FUJITSU

ETERNUS SF
AdvancedCopy Manager 13.4

Operator's Guide for
Tape Backup Option

Preface

Purpose

This manual describes the functionality of ETERNUS SF AdvancedCopy Manager for Tape Backup.

Intended Readers

This manual is intended for a system administrator who performs storage management using ETERNUS SF AdvancedCopy Manager.

Organization

This manual has the following chapters:

Chapter 1 Overview of Tape Backup of AdvancedCopy Manager

This chapter provides an overview of Tape Backup in ETERNUS SF AdvancedCopy Manager.

Chapter 2 Starting and Stopping Daemons

This chapter explains how to start and stop daemons provided by Tape Backup in ETERNUS SF AdvancedCopy Manager.

Chapter 3 Designing the Backup Operation

This Chapter explains the configuration required for backup operation using ETERNUS SF AdvancedCopy Manager for Tape Backup.

Chapter 4 Tape Server Settings

This chapter explains the settings to be made on the Tape Server before starting the tape backup operation.

Chapter 5 Backup Operations (Normal Transaction Volumes)

This chapter explains backup operations for normal transaction volumes.

Chapter 6 Backup Operations (Symfoware)

Not supported.

Chapter 7 Backup Operations using the QuickOPC Function

This chapter explains how to perform backups using QuickOPC.

Chapter 8 Customization of the Storage Pool after the Start of Operation

This chapter explains how to customize the tape storage pools, which were defined during installation, after the start of operation.

Chapter 9 Operational Maintenance

This chapter describes how to perform troubleshooting, configuration and database maintenance tasks.

Chapter 10 Restoring from Tape when the Storage Server is Stopped

This chapter explains how to restore data from the Tape Server while the Storage Server is stopped.

Chapter 11 Commands

This chapter describes commands.

Chapter 12 GUI Client Functions

This chapter explains the GUI Client functions of Tape Backup of AdvancedCopy Manager.

Chapter 13 Notes on Operations

This chapter provides additional notes on the Tape Backup operations.

Chapter 14 Disaster Recovery Restore Function Using Tape Media

This chapter provides information on disaster recovery procedures using tape media.

Appendix A Pre-processing and Post-processing of Backup, Restoration and Tape Copy

This appendix describes shell scripts used for the pre-processing and post-processing of backup, restoration and tape copy.

Appendix B Restoring from Tape when the Cluster Service is Stopped

This chapter explains the procedure for restoration when the cluster service of a Storage Server is stopped.

Appendix C Backup and Restoration of System Volumes

This chapter explains how AdvancedCopy Manager can be used to back up and restore system volumes.

Related Manuals

This manual is included in the following series of ETERNUS SF AdvancedCopy Manager manuals:

- ● ETERNUS SF AdvancedCopy Manager Overview

  Provides an overview of ETERNUS SF AdvancedCopy Manager.
- ● ETERNUS SF AdvancedCopy Manager Installation Guide

  Describes the installation procedure.
- ● ETERNUS SF AdvancedCopy Manager Operator's Guide

  Describes the operating procedures.
- ● ETERNUS SF AdvancedCopy Manager GUI User's Guide

  Describes the operating procedures for the GUI Client.
- ● ETERNUS SF AdvancedCopy Manager Message Guide

  Explains the messages output by ETERNUS SF AdvancedCopy Manager and the associated troubleshooting.
- ● ETERNUS SF AdvancedCopy Manager Operator's Guide for cluster environment

  Describes the installation, customization, and operation of ETERNUS SFAdvancedCopy Manager when it is used in a cluster system.
- ● ETERNUS SF AdvancedCopy Manager Operator's Guide for Tape Backup Option (This Manual)

  Describes the operating procedures for Tape Backup.
- ● ETERNUS SF AdvancedCopy Manager Operator's Guide for Copy Control Module

  Describes the operating procedures for ETERNUS SF AdvancedCopy Manager Copy Control Module.

Users are advised to read "ETERNUS SF AdvancedCopy Manager Overview" first to gain an understanding of the general concepts of this software before reading other manuals as necessary.

Notes on Abbreviations

- ● Microsoft(R) Windows(R) 2000 Professional, Microsoft(R) Windows(R) 2000 Server, and Microsoft(R) Windows(R) 2000 Advanced Server are abbreviated as Windows 2000.
- ● Microsoft(R) Windows Server(R) 2003, Standard Edition, Microsoft(R) Windows Server(R) 2003, Enterprise Edition, Microsoft(R) Windows Server(R) 2003, Enterprise Edition for Itanium-based Systems are abbreviated as Windows Server 2003.
- ● Microsoft(R) Windows Server(R) 2008 Standard、Microsoft(R) Windows Server(R) 2008 Enterprise、Microsoft(R) Windows Server(R) 2008 Datacenter、Microsoft(R) Windows Server(R) 2008 for Itanium-Based Systems are abbreviated as Windows Server 2008.
- ● Microsoft(R) Windows(R) XP Professional and Microsoft(R) Windows(R) XP Home Edition are abbreviated as Windows XP.
- ● Microsoft(R) Windows Vista(R) Home Basic、Microsoft(R) Windows Vista(R) Home Premium、Microsoft(R) Windows Vista(R) Business、Microsoft(R) Windows Vista(R) Enterprise、Microsoft(R) Windows Vista(R) Ultimate are abbreviated as Windows Vista.

- Solaris (TM) Operating System is referred to as Solaris.
- "ETERNUS SF AdvancedCopy Manager" is abbreviated as "AdvancedCopy Manager".
- Manager of ETERNUS SF AdvancedCopy Manager is abbreviated as Manager of AdvancedCopy Manager.
- Agent of ETERNUS SF AdvancedCopy Manager is abbreviated as Agent of AdvancedCopy Manager.
- ETERNUS SF TSM is abbreviated as TSM.
- ETERNUS2000, ETERNUS3000, ETERNUS4000, ETERNUS6000, ETERNUS8000, and ETERNUS GR series are referred to as Fujitsu ETERNUS storage systems.
- LT270, LT250, LT230 (SCSI connection type), LT220, LT160, and LT130 are referred to as ETERNUS tape libraries. The FC (fibre channel) connection type of ETERNUS LT230 tape library device is not supported.

Trademarks

Table of Contents

Chapter 1 Overview of Tape Backup of AdvancedCopy Manager

This chapter provides an overview of Tape Backup in AdvancedCopy Manager.

1.1 What is AdvancedCopy Manager?

AdvancedCopy Manager is a product that provides storage management in an open system, and includes the following functions.

● High-speed backup
● High-speed replication

The high-speed backup function implements database backup without stopping transactions. The Tape Backup feature of AdvancedCopy Manager enhances the high-speed backup function. The high-speed backup function is explained below.

1.1.1 High-speed backup (24-hour basis)

A hardware function [Advanced Copy Function] of Fujitsu ETERNUS storage systems is used to back up data quickly. The Advanced Copy Function provides fast data copy independent of data volume, and can maintain a fixed backup time even if the amount of data to be backed up increases.

This function can drastically reduce the duration for which a transaction must be stopped to perform backup. If a transaction uses a database or a general file system, the time that transaction is stopped is still significantly reduced.

Using the remote copy function of the Fujitsu ETERNUS storage system, it is also possible to back up to ETERNUS storage systems at remote locations.

1.2 What is AdvancedCopy Manager's Tape Backup function?

1.2.1 What is the Tape Backup function?

The Tape Backup function enhances the backup function of AdvancedCopy Manager by supporting tape media in addition to disks as backup media.

If you use the Tape Backup function, you can centrally manage backup histories that are backed up to disk and tape. Backup to tape is enabled by installing a dedicated server called **Tape Server**.
However, the replication function of AdvancedCopy Manager is not enhanced even if the Tape Server is installed.

1.2.2 What are the advantages of installing Tape Server?

If the Tape Server is installed, you can back up data to both disks and tapes. Installation of Tape Server provides the following advantages.

Simple operation for backup to disks and tapes

You can easily execute the backup operation to disks and tapes.
You can back up data to both disks and tapes in a single operation.

Backup to tapes with minimum transaction stop duration

Backup to disks is implemented using the hardware function [Advanced Copy Function (OPC/EC)] of Fujitsu ETERNUS storage systems, and backup to tapes is performed from the Advanced Copy destination (backup volume). Therefore, access to transaction volumes is suppressed for a few seconds in the same manner as when using the conventional AdvancedCopy Manager. Database transactions are not stopped.
However, if the backup is performed only to tapes, not to disks, transactions are stopped until write to tape is completed.

Centralized management of backup history

Backup histories of data backed up to disks and tapes can be managed centrally.

Backup without applying load to the transaction server

The Tape Server takes care of backup to tapes, applying no load to the transaction server.

Support for multiple-platform environment

Even if the transaction servers connected to the SAN environment use different platforms, you don't need to prepare a Tape Server for each platform. One Tape Server enables backup on different platforms.

Reduce required backup destination disk capacity

You can minimize the backup destination disk capacity even when you want to save multiple generations of backups. To do this, back up to disk only the generations that need to be kept on disk (for example, the latest generation) and save the other generations to tape.

1.3 Product Configuration

1.3.1 Functions

This section explains the functions and elements of the Tape Backup function of AdvancedCopy Manager.

Table: Functions

Function name	Description
Manager of AdvancedCopy Manager	Operates on the Storage Management Server, and manages two or more Storage Servers. The Agent of AdvancedCopy Manager is included in this product. The AdvancedCopy Manager management module is only supported on the Solaris OE, Windows, or Linux operating systems.
Agent of AdvancedCopy Manager	Operates on the Storage Server to which the storage device is connected. This function performs backup management.
Tape Manager of AdvancedCopy Manager	Operates on the Tape Server to which the storage device and ETERNUS tape library are connected. This function performs backup to tape or restoration from tape.
Tape Agent of AdvancedCopy Manager	Operates on the Storage Server with which the storage device is connected. This function performs backup management using disk and tape as backup media. This product is installed with the Agent of AdvancedCopy Manager but enabled when Tape Manager is installed.
ETERNUS storage system	Disk array unit having the Advanced Copy Function (OPC/EC).
ETERNUS tape library	This is connected to the Tape Server. AdvancedCopy Manager Tape Backup saves data to tape in the ETERNUS tape library.
Web server	Provides a Web-based GUI to enable simple operation of the configuration management and TSM functions. A Web server is constructed on the Storage Management Server and Tape Server.
Operation terminal	This is a Network terminal for GUI operation.
TSM	A product used for file backup management. The Tape Server implements backup management by internally calling TSM. TSM commands are used to set up the ETERNUS tape library and storage pool used by Tape Backup.

AdvancedCopy Manager Tape Backup distinguishes Server types as follows.

● Storage Server

The Storage Server is a server to which an ETERNUS storage system is connected and which implements the backup functions provided by AdvancedCopy Manager Tape Backup. The Agent and Tape Agent are installed on the Storage Server. If a Storage Server is also to be used as the Storage Management Server then both the Manager and the Agent will need to be installed.

● Storage Management Server

The Storage Management Server manages the Storage Servers. Only one Storage Management Server can be set in the system.

The Manager is installed on the Storage Management Server.

● Tape Server

The Tape Server performs management of backup to tape. One or more Tape Servers can be installed in a system. When backup operations are executed on the Storage Server, the requests related to tape are transferred to the Tape Server and executed there.

The Tape Manager of AdvancedCopy Manager is installed on the Tape Server.

TSM is also installed on the Tape Server. TSM is a product used for file backup management. The Tape Server implements backup management by internally calling TSM.

The following figure shows the relationships between Servers and functions.

Figure: Relationship between Servers and functions
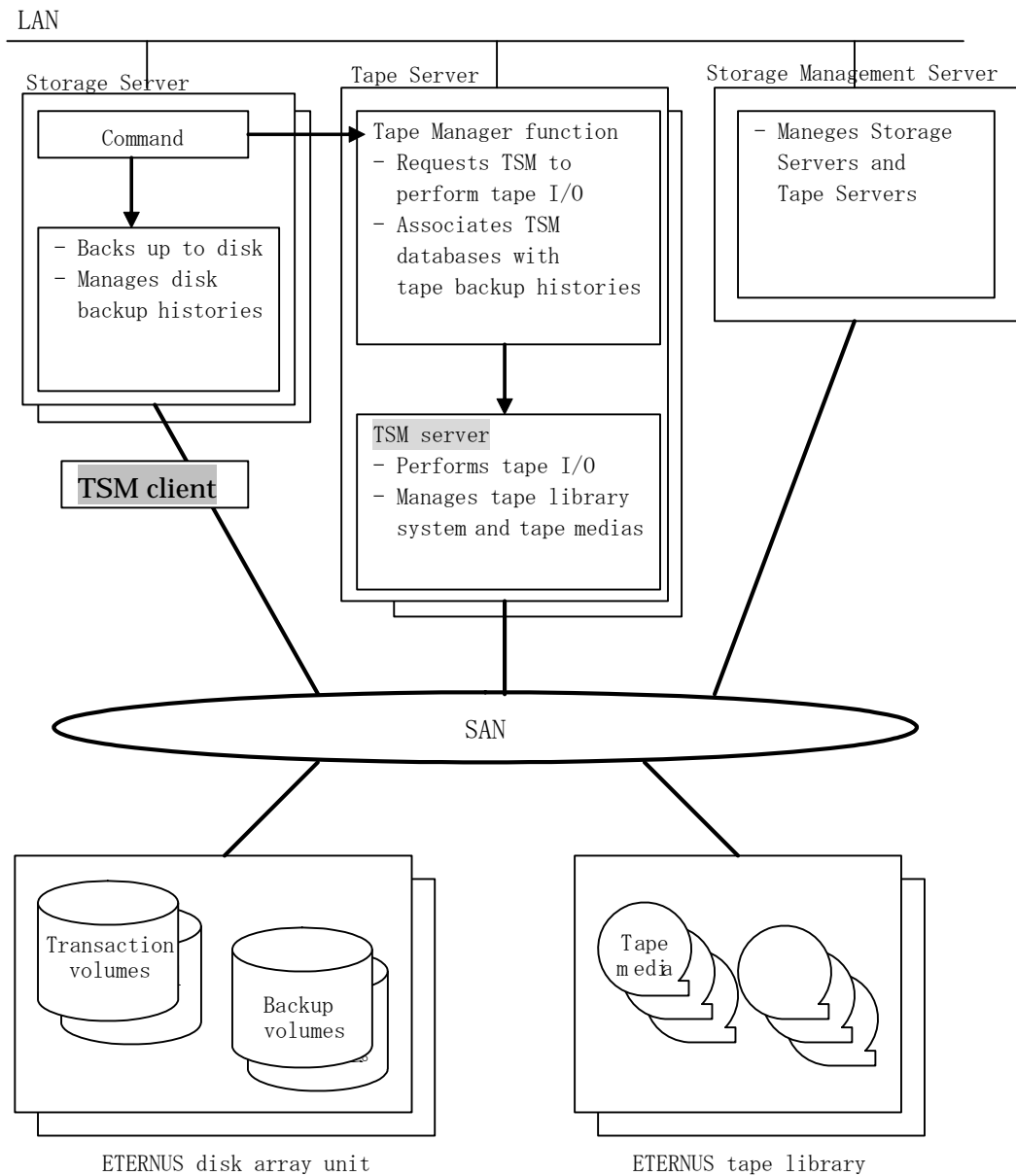
1.3.2 System Configuration

This section explains the system configuration of AdvancedCopy Manager's Tape Backup function.

A Tape Server can be configured for the Tape Backup function in the operation patterns shown in the figures below. For the configurations of the Storage Management Server and Storage Server, see "Function system" in the "AdvancedCopy Manager Operator's Guide".

For the configuration criteria, see "System configuration example of AdvancedCopy Manager" in the "ETERNUS SF AdvancedCopy Manager Installation Guide ".

When the Tape Server is also the Storage Management Server

In this case, the Tape Server is installed on the Storage Management Server. The configuration is shown below.

Figure: When the Tape Server is also operated as the Storage Management Server

<figure>
Storage Management Server and Storage Server
and **Tape Server**

(Manager and Tape Manager of AdvancedCopy Manager)

ETERNUS
tape library

SAN

ETERNUS storage system

ETERNUS storage system
</figure>
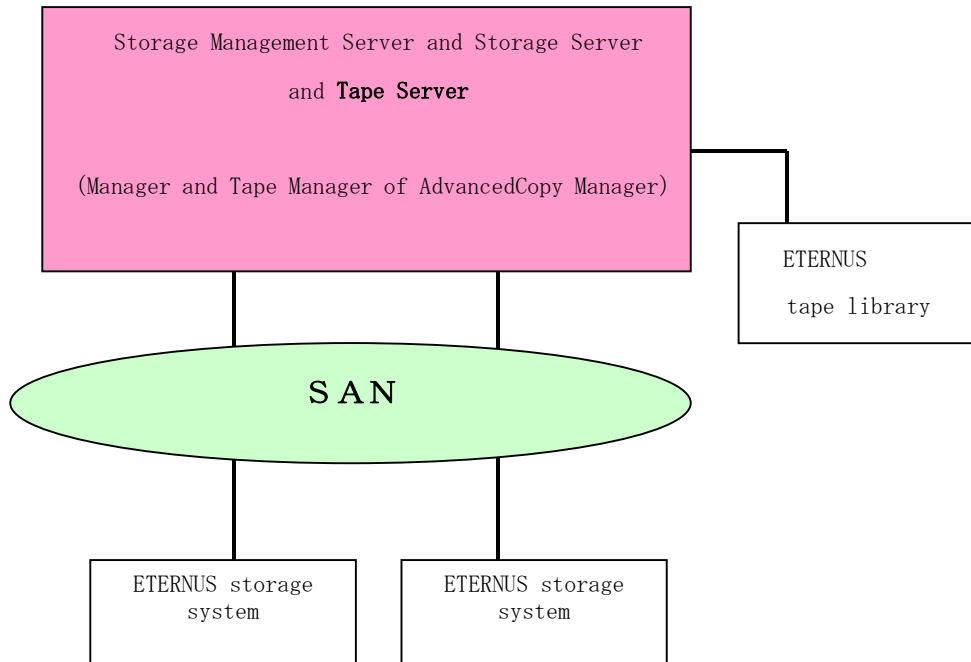
When the Tape Server is also a Storage Server

In this case, the Tape Server is installed on the Storage Server.
The configuration is shown below.

Figure: When the Tape Server is also operated as a Storage Server
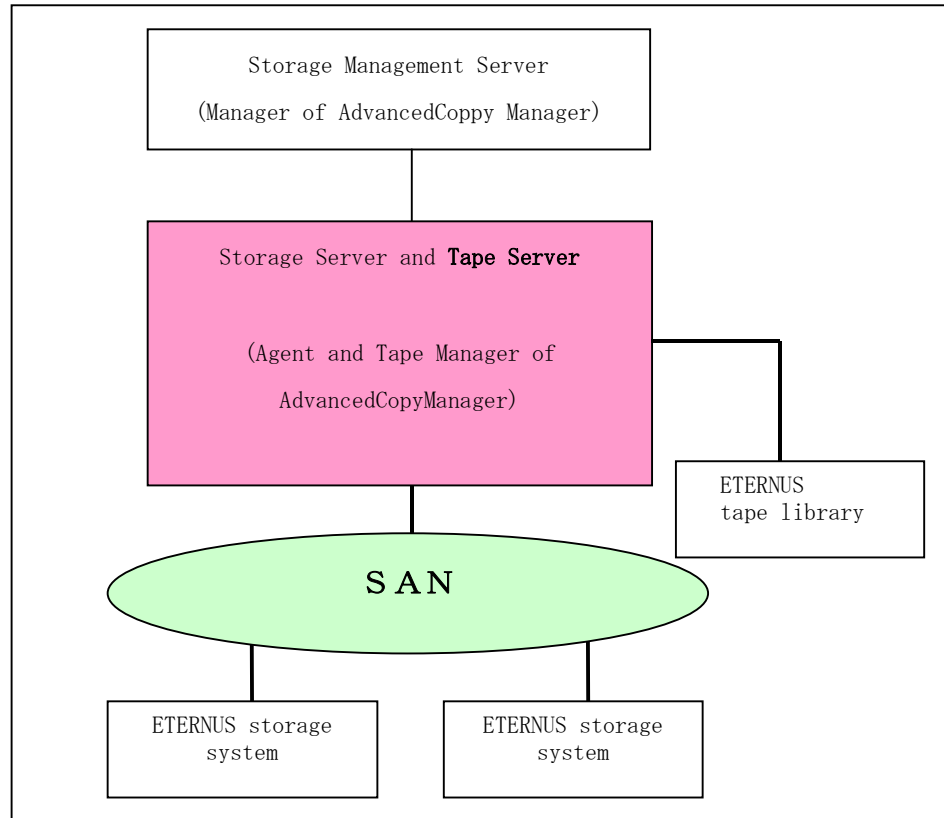
When the Tape Server and other Servers are independent

A configuration for management using an independent Tape Server is shown below.

Figure: When the Tape Server and other Servers are independent
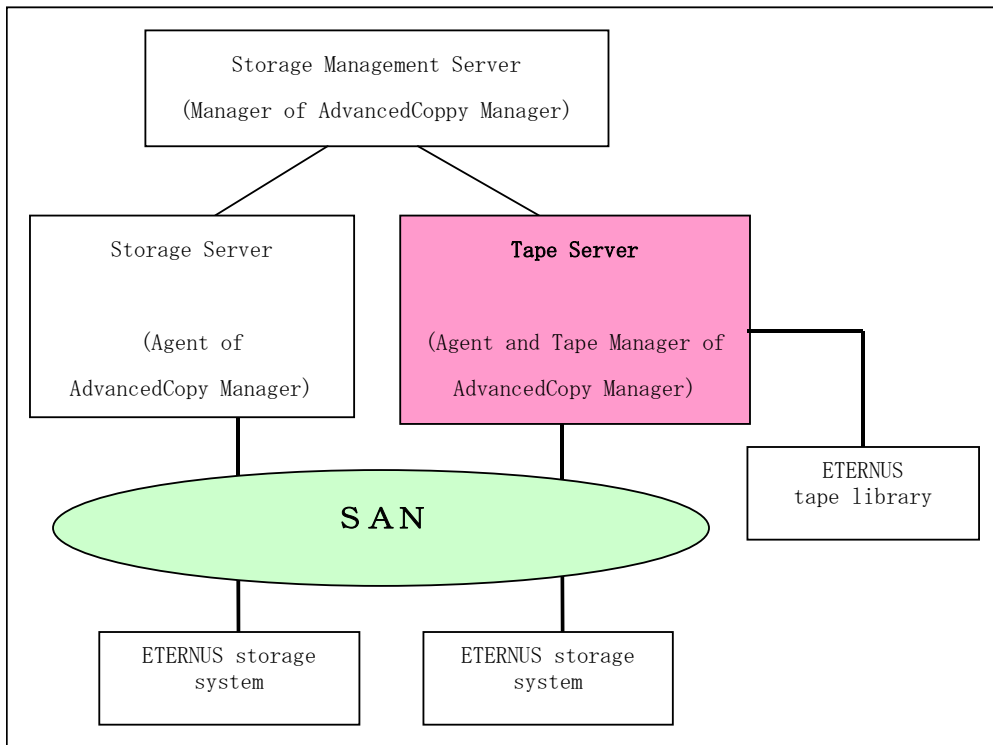
When two or more Tape Servers are operated

When a tape library system is not shared

A configuration in which Tape Servers do not share an ETERNUS tape library is shown below.

