- Before changing the registry setting
  \\.\Tape0
- After changing the registry setting
  \\.\Tape2147483641

The registry setting procedure is as follows.

Procedure

1. Click the [Start] button, click [Run], type "regedit", and then click [OK].
2. Click the following registry subkey.
   HKEY_LOCAL_MACHINE\System\CurrentControlSet\Control\Tape
3. On the [Edit] menu, point to [New], and then click [DWORD Value].
4. Type "Persistence", and then press the [ENTER] key.
5. Right-click the "Persistence" registry entry, and then click [Modify].
6. Type "1" in the [Value data] box, and then click [OK].
7. Quit Registry Editor.
8. Restart the computer.

End of procedure

Caution

Configure the library such as by executing NetWorker's "jbconfig" command after the registry is set.
If the library is configured before the registry is set, NetWorker recognizes the tape drives with the information that is set before the registry setting and, if the LT20 S2/LT40 S2/LT60 S2 has multiple tape drives, it is unable to use the LT20 S2/LT40 S2/LT60 S2 after the Windows OS is restarted.

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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 LT20 S2/LT40 S2/LT60 S2, 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 10 OS or Solaris 11 OS, only the global zone is supported by IBM Spectrum Protect.
In case that the Solaris 10 OS is used, both IBM Spectrum Protect server and IBM Spectrum Protect agent can connect to the LT20 S2/LT40 S2/LT60 S2. In case that the Solaris 11 OS is used, only IBM Spectrum Protect agent can connect to the LT20 S2/LT40 S2/LT60 S2.

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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

If the OS is Windows Server 2008 R2 or earlier, the tape device driver that is provided by Veritas Technologies, LLC is required. Windows Server 2012 or later does not require a driver.
To download the latest tape device driver, contact the seller of the software.

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4.5 NetVault

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

4.5.1 Notes on Operation

Cleaning tape drives

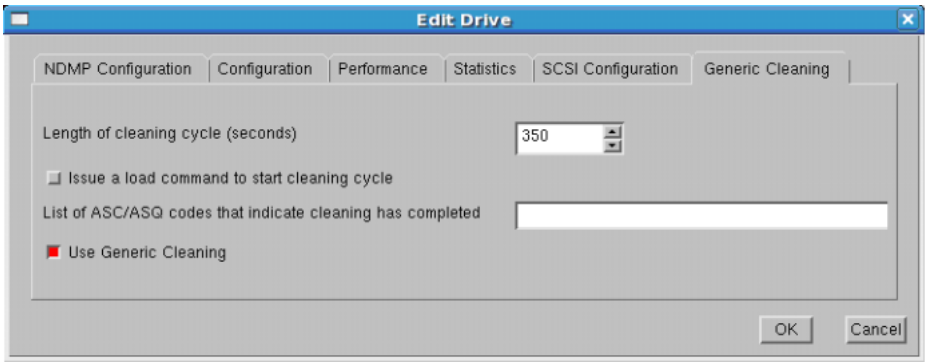
- NetVault has a function to automatically clean tape drives. When automatically cleaning tape drives, use the NetVault's automatic cleaning function.
- To use the NetVault cleaning function, make settings as follows.
  - For NetVault Backup 9 and earlier
    To use the cleaning function for NetVault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

Procedure

1 Specify the Generic Cleaning items of the drive as follows:

- When an LTO5 drive is used (model name: LTS2Z125E, LTS2Z135E, LTS2Z225E, LTS2Z235E, LTS2Z125L, LTS2Z135L, LTS2Z225L, LTS2Z235L)
  - Issue a load command to start cleaning cycle: on (the default setting is "on")
  - Use Generic Cleaning: on (the default setting is "off")
- When an LTO6, LTO7, or LTO8 drive is used (model name: LTS2Z246E, LTS2Z247E, LTS2Z248E, LTS2Z256E, LTS2Z257E, LTS2Z258E, LTS2Z246L, LTS2Z247L, LTS2Z248L, LTS2Z256L, LTS2Z257L, LTS2Z258L)
  - Issue a load command to start cleaning cycle: off (the default setting is "on")
  - Use Generic Cleaning: on (the default setting is "off")