When an ETERNUS tape library is not shared
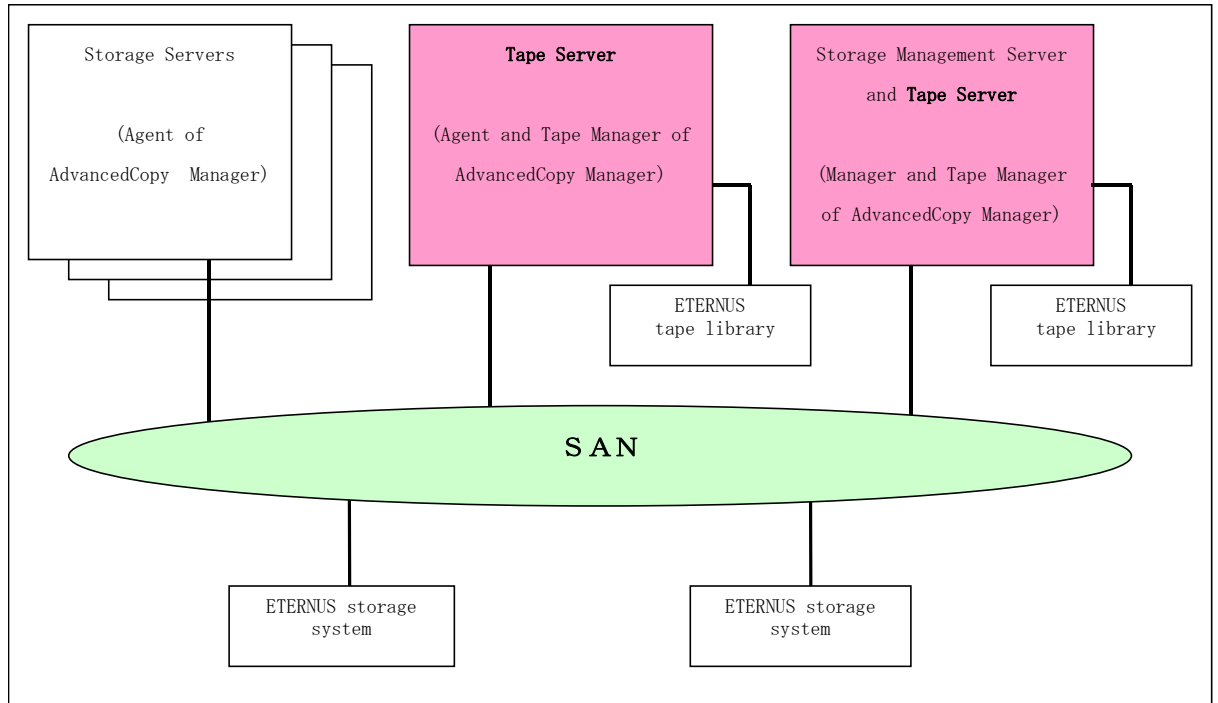
When a tape library system is shared

A configuration in which Tape Servers share an ETERNUS tape library is shown below.

Figure: When an ETERNUS tape library is shared
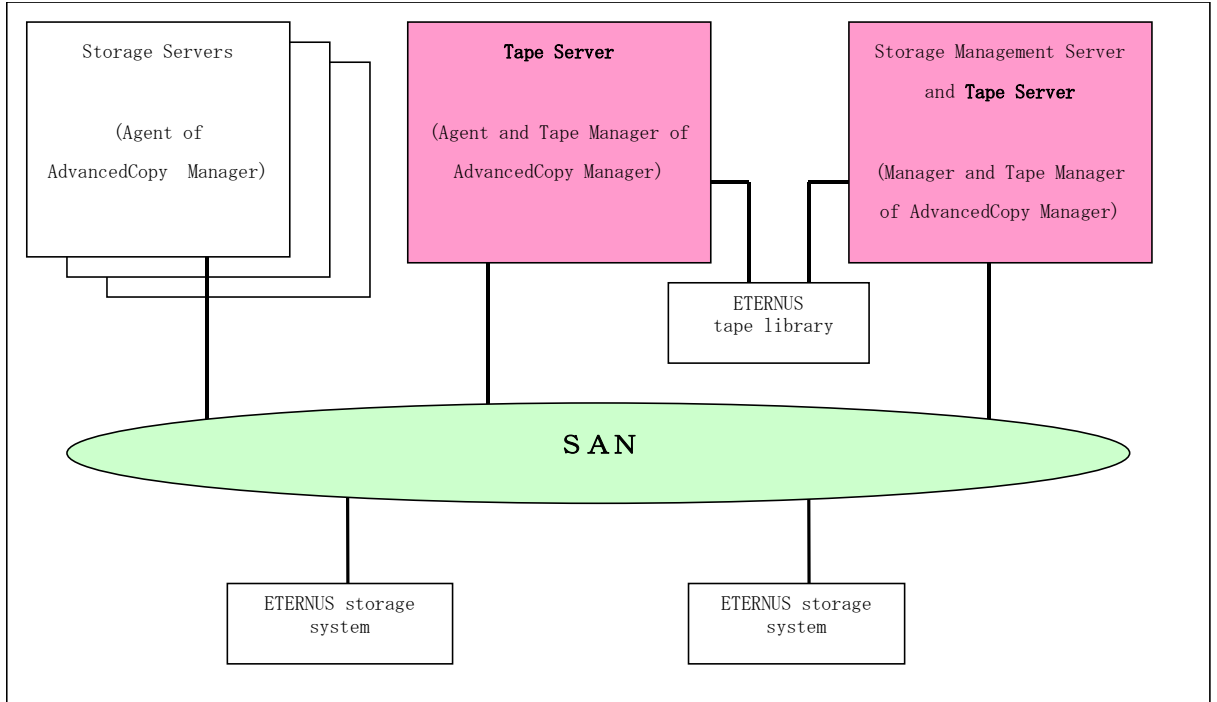
1.3.3 Combinations of Products

This section explains combinations of AdvancedCopy Manager products in a system environment using the Tape Backup function.

1.3.3.1 Combinations of Manager and Agent

The following table summarizes the combinations of product versions.
The Manager of AdvancedCopy Manager that is installed in the Storage Management Server and the Tape Manager installed in the Tape Server must be the same version.
If backup operations are performed when the Tape Server is also used as a Storage Server, the installed Tape Manager must be the same version as the Agent of AdvancedCopy Manager.

If the Agent platform is Solaris or Linux

Table: Combinations of product versions for Solaris or Linux

Tape Manager version	Agent version			
	13.x	11.1	11.0	11.0 or earlier
13.x	A	A (*)	A (*)	NA
11.1	NA	A	A (*)	NA
11.0	NA	NA	A	NA

A: Compatible

NA: Not compatible

(*): However, functions supported by later Storage Server versions cannot be used.

Note

● There are functional differences between different product levels. Installation of the same Tape Manager and Agent levels is recommended.

● The following applies if products with the same version but different levels are connected:

— If the Tape Manager is a later level than the Agent
Tape backup operations are possible (but functions supported by later Storage Server levels cannot be used).

— If the Agent is a later level than the Tape Manager
Tape backup operations are not possible.

If the Agent platform is HP-UX, AIX, or Windows

Table: Combinations of product versions for HP-UX, AIX, or Windows

Tape Manager version	Agent version			
	13.x	11.1	11.0	11.0 or earlier
13.x	A	NA	NA	NA
11.1	NA	A	NA	NA
11.0	NA	NA	A	NA

A: Compatible
NA: Not compatible

Note

● There are functional differences between different product levels. Installation of the same Tape Manager and Agent levels is recommended.

● The following applies if products with the same version but different levels are connected:

— If the Tape Manager is a later level than the Agent
Tape backup operations are possible (but functions supported by later Storage Server levels cannot be used).

— If the Agent is a later level than the Tape Manager
Tape backup operations are not possible.

1.3.3.2 Combinations of Servers and platforms

The following table summarizes the combinations of Server types and supported platforms.

Table: Combinations of Server types and platforms

Platform	Storage Management Server	Storage Server	Tape Server
Solaris	Supported	Supported	Supported
Linux	Supported	Supported	Not Supported
Windows	Supported	Supported	Not Supported
HP	Not Supported	Supported	Not Supported
AIX	Not Supported	Supported	Not Supported

Information regarding the versions of supported platforms can be found in the manuals listed below.

- ● Storage Management Server

  For details, refer to "Software requirements" in the "ETERNUS SF AdvancedCopy Manager Operator's Guide" for the operating system of the target Storage Management Server.

- ● Storage Server

  For details, refer to "Software requirements" in the "ETERNUS SF AdvancedCopy Manager Operator's Guide" for the operating system of the target Storage Server.

- ● Tape Server

  For details, refer to "Installation of Tape Manager" in the "ETERNUS SF AdvancedCopy Manager Installation Guide".

1.4 Overview of Tape Backup Functions

1.4.1 Management Functions

Tape library system management by TSM

AdvancedCopy Manager's Tape Backup function automatically allocates drivers used for backup and restoration, as an extension of backup or restoration. TSM manages the allocation.

Tape storage pool management by TSM

AdvancedCopy Manager's Tape Backup function automatically allocates tape media used for backup and restoration, as an extension of backup or restoration. TSM manages the allocation.

Associating Storage Servers with Tape Servers

When multiple Tape Servers are installed, it is necessary to decide which backup requests should be processed on which Tape Servers. You can decide on a Tape Server for each Storage Server. This function thus manages the association between the Storage Servers that issue requests and Tape Servers that process the requests.

Policy management

This function configures the storage pool and history management.

Storage configuration management

This function manages the configuration of volumes to be backed up and backup destination volumes.

AdvancedCopy Manager's Tape Backup function calls the volumes to be backed up "transaction volumes" and the backup destination volumes "backup volumes".

1.4.2 Backup and Restoration Function

Backup methods

The following two backup methods are supported:
— Combining backup to tape media with high-speed backup to disk
High-speed backup to disk is a function for implementing high-speed backup between volumes, regardless of volume capacities, using the Advanced Copy Function (OPC/EC) of Fujitsu ETERNUS storage systems. Backup to tape media is performed from the backup destination disk. Therefore, this function can greatly reduce the time during which system service is stopped for backup. Using EC enables faster backup because it supports differential copying for updates. This backup method requires a backup destination disk.
The figure below shows the operation for backup to tape media via disk.

Figure: Combining backup to tape media with high-speed backup to disk
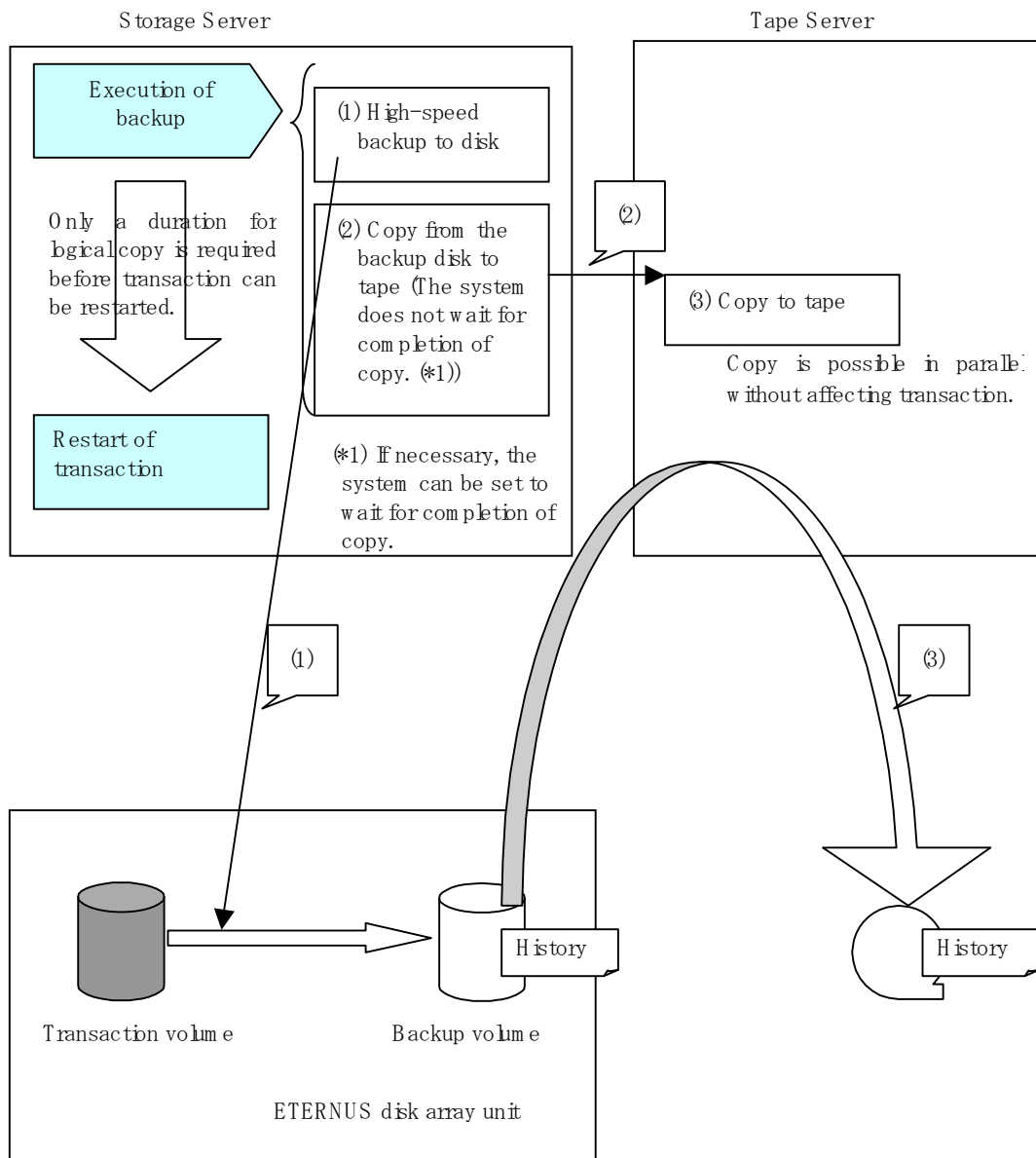
— Backup method directly to tape
This method performs backup to tape media directly from a transaction volume
without using the Advanced Copy Function of the ETERNUS storage system.
Transactions cannot be restarted until tape backup is completed. Therefore, it
increases the time during which transaction must be stopped for backup.
The figure below shows the operation for backup to tape.

Figure: Method for direct backup to tape
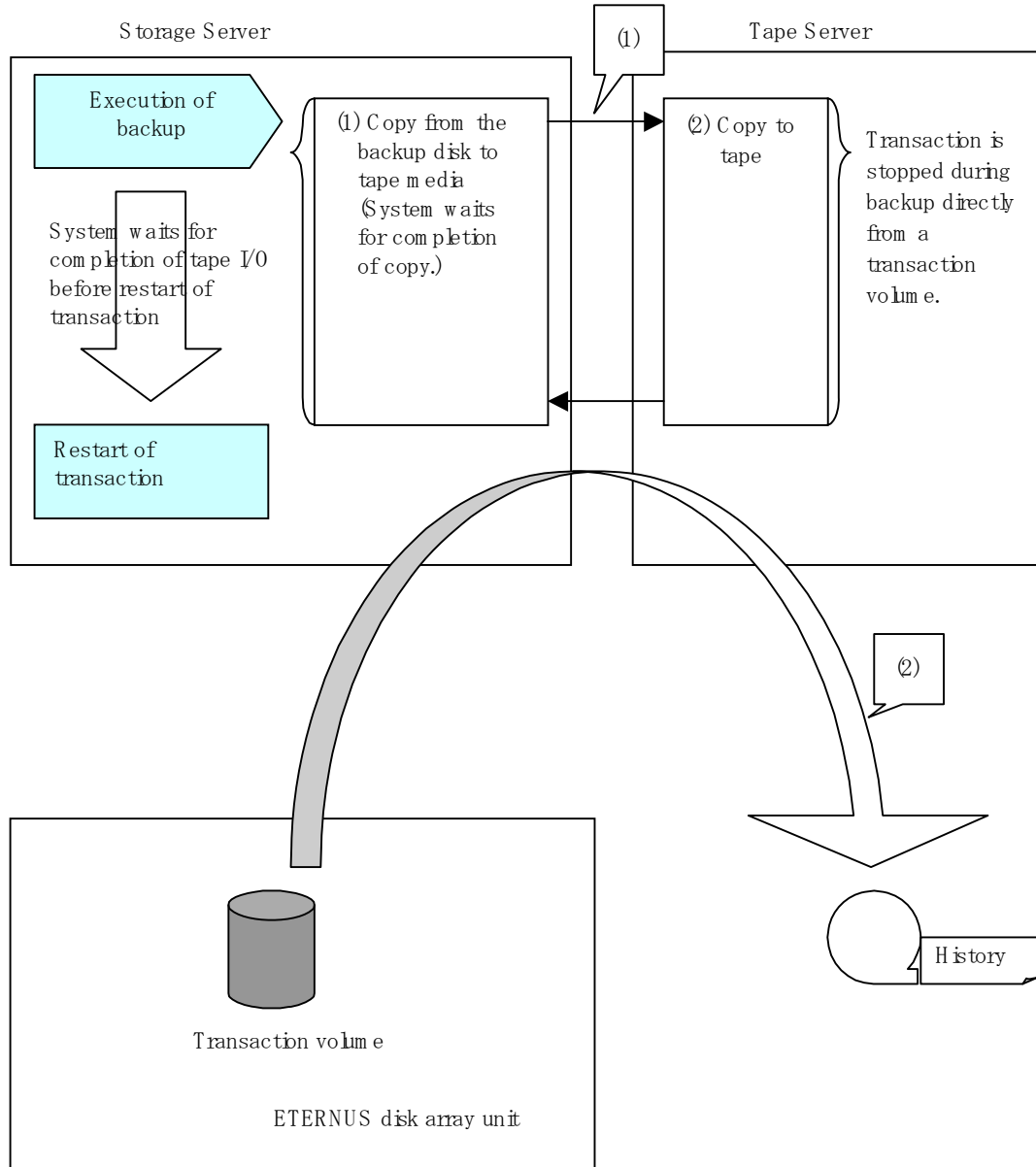
Restoration methods

The following two restoration methods are supported:

● Restoration from disk

When backup data is stored on a disk, the Advanced Copy Function (OPC/EC) of Fujitsu ETERNUS storage systems is used for restoration. This method can implement restoration instantaneously regardless of the size of a transaction volume.

● Restoration from tape media

When backup data is stored on tape, data is directly written to a transaction volume from tape media. This increases the time required for restoration.

Coordination with the transaction server

● When the transaction server is active

Backup data is guaranteed by coordination between the Tape Server and the transaction server.

● When the transaction server is inactive

Restoration from the tape server independent of transaction is possible. This function can be used to recover system volumes.

Backup history management

● Centralized management of backup to both disk and tape media

Backup data of transaction volumes is centrally managed as history information regardless of the backup destination media. Automatic management is also possible by setting the number of preservation generations or preservation days.

Operation managed by the number of preservation generations is referred to as "generation management backup", and operation managed by the number of preservation days is referred to as "day management backup".

In generation management backup mode, backup data is assigned a unique number called a generation number. An absolute generation is assigned uniquely to each transaction volume regardless of the media type (disk or tape). A relative generation is assigned uniquely to respective data stored on the disk or tape media.

Progress check for operation

The progress of backup, restoration, or tape copy being executed, or the result of the execution, can be checked.

1.4.3 Other Functions

Support for multiple platforms with one Tape Server

Transaction volumes based on different platforms can be backed up with one Tape Server. This function eliminates the need to prepare a Tape Server for each platform.

Load distribution with multiple Tape Servers

Installing multiple Tape Servers can distribute loads on the Tape Servers due to an increase in the number of transaction volumes.

1.5 Operating Environment of Tape Backup of AdvancedCopy Manager

1.5.1 Hardware Requirements

The following hardware devices are mandatory if tape backup operations are to be performed. An Advanced Copy licence and appropriate cache table size settings are also required. Each device requires different settings for the provided Advanced Copy functions, so check the setting requirements with your Fujitsu SE.

[ETERNUS storage system]
- ETERNUS2000 model 100 or higher
- ETERNUS3000 model 100 or higher
- ETERNUS4000 model 100 or higher
- ETERNUS6000
- ETERNUS8000
- ETERNUS GR720
- ETERNUS GR730
- ETERNUS GR740
- ETERNUS GR820
- ETERNUS GR840

[ETERNUS tape library]
- ETERNUS LT130
- ETERNUS LT160
- ETERNUS LT220
- ETERNUS LT230
- ETERNUS LT250
- ETERNUS LT270

[Tape media]

Table: When using the ETERNUS tape library in the SAN Environment

ETERNUS tape library name	Ultrium				Host Interface	Remarks
	1	2	3	4		
ETERNUS LT130	Y	Y	Y	N	SCSI/FC	
ETERNUS LT160	Y	Y	Y	N	FC	
ETERNUS LT220	N	N	Y	Y	SCSI	
ETERNUS LT230	N	N	Y	Y	Ultrium3: SCSI/FC	
					Ultrium4: FC	
ETERNUS LT250	N	N	Y	Y	Ultrium3: SCSI/FC	
					Ultrium4: FC	
ETERNUS LT270	N	Y	Y	Y	FC	

Y: Supported, N: Not supported

1.5.2 Software Requirements

1.5.2.1 Tape Manager of AdvancedCopy Manager

The following table shows the software requirements for the Tape Manager of AdvancedCopy Manager.

Note that different software versions and levels are required, depending on the system environment in which the Tape Manager is installed. Refer to the appropriate software manuals for details.

Table: Software requirements for the Tape Manager of AdvancedCopy Manager

Product name	Requirement	Remarks
Solaris 9 Solaris 10 11/06 or later	Required	Support OS In Solaris 9, apply the following patches: • 111712-12 Sun OS 5.9 64 bit shared library patch (C++) • 112963-22 linker patch
PRIMECLUSTER 4.1 or later	Conditionally required	If cluster operation is used at the AdvancedCopy Manager Tape Server
ETERNUS multi-path driver	Required	

Note For Solaris 10 operating system

The following function of the Solaris 10 operating system is not supported:
— Containers (Zones)

1.5.2.2 Tape Agent of AdvancedCopy Manager

The following table shows the software requirements for the Tape Agent of AdvancedCopy Manager.

Note that different software versions and levels are required depending on the system environment in which the Tape Agent is installed. Refer to the appropriate software manuals for details.

Solaris

Table: Software requirements for the Tape Agent of AdvancedCopy Manager

Product name	Requirement	Remarks
Solaris 8 Solaris 9 Solaris 10	Required	Support OS
Symfoware Server Advanced Backup Controller 6.x or later	Conditionally required	If backup operations are performed in conjunction with Symfoware
SynfinityCluster 2.0 PRIMECLUSTER 4.1 or later VERITAS Cluster Server 4.0 VERITAS Cluster Server 4.1 VERITAS Cluster Server 5.0 SunCluster 3.1	Conditionally required	If cluster operation is used at the AdvancedCopy Manager Tape Agent
Multi-path disk control (MPHD) 2.0 or later	Conditionally required	If multi-path disk control are implemented
Multi-path disk control load balance option (MPLB) 2.0 or later	Conditionally required	If multi-path disk control and path load balancing are implemented

Product name	Requirement	Remarks
GR multi-path driver (GRMPD) 1.0 for Solaris	Conditionally required	If multi-path disk control and path load balancing are implemented
ETERNUS multi-path driver	Conditionally required	If multi-path disk control and path load balancing are implemented
VERITAS Volume Manager 4.0 VERITAS Volume Manager 4.1 VERITAS Volume Manager 5.0	Conditionally required	If operations target logical volumes of the VERITAS Volume Manager

For Solaris 10 operating system

The following functions of the Solaris 10 operating system are not supported:
- ― Containers(Zones)
- ― ZFS

Linux

Table: Software requirements for the Tape Agent of AdvancedCopy Manager

Product name	Requirement	Remarks
Red Hat Enterprise Linux AS (v.3 for x86) Red Hat Enterprise Linux ES (v.3 for x86) Red Hat Enterprise Linux AS (v.4 for x86) Red Hat Enterprise Linux ES (v.4 for x86) Red Hat Enterprise Linux AS (v.4 for EM64T) *operating in 32-bit compatible mode Red Hat Enterprise Linux ES (v.4 for EM64T) *operating in 32-bit compatible mode Red Hat Enterprise Linux AS (v.4 for Itanium) Red Hat Enterprise Linux 5 (for x86) Red Hat Enterprise Linux 5 (for Intel64) *operating in 32-bit compatible mode Red Hat Enterprise Linux 5 (for Intel Itanium)	Required	Support OS
PRIMECLUSTER 4.1A20 or later	Conditionally required	If cluster operation is used at the AdvancedCopy Manager Tape Agent
GR multi-path driver (GRMPD) 1.0 for Linux	Conditionally required	If multi-path disk control and path load balancing are implemented
ETERNUS multi-path driver	Conditionally required	If multi-path disk control and path load balancing are implemented
Symfoware Server Advanced Backup Controller 7.x or later	Conditionally required	If backup operations are performed in conjunction with

Product name	Requirement	Remarks
		Symfoware

HP-UX

Table: Software requirements for the Tape Agent of AdvancedCopy Manager

Product name	Requirement	Remarks
HP-UX 11.00 HP-UX 11i v1 HP-UX 11i v2 (PA-RISC) HP-UX 11i v2.0 (Itanium) HP-UX 11i v3 (Itanium)	Required	Support OS
MC/Service Guard 11.13 VERITAS Cluster Server 5.0	Conditionally required	If cluster operation is used at the AdvancedCopy Manager Tape Agent
VERITAS Volume Manager 3.5 VERITAS Volume Manager 5.0	Conditionally required	If operations target logical volumes of the VERITAS Volume Manager

AIX

Table: Software requirements for the Tape Agent of AdvancedCopy Manager

Product name	Requirement	Remarks
AIX 5L V5.1 AIX 5L V5.2 AIX 5L V5.3	Required	Support OS
High Availability Cluster Multi-Processing 5.1 VERITAS Cluster Server 5.0	Conditionally required	If cluster operation is used at the AdvancedCopy Manager Tape Agent
VERITAS Volume Manager 4.0 VERITAS Volume Manager 5.0	Conditionally required	If operations target logical volumes of the VERITAS Volume Manager

Windows

Table: Software requirements for the Tape Agent of AdvancedCopy Manager

Product name	Requirement	Remarks
Microsoft(R) Windows(R) 2000 Server SP4 or later Microsoft(R) Windows(R) 2000 Advanced Server SP4 or later Microsoft(R) Windows Server(R) 2003, Standard Edition SP1, SP2 Microsoft(R) Windows Server(R) 2003, Enterprise Edition SP1, SP2 Microsoft(R) Windows Server(R) 2003, Standard x64 Edition Microsoft(R) Windows Server(R) 2003, Standard x64 Edition SP2 Microsoft(R) Windows Server(R) 2003, Enterprise x64 Edition Microsoft(R) Windows Server(R) 2003, Enterprise x64 Edition SP2 Microsoft(R) Windows Server(R) 2003 R2, Standard Edition Microsoft(R) Windows Server(R) 2003	Required	Support OS

Product name	Requirement	Remarks
R2, Standard Edition SP2 Microsoft(R) Windows Server(R) 2003 R2, Enterprise Edition Microsoft(R) Windows Server(R) 2003 R2, Enterprise Edition SP2 Microsoft(R) Windows Server(R) 2003 R2, Standard x64 Edition Microsoft(R) Windows Server(R) 2003 R2, Standard x64 Edition SP2 Microsoft(R) Windows Server(R) 2003 R2, Enterprise x64 Edition Microsoft(R) Windows Server(R) 2003 R2, Enterprise x64 Edition SP2 Microsoft(R) Windows Server(R) 2003, Enterprise Edition for Itanium-based Systems Microsoft(R) Windows Server(R) 2003, Enterprise Edition for Itanium-based systems SP1/SP2 Microsoft(R) Windows Server(R) 2003, Enterprise Edition for Itanium-based Systems SP2		
Multi-path control for WindowsNT/2000 V2.0L12	Conditionally required	If multi-path disk control is implemented
GR multi-path driver (GRMPD) 1.0 for Windows	Conditionally required	If multi-path disk control and path load balancing are implemented
ETERNUS multi-path driver V2.0L10 or later	Conditionally required	If the Storage Management Server is also used as Storage Server, and if multi-path disk control and path load balancing are implemented
The Microsoft(R) Cluster Service (MSCS)	Conditionally required	If MSCS is used for cluster operation with the Agent of AdvancedCopy Manager (included in Microsoft(R) Windows(R) 2000 Advanced Server and Microsoft(R) Windows Server(R) 2003)
SynfinityCluster/Standard V1.1L10 or later	Conditionally required	If SynfinityCluster operation is used at the Agent of AdvancedCopy Manager

1.6 Supported Devices of Tape Backup of AdvancedCopy Manager

For information on the devices supported by Tape Backup, refer to "Managing a Device on AdvancedCopy Manager" in the "AdvancedCopy Manager Operator's Guide" for the operating system of the target Storage Server.

1.6.1 Normal Devices

For information on the devices supported by Tape Backup of AdvancedCopy Manager, refer to "Managing a Device on AdvancedCopy Manager" in the "ETERNUS SF AdvancedCopy Manager Operator's Guide" for the operating system of the target Storage Server.

1.6.2 SDX Object of PRIMECLUSTER GDS/SynfinityDISK

PRIMECLUSTER GDS (referred to as "GDS")/SynfinityDISK is software whose main function is mirroring disk units.
The operation modes supported by Tape Backup of AdvancedCopy Manager are as follows.
● For operation in units of slices
Solaris:
/dev/sfdsk/(class name)/dsk/(volume name):(devnam-value-of-sdxinfo)
Linux:
/dev/sfdsk/(class name)/dsk/(volume name):(device name)
One of the following is used for the device name that makes up of volume.
— sdxinfo@DEVNAM value
Example of using the sdxinfo@DEVNAM value for the operation of a slice unit is described below:
Example:/dev/sfdsk/class1/dsk/volume1:sda
– Class name:class1
– Volume name:volume1
– Device name:sda(sdxinfo DEVNAM value)

— Device name (udev devide name) generated by the udev mechanism specified by sdxinfo DEVNAM sdxinfo DEVNAM value.
An example of using udev device name for the operation of a slice unit is described below.
Example)/dev/sfdsk/class1/dsk/volume1:/dev/disk/by-id/scsi-3600e000000cb000 00000000100020000
– Class name:class1
– Volume name:volume1
– Device name:/dev/disk/by-id/scsi-3600e000000cb00000000000100020000(udev device name specified by the sdxinfo DEVNAM value)

The udev device name is used as the priority under the environment in which udev device name exists. The udev device name can use the by-id name. If the udev device name is used but by-id is not generated, by-id should be generated. If a backup operation is performed by the tape backup option under the environment where only the by-path name is generated, the format should be changed to the conventional format (compatible device name) according to the "Information capture mode setting command (stgxfwcmsetmode)" in the "ETERNUS SF AdvancedCopy Manager Operator's Manual (Linux version)". Even if in the environment where the udev device exists and the sdxinfo DEVNAM value is used, the mode should be changed to the information capture mode prior to device information capture/reflection processing in order to avoid the use of udev device name.

For details, refer to "Information capture mode setting command (stgxfwcmsetmode)" in the "ETERNUS SF AdvancedCopy Manager Operator's Manual (Linux version)".

Windows:
disk class name/mirror volume:g?d?p?

Operation mode for the logical volume units is not supported.
Solaris and Linux are the only supported operating systems.

Notes on Linux

The following are notes on using PRIMECLUSTER GDS/SafeDISK SDX object in the tape backup option.

— —the by-id name should be used when the udev device name is used.
If the by-id name is not generated, the settings should be changed to generate the by-id name. The operation is not possible with by-path.
— Note the following if the udev device is used under the environment where the ETERNUS multipath driver is not installed.
If the disk is replaced while using by-id, the udev device name may change. Even if the udev device name is changed, the procedure for "Change of the device configuration" is required.

1.6.3 Volumes under control of VERITAS Volume Manager (VxVM)

For details, refer to "Volumes under control of VERITAS Volume Manager (VxVM)" in the "ETERNUS SF AdvancedCopy Manager Operator's Guide" for the relevant operating system.

1.6.4 Volumes under control of Logical Volume Manager (LVM)

For details, refer to "Volumes under control of Logical Volume Manager (LVM)" in the "ETERNUS SF AdvancedCopy Manager Operator's Guide" for the relevant operating system.

Chapter 2　Starting and Stopping Daemons

This chapter provides information on how to start and stop the daemons provided by Tape Backup in AdvancedCopy Manager.

2.1 Daemons that Configure Tape Backup in AdvancedCopy Manager

The Manager of AdvancedCopy Manager is configured with the following daemons.

Table: Types of daemons that configure Manager of AdvancedCopy Manager

Daemon type	Description
The Communication Daemon	Communicates with the Storage Server and Tape Server.
The RMI Daemon	Manages the GUI display.
The RDB Daemon	Accesses the repository.
The Authentication Daemon	Manages the authentication feature.

The Agent of AdvancedCopy Manager is configured with the following daemon.

Table: Types of daemons that configure Agent of AdvancedCopy Manager

Daemon type	Description
The Communication Daemon	Communicates with the Storage Management Server, Tape Server, and other Storage Servers.

The Storage Manager Server is configured with the following daemons, when the Storage Management Server is operated in a cluster system.

Table: Types of daemons that configure Storage Manager Server transactions

Daemon type	Description
The Communication Daemon	Communicates with the Storage Server.
The RMI daemon	Manages the GUI display.
The RDB daemon	Accesses the repository.
The Authentication Daemon	Manages the authentication feature.

A Storage Server is configured with the following daemons, when the Storage Management Server is operated in a cluster system.

Table: Types of daemons that configure Storage Server transactions

Daemon type	Description
The Communication Daemon	Communicates with the Storage Management Server and other Storage Servers.

![Note icon]

The following daemons cannot run a Storage Management Server transaction or Storage Server transaction.
— The Communication Daemon for local node

Tape Manager of AdvancedCopy Manager is configured with the following daemons.

Table: Types of daemons that configure Tape Manager of AdvancedCopy Manager

Daemon type	Description
The Communication Daemon	Communicates with the Storage Management Server and Storage Server.
The Tape Server Daemon	Processes tape-related requests issued from the Storage Server.
The TSM Server Daemon	Required for using the TSM function.

2.2 Starting Daemons

2.2.1 Starting daemons while the operating system is stopped

The daemons on the Storage Management Server, Storage Server, and Tape Server are all automatically activated when the operating system is started.
Therefore, when the operating system is started from the stopped state, you need not intentionally start daemons.

2.2.2 Starting daemons while the operating system is active

When you want to start a daemon if starting the daemon has failed or after you stopped the daemon intentionally, perform the action explained below, on the appropriate server.

Storage Management Server and Storage Server

For details, see "Starting and Stopping Daemons" in the "ETERNUS SF AdvancedCopy Manager Operator's Guide" for the operating system of the target Storage Management Server and Storage Server.

Tape Server

To start daemons, execute the following commands as the root user.

```
# /opt/swstorage/bin/startacm
# /etc/init.d/FJSVswstm start
# /etc/init.d/initTSM start
```

If you need to start the daemon on the Tape Server individually, you can start the daemon as follows.
— In the case of the Communication Daemon
1) The following commands are executed at the command line.

```
# ps -ef | grep stgxfws
```

Confirm that the following is not displayed:

```
/opt/FJSVswstf/bin/stgxfws Logical-Node-Name
```

If the above message is displayed, the daemon has already started.
2) For environment variable SWSTGNODE, specify the name of the logical node on which the transaction is to be performed.
3) Start the Communication Daemon.
For the daemon start command, see "Starting and Stopping Daemons" in the chapter "Commands".
— In the case of daemons other than the Communication Daemon
Refer to "Starting and Stopping Daemons" in the chapter "Commands". A logical node name is set as an environment variable SWSTGNODE, and a daemon starting command is executed.

2.3 Stopping Daemons

Before executing the command, make sure that environment variable SWSTGNODE has not been set.

2.3.1 Stopping daemons by stopping the operating system

The daemons on the Storage Management Server, Storage Server, and Tape Server are all automatically stopped when the operating system is stopped.
Therefore, when the operating system is stopped, you need not intentionally stop daemons.

2.3.2 Stopping daemons without stopping the operating system

If you want to stop a daemon without stopping the operating system, you can perform the action described below on the appropriate server.

Storage Management Server and Storage Server

For details, refer to "Starting and Stopping Daemons" in the "ETERNUS SF AdvancedCopy Manager Operator's Guide" for the operating system of the target Storage Management Server and Storage Server.

Tape Server

To stop daemons, execute the following commands as the root user.

```
# /etc/init.d/initTSM stop
# /etc/init.d/FJSVswstm stop
# /opt/swstorage/bin/stopacm
```


Before executing the stopadacm command, confirm that the SWSTGNODE environment variable is not defined.

If daemons are stopped while backup or restoration is in progress, the backup or restoration terminates with an error. If necessary, restart daemons and execute the backup or restoration again.

Note

If you need to stop the daemon on the Tape Server individually, you can stop the daemon as follows.

— In the case of the Communication Daemon

1) The following commands are executed at a command line.

```
# ps -ef | grep stgxfws
```

Confirm that the following is displayed:

```
/opt/FJSVswstf/bin/stgxfws Logical-Node-Name
```

If the message above is not displayed, the daemon has already stopped.

2) For the environment variable SWSTGNODE, specify the name of the logical node on which the transaction is to be performed.

3) Stop the Communication Daemon.
For the daemon stop command, see "Starting and Stopping Daemons" of the chapter "Commands".

Note

If you execute the command to stop the communication daemon while it is running, the command may take up to 10 seconds to complete.

— In the case of daemons other than the Communication Daemon
Refer to "Starting and Stopping Daemons" in the chapter "Commands". A logical node name is set as an environment variable SWSTGNODE, and a daemon stop command is executed.

Chapter 3 Designing the Backup Operation

This chapter explains the configuration required for Tape Backup operation in AdvancedCopy Manager.

3.1 Considerations on Designing the Tape Backup Operation

The items that may be required for tape backup, and how to configure the items, are explained below.

Number of Tape Servers for load balancing

According to the number of transaction volumes on all Storage Servers, install multiple Tape Servers to distribute loads on the Tape Servers. Considering the general backup schedule, decide which Tape Servers should handle requests from which Storage Servers. Make this setting according to "Association of Storage Servers with Tape Servers".

Backup destination media

Decide whether to back up data to both disks and tapes or to only tapes.

Consider whether a backup destination disk is available and how long transaction can be stopped for backup (a disk is required if transaction can only be stopped for a short time).

Make this setting using an option of the "Backup command (acmbackup)".

Point

> The tape storage capacity depends on the type of tape. Refer to the following values to estimate the number of tapes required for backing up to tape:
>> LTO Generation 1 = 100GB
>> LTO Generation 2 = 200GB
>> LTO Generation 3 = 400GB
>> LTO Generation 4 = 800GB

Number of preservation generations

Determine the maximum generations of backup data to be saved. This will depend on how many backup destination disks and tapes can be reserved. For information on the number of preservation generations and the size of backup destination disks (backup volumes) required for it, refer to the "Operation Design" section of the Backup Operation chapter in the "ETERNUS SF AdvancedCopy Manager Operator's Guide" for the target Storage Server s operating system.

Set the number according to the "Tape backup management class" and "Backup Policy".

Number of preservation days

Decide how long the backup data saved to tape should be kept.

Set the number of preservation days using the "Tape backup management class". The number of preservation days cannot be set for disk data.

Number of concurrent backup tasks and the number of drives used.

In the operation mode in which multiple backup tasks are executed concurrently, the number of drives assigned to each Storage Server can be limited to prevent unbalanced allocation of drives.

When deciding upon the appropriate configuration, consider the entire backup schedule. For instance, when multiple Storage Servers execute backup concurrently, a certain Storage Server may first occupy all drives for executing backup. If so, the completion of backup by other Storage Servers may be delayed and this may adversely affect the start time of transaction. Limiting the number of drives each Storage Server can use concurrently can balance the drive allocation to Storage Servers and prevent this delay.

Limit the number of drives using the "Device Class". Create a storage pool that uses this device class and set the storage pool in the backup policy of the transaction volume.

In tape backup, if the number of backup tasks executed concurrently exceeds the number of drives, backup tasks that were started later have to wait for idle drives. (The backup command does not return at this stage).
In this case, writing to tape starts automatically when the backup tasks that were started earlier are completed.

Number of tape copies
Decide whether to simultaneously write the same backup data to multiple tapes. Make this setting in such cases as when backing up duplicate data to two different tapes and keeping one at a remote site in preparation for disasters. This setting cannot be made for disk data.
Make this setting in "Storage Pool".
Snapshot or synchronous backup
Decide which type of disk backup is to be used, snapshot or synchronous.
For details of the snapshot backup and synchronous backup, see the "Overview" section in the Backup Operation chapter of the "ETERNUS SF AdvancedCopy Manager Operator's Guide" for the target Storage Server's operating system.

3.2 Association of Storage Servers with Tape Servers

Multiple Tape Servers can be installed. Installing the appropriate number of Tape Servers according to the number of transaction volumes on all Storage Servers can distribute loads on the Tape Servers.

The association of Storage Servers with Tape Servers defines which Tape Servers execute requests from each Storage Server.

Make this setting using the "Storage Server configuration command (acmsvrset)".

3.3 Device Class

Tape Backup of AdvancedCopy Manager uses TSM to manage tape library systems. TSM allows the user to set the method of using drives as a device class.

The following types of information can be set in the device class:

Device type

Format type

Library name

Options specified for mounting tapes on drives (the major options are shown below)

Maximum number of drives that can be used concurrently

Time remaining before tape is unmounted after use

3.4 Storage Pool

A storage pool is a logical area of backup destination tapes. Tapes in a tape library system are grouped and managed as a pool. Tape Backup of AdvancedCopy Manager uses TSM to manage storage pools.

Allocating the backup destination to a storage pool can eliminate the need to recognize individual tapes for backup. Storage pools can be customized in various ways.

3.4.1 Private operation and scratch operation

Tape operation using storage pools can be performed in two ways: private operation and scratch operation.

Private operation

The tapes to be used need to be registered in advance in the storage pool. Backup is executed within the range of the tapes registered in the storage pool. The tapes once registered in the pool remain in the pool and reused as long as they are not removed intentionally.

Scratch operation

The user need not register tapes in the storage pool. When needed, tapes are automatically registered and used for backup. When a tape is emptied after backup data on it is completely deleted, the tape is automatically removed from the storage pool.

Criteria for selecting tape operation modes

The criteria for selecting the private operation and scratch operation are shown below.

Figure: Private operation and scratch operation selection criteria

Private operation

Because the framework of scratch operation is complicated, the private operation is easier to use when the number of tapes used is small.
The private operation is suitable when you want to specify a tape used for each processing day.

Scratch operation

Registration of tapes to the storage pool (define volume) is not required.
Groups of tapes can be shared by registering them in multiple storage pools.
When the size of backup data is unspecified (such as when the size of backup data may suddenly increase), scratch volumes are automatically defined and used.
The scratch operation is suitable for a large-scale tape library involving a large number of tapes.

3.4.2 Primary storage pool and copy storage pool

Storage pools are classified as either primary storage pools or copy storage pools. By defining one or more copy storage pools for a primary storage pool, backup data can be written simultaneously to both types of pools.

Point

Copy storage pools can be used only with sequential access storage devices (for example, the tape storage class).

When backup is executed, backup data is written to the primary storage pool and simultaneously kept in the related copy storage pool.
In this manual, the primary storage pool is represented as a "storage pool".

Figure: Overview of primary storage pool and copy storage pool
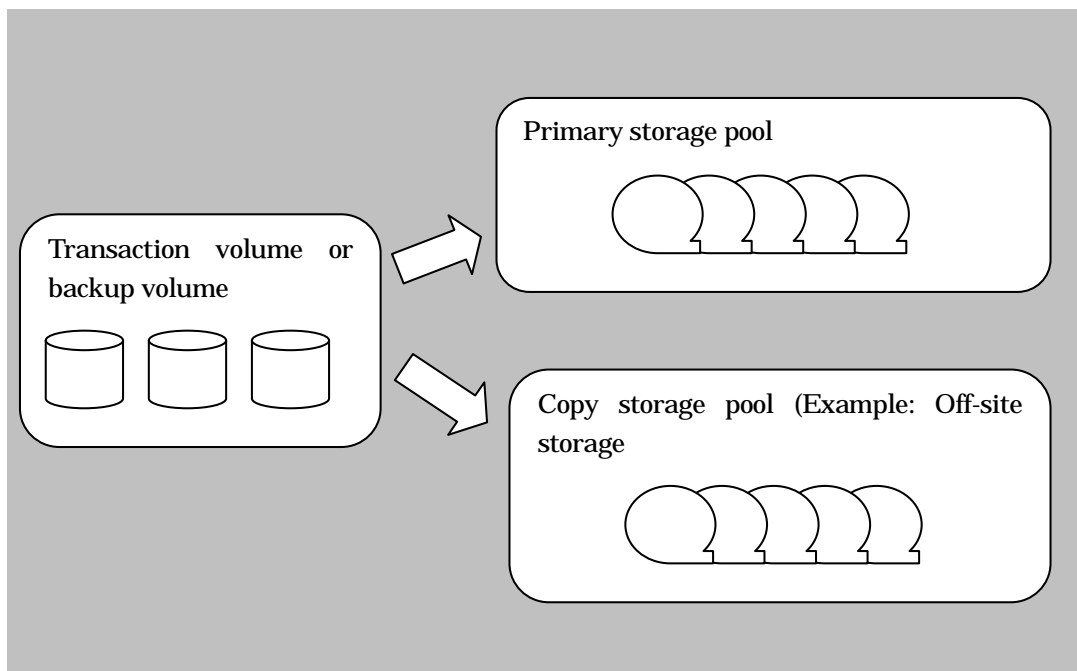
3.5 Backup Policy

The backup policy specifies the management methods of backup destination storage pools and backup data.

A backup policy is defined for each transaction volume.

3.5.1 Backup policy for using disks

If disks are used as backup media, the following variables must be set.

Number of preservation generations

The number of preservation generation means how many generations of backup data should be preserved.

The snapshot high-speed backup first releases the oldest generation from generation management. For this reason, if a fault such as a system failure occurs during backup operation, the oldest generation may have been released and the required number of generations of backup data may not exist. Fujitsu recommends re-executing backup immediately to create the required number of generations of backup data.

If the snapshot high-speed backup operation is performed with 1 specified for the number of preservation generations, Fujitsu recommends using the operation mode in which backup data is saved additionally to tape.

The synchronous high-speed backup releases the oldest generation from generation management after completion of backup of the latest generation. To keep complete history information, therefore, "number of preservation generations + 1" backup volumes are required.

Number of days (interval)

Set the number of days between required backups.

If the number of days after the last backup is exceeded without a backup being executed, a delay message is displayed.

Backup is not executed automatically, even if the number of days between backups is set.

Set the number using the "Disk backup policy setting command (acmbkpolset)".

3.5.2 Backup policy for using tapes

Set a backup policy for using tapes. To do so, use a combination of a tape backup management class and tape backup policy.

3.5.2.1 Tape backup management class

The tape backup management class defines the operation rules for backup destination storage pools.

Define the following:

Generation management storage pool name

The name of the storage pool used to store backup data that is managed with the number of preservation generations specified.

Number of preservation generations

Set the number of generations of backup data that should be preserved.

Day management storage pool name

Set the name of the storage pool used to store backup data that is managed with the number of preservation days specified.

Preservation days

Set the number of days that backup data should be preserved. Set the number using the "Tape backup management class setting command (acmtpmgmtclassset)".

3.5.2.2 Tape backup policy

Define the following:

Tape backup management class name

Specify the name of the tape backup management class to be used.

Number of days (interval)

Set the number of days between required backups.

If the number of days after the last backup is exceeded without a backup being executed, a delay message is displayed.

Backup is not executed automatically, even if the number of days between backups is set.

Set the number using the "Tape backup policy setting command (acmtpbkpolset)".

3.6 Summary of Relationships in Tape Backup

This section summarizes the relationship between transaction volumes and policies, storage pools, device classes, and drives.

A policy is defined for each transaction volume. The policy defines an arbitrary storage pool to decide on the tapes to be used. In addition, a device class is defined for each storage pool. The device class defines the maximum number of drives that can be used concurrently.

In the following figure, seven transaction volumes and five drives are used. If backup is executed concurrently without defining the maximum number of drives that can be used concurrently, the backup operations by Server B may occupy four drives and Server A may be able to use only one drive.

The maximum number of drives that can be used simultaneously by Server A and Server B can be set using the device class.