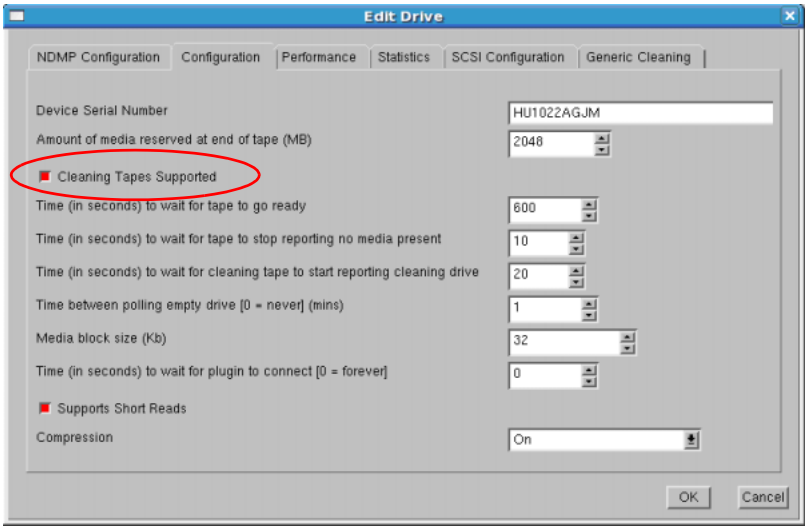
The following shows an example configuration in which "Issue a load command to start cleaning cycle" is set to "off" and "Use Generic Cleaning" is set to "on".



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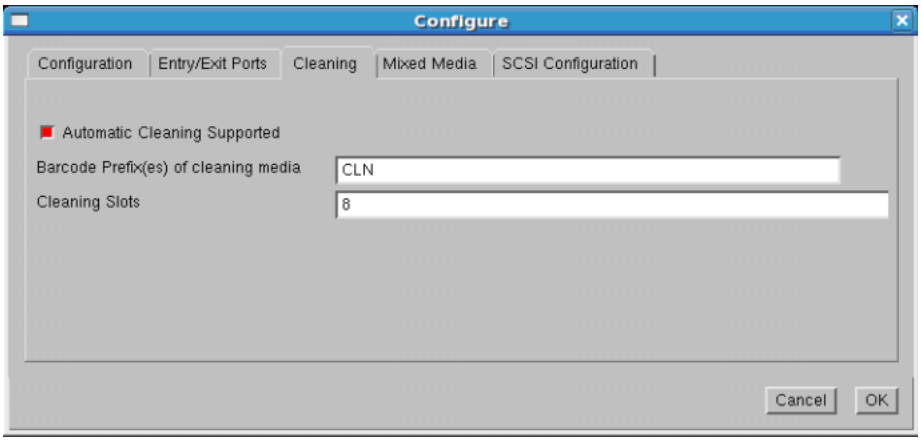
2 Specify the Configuration item of the drive as follows:

- Cleaning Tapes Supported: on



3 Specify the Cleaning items of the library 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

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- 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 61).

Procedure

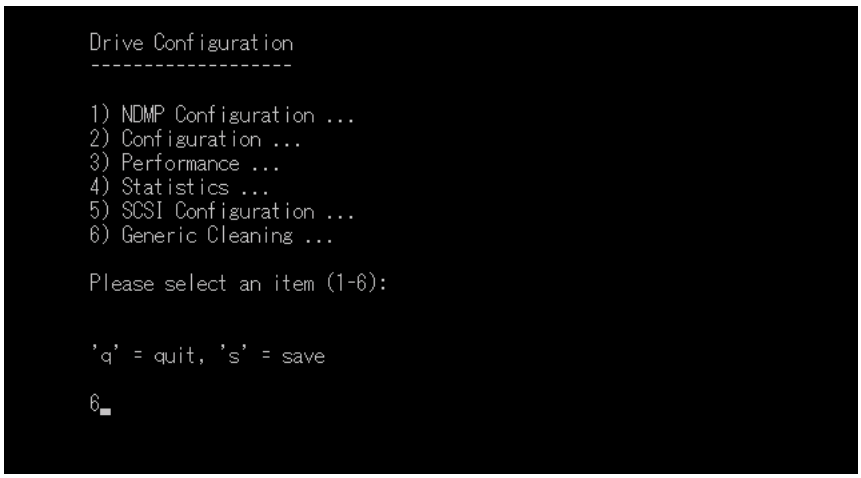
1 Start the command prompt and change directory to the following location.
<Installation folder for NetVault>\bin

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.