In this example, Server A can use two drives simultaneously to backup three transaction volumes, and Server B can use three drives simultaneously to backup four transaction volumes. If the backup operations of all volumes are performed concurrently, the backup operation for any one of the transaction volumes of each server is made to wait for an idle drive. When an idle drive becomes available, writing to tape begins.

Figure: Relationships between transaction volumes and definitions
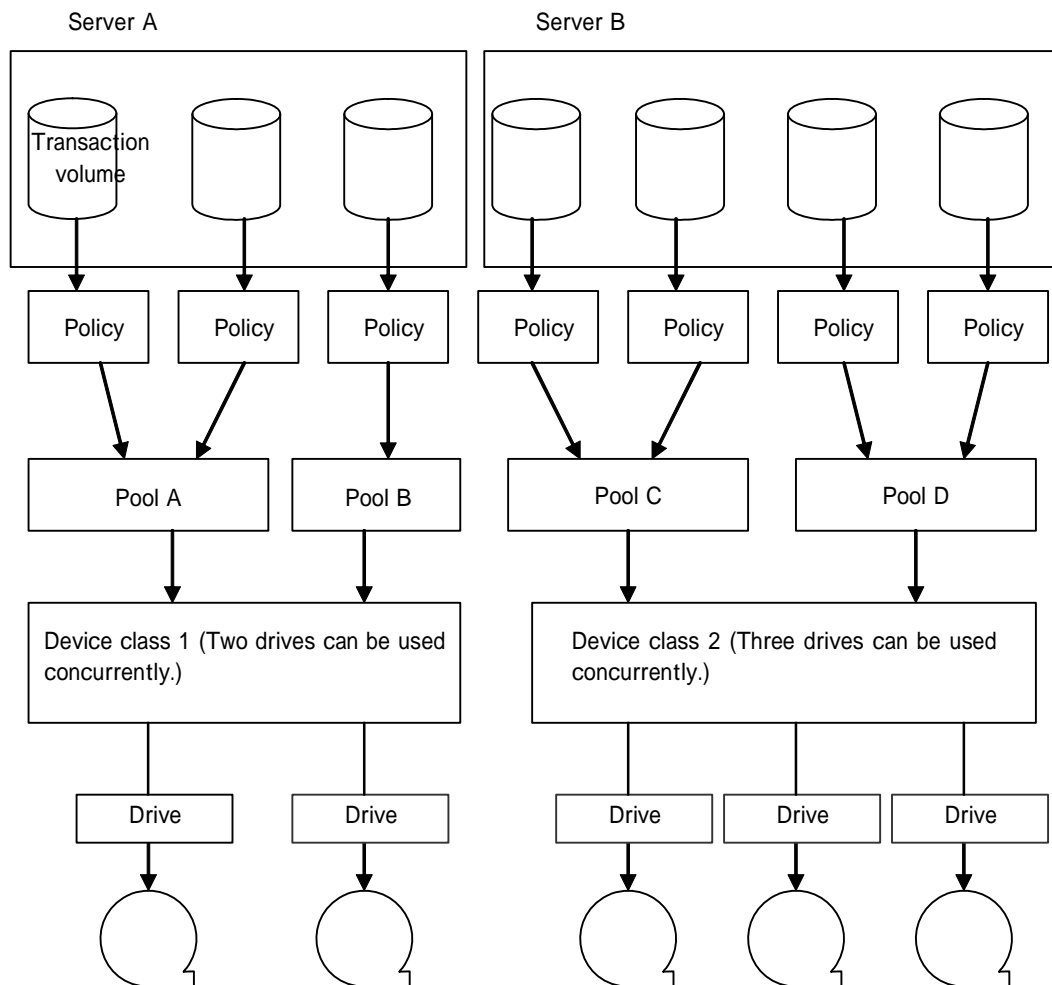
Chapter 4 Tape Server Settings

This chapter explains the settings to be made on the Tape Server before starting the tape backup operation of AdvancedCopy Manager.

All setup tasks are performed after the TSM management client command (dsmadmc) is started.

If the "tsm>" prompt is displayed, activate the TSM management client command (dsmadmc) before performing operations.

The start and stop methods for the TSM management client command are described below.

1. Starting the TSM management client command
   — Move to the directory.

   ```
   # cd /opt/tivoli/tsm/client/ba/bin
   ```

   — Execute the TSM management client command (dsmadmc).

   ```
   # ./dsmadmc
   IBM Tivoli Storage Manager
   Command line management interface - Version 5, Release 6, Level 4.0
   (c) Copyright by IBM Corporation and other(s) 1990, 2006. All Rights Reserved.


   Enter User ID:  admin


   Enter password:


   Session establishment, server:*****: Solaris 8/9
     :
     :
   tsm >
   ```

   — At "Enter User ID", enter the TSM administrator ID, then press the Return key.
   — At "Enter password", enter the TSM administrator password, then press the Return key.

   Point

   The Tape Server must be activated for this procedure. If the TSM management client command fails to start, activate the Tape Server.

2. Stopping the TSM management client command
   At the "tsm>" prompt, enter "quit" to stop the TSM management client command (dsmadmc).

   ```
   tsm> quit
   ```

4.1 Setting a Device Class

This section explains how to set a device class.

Use a TSM command to set a device class, which represents the device type that TSM can use.

TSM checks the device class to determine the types of the drive and tape to be used. Set the device class as shown below.

For details of the command, refer to the TSM manual "ETERNUS SF TSM Administrator's Reference".

```
tsm> define devclass <device class name> devtype=<device type> format=<format>
library=<library name> <mount-related-option>
```

● Device class name
  Specify any name that identifies the device class.
● Device type
  Specify the device type.
● Format
  Specify the format used to write to tape. The default is drive.
  Avoid the drive specification if mixed types of drives are used within the library.
  For example, do not specify drive for a library that includes a special drive that supports a higher-order recording format than other drives.
  The value to specify varies in accordance with the cartridge being used.
  Specify the value as follows:
    — If the Ultrium1 cartridge is used, specify "ultriumc".
    — If the Ultrium2 cartridge is used, specify "ultrium2c".
    — If the Ultrium3 cartridge is used, specify "ultrium3c".
● Library name
  Specify the library name included in the library definition.
● Mount-related option
  If necessary, specify an option to be used when a tape is mounted on the drive. This may be omitted. The main options are as follows:
    — Mountlimit
      Specifies the maximum number of drives that TSM can use concurrently (ie, can mount tapes on the drives concurrently) in the tape library associated with the device class. For a tape library having two drives, specify "mountlimit=2." The default is 1 (TSM can use only one drive at a time).
    — Mountretention
      Specifies the time to be taken before TSM unmounts a tape after it was mounted. This function saves the time taken for mounting a tape if another mount request is issued for the same tape once mounted. The default is 60 minutes. If you want to unmount a tape immediately after it is used, specify "mountretention=0" (0 minutes).
    — Mountwait
      If the time specified for this option elapses before a tape is actually mounted after TSM issues a mount request to the tape library, the mount request is returned with an error. The default is 60 minutes.

[Example] Define device class DRIVECLASS1 with device type LTO and format drive for library LT160.

```
tsm> define devclass DRIVECLASS1 devtype=LTO format=drive library=LT160 driveencryption=off
```

The device class can be checked with the following command.

```
tsm> query devclass format=detail
```

4.2 Setting a Storage Pool

This section explains how to set a storage pool.
Use a TSM command to set a storage pool. For details of the command, refer to the TSM manual "ETERNUS SF TSM Administrator's Reference".

4.2.1 Creating a storage pool

A storage pool is a logical area of the backup destination. By logically allocating tapes to a storage pool, data is backed up to media in the relevant storage pool. A storage pool can be created as follows.

```
tsm> define stgpool <pool name> <device class name> maxscratch=<maximum number of scratch
volumes> highmig=100 reclaim=100 collocate=no
```

Ensure that the following parameters are set. Do not set any other parameters.
- ● Pool name
  Specifies any name that identifies the storage pool.
- ● Device class name
  Specifies the device class name included in the device class definition.
- ● maxscratch=<Maximum number of scratch volumes>
  Specifies the maximum number of volumes that can be fetched as scratch volumes (tapes used for Scratch operation) into the storage pool.
  Specify 0 if you do not use scratch volumes. highmig=100
  Specify the fixed value of 100.
- ● reclaim=100
  Specify the fixed value of 100.
- ● collocate=no
  Specify the fixed value of no.

[Example] Create storage pool POOL1, with up to 50 scratch volumes, in device class DRIVECLASS1.

```
tsm> define stgpool POOL1 DRIVECLASS1 maxscratch=50 highmig=100 reclaim=100 collocate=no
```

4.2.2 Loading a Tape (CHECKIN)

This section explains tape loading. A TSM command is used to load a tape. For details of the command, refer to the TSM manual "ETERNUS SF TSM Administrator's Reference".
TSM refers to the loading of a tape to the tape library as CHECKIN, and to the unloading of a tape from the tape library as CHECKOUT.
A checked-in tape cannot be used immediately but must first be registered in a TSM storage pool using the "define volume" command for volume definition. In addition, a tape that is newly checked in must be initialized (labeled). A tape that is used as a scratch volume need not be registered.

4.2.2.1 Checking in a new tape

The "label libvolume" command performs tape initialization (labeling) and check-in simultaneously.

A new tape must be labeled before use. Note that labeling a tape disables any data that has been left on the tape.

Checking in tapes by labeling one by one

This method can be used when you want to check in specific tapes.

Before executing this command, enter tapes in the entry port of the library.

```
tsm> label libvolume <library name> <volume name> checkin=<scratch or private> overwrite=yes
```

- ● Specifying the "checkin=scratch" option checks in the tape volume as scratch.
- ● Specifying the "checkin=private" option checks in the tape volume as private. To use a private volume, volume definition is required.
- ● Always specify the "overwrite=yes" option. Failure to do so may cause labeling to fail.

[Example] Check in and label volume DAT001 in library LT160 as scratch.

```
tsm> label libvolume LT160 DAT001 checkin=scratch overwrite=yes
```

The following command can be used to check the status of the "label libvolume" command.

```
tsm> query process
```

The following command can be used to check for tapes that have been checked into the library.

```
tsm> query libvolume format=detail
```

Checking in all tapes together in the library

You can automatically check in all volumes in the library without specifying volume names.

To do so, enter the "label libvolume" command with the "search=yes" option specified.

```
tsm> label libvolume <library name> search=yes labelsource=<barcode or prompt>
checkin=<scratch or private> overwrite=yes
```

- ● Specifying the "checkin=scratch" option checks in the tape volume as scratch.
- ● Specifying the "checkin=private" option checks in the tape volume as private. To use a private volume, volume definition is required.
- ● Specifying the "labelsource=barcode" option reads the barcode label and initializes (labels) the tape with the barcode label name thus read.
- ● Specifying the "labelsource=prompt" option enables you to enter a label name as necessary.
- ● Always specify the "overwrite=yes" option. Failure to do so may cause labeling to fail.
- ● If multiple tapes can be entered in the entry port of the library, the "search=bulk" option can be used to check in and label all the tapes in the entry port.
- ● "Labeling and check-in" handles tapes one by one even if the search option is specified. It does not check in multiple tapes simultaneously.

[Example] Search library LT160, read volume names from the barcode labels, and check them in as scratch volumes.

```
tsm> label libvolume LT160 search=yes labelsource=barcode checkin=scratch overwrite=yes
```

The following command can be used to check the status of the "label libvolume" command.

```
tsm> query process
```

The following command can be used to check for tapes that have been checked into the library.

```
tsm> query libvolume format=detail
```

4.2.2.2 Checking in an initialized tape

This section explains how to check in a tape that has already been initialized (labeled). The "checkin libvolume" command is used for this operation.

Checking in tapes by labeling one by one

This method can be used when you want to check in specific tapes.
Before executing this command, enter tapes in the entry port of the library.

```
tsm > checkin libvolume <library name> <volume name> status=<scratch or private>
```

● Specifying the "status=scratch" option checks in the tape volume as scratch.
● Specifying the "status=private" option checks in the tape volume as private. To use a private volume, volume definition is required. However, volume definition is not required for volumes that have already been used by TSM (volumes that are displayed by the "query volume" command).

[Example] Check in volume DAT001 in library LT160 as scratch.

```
tsm> checkin libvolume LT160 DAT001 status=scratch
```

The following command can be used to check the status of the "checkin libvolume" command.

```
tsm> query process
```

The following command can be used to check for tapes that have been checked into the library.

```
tsm> query libvolume format=detail
```

Checking in all tapes together in the library

You can automatically check in all volumes in the library without specifying volume names. To do so, enter the "checkin libvolume" command with the "search=yes" option specified.

```
tsm> checkin libvolume <library name> status=<scratch or private> checklabel=<yes or barcode
> search=yes
```

● Specifying "checklabel=yes" reads the label written to the tape and checks in the tape with the label name. "checklabel=yes" is the default.
● Specifying the "checklabel=barcode" option reads the barcode label and checks the tape in with this name. A barcode reader is required.
● If multiple tapes can be entered in the entry port of the library, the "search=bulk" option can be used to check in all the tapes in the entry port.
● Check-in handles tapes one by one even if the search option is specified. It does not check in multiple tapes simultaneously.

[Example] Search library LT160, read volume names from the barcode labels, and check them in as scratch volumes.

```
tsm> checkin libvolume LT160 status=scratch checklabel=yes search=yes
```

The following command can be used to check the status of the "checkin libvolume" command.

```
tsm> query process
```

The following command can be used to check for tapes that have been checked into the library.

```
tsm> query libvolume format=detail
```

4.2.3 Registering a tape volume

When a tape that has been checked in as private (ie, "status=private" was specified) is used, the tape must be registered in a storage pool.
Tapes that are used as scratch need not be registered.

```
tsm> define volume <storage pool name> <volume name>
```

● Scratch volumes (volumes that have been checked in with the "status=scratch" option specified) need not be registered with the "define volume" command. TSM automatically registers volumes as necessary.

[Example] Register volume DAT001 in storage pool DAT-POOL.

```
tsm> define volume DAT-POOL DAT001
```

The following command can be used to check the status of the registered volume.

```
tsm> query volume <volume name> format=detail
```

The following command can be used to check the content of the registered volume.

```
tsm> query content <volume name> format=detail
```

4.2.4 Setting for simultaneous writing

This section explains the setting for simultaneous writing to the copy storage pool during backup. A TSM command is used for making this setting. Up to 10 copy storage pools can be specified.
Do the following to implement simultaneous writing to a copy storage pool by using an existing storage pool:

Creating a copy storage pool

1. Create a copy storage pool. Do not set any parameters other than those described below.

```
tsm> define stgpool <pool name> <device class name> pooltype=copy maxscratch=X
reclaim=100 collocate=no
```

[Example] Define storage pool COPYPOOL with device class DEVC1.

```
tsm> define stgpool COPYPOOL DEVC1 pooltype=copy maxscratch=50 reclaim=100 collocate=no
```

2. Use the "define volume" command to define a volume in the copy storage pool.

```
tsm> define volume <storage pool name> <volume name>
```

[Example] Define volume VOL001 in storage pool COPYPOOL.

```
tsm> define volume COPYPOOL VOL001
```

Defining the copy storage pool for a storage pool

1. Use the "update stgpool" command to define the copy storage pool for an existing storage pool.

```
tsm> update stgpool <storage pool name> copystgpools=<copy storage pool name>
```

[Example] Define COPYPOOL as a copy storage pool.

```
tsm> update stgpool POOL1 copystgpools=COPYPOOL
```

2. Use the following command to check the storage pool.

```
tsm> query stgpool format=detail
```

Chapter 5 Backup Operations (Normal Transaction Volumes)

This chapter explains the backup operation for ordinary transaction volumes by the Tape Backup function of AdvancedCopy Manager.

5.1 Overview

This section explains backup and restoration in the Tape Backup function of AdvancedCopy Manager.

The Tape Backup function of AdvancedCopy Manager uses the Advanced Copy Function (OPC/EC) of Fujitsu ETERNUS storage systems to implement high-speed backup between volumes, regardless of the volume capacity. Once the data is backed up to the destination volume it is copied from there to tape. Therefore, data can be backed up to tape and disk by stopping transaction for the same duration as when data is backed up only to a disk.
Backup that uses the One Point Copy (OPC) or Remote One Point Copy (ROPC) function of Fujitsu ETERNUS storage systems is called "snapshot high-speed backup". Backup that uses the Equivalent Copy (EC) or Remote Equivalent Copy (REC) function is called synchronized high-speed backup.

Automatic snapshot backup can be scheduled without first estimating its duration because it does not require backup synchronous processing. Note, however, that when the save number is 1, a situation may occur where there is no backup data, because a snapshot backup deletes the history prior to copy processing.

Synchronized high-speed backup deletes the history after the completion of backup processing, so in this case a situation where backup data does not exist will not occur, even if the generation number is 1. However, synchronized high-speed backup requires one more backup volume than snapshot fast backup. Synchronized high-speed backup also requires synchronized backup processing before the backup execution command is entered. Therefore, execution of automatic synchronized high-speed backup must be scheduled so that the time required for synchronized processing is estimated in advance. Synchronized backup processing is then started based on the estimated time, and the backup execution command is entered after equivalency maintenance status has been reached.

The Tape Backup function of AdvancedCopy Manager automatically selects and manages media (backup volumes and tapes) used for backup.

The Tape Backup function of AdvancedCopy Manager also manages the history and generations of backup data, so backup data can be restored from past generations to the latest generation.

Figure: Backup volume management

Unused backup volume management area

Empty BD | Empty BD | Empty BD | Empty BD

Getting a backup volume

Released from management generation

TD → OPC/EC → BD0 ⇨ BD1 ▶ BD (n-1) ⇨ BDn

Number of preservation generations (n)
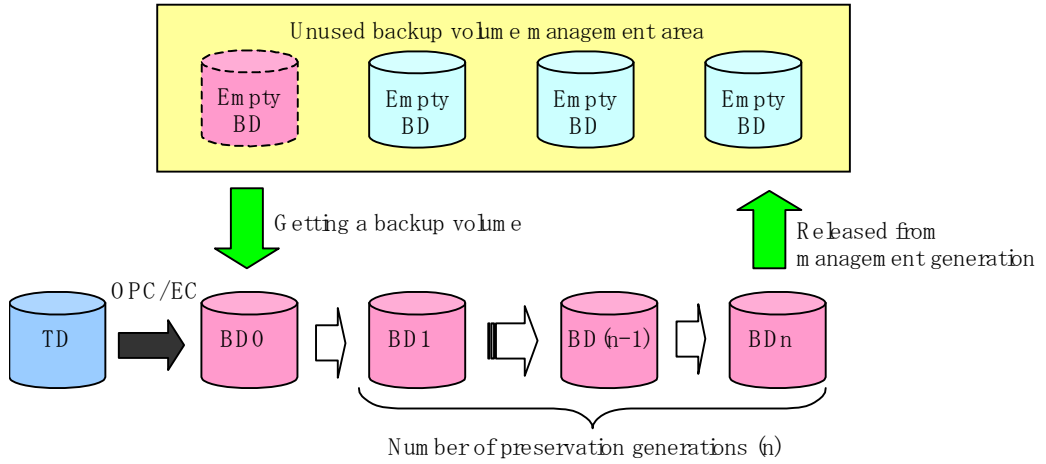
* n: Number of preservation generations (backup volume management)
* TD: Transaction Volume
* BD: Backup Volume
* Empty BD: Unused Backup Volume

Figure: Tape management

Backup is executed.

Tape-A is used.

Backup of some generations is executed. Tape B is used when tape A is full

When all data is deleted from tape A, tape A is empty (can be reused).

Storage Pool

| A | B |
| C | D |

1
Tape-A :empty
Tape-B :empty
Tape-C :empty
Tape-D :empty

2
Tape-A :filling
Tape-B :empty
Tape-C :empty
Tape-D :empty

3
Tape-A :full
Tape-B :filling
Tape-C :empty
Tape-D :empty

4
Tape-A :empty
Tape-B :full
Tape-C :full
Tape-D :empty

empty:Empty tape

filling:Tape that partially contains backup data

full:Tape without free space

5.1.1 Snapshot backup processing

The One Point Copy (OPC) / Remote One Point Copy (ROPC) function of the Fujitsu ETERNUS storage system is used to copy data from a transaction volume to an unused backup volume. Backup data is then copied from the backup volume to tape.

Snapshot high-speed backup is performed as follows:

1. When the "Backup command (acmbackup)" is executed (Step 1 in the figure below, "Snapshot high-speed backup processing"), the following processing is performed:
   - If backup volumes under generation management exist for all the generations, the oldest backup volume will be treated as an unused backup volume.
   - An unused backup volume will be acquired from the unused backup volume management area.
2. Data on the transaction volume will be copied to the unused backup volume (Steps 2 to 4 in the figure below, "Snapshot high-speed backup processing"). Copy is also performed from the backup volume to tape. The timing for starting copy to tape can be selected from either Step 2 or Step 4 in the figure below, "Snapshot high-speed backup processing".
3. Backup carrier information will be set.

Figure: Snapshot high-speed backup processing
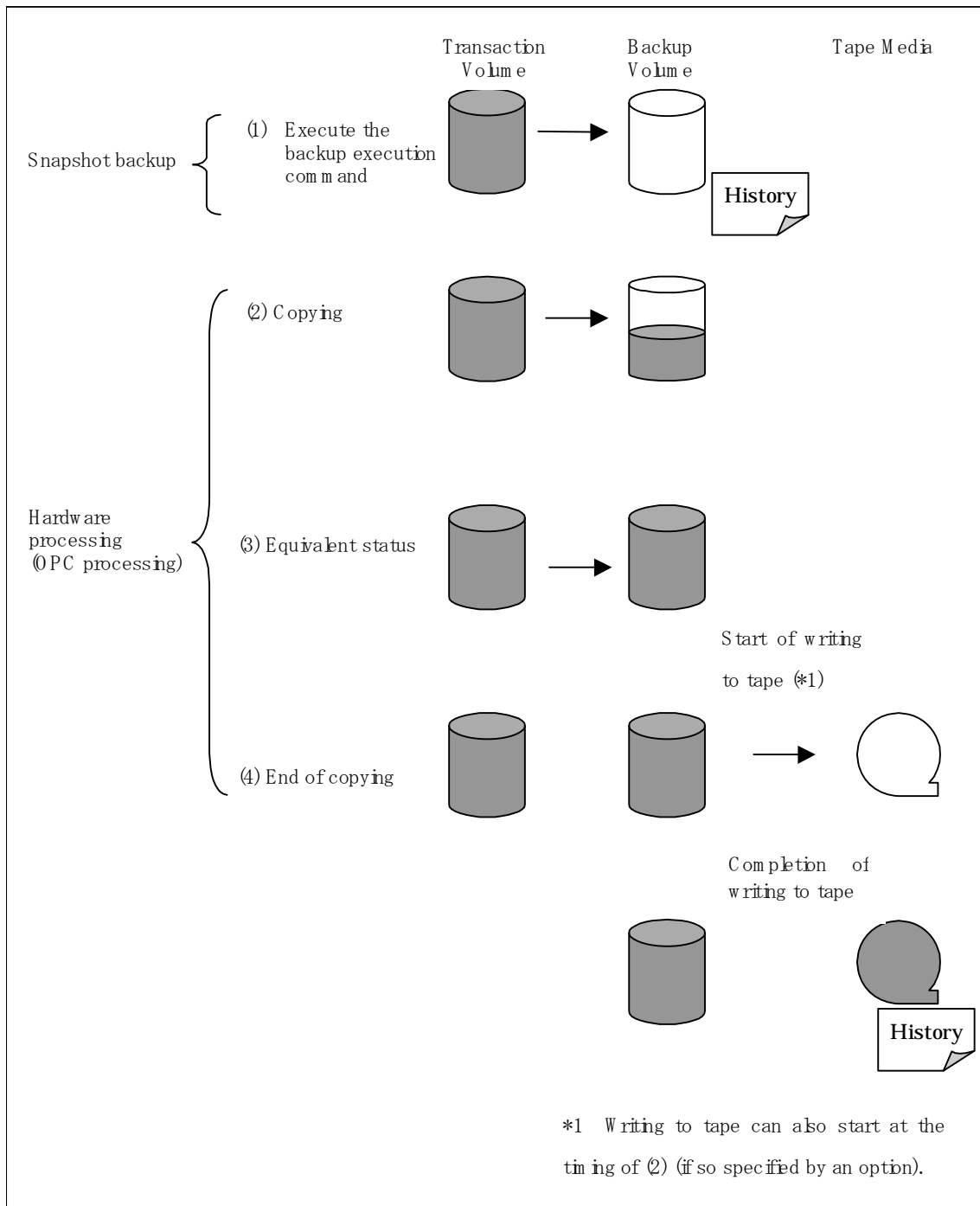
In snapshot high-speed backup, backup to a disk is complete at Step 1 in the figure above, "Snapshot high-speed backup processing" and backup history information is created. The actual data copying will be internally performed by the OPC function of the Fujitsu ETERNUS storage system.

The command completion timing can be selected from the history created either in the disk backup history information or the tape backup history information using the relevant option.

Using the QuickOPC function in the snapshot high-speed backup, which physically copies only data that has been modified since the start of the previous backup, can create a complete snapshot image, while greatly reducing the time taken for physical copying.

For information on the QuickOPC function, refer to "Backup Operations Using the QuickOPC Function".

● If all generations of backup volumes are managed, and if no backup volume can be obtained from the unused region in the backup volume management area, backup copies cannot be created.

● Backup using ROPC is restricted to the ETERNUS storage system within the same Storage Server that supports ROPC.

5.1.2 Synchronized high-speed backup processing

The Equivalent Copy (EC) or The Remote Equivalent Copy (REC) function of the Fujitsu ETERNUS storage system is used to copy data from a transaction volume to an unused backup volume. Backup data is then copied from the backup volume to tape.

Synchronous high-speed backup is performed as follows:

1. When the "Backup synchronous processing start command (acmstartsync)" is executed (Step 1 in the figure below, "Synchronous high-speed backup processing"), an unused backup volume with the same size as the relevant transaction volume is selected from the unused backup volume management area and backup synchronous processing begins.

2. The transaction and backup volumes are both placed in equivalency maintenance status. From this point on, equivalence between the transaction volume and backup volume is maintained. This status is referred to as the equivalency maintenance status (Step 3 in the figure below, "Synchronous high-speed backup processing").

3. When the "Backup command (acmbackup)" is executed (Step 4 in the figure below, "Synchronous high-speed backup processing"), backup synchronous processing stops and copy from the backup volume to tape begins. Backup history information is set.

4. If backup volumes under generation management exist for all the generations when backup has been completed, the oldest backup volume is treated as an unused backup volume.

The backup execution command cannot be executed before the transaction and backup volumes have become equivalent.

Figure: Synchronous high-speed backup processing
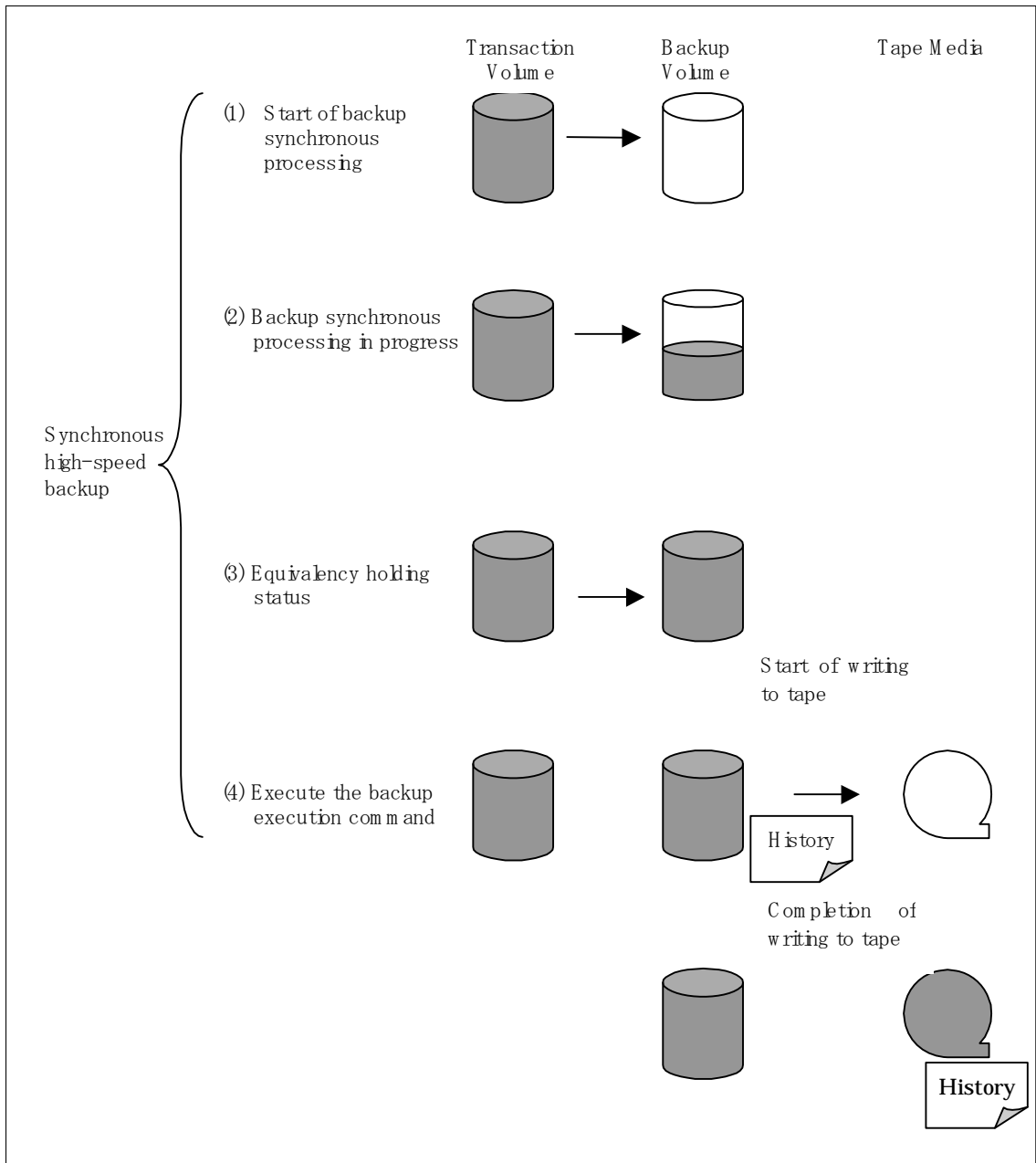
The command completion timing can be selected from the history created in either the disk backup history information or the tape backup history information using the relevant option. During synchronous high-speed backup using the Suspend/Resume function, the equivalency maintenance status of EC can be set to Suspend or Resume. Consequently, the synchronous backup process can be made faster because the function can create a differential copy from the Suspend state.

For more information on the Suspend/Resume function, refer "Backup processing using the Suspend/Resume function".

— If all generations of backup volumes are managed, and if no backup volume can
be obtained from the unused region in the backup volume management area, backup
copies cannot be created.
— The backup function which used REC/ROPC is restricted to the ETERNUS storage
systems corresponding to REC/ROPC in the same Storage Server.

5.1.3 Backup processing using the Suspend/Resume function

The Suspend/Resume function sets Suspend/Resume for the equivalency maintenance status using
EC. Using this function for differential copying from the Suspend state enables higher-speed
synchronous backup.

AdvancedCopy Manager provides two backup functions: snapshot high-speed backup and
synchronous high-speed backup. In snapshot high-speed backup, OPC is used to create a backup;
in the synchronous high-speed backup, EC is used to create a backup. The Suspend/Resume
function can be thought of as a kind of synchronous high-speed backup that uses EC.

In ordinary synchronous high-speed backup, the synchronous processing start command starts
copying using the EC function, then sets the equivalency maintenance status after the copying
is completed. The backup execution start command is then executed. This cancels EC and creates
a backup. Copy to tape is implemented from the backup volume, the same as in ordinary
synchronous high-speed backup.

In synchronous high-speed backup using the Suspend/Resume function, when the backup execution
start command with -suspend specified is executed, EC is suspended, the backup process is
completed, and the EC status is saved. The next time that the synchronous processing start
command is executed, EC resumes and only data that has been updated since the suspend state
was last set is copied. As a result, the backup preparation time is shortened.

A comparison between ordinary synchronous high-speed backup and synchronous high-speed
backup using the Suspend/Resume function is shown below.

Figure: Comparison between ordinary synchronous high-speed backup and synchronous high-speed backup using the Suspend/Resume function
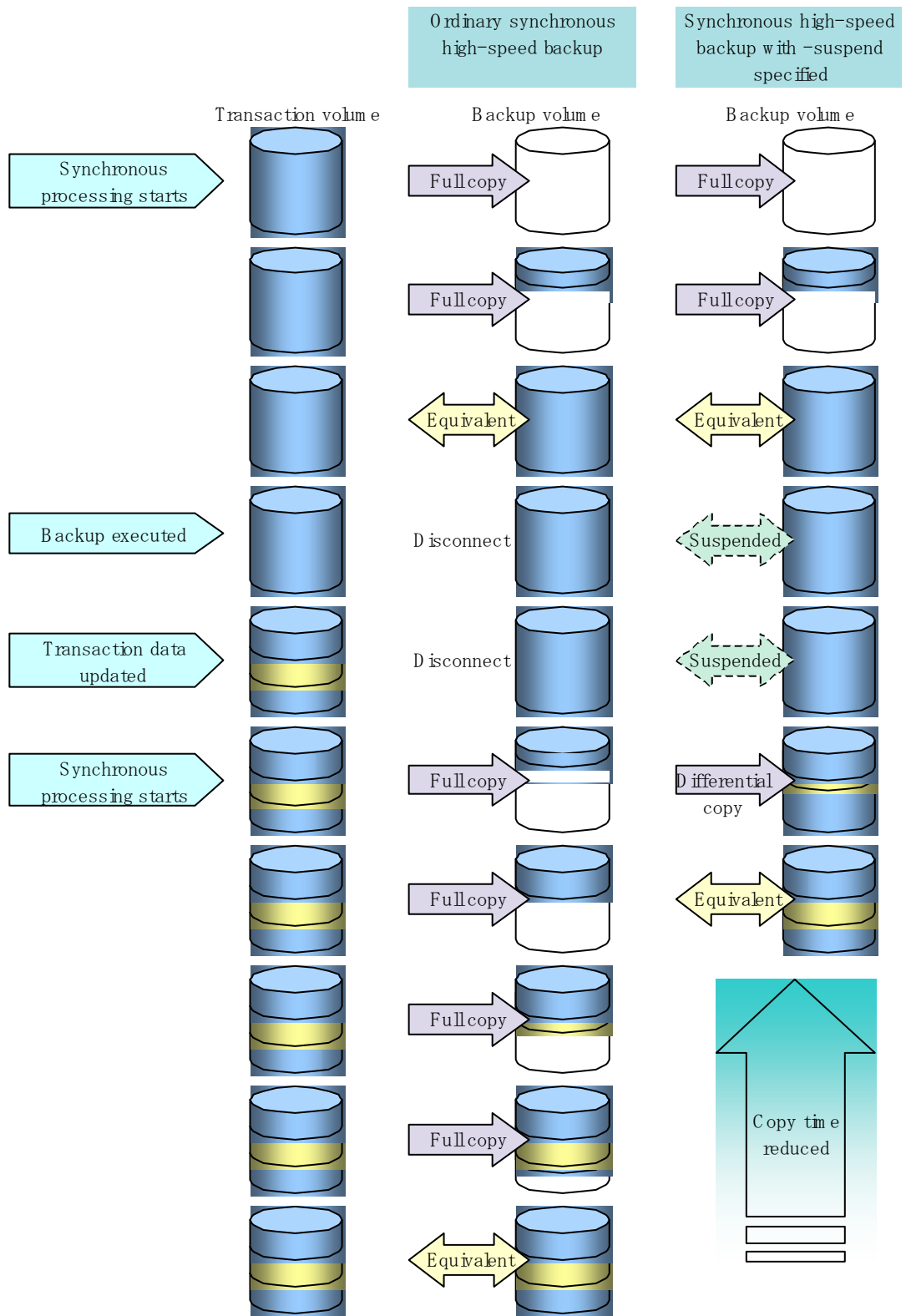
Perform synchronous high-speed backup using the Suspend/Resume function as follows:
When the equivalency maintenance status is reached after the start of synchronous processing,
execute the "Backup command (acmbackup)" with the suspend specification to suspend
synchronous processing.
When history information is deleted because the number of generations has been exceeded or
by the history information deletion command, the backup volume enters the Suspend state
without any history information. If new synchronous processing starts at this time, then
the suspended backup volume without history information is selected first, and differential
copying starts. Only data that has been updated since the Suspend state was last set is copied,
therefore the equivalency maintenance status can be reached quickly.
The flow of synchronous high-speed backup operations using the Suspend/Resume function is
shown below.

Figure: Synchronous high-speed backup operation using the Suspend/Resume function

Excution of the backup command with -suspend specified

TD — Suspend — EC session

BD1 — With history information — In use — Write to tape → TP1

Number of preservation generations = 1

No EC session — BD2 — Empty

Synchronous processing started

TD — Suspend — EC session

BD1 — With history information — In use — TP1

Number of preservation generations = 1

Full copy → BD2 — EC session — In use

Equivalency maintain status

TD — Suspend — EC session

BD1 — With history information — In use — TP1

Number of preservation generations = 1

Equevalent — BD2 — EC session — In use

Excution of the backup command with -suspend specified

TD — Suspend — EC session

BD1 — Usable — TP1

Number of preservation generations = 1

Suspend — EC session — BD2 — With history information — In use — Write to tape → TP2

History information was deleted because the number of generations was exceeded (*1) at backup execution.

*1 "Number of generations exceeded" means that the oldest history information is automatically deleted if existing history information has a certain number of saved generations when the backup command is executed.

Transaction volume data updated

TD — Data updated — Suspend — EC session

BD1 — Usable — TP1

Number of preservation generations = 1

Suspend — EC session — BD2 — With history information — In use — TP2

TPx — Tape backup history x: absolute generation number

5.1.4 Backup processing without using the advanced copy function

The Tape Backup function of AdvancedCopy Manager also enables backup only to tape without using backup volumes. Data is written directly to tape from transaction volumes without using the advanced copy function.
This mode of backup is therefore not a high-speed backup.

Figure: Backup processing without using the advanced copy function
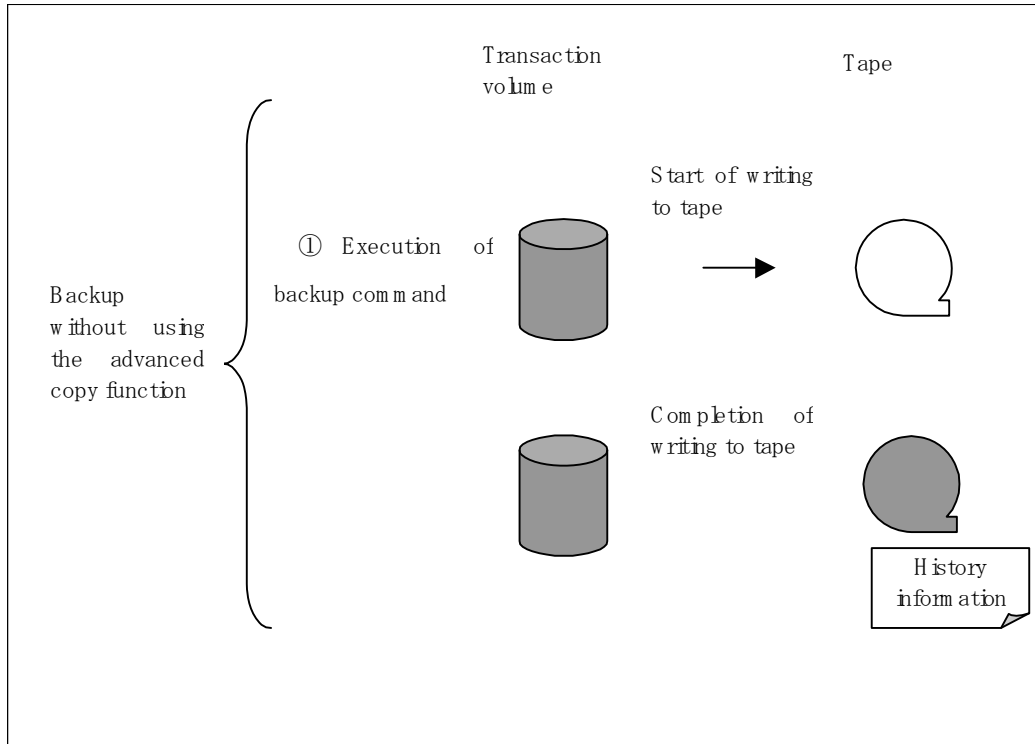
5.1.5 Restore processing

This sub-section explains how the Tape Backup function of AdvancedCopy Manager restores backup data.

Restore processing refers to restoring the data of a transaction volume from the backup volume or tape that is managed with backup history information. The restoration operation restores data from a backup volume managed by the backup carrier information to a transaction volume. Restoration from a backup volume involves using the OPC function provided by the ETERNUS storage system to restore data from a backup volume to a transaction volume. If the data on a backup volume under carrier management is restored to a transaction volume, the carrier management information will not change.

In restoration from tape, tape data is read and written directly to the restoration destination (transaction) volume.

When data backed up to both a disk and tape is restored based on history information, the Tape Backup function automatically selects disk data, unless otherwise specified, and restores it by OPC.

Note that data will be restored to a transaction volume that is the backup source. However, you can change the restoration destination.

![Note]

> If transaction volume contents are rewritten in the period between collection of the latest backup volume and a subsequent restore operation, the rewritten data will be lost.

Figure: Notes on restoration with AdvancedCopy Manager
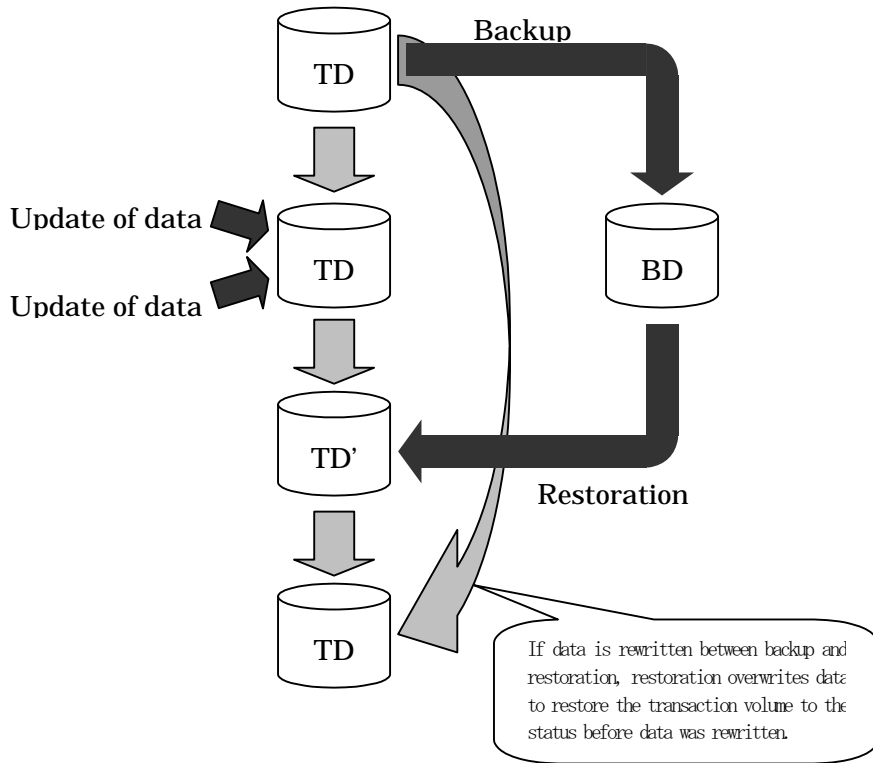
TD: Transaction volume
BD: Backup volume

5.2 Operation Design

The flow of backup operation for ordinary transaction volumes is shown below:

1. Activating daemons
2. Registering a Storage Server (Only performed once, during Storage Server setup)
3. Fetching device information on a Storage Server (Performed initially and then on a device change)
4. Configuring the environment for a backup operation server (Only when the operation mode is changed)
5. Setting the operation type for a device (Only when the operation mode is changed)
6. Configuration options (Only when inter-cabinet backup is performed)
7. Setting backup policies (Only when the operation mode is changed)
8. Customizing the pre-processing and post-processing scripts (Only when the operation mode is changed)
9. Preparing a device map file (Only when the backup destination is changed)
10. Operation
11. Stopping the operation

5.3 Preparations

This section describes the preparations required before backup is performed.

5.3.1 Activating daemons

When backup is started, the daemon required for AdvancedCopy Manager Tape Backup must be running on the Storage Management Server, Tape Server, and Storage Server. Normally, these daemons are automatically started when the system is started. If the startup of a daemon fails for some reason, or if a daemon has been stopped, you need to start the daemon on each server. For information on starting a daemon, refer to "Starting and Stopping Daemons".

5.3.2 Registering a Storage Server

The Storage Management Server registers the Storage Server to be managed. When the Storage Server is operated as a Storage Management Server, the server does not need to be added. Use the "Server information addition command (stgxfwcmaddsrv)", which is described in the "ETERNUS SF AdvancedCopy Manager Operator's Guide" for the operating system of the target Storage Management Server.

5.3.3 Fetching device information on a Storage Server

Before backup management can be performed, device information on a Storage Server must be temporarily stored in the repository.
Use the "Device information collection/reflection command (stgxfwcmsetdev)" in the "ETERNUS SF AdvancedCopy Manager Operator's Guide" for the operating system of the target Storage Management Server.

Note

The time required for this operation is proportional to the total number of devices defined on the Storage Server. If the number of devices is large, perform this operation while the CPU load and I/O load on the system are low.
As a guide, each operation takes about 0.5 seconds per device (partition) when there is no load on the system.

5.3.4 Configuring the environment for a backup operation server

Configure the environment for each Storage Server.
This will also need to be performed on the Storage Management Server if it operates as a Storage Server. This step is not required if the environment configuration has already been performed on the Storage Server.
Use the "Storage Server configuration information setting command (acmsvrset)".
● Associating the Tape Server
The Tape Server name must be specified during initialization.

5.3.5 Setting the operation type for a device

The device operation type must be set before backing up in a Storage Server. This involves the following:

● Defining the volume to be backed up as a transaction volume.

● Preparing backup volumes. Prepare as many partitions, each with the same size as the transaction volume, as required for the backup type, and define them as the backup volumes:

Table: Number of backup volumes

Backup operation type	Number of required backup volumes
Snapshot fast backup	Number of backup generations
Synchronized high-speed backup	Number of backup generations + 1

Use the "Device information setting command (acmdevinfoset)" for this operation.

The following execution example registers a device (/dev/dsk/c1t1d0s6) as the transaction volume and a device (/dev/dsk/c1t2d1s6) as the backup volume.

[For Solaris]

```
# /opt/FJSVswstc/bin/acmdevinfoset -t /dev/dsk/c1t1d0s6
acmdevinfoset completed
# /opt/FJSVswstc/bin/acmdevinfoset -b /dev/dsk/c1t2d1s6
acmdevinfoset completed
#
```

For notes on setting the device operation type, refer to "Setting the operation type for a device" in the "ETERNUS SF AdvancedCopy Manager Operator's Guide" for the operating system of the target Storage Server.

The information on the registered transaction volumes and backup volumes can be referenced using the "Device operating status display command (acmdevdisp)".

If no more backup volumes than the number of preservation generations can be prepared for synchronous high-speed backup, you can implement backup operation in combination with the backup history deletion function.

The operation procedure is as follows:

1) Start backup synchronous processing
2) Confirm the equivalency maintenance status
3) Execute backup (to both disk and tape)
4) Delete disk backup history information
5) Return to step 1

If restoration occurs before completion of the next backup after history information is deleted, backup data is restored from tape because disk history information is not available.

5.3.6 Configuration options

It will be necessary to set a number of options when performing backup to a backup volume in a cabinet that is different from the cabinet containing the transaction volume.
If the option settings file is changed after operation starts, backup may not be able to continue. For this reason, do not change the option settings file after the start of operation. To change the option settings file, you must recreate the backup policy.