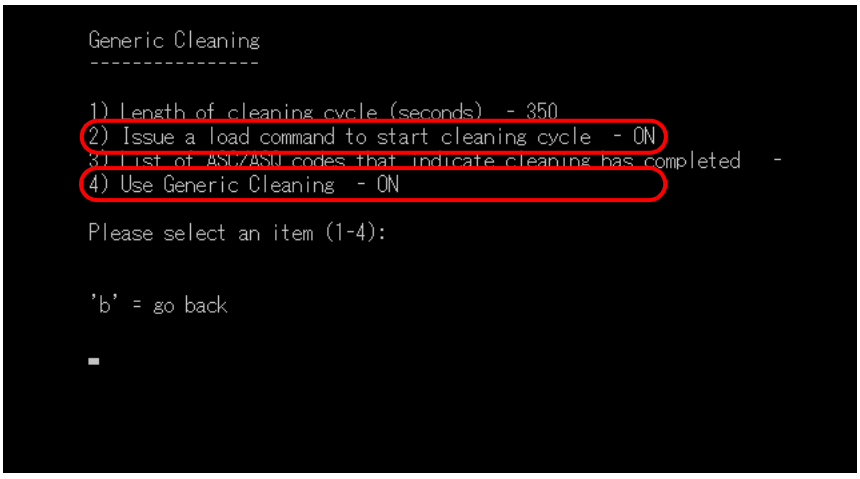
"6) Generic Cleaning..." is selected. The Generic Cleaning screen appears.

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4 Specify the Generic Cleaning items as follows:

- When an LTO5 drive is used (model name: LTS2Z246E, LTS2Z247E, LTS2Z248E, LTS2Z256E, LTS2Z257E, LTS2Z258E, LTS2Z246L, LTS2Z247L, LTS2Z248L, LTS2Z256L, LTS2Z257L, LTS2Z258L)
  - Issue a load command to start cleaning cycle: ON (the default setting is "ON")
  - Use Generic Cleaning: ON (the default setting is "OFF")
- When an LTO6, LTO7, or LTO8 drive is used (model name: LTS2Z246E, LTS2Z247E, LTS2Z248E, LTS2Z256E, LTS2Z257E, LTS2Z258E, LTS2Z246L, LTS2Z247L, LTS2Z248L, LTS2Z256L, LTS2Z257L, LTS2Z258L)
  - 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".



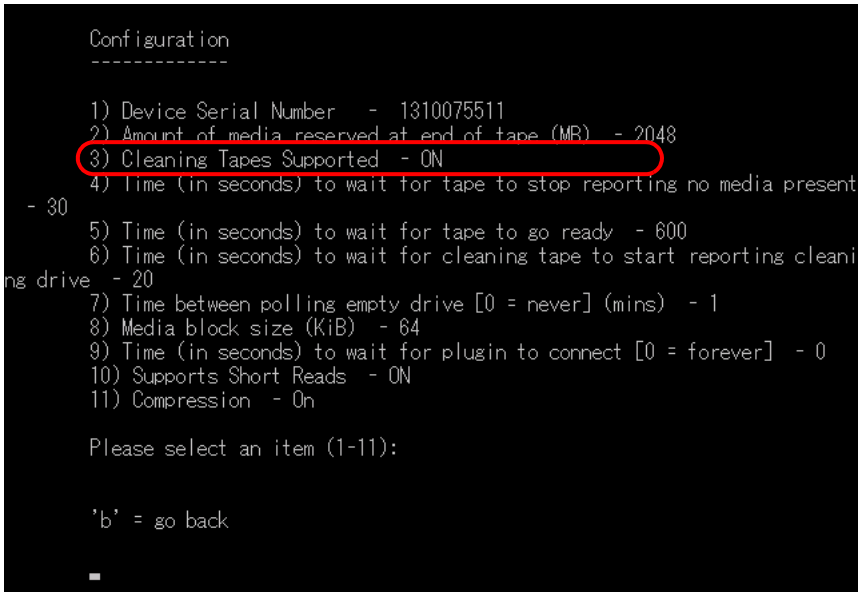
5 Enter "b" and then press the [Enter] key.
The Device Configuration screen appears again.

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

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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.