— The ETERNUS storage system must support the REC or ROPC function.
— Both cabinets must be connected to an FCRA (FC Remote Adapter).
  Since data flows only from the Initiator side to the Target side through an FCRA connection, FCRA connections must be established in sets of two or more.
— In a backup operation involving an ETERNUS storage system that does not support the ROPC function, only the REC function can be used. In this case, you cannot back up data to a backup volume in a cabinet that does not contain a transaction volume, since the backup operation uses the ROPC function during restoration.
— Both cabinets must be connected to the Tape Server.

Create a check.ini file to specify the options. For information on the file path and on how to specify options, refer to "Setting Options" in the "ETERNUS SF AdvancedCopy Manager Operator's Guide" for the operating system of the target Storage Server.

5.3.7 Setting backup policies

A backup policy for the backup destination disk or tape must be set for the transaction volume registered in the Storage Server. When data is backed up to both disk and tape, a backup policy must be set for each of them.

5.3.7.1 Backup policy for using disks

Set the following backup policy.
● The number of preservation generations
  This refers to how many generations of backup data should be retained.
● Interval days
  This refers to the number of days between one backup and the next. If the specified number of days is exceeded, the number of elapsed days is displayed when the execution status display command is executed.

Use the "Disk backup policy setting command (acmbkpolset)" to set the backup policy.
The following command execution example sets 3 as the number of preservation generations for the device (/dev/dsk/c1t1d0s6).

[For Solaris]

```
#/opt/FJSVswstc/bin/acmbkpolset -s 3 /dev/dsk/c1t1d0s6
/dev/dsk/c1t1d0s6 acmbkpolset completed
#
```

— Even if the number of interval days is specified, the Tape Backup function of AdvancedCopy Manager does not automatically back up data. This value is used only to prompt the user to perform backup when the number of backup interval days is exceeded.

— When you set a backup policy, there must be as many registered backup volumes as required to perform backup according to the specified backup policy. For the required number of backup volumes, refer to "Preparing a backup volume" in "Operation Design" in the backup operation chapter of the "ETERNUS SF AdvancedCopy Manager Operator's Guide" for the operating system of the target Storage Server.

— Even if the number of backup volumes required for the backup was not registered when backup policies for synchronized high-speed backup were set, the number can be set by default provided the number of backup volumes that are required for snapshot fast backup have already been registered. In this case, however, it may not be possible to execute synchronized high-speed backup.

Information on a defined backup policy can be viewed using the "Disk backup policy display command (acmbkpoldisp)".

5.3.7.2 Backup policy for using tapes

5.3.7.2.1 Tape backup management class

Set the tape backup management class. Define the following in the management class:

● Generation management storage pool name
   The name of the storage pool used to store backup data when a backup with generation management is executed
● Number of preservation generations
   The number of generations of backup data that should be preserved
● Day management storage pool name
   The name of the storage pool used to store backup data when a backup with day management is executed
● Preservation days
   The number of days for which backup data should be preserved

The tape backup management class can be set using the "Tape backup management class setting command (acmtpmgmtclassset)".
The following command execution example creates tape backup management class ACM_CLASS1 for backup with generation management to preserve five generations in COPYPOOL and for day management for 30 days in ARCPOOL.

[For Solaris]

```
# /opt/FJSVswstc/bin/acmtpmgmtclassset -g COPYPOOL -d ARCPOOL -s 5 -t 30 ACM_CLASS1
ACM_CLASS1 acmtpmgmtclassset completed
#
```

Point

Information on the tape backup management class that has been set can be viewed using the "Tape backup management class display command (acmtpmgmtclassdisp)".

5.3.7.2.2 Tape backup policy

Set the tape backup policy. Define the following in the tape backup policy:
- ● Tape backup management class name

  The name of the tape backup management class used for backup operation. When backup is performed, data is stored in the storage pool defined in the specified tape backup management class. The backup is managed according to the number of preservation generations and preservation days defined in the tape backup management class.
- ● Number of interval days for generation management

  The number of days before another backup with generation management is performed after a backup with generation management is performed. If the specified number of days is exceeded, the user will be prompted to perform backup when the "Execution status display command (acmexecstat)" is executed.
- ● Number of interval days for day management

  The number of days before another backup with day management is performed after a backup with day management is performed. If the specified number of days is exceeded, the user will be prompted to perform backup when the "Execution status display command (acmexecstat)" is executed.

The tape backup policy can be set using the "Tape backup policy setting command (acmtpbkpolset)".
The following command execution example sets a tape backup policy for the device (/dev/dsk/c1t1d0s6) with ACM_CLASS1 as the tape backup management class and with 10 as the number of interval days for backup with generation management.

[For Solaris]

```
#/opt/FJSVswstc/bin/acmtpbkpolset -i 10 -c ACM_CLASS1 /dev/dsk/c1t1d0s6
/dev/dsk/c1t1d0s6 acmtpbkpolset completed
#
```


Note

― Even if the number of interval days is specified, the Tape Backup function of AdvancedCopy Manager does not automatically perform backup. The value specified here is used to urge the user to perform backup if the user fails to perform backup within the specified number of interval days.

Point

Information on a defined tape backup policy can be viewed using the "Tape backup policy display command (acmtpbkpoldisp)".

5.3.8 Customizing pre-processing and post-processing scripts

Backup with the Tape Backup function of AdvancedCopy Manager must be performed when the transaction volume is unmounted. Therefore, when backup or restore is executed, mount and unmount processing of the transaction volume is done using the pre-processing and post-processing scripts.

Backup or restore processing is not executed if the transaction volume cannot be unmounted. When backup history information is copied to tape, pre-processing is performed over the backup volume. When copying to tape is performed, the backup volume is unmounted before data is written to the tape. The backup volume is not automatically mounted upon completion of writing to tape.

For details of pre-processing and post-processing scripts, see Appendix "Pre-processing and Post-processing of Backup, Restoration, and Tape Copy".

In either of one of the following situations, the backup pre-processing and post-processing scripts will need to be customized:

- ● To avoid unmount/mount processing for a transaction volume where a file system is constructed
- ● To add special pre-processing and post-processing to the scripts

For information about customizing the scripts, refer to Appendix "Pre-processing and Post-processing of Backup, Restoration, and Tape Copy".

5.3.9 Preparing a device map file

When using the Tape Backup function of AdvancedCopy Manager to back up data, a backup volume with the same capacity as the transaction volume is automatically selected from the registered backup volumes. If a specified backup volume is to be used to back up a given transaction volume, a "Device map file" (i.e., a file defining the correspondence between transaction and backup volumes) must be created.

Create a device map file anywhere on the Storage Server that performs backup. If you specify this file while performing backup, an operation that recognizes the backup destination is enabled.

Point

To manage multiple backup generations, multiple device map files must be prepared.
The device map file which can be used when backing up or starting synchronous processing should meet either of the following requirements:

- ● An unused backup volume is specified, or
- ● The backup volume used by the history data deleted by this backup is specified.
- ● You should ensure that you configure and use the device map file appropriately, depending on how you are using the backup system with two or more backup volumes.
- ● If the number of backup volumes that can be prepared for synchronized high-speed backup is only the same as the number of preservation generations, the backup operation can still be carried out by saving the backup volumes to secondary media, such as tapes, and then deleting history information.
- ● In such cases, the device map file that is subsequently specified at the start of synchronous backup processing is the device map file specifying the backup volumes that become available for reuse when history information is deleted.

5.3.9.1 Describing a device map file

For a description of a device map file, refer to "Describing a device map file" in the "ETERNUS SF AdvancedCopy Manager Operator's Guide" for the operating system of the Storage Server.

5.3.10Backup schedule

Tape backup operation must be scheduled by considering the number of concurrent backup and/or restore operations and the number of drives in the ETERNUS tape library. The number of backup and restore operations is not in reference to a single Storage Server but instead refers to all Storage Servers.

If the number of drives is insufficient, some backup and/or restore operations that are activated later must wait for idle drives. When a backup or restore operation that was activated earlier is complete and the relevant drive is released, tape I/O processing for a backup or restore operation that has been made to wait begins. In this case, the backup or restore time is calculated by adding the drive wait time to the time during which tape I/O is actually performed.

The following figure shows the backup processing time when three transaction volumes are backed up concurrently in an environment with two drives.

Figure: Backup processing time relationships

〈Concurrent backup of three volumes with two drives〉

Processing time
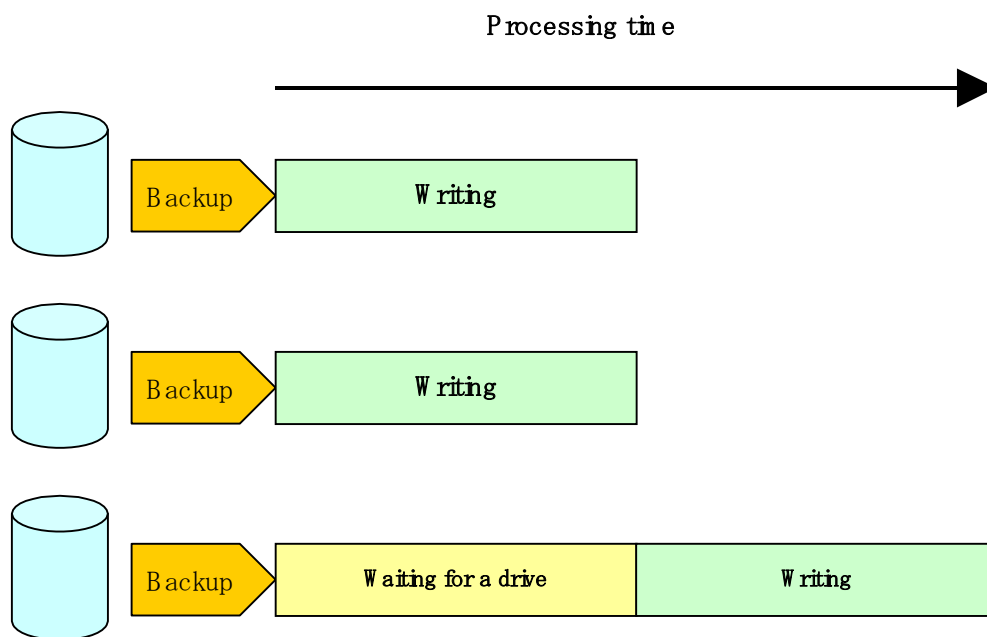
In light of the above, consider the following two points for scheduling:
- ● Tape I/O performance
- ● When more backup and/or restore operations than the number of drives are performed concurrently, a timeout can be defined for the wait for drives. Also, when a wait for drives occurs, upper limits can be defined so that drive allocation is performed evenly among Storage Servers. Refer to "Designing the Backup Operation" for more information.

5.4 Operation

The backup operation using the Tape Backup function of AdvancedCopy Manager is explained in this section.

5.4.1 Backup to disks and tapes

5.4.1.1 Snapshot high-speed backup

Perform the snapshot fast backup as follows:

1. Before backing up a general file system, stop transaction.
2. Execute the "Backup command (acmbackup)" to perform the backup.

    — To perform backup to both a disk and tape
    — Specify BOTH for the -m option.
    — Other tape-related specifications
        — Specify the -b option to select generation management or day management.
        — To start writing to tape without waiting for actual copying of OPC, specify the -o option.
        — To make the command return without waiting for the completion of writing to tape, specify the -w option.
    — To use a specific volume as a backup volume
    — Specify the device map file name in the -X option. A device map file is created on the Storage Server (such as /home/usr1/devmap1) to be backed up.
        The following command execution example performs backup to both disk and tape and returns without waiting for completion of writing to tape.
        [For Solaris]

```
# /opt/FJSVswstc/bin/acmbackup -m BOTH -w /dev/dsk/c1t1d0s6
/dev/dsk/c1t1d0s6 acmbackup DISK backup completed, TAPE backup started
#
```

3. Unless the "-o" or "-w" options were specified, backup is now complete and you can restart transaction. If the -o option was specified, physical copying of a volume has not been completed at this point. If the -w option was specified, writing to tape has not been completed at this point. To check the status of the physical copying or writing to tape, refer to "Checking the backup status".
4. If you have stopped transaction in Step 1, restart the transaction.

Refer to "Executing backups" in "Backup Operations Using the QuickOPC Function" in this manual for information about executing backups with the QuickOPC function.

5.4.1.2 Synchronous high-speed backup

Perform synchronized high-speed backup for a transaction volume as follows:

1. Use the "Backup synchronous processing start command (acmstartsync)" to start backup synchronous processing.
   — To use a specific volume as a backup volume:
   — Specify the device map file name in the -X option. A device map file is created on the Storage Server (such as /home/usr1/devmap1) to be backed up.
     A command execution example is shown below.
     [For Solaris]

```
# /opt/FJSVswstc/bin/acmstartsync /dev/dsk/c1t1d0s6

/dev/dsk/c1t1d0s6 acmstartsync completed

#
```

2. Physical copying from the transaction volume to the backup volume now starts. To cancel synchronous processing that has been started, refer to "To cancel synchronous processing that has started". To check the physical copy status, perform the following operation.

3. To check the status of backup synchronous processing, use the "Backup synchronous processing progress display command (acmsyncstat)".

4. When the [Status] field changes to "equivalent," the transaction volume and backup volume are put in the equivalency maintenance status.
   [For Solaris]

```
# /opt/FJSVswstc/bin/acmsyncstat /dev/dsk/c1t1d0s6
Server Transaction-Disk  Backup-Disk       Status    Execute
server1 /dev/dsk/c1t1d0s6 /dev/dsk/c1t2d1s6 equivalent 100%
#
```

5. Execute the "Backup command (acmbackup)" to perform backup.

   — To perform backup to both a disk and tape
   — Specify BOTH for the -m option.
   — Other tape-related specifications
     -Specify the -b option to select generation management or day management.
     -To make the command return without waiting for completion of writing to tape, specify the -w option.
   — To use Suspend/Resume
   — Specify the -suspend option. For more information on the Suspend/Resume function, refer to "Backup using the Suspend/Resume function".
     The following example performs backup to both disk and tape and returns without waiting for completion of writing to tape.
     [For Solaris]

```
# /opt/FJSVswstc/bin/acmbackup -m BOTH -w /dev/dsk/c1t1d0s6

/dev/dsk/c1t1d0s6 acmbackup DISK backup completed, TAPE backup started

#
```

Note

   — If a backup command is executed before the transaction volume and the backup volume are in the equivalency maintenance status, the command results in an error.
   — No device map can be specified during backup.

To cancel synchronous processing that has started

The "Backup synchronous processing cancel command (acmcancelsync)" can be used to cancel synchronous processing (an EC session). The statuses of the synchronous processing cancelled by the synchronous processing cancel command are explained below.

— executing: synchronous processing in progress (ie, copying in progress)
— equivalent: equivalency maintenance status
— suspend: suspended processing

If the synchronous processing is cancelled with no options specified, then the EC session in the synchronous processing status or in the equivalency maintenance state is cancelled.

If one transaction volume has multiple synchronous processing (EC sessions), then specify the backup volume and cancel only the specified EC session. All of the synchronous processing of the transaction volume can be cancelled by specifying the -all option.

![Note]

— Both the backup volume and all synchronous processing cannot be specified simultaneously.

5.4.1.3 Backup using the Suspend/Resume function

Back up a transaction volume using the Suspend/Resume function as follows:

1. Use the "Backup synchronous processing start command (acmstartsync)" to start backup synchronous processing.

   — To use a specific volume as a backup volume:
   — Specify the device map file name in the -X option. A device map file is created on the Storage Server (such as /home/usr1/devmap1) to be backed up.

   A command execution example is shown below.

   [For Solaris]

```
# /opt/FJSVswstc/bin/acmstartsync /dev/dsk/c1t1d0s6
/dev/dsk/c1t1d0s6 acmstartsync completed
#
```

If there is a suspended backup volume at the start of the synchronous processing, then the following devices are selected first, and EC resumes (ie, differential copying starts or Resume is invoked):

— The backup volume from which history information is deleted because the number of generations has been exceeded, or
— The suspended backup volume without history information

If there is no suspended backup volume at the start of the synchronous processing, EC starts (i.e., a full copy begins).

The figure below shows backup volume selection at the start of synchronous processing.

![Note]

If synchronous processing is started with a device map specified, other transaction volumes and suspended backup volumes cannot be used as the backup destination. The "Backup synchronous processing progress display command (acmsyncstat)" can be used to determine the transaction volume with which the backup volume is suspended.

Figure: Backup volume selection at start of synchronous processing
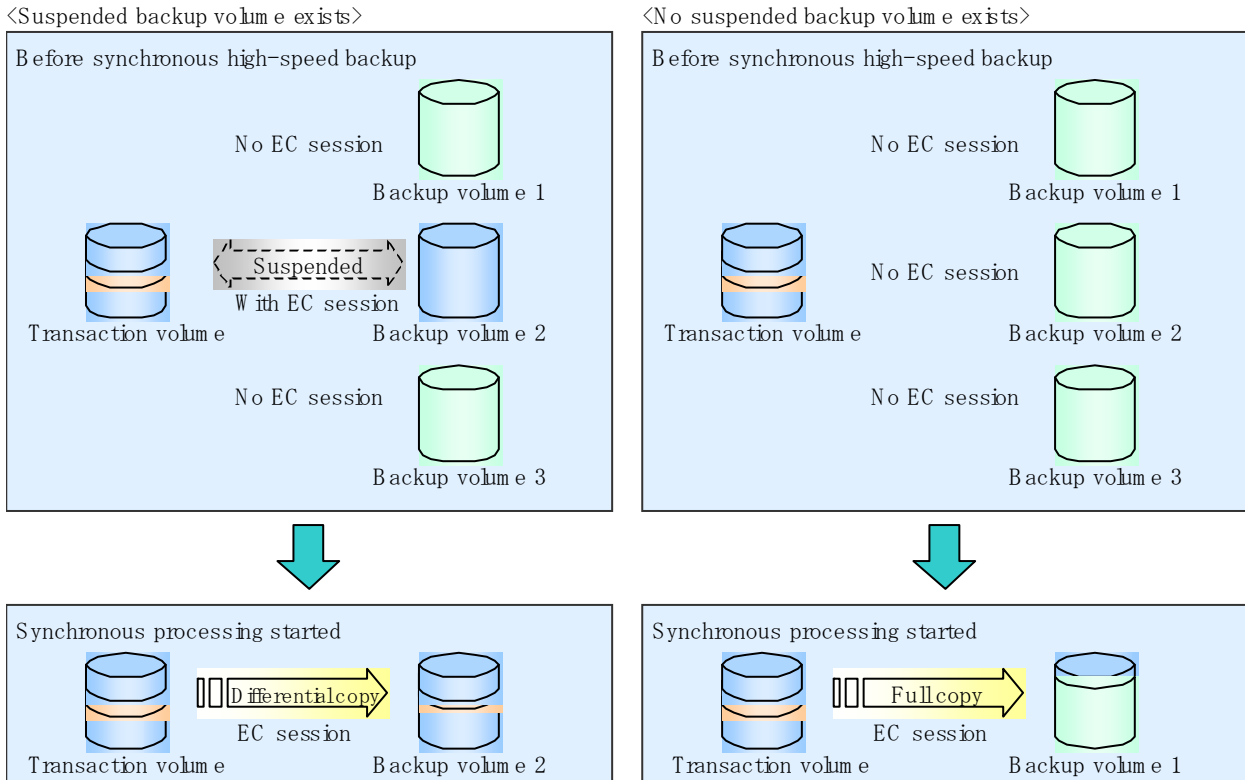
<Suspended backup volume exists>

Before synchronous high-speed backup

No EC session

Backup volume 1

Transaction volume — Suspended — Backup volume 2
With EC session

No EC session

Backup volume 3

↓

Synchronous processing started

Transaction volume → Differential copy → Backup volume 2
EC session

<No suspended backup volume exists>

Before synchronous high-speed backup

No EC session

Backup volume 1

Transaction volume — No EC session — Backup volume 2

No EC session

Backup volume 3

↓

Synchronous processing started

Transaction volume → Full copy → Backup volume 1
EC session

2. Physical copying from the transaction volume to the backup volume now starts. To cancel synchronous processing that has been started, see "To cancel synchronous processing that has started". To check the physical copy status, perform the following operation.

3. To check the status of backup synchronous processing, use the "Backup synchronous processing progress display command (acmsyncstat)".

   If one transaction volume has multiple EC sessions, then this command displays the status of all EC sessions. The statuses displayed for synchronous processing are explained below.
   — executing: synchronous processing in progress (ie, copying is in progress)
   — equivalent: equivalency maintenance status
   — suspend: suspended processing

The figure below shows the progress information displayed by the synchronous processing progress display command.

Figure: Progress information displayed by the synchronous processing progress display command
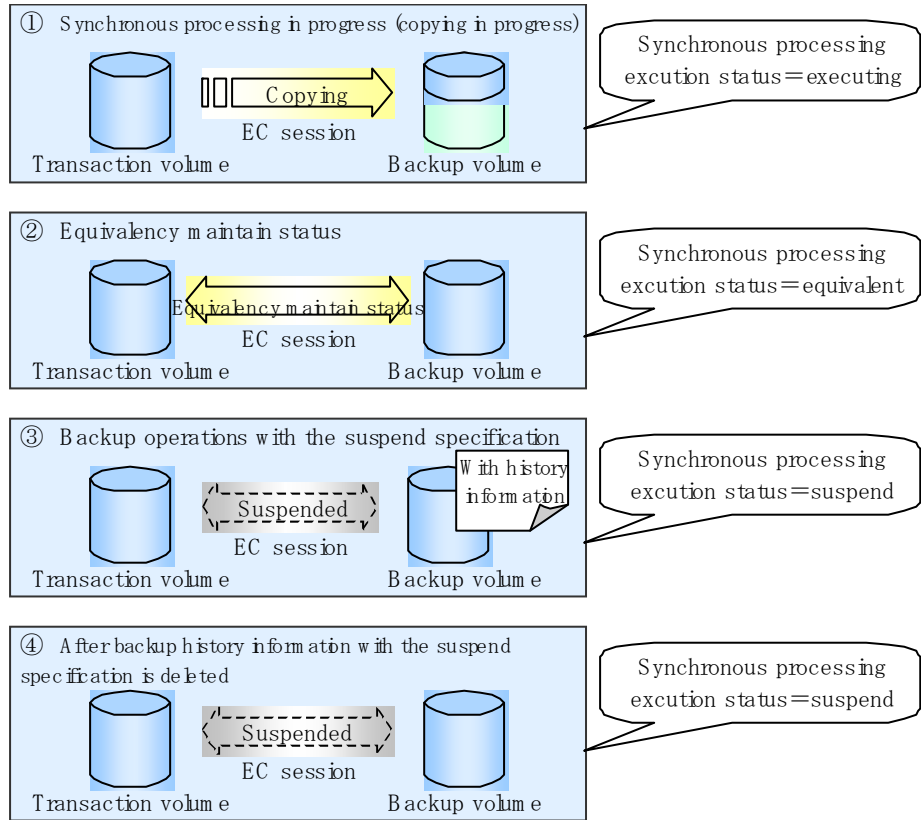
4. When the [Status] field changes to "equivalent," the transaction volume and backup volume are placed in the equivalency maintenance status.
   [For Solaris]

```
# /opt/FJSVswstc/bin/acmsyncstat /dev/dsk/c1t1d0s6
Server  Transaction-Disk  Backup-Disk       Status    Execute
server1 /dev/dsk/c1t1d0s6 /dev/dsk/c1t2d1s6 equivalent 100%
#
```

5. Execute the "Backup command (acmbackup)" with the suspend specification to perform backup.
   If backup is performed without the suspend specification in synchronous high-speed backup operation mode, the EC session is released. If backup is performed with the suspend specification, the EC session is not released but is suspended.
   The figure below, "Ordinary backup, and backup with the suspend specification", shows ordinary backup operation and backup operation with the suspend specification.

   — To perform backup to both a disk and tape
   — Specify BOTH for the -m option.

— Other tape-related specifications

    - Specify the -b option to select generation management or day management.

    - To make the command return without waiting for completion of writing to tape, specify -w option.

The following command execution example performs backup with the suspend specification to both disk and tape and returns without waiting for completion of writing to tape.

[For Solaris]

```
# /opt/FJSVswstc/bin/acmbackup -m BOTH -w -suspend /dev/dsk/c1t1d0s6
/dev/dsk/c1t1d0s6 acmbackup DISK backup completed, TAPE backup started
#
```

Figure: Ordinary backup, and backup with the suspend specification
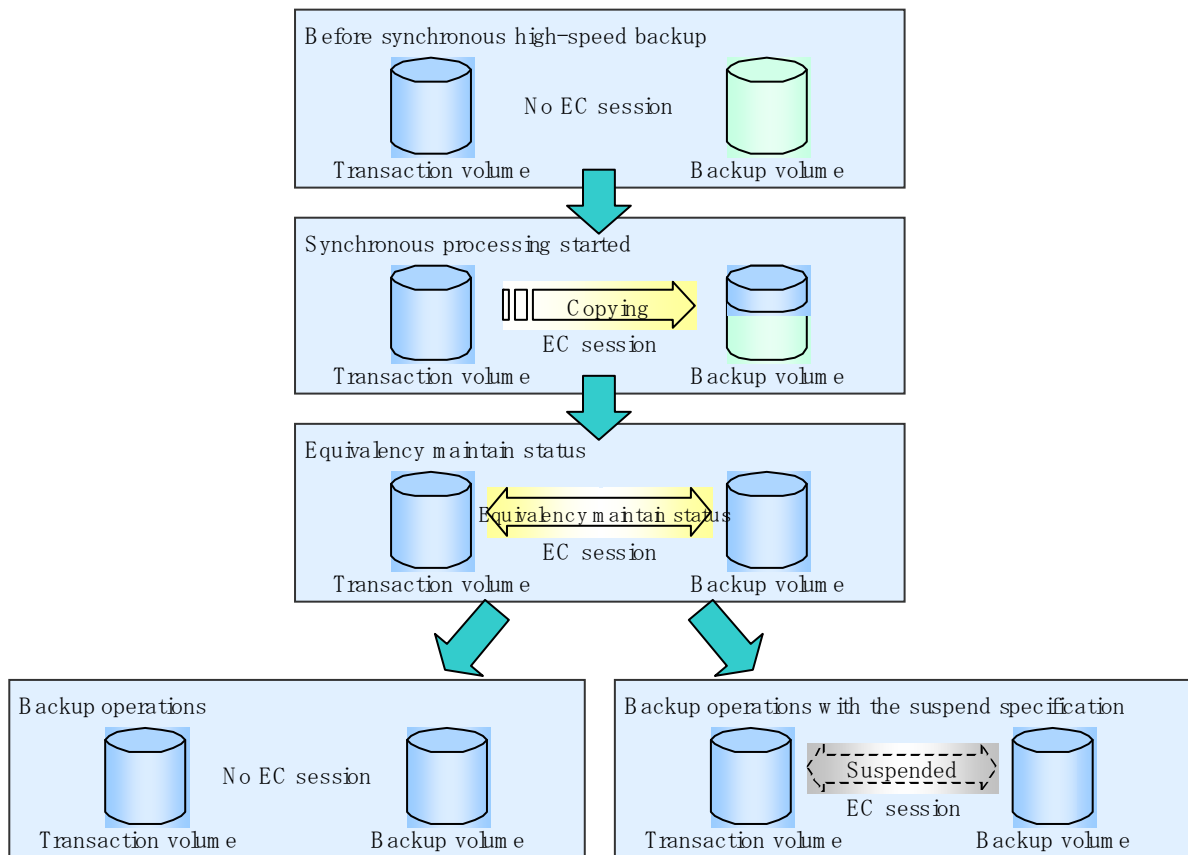
To cancel synchronous processing that has been started

The "Backup synchronous processing cancel command (acmcancelsync)" can be used to cancel synchronous processing (an EC session). The statuses of the synchronous processing cancelled by the synchronous processing cancel command are explained below.

    — executing: synchronous processing in progress (ie, copying is in progress)

    — equivalent: equivalency maintenance status

    — suspend: suspended processing

After the backup command with -suspend specified is executed, the Suspend state is maintained even if history information is deleted. A suspended EC session cannot be released unless the synchronous processing is cancelled.

If the synchronous processing is cancelled with no options specified, then a EC session in the synchronous processing status or in the equivalency maintenance status is cancelled. If one transaction volume has multiple synchronous processing (EC sessions), then specify the backup volume and cancel only the cpecified EC session. All of the synchronous processing of the transaction volume can be cancelled by specifying the -all option.

— Both the backup volume and all synchronous processing cannot be specified simultaneously.

— Cancelling suspended synchronous processing that has history information does not delete the history information.
— Cancelling the synchronous processing (during copying, in the equivalency maintenance status, or in the Suspend state) that does not have any history information sets the backup volume to the unused state. Cancelling synchronous processing (in the Suspend state) that has history information leaves the backup volume in the used state.
Operations when the synchronous processing is cancelled are shown below.

Figure: Operation when synchronous processing is cancelled

〈Case of the backup volume being cleared because copy processing is cancelled〉

① Synchronous processing in progress (copying in progress)

Copying
EC session

Transaction volume   In use   Backup volume

①´ After synchronous processing cancellation

No EC session

Transaction volume   Empty   Backup volume

〈Case of the backup volume being cleared because of cancellation under the equivalency maintain status〉

② Equivalency maintain status

Equivalency maintain status
EC session

Transaction volume   In use   Backup volume

②´ After synchronous processing cancellation

No EC session

Transaction volume   Empty   Backup volume

〈Case of the backup volume remaining in use after cancellation in the Suspend state〉

③ After execution of the backup command with -suspend specified

Suspended
EC session

Transaction volume   In use   With history information   Backup volume

③´ After synchronous processing cancellation

No EC session

Transaction volume   In use   With history information   Backup volume

〈Case of the backup volume being cleared because of cancellation in the Suspend state〉

④ After backup history information with the suspend specification is deleted

Suspended
EC session

Transaction volume   In use   Backup volume

④´ After synchronous processing cancellation

No EC session

Transaction volume   Empty   Backup volume

5.4.2 Backup to tape only

To perform backup to tape only, follow the procedure below:
1. To back up a general file system, stop the application.
2. Execute the "Backup command (acmbackup)" to perform backup.
   — To perform backup to tape only
     Specify TAPE in the -m option.
   — Other tape-related specifications
     Specify the -b option to select generation management or day management.
     The following command execution example performs backup only to tape.
     [For Solaris]

```
# /opt/FJSVswstc/bin/acmbackup -m TAPE /dev/dsk/c1t1d0s6
/dev/dsk/c1t1d0s6 acmbackup completed
#
```

3. The backup procedure is completed. Restart the application.
4. If the application was stopped in step 1, restart the application.

— A backup to tape alone is performed by backing up data to tape directly from the transaction volume without using the advanced copy function. This prolongs the time during which the application is stopped.

5.4.3 Copying backup data once saved to a disk to a tape

Backup data saved to a disk can be copied to a tape later. The data thus saved to the tape is managed as backup history information. The same generation number as the backup history on the source disk is assigned to this backup history for management.

This function can be used in the following cases:
● You want to keep backup data on both a disk and tape but want to write backup data to tape some time later than writing to the disk.
  In this case, when performing backup, specify DISK in the -m option to perform backup to only a disk.
● Even though you performed backup to save data to both a disk and tape, you failed in an attempt to back up data to tape because the tape ran out.
  In this case, the backup to the disk was successful and so you can add tape and then create backup history information on tape by using the copy function.

Follow the procedure below for copying to tape:
1. Determine the backup history to be copied. Use the "History information display command (acmhistdisp)" to display backup history information. If a backup history exists on the disk, a relative generation number is displayed in the "Generation" field. From the backup history information on the disk, select the history you want to copy to tape.

A command execution example is shown below.

[For Solaris]

```
# /opt/FJSVswstc/bin/acmhistdisp /dev/dsk/c1t1d0s6
Generation Management Backup
Server=server1 Device/dev/dsk/c1t1d0s6 Mount-Point=/mnt/Tran1 (ufs)
Generation Version Backup-Date      Backup-Device     Status     Execute
Tape-Gen
    1        10    2004/11/12 22:00 /dev/dsk/c1t0d2s6 succeeded ----        1
    2         9    2004/11/11 22:00 /dev/dsk/c1t0d4s6 succeeded ----        -


Day Management Backup
Server=server1 Device=/dev/dsk/c1t1d0s6 Mount-Point=/mnt/Tran1 (ufs)
TapeCopy-Date        Backup-Date        Expiration-Date
#
```

2. Execute the "Tape copy command (acmtphistcopy)" for copy to tape.
― To copy a specific backup history
― Use the -g or -v option to specify the target backup history using either the relative generation number or the absolute generation number.
― To copy the latest backup history
― If no backup history is specified, the Tape Backup of AdvancedCopy Manager copies the latest backup history on the disk it manages.
― Other tape-related specifications
― Specify the -b option to select generation management or day management.
The following command execution example copies the backup history with relative generation number 2, displayed in step 1, to tape.
[For Solaris]

```
# /opt/FJSVswstc/bin/acmtphistcopy -g 2 /dev/dsk/c1t1d0s6
/dev/dsk/c1t1d0s6 acmtphistcopy completed
#
```

3. This completes the procedure for copying to tape.

5.4.4 Checking the backup status

The backup status can be checked with the "Execution status display command (acmexecstat)" or "History information display command (acmhistdisp)".

You can check the following with the execution status display command:
● Status of physical copy of backup to a disk
● Status of writing backup data to a tape

In backup to tape, the execution status display command does not display information on whether writing to tape is complete or terminated with an error. The "History information display command (acmhistdisp)" must be used to check whether a backup history has been created.

When backup is performed to tape only, or to both a disk and tape, you can check whether the backup to tape is complete as follows:

1. Perform the "Execution status display command (acmexecstat)" to check the execution status of backup to tape. Backup to tape is not complete while [TapeExecute] is [Writing]. When [TapeExecute] is [----], backup to tape is complete, so perform the following to check a backup history.

2. Execute the "History information display command (acmhistdisp)" to check whether a backup history has been created. If a tape backup history has been created, a relative generation number is displayed at [Tape-Gen]. If [idle] is displayed in step 1 for the relevant backup and a hyphen "-" is displayed at [Tape-Gen] as a result of this command, the attempt to back up data to tape terminated with an error. The error cause is indicated on the standard error output of the backup command.

```
<Checking the status of backup to tape using the acmexecstat command.>
# /opt/FJSVswstc/bin/acmexecstat /dev/dsk/c1t1d0s6
Generation Management Backup
Server Device            Last-Backup-Date DiskInterval Status Mount-Point (Method)
DiskExecute  TapeInterval  TapeExecute
server1 /dev/dsk/c1t1d0s6 2004/12/10 12:20 DELAY=1     EXEC   /usr2 (ufs)
sync(22%)    OK     Writing(50%)


Day Management Backup
Server Device            Last-Backup-Date Status Mount-Point (Method)   TapeInterval
 TapeExecute
server1 /dev/dsk/c1t1d0s6 2004/12/11 12:20 IDLE   /usr1 (ufs)           OK     ----


<Writing to tape is in progress (Writing), so execute the acmexecstat command later.>
Generation Management Backup
Server Device            Last-Backup-Date DiskInterval Status Mount-Point (Method)
DiskExecute  TapeInterval  TapeExecute
server1 /dev/dsk/c1t1d0s6 2004/12/10 12:20 DELAY=1     IDLE   /usr2 (ufs)
----     OK     ----


Day Management Backup
Server Device            Last-Backup-Date Status Mount-Point (Method)   TapeInterval
TapeExecute
server1 /dev/dsk/c1t1d0s6 2004/12/11 12:20 IDLE   /usr1 (ufs)           OK     ----


<Writing to tape is finished (----), check for backup history.>
# /opt/FJSVswstc/bin/acmhistdisp /dev/dsk/c1t1d0s6
Generation Management Backup
Server=node1 Device=/dev/dsk/c1t1d0s6 Mount-Point=/mnt/Tran1 (ufs)
Generation Version Backup-Date      Backup-Device    Status    Execute
Tape-Gen
    1          1    2004/12/11 12:20 /dev/dsk/c1t0d2s3 succeeded ----      1


Day Management Backup
Server=node1 Device=/dev/dsk/c1t1d0s6 Mount-Point=/mnt/Tran1 (ufs)
TapeCopy-Date        Backup-Date        Expiration-Date
#


<A backup history has been created. This means that the backup to tape is finished
successfully.>
```

5.4.5 Restoration

This sub-section describes restoring a volume or data that has been backed up.

5.4.5.1 Restoring an entire volume

To restore all data in a volume that was backed up, follow the procedure below:

1.   Stop transaction if you want to perform restoration on a general file system.
2.   If there is any EC session set for the transaction volume, cancel it using the "Backup synchronous processing cancel command (acmcancelsync)". You can check for EC sessions that are set for the transaction volume by using the "Backup synchronous processing progress display command (acmsyncstat)".
3.   Use the "Restore command (acmrestore)" to execute restoration.
     — To perform restoration using a specific backup history
          Use the -g, -v, or -t option to specify the target backup history.
     — To perform restoration using the latest backup history
          If no backup history is specified, the Tape Backup function performs restoration using the latest backup history on the disk it manages.
     — Media from which restoration data is read
          - When the target backup history exists only on a disk, data is restored from the disk.
          - When the target backup history exists only on tape, data is restored from tape.
          - When the target backup history exists on both a disk and tape, data is restored from the disk. You can specify TAPE in the -m option if you want to restore data from tape.
     — To change the restoration destination volume
     — Specify the -r option.
          The following command execution example performs restoration using the latest backup history.
          [For Solaris]

```
# /opt/FJSVswstc/bin/acmrestore /dev/dsk/c1t1d0s6
/dev/dsk/c1t1d0s6 acmrestore completed
#
```

4.   The restoration procedure is now complete and the transaction can be restarted (in Step 5). Note, however, that if restoration was performed from the disk, physical copying of the volume is not complete in backend processing. For information on checking the status of the physical copy, refer to "Checking the status of restoration".
5.   If the transaction was stopped in step 1, restart it.

> **Note**
>
> If the transaction volume has a backup volume being copied by EC, backup volume under the equivalency maintenance status, or a suspended backup volume, then restoration is not possible.
> A suspended backup volume cannot be used as the restore destination volume.

> **Note**
>
> If the -g, -v, and -t options are all omitted, the latest backup history is selected from those subject to generation management. Any backup history subject to day management is not selected even if it is the latest backup history.

If you want to restore the latest backup data and it is subject to day management, specify the -t option.

5.4.5.2 Restoring an individual file

Restore an individual file as shown below.

When backup data exists on a disk

1. Mount the backup volume and use the "History information display command (acmhistdisp)" to confirm the backup volume.
2. Use the copy command provided by the operating system to copy the file to be restored.
3. Unmount the backup volume.

When backup data exists on tape

1. Perform restoration by specifying (using the -r option) a volume other than the transaction volume. Use the "Restore command (acmrestore)" to do this.
2. Mount the restoration destination volume specified in step 1.
3. Use the copy command provided by the operating system to copy the file to be restored.

5.4.6 Checking the status of restoration

Use the "Execution status display command (acmexecstat)" to check the status of restoration. You can check the following with the execution status display command:
● The status of OPC physical copy when backup data is being restored from a disk
● The status of reading from tape when backup data is being restored from tape

The [DiskExecute] field shows the status of OPC physical copy.
The [TapeExecute] field shows the status of reading from tape.

```
<Execute the acmexecstat command to check the status of restoration.>
# /opt/FJSVswstc/bin/acmexecstat /dev/dsk/c1t1d0s6
Generation Management Backup
Server Device          Last-Backup-Date DiskInterval Status Mount-Point (Method)
DiskExecute  TapeInterval  TapeExecute
server1 /dev/dsk/c1t1d0s6 2004/12/10 12:20  OK           EXEC   /usr2 (ufs)
----      OK             Reading(50%)


Day Management Backup
Server Device          Last-Backup-Date Status Mount-Point (Method)   TapeInterval
TapeExecute
server1 /dev/dsk/c1t1d0s6 2004/12/11 12:20 IDLE    /usr1 (ufs)            OK       ----
#
```

This example shows that backup data is being read (restored) from tape.

5.4.7 Managing a backup history

Backup history information includes the backup volume name, tape names, and backup dates of backup data for a transaction volume that is under generation management or day management.

5.4.7.1 Displaying a backup history

To display backup history information, use the "History information display command (acmhistdisp)".

5.4.7.2 Deleting a backup history

To delete backup history information, use the "History information delete command (acmhistdel)".

Point

● Backup history that exceeds the preservation generations or preservation days specified in the backup policy is automatically deleted.

● Even when the history information created during backup operations with the suspend specification is deleted, an associated EC session is not released.

● If history information is deleted after ordinary synchronous high-speed backup is performed, the relevant backup volume is released and "Backup (free)" is displayed in the Device-Mode field when the "Device operating status display command (acmdevdisp)" is executed. However, if backup is performed with the suspend specification, the backup volume is not released even after deletion of history information and "Backup (used)" is displayed in the Device-Mode field when the "Device operating status display command (acmdevdisp)" is executed.

● The figure below shows the ordinary deletion of a backup history and the deletion of backup with the suspend specification.

Figure: Deletion of an ordinary backup history and the deletion of backup history with the suspend specification
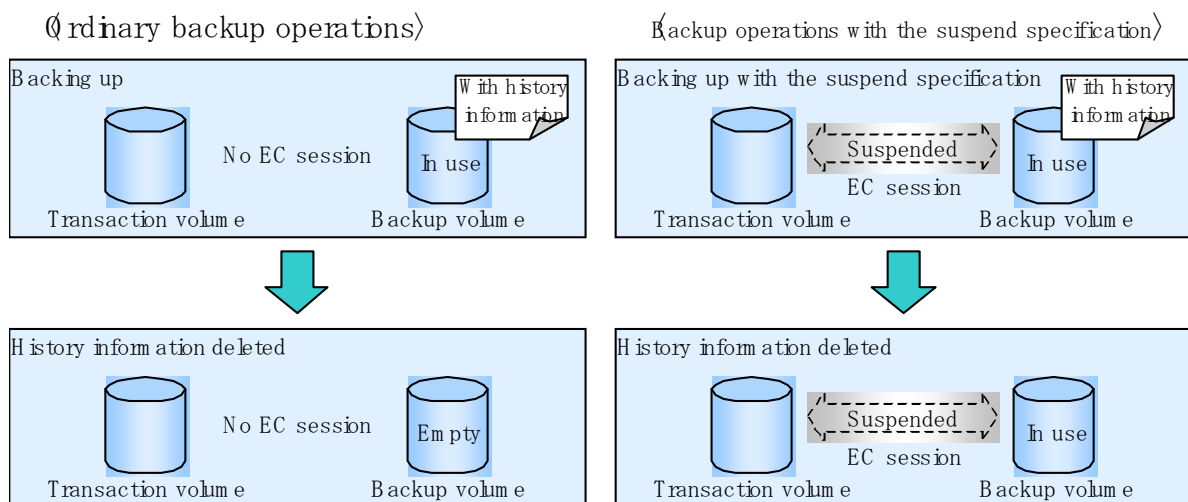
5.4.8 Canceling backup or restoration

5.4.8.1 Canceling backup

When backing up to disk, an OPC physical copy cannot be canceled during execution.
If cancelling a backup to tape, use the acmtpcancelback command. For details, refer to "Tape backup cancel command (acmtpcancelback)".

For information on checking the backup status, refer to "Checking the backup status".

To finish physical copying to a disk, execute the "History information delete command (acmhistdel)" to delete the backup history.

5.4.8.2 Canceling restoration

In restoration from a disk, OPC physical copying in progress can be canceled using the "Restore cancellation command (swstcancelrest)".

For details of the restore cancel command (swstcancelrest), see the chapter "Commands" in the "ETERNUS SF AdvancedCopy Manager Operator's Guide" for the operating system of the target Storage Server.

If cancelling a restore from tape, execute the "Tape restore cancel command (acmtpcancelrest)".

For information on checking the restore status, refer to "Checking the status of restoration".

5.5 Changing the setting information

If a Storage Server/device configuration for backup operation is changed, the settings of the Tape Backup function of AdvancedCopy Manager must also be changed.

5.5.1 Adding a Fujitsu ETERNUS storage system

When adding a Fujitsu ETERNUS storage system to the current ETERNUS environment, change the settings on the Tape Server as follows. This section describes changing the settings when various changes are made.

1. Create an access path partition for the added Fujitsu ETERNUS storage system.
2. For details, refer to "Creation of Access Path Partition" in the "ETERNUS SF AdvancedCopy Manager Installation Guide".
3. Edit the /etc/opt/FJSVswstm/conf/devpath.conf file to add the access path of the added Fujitsu ETERNUS storage system.
4. For details, refer to "Setting Access Path Definition Files" in the "ETERNUS SF AdvancedCopy Manager Installation Guide".
5. Execute the "Tape Server definition file check command (tbochkconf)".
6. When ETERNUS2000/ETERNUS3000/ETERNUS4000 disk array unit has been added, follow the procedure below in accordance with the type of multi-path driver installed in the Tape Server:

   - If the ETERNUS multi-path driver is installed

   Execute the "ETERNUS2000/ETERNUS3000/ETERNUS4000 information acquisition command (tbogetoluinfo)" with the IP address of the added ETERNUS2000/ETERNUS3000/ETERNUS4000 disk array unit.

```
# /opt/FJSVswstm/bin/tbogetoluinfo -l 200.30.40.30
200.30.40.30 comleted. [total olu = 100]
The configuration file of CM information was update.
#
```

   ― If the GR multi-path driver is installed

   1- Execute the "ETERNUS2000/ETERNUS3000/ETERNUS4000 information acquisition command (tbogetoluinfo)" with the IP address of the added ETERNUS2000/ETERNUS3000/ETERNUS4000 disk array unit.

```
# /opt/FJSVswstm/bin/tbogetoluinfo -l 200.30.40.30
200.30.40.30 completed. [total olu = 100]
/var/opt/FJSVmplb/mplb_ext.conf was update.
#
```

   Execute the command below to read information to the GR multi-path driver. This command need not be executed if the ETERNUS multi-path driver is installed in the Tape Server.

```
# mplbconfig -q
#
```

Note

This command should not be executed while the RAID device is processing the migration.

5.5.2 Deleting a ETERNUS storage system

When deleting a Fujitsu ETERNUS storage system from the current ETERNUS environment, change the settings on the Tape Server as follows:

1. Follow the "Deleting a device" procedure for all devices of the Fujitsu ETERNUS storage system to be deleted.
2. Edit the /etc/opt/FJSVswstm/conf/devpath.conf file to delete the access path of the Fujitsu ETERNUS storage system to be deleted.
3. For details, refer to "Setting Access Path Definition Files" in the "ETERNUS SF AdvancedCopy Manager Installation Guide".
4. Execute the "Tape Server definition file check command (tbochkconf)".

5.5.3 Adding a device

If a device is added to a Storage Server, incorporate it into the backup operation of the Tape Backup function as described below.

— System resources such as disk and memory resources may be insufficient when a device is added. Re-estimate the system resource requirements before adding a device. Refer to "Required resources" in the "ETERNUS SF AdvancedCopy Manager Installation Guide" for details.
— The area required when updating the repository may not be available when a device is added. Therefore, check if there is sufficient area for updating the repository before fetching the device information. If there is insufficient area, allocate the required area before fetching the device information.
— Refer to the version of the following manual that is applicable to the Storage Management Server operating system for the procedure:
    - Step 2 in "Action required when access to the repository fails" in the "ETERNUS SF AdvancedCopy Manager Operator's Guide"
— The Storage Management Server repository (directory for the DB space that stores repository data) may be too small when a device is added. Re-estimate the repository size before adding a device.
— Refer to "Estimating database area" in the "ETERNUS SF AdvancedCopy Manager Installation Guide" for the estimation method.
— If the estimation result is less than 65 megabytes, the size does not need to be increased. If it is more than 65 megabytes, extend the size before adding a device. Refer to "Action required when the repository is too small" for the extension method.