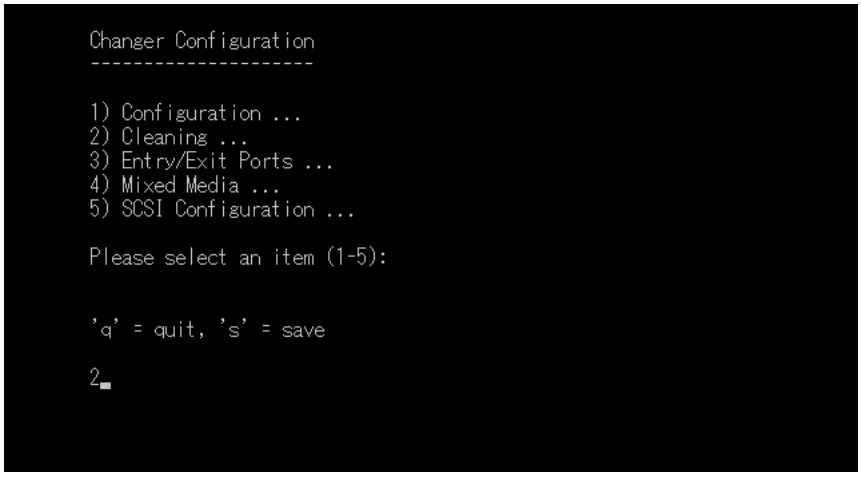
11 Execute the following command to perform the library cleaning settings.

```
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.

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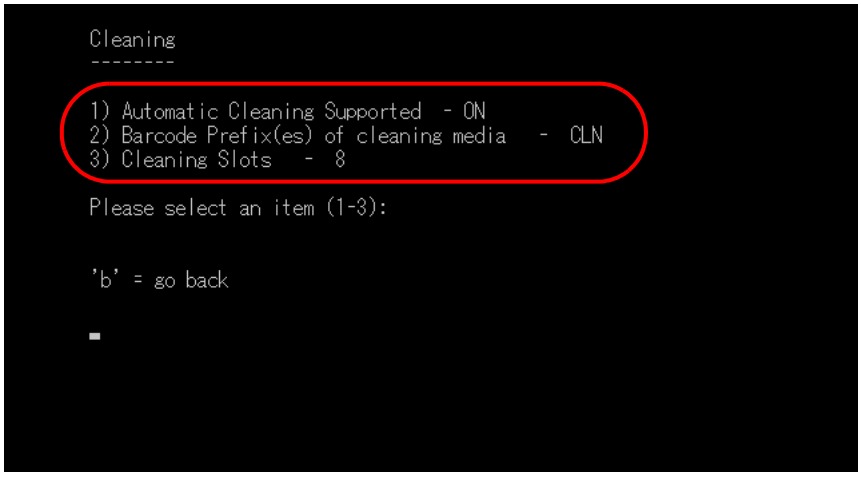
12 Enter "2" and then press the [Enter] key.



"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

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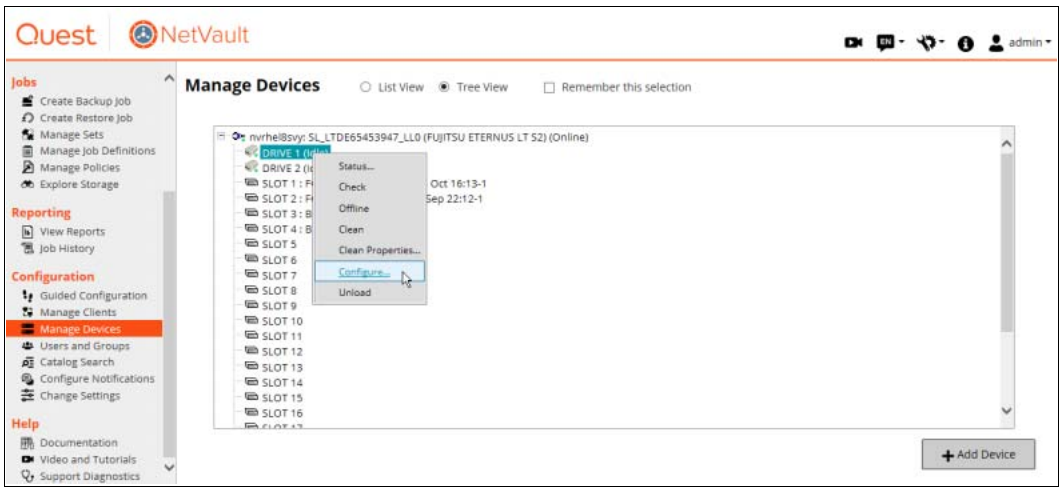
- When WebUI is used with NetVault Backup 11.2 or later
  To use the cleaning function for NetVault Backup 11.2 or later, perform the following settings with the WebUI.

Procedure

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

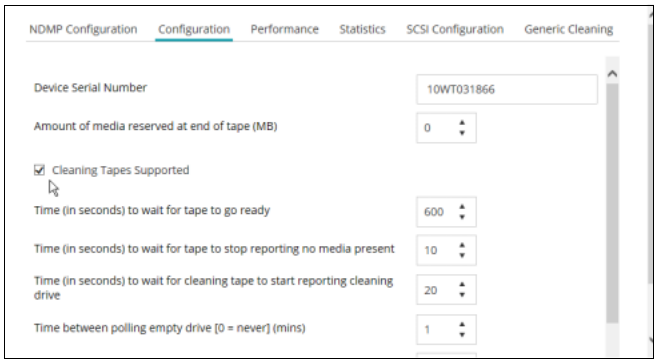


2 Select [Tree View] to switch the view to the tree view mode.
Click the name of the drive and select [Configure] from the menu that appears.



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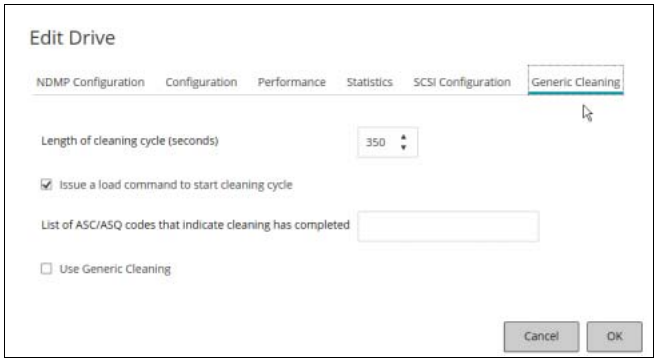
3 In the [Edit Drive] page that appears, click the [Configuration] tab and check that the [Cleaning Tapes Supported] checkbox is selected. If cleared, select it.



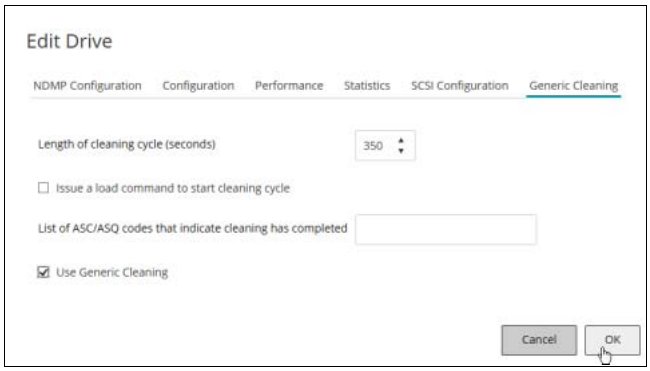
4 Click the [OK] button to go back to the [Manage Devices] page in the tree view mode.
When the drive becomes idle, click the name of the same drive again and select [Configure].

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

- When an LTO5 drive is used (model name: LT20SSH1, LT40SSH1, LT20SFH1, LT40SFH1, LT60SSG1, LT60SFG1)
  - Issue a load command to start cleaning cycle: on (the default setting is "on")
  - Use Generic Cleaning: on (the default setting is "off")
- When an LTO6, LTO7, or LTO8 drive is used (model name: LT20SSK1, LT40SSK1, LT60SSK1, LT20SFK1, LT40SFK1, LT60SFK1, LT20SSM1, LT40SSM1, LT60SSM1, LT20SFM1, LT40SFM1, LT60SFM1, LT20SSN1, LT40SSN1, LT60SSN1, LT20SFN1, LT40SFN1, LT60SFN1)
  - Issue a load command to start cleaning cycle: off (the default setting is "on")
  - Use Generic Cleaning: on (the default setting is "off")



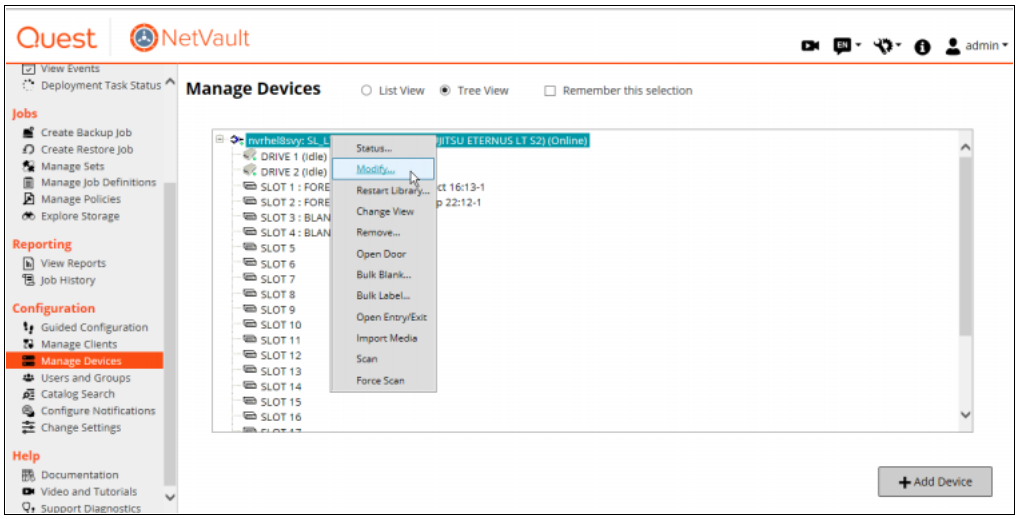
The following is an example setting for an LTO6, LTO7, or LTO8 drive.



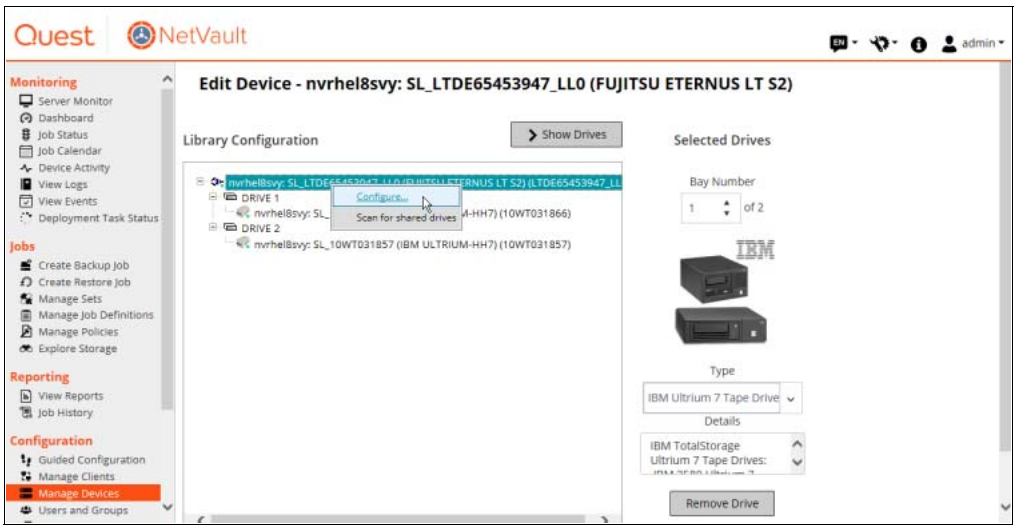
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6 After confirming that the checkboxes are set correctly, click the [OK] button to go back to the [Manage Devices] page in the tree view mode.
The setting of one drive is now complete. When using multiple drives, set the other drives in the same way.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

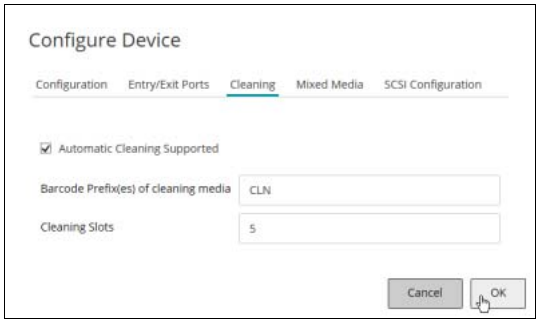


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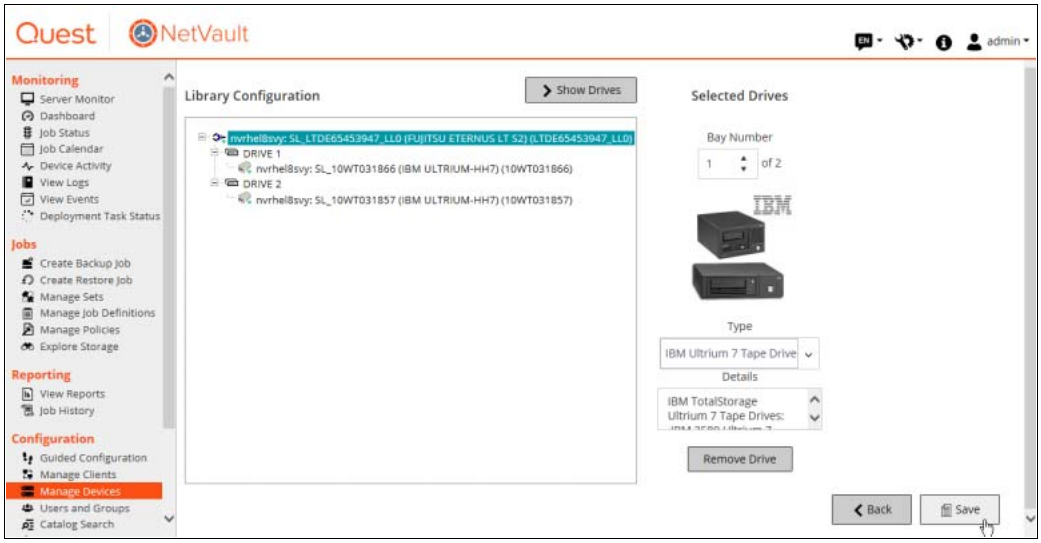
9 Click the [Cleaning] tab in the [Configure Device] page that appears, set the following Cleaning items, and click the [OK] button.

- Automatic Cleaning Supported: on (the default setting is "on")
- Barcode Prefix(es) of cleaning media: set the label string of the cleaning cartridge.
- Cleaning Slots: set the slot number that contains the cleaning cartridge.

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 LT20 S2/LT40 S2/LT60 S2 by clicking the [Restart] button at the bottom right of the page.
The new settings are applied after the LT20 S2/LT40 S2/LT60 S2 is rebooted.

End of procedure

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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

When Arcserve Backup is used as the backup software, do not use an HP tape driver or IBM tape driver. Use a dedicated driver instead (this driver is automatically installed during installation of Arcserve Backup).

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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/

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4.8 SCDPM2012

4.8.1 Device Drivers

A dedicated device driver is required to use the LT20 S2/LT40 S2/LT60 S2.
To install the latest Microsoft certified library driver, search for and download the appropriate device driver by specifying the product name and OS at the following site.

http://support.ts.fujitsu.com/Download/Index.asp?LNG=COM

4.8.2 Setting the LT20 S2/LT40 S2/LT60 S2

In the system settings for the LT20 S2/LT40 S2/LT60 S2, set "New ID String" for "Change ID String".
After this setting, the LT20 S2/LT40 S2/LT60 S2 needs to be restarted.

4.9 Tuning Backup Performance

The LT20 S2/LT40 S2/LT60 S2 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 the person in charge of the backup software.
The upper limit of the block size must be 128KB.

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Chapter 5
LTFS Option

This chapter provides notes on the LTFS option that is used with the LT20 S2/LT40 S2/LT60 S2.

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 LT20 S2/LT40 S2/LT60 S2's automatic cleaning function (Auto Cleaning) or the LTFS option's cleaning command.
For more details, refer to "3.8 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 LT20 S2/LT40 S2/LT60 S2 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

To stably operate the LT20 S2/LT40 S2/LT60 S2, applying the latest security patches for the LTFS server OS is recommended.

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FUJITSU Storage
ETERNUS LT20 S2/LT40 S2/LT60 S2 Tape Library
User's Guide -Server Connection-

P3AM-5322-12ENZ0

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