1. Fetch all the device information for a Storage Server. When device information is fetched, a newly added device will be detected. Move it to the [Device to be added] field. For information on fetching device information, see "Fetching device information on a Storage Server".
2. Set the operation type for a device that has been added. For more information, refer to "Setting the operation type for a device".
3. If the added device has been defined as a transaction volume, set a backup policy for it. For more information, refer to "Setting backup policies".

5.5.4 Deleting a device

This section describes deleting a device. The process depends on the device type.

5.5.4.1 Deleting a transaction volume

To delete a transaction volume, follow the steps shown below. Ensure that these steps are performed before the target transaction volume is removed.

1. Execute the History information delete command (acmhistdel) to delete the backup history for the transaction volume to be deleted.
    A command execution example is shown below.

```
# /opt/FJSVswstc/bin/acmhistdel -z /dev/dsk/c1t1d0s6
/dev/dsk/c1t1d0s6 acmhistdel completed
#
```

2. Execute the Disk backup policy delete command (acmbkpoldel)" and "Tape backup policy delete command (acmtpbkpoldel) to delete the backup policy for the transaction volume to be deleted.
    Command execution examples are shown below.

```
# /opt/FJSVswstc/bin/acmbkpoldel /dev/dsk/c1t1d0s6
/dev/dsk/c1t1d0s6 acmbkpoldel completed
#
# /opt/FJSVswstc/bin/acmtpbkpoldel /dev/dsk/c1t1d0s6
/dev/dsk/c1t1d0s6 acmtpbkpoldel completed
#
```

3. Execute the Device information setting command (acmdevinfoset) to delete device information for the transaction volume to be deleted.
    A command execution example is shown below.

```
# /opt/FJSVswstc/bin/acmdevinfoset -o /dev/dsk/c1t1d0s6
acmdevinfoset completed
#
```

5.5.4.2 Deleting a backup volume

To delete a backup volume follow the steps as shown below.
1. Give the backup volume to be deleted the unused status.
    When a volume is unused, this volume does not exist in a backup history. If the volume exists in a backup history, delete the backup history. When the same backup history also exists on tape, the history on tape need not be deleted. For details, refer to "History information delete command (acmhistdel)".
    If the volume is already unused, skip to the next step.
    A command execution example is shown below.

```
# /opt/FJSVswstc/bin/acmhistdel -m DISK -g 1 /dev/dsk/c1t1d0s6
/dev/dsk/c1t1d0s6 acmhistdel completed
#
```

2. Execute the Device information setting command (acmdevinfoset) command delete device information for the backup volume to be deleted.
    A command execution example is shown below.

```
# /opt/FJSVswstc/bin/acmdevinfoset -o /dev/dsk/c1t2d1s6
acmdevinfoset completed
#
```

Note

If a backup volume is deleted, an already defined backup policy may no longer be met (e.g., the number of backup volumes may now be less than the number of preservation generations). In such a case, the backup operation can no longer be continued. To avoid this, be sure to check already defined backup policies before deleting a backup volume.

If an insufficient number of backup volumes will remain, first register a backup volume and then delete the target backup volume.

5.5.5 Adding a Storage Server

Add a Storage Server to the backup operation as described below.

Note

— System resources such as disk and memory resources may be insufficient when a Storage Server is added. Re-estimate the system resource requirements before adding a Storage Server. Refer to "Required resources" in the "ETERNUS SF AdvancedCopy Manager Installation Guide" for details.
— The area required when updating the repository may not be available when a Storage Server is added. Therefore, check if there is sufficient area for updating the repository before adding the Storage Server. If there is insufficient area, allocate the required area before adding the Storage Server.
— Refer to the version of the following manual that is applicable to the Storage Management Server operating system for the procedure:
  - Step 2 in "Action required when access to the repository fails" in the "ETERNUS SF AdvancedCopy Manager Operator's Guide"
— The Storage Management Server repository (directory for the DB space that stores repository data) may be too small when a Storage Server is added. Re-estimate the repository size before adding the Storage Server.
— Refer to "Estimating database area" in the "ETERNUS SF AdvancedCopy Manager Installation Guide" for the estimation method.
— If the estimation result is less than 65 megabytes, the size does not need to be increased. If it is more than 65 megabytes, extend the size before adding the Storage Server. Refer to "Action required when the repository is too small" for the extension method.

1. Register a Storage Server. For details, refer to "Registering a Storage Server".
2. Fetch all the information of devices connected to the added Storage Server. For more information, refer to "Fetching device information on a Storage Server".
3. Set the information for the Storage Server. For more information, refer to "Setting the environment for a backup operation server".
4. Set the operation type for a device whose information has been fetched in Step 3. For more information, refer to "Setting the operation type for a device".
5. Set a backup policy for all the transaction volumes registered in Step 4. For more information, refer to "Setting backup policies".

5.5.6 Deleting a Storage Server

To delete a Storage Server follow the steps shown below.

1. Delete device information on the Storage Server to be deleted. For information on deleting device information, refer to "Deleting a device".

2. Delete the Storage Server by executing the "Server information deletion command (stgxfwcmdelsrv)". For details of the command, refer to "Commands" in the "ETERNUS SF AdvancedCopy Manager Operator's Guide" for the operating system of the target Storage Management Server.

5.6 Stopping the Operation

To stop a backup, stop daemons on the Storage Server. Normally, they are automatically stopped when the system stops.

It is also possible to stop an individual daemon if required. For more information, refer to "Starting and Stopping Daemons".

Note

● When the daemons stop, all functions of AdvancedCopy Manager running on the Storage Server stop.

● Stop daemons on a Storage Management Server only after checking that all the Storage Servers that it manages are stopped.

5.7 SDX Object Operations

This section describes the backup and restore operations of SDX objects. A good understanding of the basic operation of normal volumes is required for these operations.
For details of GDS, refer to the GDS manual "PRIMECLUSTER(TM) Global Disk Services Handbook".

5.7.1 Supported Storage Server platforms

The following platforms support the backup of SDX objects:
[Solaris]
 ● Solaris (TM) 8 Operating System
 ● Solaris (TM) 9 Operating System
 ● Solaris (TM) 10 Operating System
[Linux]
 ● Red Hat Enterprise Linux AS (v.4 for x86)
 ● Red Hat Enterprise Linux ES (v.4 for x86)
 ● Red Hat Enterprise Linux AS (v.4 for EM64T)
 ● Red Hat Enterprise Linux ES (v.4 for EM64T)
 ● Red Hat Enterprise Linux AS (v.4 for Itanium)
 ● Red Hat Enterprise Linux 5 (for x86)
 ● Red Hat Enterprise Linux 5 (for Intel64)
 ● Red Hat Enterprise Linux 5 (for Intel Itanium)

5.7.2 Units of SDX object operations

Tape backup operation can be performed in units of the following:
 ● Slice (GDS Snapshot not used)

Note

Backup in units of logical volumes is not possible.

5.7.2.1 Configuration and conditions of unsupported SDX objects

The Tape Backup function of AdvancedCopy Manager cannot handle the following SDX object (volume):

 ● Volume of a shadow class
 ● Stripe volume
 ● Switch volume
 ● Volume in a concatenation group
 ● Stripe groups and concatenation groups, however, can be used as subordinate groups of a mirror group.
 ● Volume with the physical slice attribute off

If the total number of slices that make up the transaction volume and slices that make up all backup volumes associated with the transaction volume at the start of synchronous processing or snapshot-type backup processing is 33 or greater, copying cannot be processed. Also, if the source volume (the transaction volume for backup processing or the backup volume for restore processing) is in the invalid state, copying cannot be processed.

To confirm the type of volume being used (single, mirror, stripe, concatenation, or switch), execute "sdxinfo -e long" and see the volume type attribute, which is displayed in the TYPE column on the line indicated for the volume in the OBJ column.

[Volume object type attributes]
● single : Single volume (supported)
● mirror : Mirror volume (supported)
● stripe : Stripe volume (not supported)
● concat : Volume in a concatenation group (not supported)
● switch : Switch volume (not supported)

5.7.3 Backup operation (without using GDS Snapshot)

Backup can be performed using only the tape backup function of AdvancedCopy Manager without linkage with GDS Snapshot. For its proper design and operation, you need to know the type of physical volumes that make up the logical volume.

Figure: Backup operation in units of slices
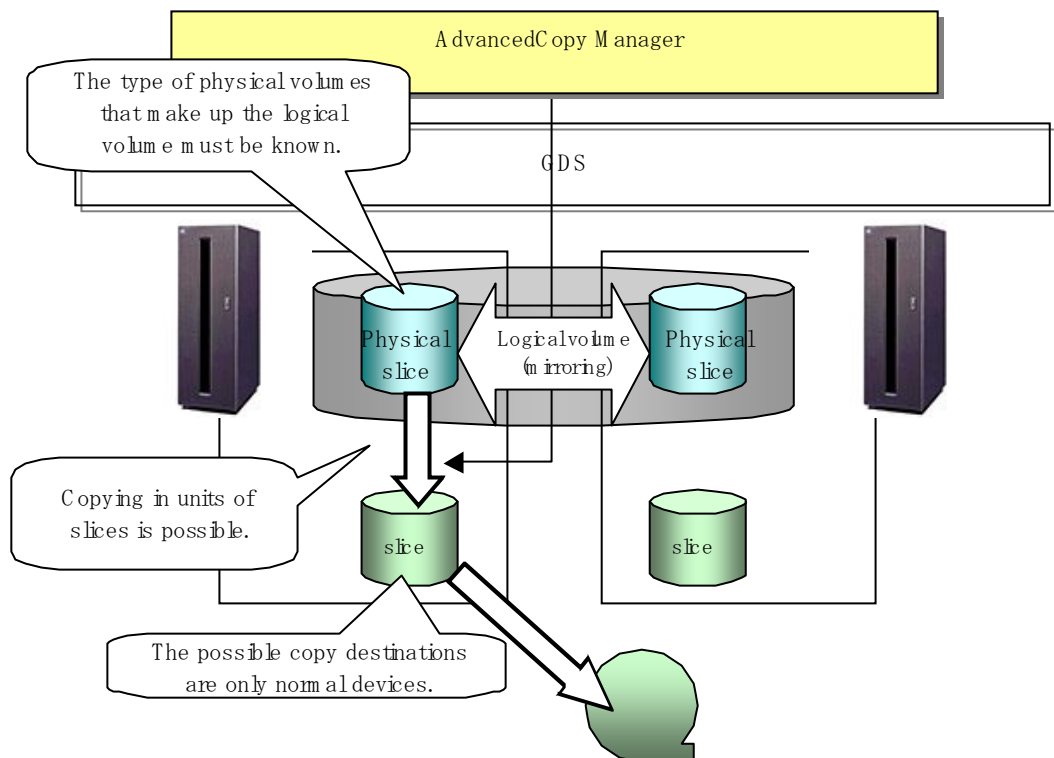
When specifying an SDK object in the Tape Backup function, use a name in the following format that combines a logical volume name and AdvancedCopy Manager device name.

Operation in units of slices
- ● [Solaris]

  /dev/sfdsk/(class name)/dsk/(volume name:):(sdxinfo DEVNAM value)
- ● [Linux]

  /dev/sfdsk/(class name)/dsk/(volume name):(devic ename)

  One of the following is used for the device name that makes up a volume.
  - ― Sdxinfo DEVNAM value

    Example of using the sdxinfo DEVNAM value for the operation in units of slices
    is described below:

    Example: /dev/sfdsk/class1/dsk/volume1:sda
    - ― Class name:class1
    - ― Volume name:volume1
    - ― Device name:sda(sdxinfo DEVNAM value)

  - ― Device name (udev devide name) generated by the udev mechanism specified by
    sdxinfo DEVNAM sdxinfo DEVNAM value.

    An example of using udev device name for the operation in units of slices is
    described below.

    Example)/dev/sfdsk/class1/dsk/volume1:/dev/disk/by-id/scsi-3600e000000cb000
    00000000100020000
    - ― Class name:class1
    - ― Volume name:volume1
    - ― Device
      name:/dev/disk/by-id/scsi-3600e000000cb00000000000100020000(udev
      device name specified by the sdxinfo DEVNAM value)

  The udev device name is used as the priority in an environment in which the udev device
  name exists. The udev device name can use the by-id name. If the udev device name is
  used but the by-id is not generated, the by-id should be generated. If a backup
  operation is performed by the tape backup option in an environment where only the
  by-path name is generated, the format should be changed to the conventional format
  (compatible device name) according to the "Information capture mode setting command
  (stgxfwcmsetmode)" in the "ETERNUS SF AdvancedCopy Manager Operator's Manual (Linux
  version)". Even if in an environment where the udev device exists and the sdxinfo DEVNAM
  value is used, the mode should be changed to the information capture mode prior to
  device information capture/reflection processing, in order to avoid the use of the
  udev device name.

  For details, refer to "Information capture mode setting command (stgxfwcmsetmode)"
  in the "ETERNUS SF AdvancedCopy Manager Operator's Manual (Linux version)".

- ● [Windows]

Disk class name/Mirror volume:g?d?p?

Note

Operation mode for the logical volume units is not supported.
Solaris and Linux are the only supported operating systems.

Notes on Linux

The following are notes on the use of PRIMECLUSTER GDS/SafeDISK SDX object in the tape backup option.

— The by-id name should be used when the udev device name is used.
If the by-id name is not generated, the settings should be changed to generate the by-id name. The operation is not possible with by-path.

— Note the following if the udev device is used in an environment where the ETERNUS multipath driver is not installed.
If the disk is replaced while using by-id, the udev device name may change. Even if the udev device name is changed, the procedure for "Change of the device configuration" is required.

For notes on operating SDX objects, refer to "Notes on SDX Object Operations".

If mirroring between cabinets is enabled and restoration by OPC is required in the event of a cabinet failure, both mirrored systems must be backed up. In such cases, the required capacity of the backup volume is not the size of the logical volume but the size of the physical volume.

5.7.3.1 Designing the backup operation

For notes on designing backup operation, refer to "Notes on SDX Object Operations".

5.7.3.2 Fetching device information from a Storage Server

To perform backup with a Storage Server and get information about a subordinate device of the Storage Server, register the server.
For details on how to fetch the device information, refer to "Fetching device information on a Storage Server".

5.7.3.3 Setting the operation type for a device

Transaction volume

Register the slices that make up the logical volume used for transactions as a transaction volume.

```
#/opt/FJSVswstc/bin/acmdevinfoset -t /dev/sfdsk/CLS01/dsk/VOL01:c1t0d1
acmdevinfoset completed
#
```

Backup volume

Slices of an SDX object cannot be registered as a backup volume. Use general slices for a backup volume.

```
#/opt/FJSVswstc/bin/acmdevinfoset -b /dev/dsk/c1t0d2s6
acmdevinfoset completed
#
```

5.7.3.4 Customizing pre-processing and post-processing

When a transaction volume is registered as a cluster resource, modify the backup pre-processing script so that the volume is not unmounted. For information on how to modify the script, refer to "When you do not want to unmount a transaction volume" in Appendix "Pre-processing and Post-processing of Backup and Restoration," in the "ETERNUS SF AdvancedCopy Manager Operator's Guide" for the operating system of the target Storage Server.

5.7.3.5 Backup

Backup example

A command execution example is shown below.

```
#/opt/FJSVswstc/bin/acmbackup /dev/sfdsk/CLS01/dsk/VOL01:c1t0d1
/dev/sfdsk/CLS01/dsk/VOL01:c1t0d1 acmbackup completed
#
```

From a transaction volume registered in the cluster resource, do not perform backup by specifying tape only. This is because the integrity of collected backup data cannot be checked when backup is performed to tape alone without unmounting.

Backup states

Backup can be performed when the SDX object that makes up the applicable logical volume is in one of the states listed below. If the object is in any other state, backup cannot be performed. (The Tape Backup of AdvancedCopy Manager checks the status of an SDX object using the SafeDISK/PRIMECLUSTER GDS sdxinfo command.)

1. The state of the volume is ACTIVE or STOP.
2. The state of the physical disk is ENABLE.
3. The state of the slice is ACTIVE or TEMP.

Backup pre-processing and post-processing

In the following case, the pre-processing and post-processing script is not executed:

● A slice of an SDX object is in the TEMP state.

5.7.3.6 Restore

The "Restore command (acmrestore)" is used to perform restoration.
A command execution example is shown below.

```
#/opt/FJSVswstc/bin/acmrestore /dev/sfdsk/CLS01/dsk/VOL01:c1t0d1
/dev/sfdsk/CLS01/dsk/VOL01:c1t0d1 acmrestore completed
#
```

When a transaction volume (restoration destination volume) is registered as a cluster resource, the backup data of an SDX object slice can be restored as follows:

1. Stop the cluster service of the Storage Server subject to restoration.
2. Set the shared disk of the restoration destination to online.

```
# sdxvolume -N -c class-name
#
```

3. If the restoration destination volume is a mirror volume, disconnect the mirror volume. If it is a single volume, proceed to the next step.

```
# sdxslice -M -c class-name -d mirror-disk-name -v volume-name -a jrm=off
#
```

> **Note**
>
> Be sure to set the high-speed equivalency recovery mode to off (-a jrm=off). If restoration is performed without setting it to off, the data before restoration is restored when the mirror volume is incorporated after restoration.

4. Once SWSTGNODE is set, activate the communication daemon.

```
# /opt/FJSVswstf/bin/stgfwcom start
#
```

5. Execute the "Restore command (acmrestore)". For information on this command, refer to Appendix "Restoring from Tape while the Cluster Service is Stopped".
6. If the mirror volume was disconnected in step 3 above, incorporate the mirror volume.

```
# sdxslice -R -c class-name -d mirror-disk-name -v volume-name
#
```

7. Set the shared disk of the restoration destination to offline.

```
# sdxvolume -F -c class-name
#
```

8. Start the cluster service.

5.8 VxVM Volume Operation

This section describes backup for volumes under VERITAS Volume Manager (VxVM).

The following table shows the operation modes available for each platform.

Table: Operation modes for each platform

Platform	Backup operations for each physical slice on the logical volume	Backup operations for each physical disk in the disk group
Solaris	Supported	Supported
HP-UX	Not Supported	Supported
AIX	Not Supported	Supported

5.8.1 Backup operation in units of physical slice

Backup of VxVM volumes can be performed in units of physical slices where the logical volume of VxVM exists.

> Before starting this operation, be sure to understand the basic operation for physical slice units where the logical volume of VxVM exists.
> For more information, refer to "Backup operation in units of logical volumes" of "VxVM Volume Operation" in the "ETERNUS SF AdvancedCopy Manager Operator's Guide" for Solaris OS.

5.8.2 Backup operation in units of physical disk

VxVM volumes are backed up in units of the physical disks that constitute each VxVM volume. When backup is performed in units of physical disks, disk group integrity must be maintained. Therefore, all the physical disks in the disk group must be operated synchronously.

> Before starting this operation, be sure to understand the basic operation of the physical disk units that constitute each VxVM volume.
> For information about basic operations, refer to "Backup operation for each physical disk in the disk group" under "VxVM Volume Operation" in the "ETERNUS SF AdvancedCopy Manager Operator's Guide" for the relevant operating system.

5.8.2.1 Executing backup

It is necessary to perform the operation by synchronizing all physical disks in the disk group.
Perform the required pre-processing or post-processing work for each volume group before and after (respectively) the backup operation. Disable pre-processing and post-processing when operating individual physical disks.

Backup to both disk and tape

For backups to both disk and tape, if the Storage Server restarts while data is being written, the transaction volume and the backup volume will both have the same configuration, and an inconsistency with VxVM will occur when the Storage Server starts. Accordingly, use the following procedure to create a backup log if backups are being made to both disk and tape.

1. Execute the pre-processing for backup to disk.
2. Execute Backup command (acmbackup) by specifying "DISK" for -m option.
3. Execute the post-processing for backup to disk.
4. Execute the pre-processing for tape copy.
5. Execute Tape copy command (acmtphistcopy).
6. Execute the post-processing for tape copy.

Backup to tape

The table below summarizes the pre-processing and post-processing work to be performed before and after the backup to tape.

Table: Pre-processing and post-processing for backup to tape

Object	Pre-processing	Post-processing
Transaction volume	1. Stop access to all logical volumes in the disk group. 2. Unmount all file systems in the disk group, if file systems are included. 3. Import the disk group.	1. Remount the volumes that were unmounted by pre-processing, if file systems are included.

Backup to disk

For information about backing up to disk, refer to "Backup operation for each physical disk in the disk group" under "VxVM Volume Operation" in the "ETERNUS SF AdvancedCopy Manager Operator's Guide" for the relevant operating system.

5.8.2.2 Executing tape copy

To perform this operation, synchronize all physical disks in the disk group.
Perform the required pre-processing and post-processing work for each volume group before and after (respectively) the tape copy operation. Disable pre-processing and post-processing when operating individual physical disks.

Note

Before making tape copies, reconfigure the disk group for the backup volume. This is necessary because if a tape copy is made from a backup volume where the disk group has not been reconfigured and the Storage Server restarts during the tape copy, the transaction volume and the backup volume both have the same configuration, and an inconsistency with VxVM will occur when the Storage Server starts. (In cluster system environment, this event will occur when the node fails over.)

The table below summarizes the pre-processing and post-processing work to be performed before and after the tape copy.

Table: Pre-processing and post-processing for tape copy

Object	Pre-processing	Post-processing
Backup volume	1. Stop access to all logical volumes in the disk group. 2. Unmount all file systems in the disk group, if file systems are included.	1. Remount any volumes that were unmounted by pre-processing.

5.8.2.3 Executing restoration

To perform this operation, synchronize all physical disks in the disk group.
Perform the required pre-processing and post-processing work for each volume group before and after (respectively) the restoration. Disable pre-processing and post-processing when operating individual physical disks.

Only backup histories made by the following methods indicated can be restored.
— Executing backup
— Executing tape copy

Restoration from tape

The table below summarizes the pre-processing and post-processing work to be performed before and after restoration from tape.

Table: Pre-processing and post-processing for restoration from tape

Object	Pre-processing	Post-processing
Restoration destination volume	1. Stop access to all logical volumes in the disk group. 2. Unmount all file systems in the disk group, if file systems are included. 3. Deport the disk group.	1. Reconfigure the disk group. (*1) 2. Remount the volumes that were unmounted by pre-processing, if file systems are included.

*1: For the reconfiguration requirements of the disk group, see the table below.

Table: Reconfiguration requirements of the disk group

Making method of backup history on tape	Restoration destination	Reconfiguration of disk group
Backup to tape directly	Transaction volumes	Not required
	Volumes other than transaction volumes	Required
Tape copy	All volumes	Required

Restoration from disk

For information about restoring from disks, refer to "Backup operation for each physical disk in the disk group" under "VxVM Volume Operation" in the "ETERNUS SF AdvancedCopy Manager Operator's Guide" for the relevant operating system.

5.9 LVM Volume Operations

This section explains backup operations for volumes that are managed by an LVM (Logical Volume Manager).
The following table shows the operation modes available for each platform.

Table: Operation modes for each platform

Platform	Operations for each volume group	Backup operations for each physical disk in the disk group
HP-UX	Supported	Supported
AIX	Supported	Supported

5.9.1 Operations for each volume group

When LVM volumes are backed up, backups are taken for each LVM volume group.

You should ensure that you understand the basic operations of LVM volume group units before using them. For information about basic operations, refer to "Operation for each volume group" under "LVM Volume Operation" in the "ETERNUS SF AdvancedCopy Manager Operator's Guide" for the relevant operating system.

5.9.2 Backup operations for each physical disk in the disk group

When LVM volumes are backed up, backups are taken for each physical disk in the LVM volume. Backup operations must maintain consistency as disk groups and operations on all physical disks in a disk group must be synchronized.

You should ensure that you understand the basic operations of the physical disk units that make up the LVM volume before using them. For information about basic operations, refer to "Backup operations for each physical disk that makes up the disk group" under "LVM Volume Operations" in the "ETERNUS SF AdvancedCopy Manager Operator's Guide" for the relevant operating system.

5.9.2.1 Executing backups

Synchronize all of the physical disks in the disk group when operating on them.
Perform the necessary pre- processing and post-processing for each disk group before and after backup operations, and prevent pre-processing and post-processing from being performed when each physical disk is being used.

Backups to both disk and tape

For backups to both disk and tape, if the Storage Server restarts while data is being written, the transaction volume and the backup volume will both have the same configuration, and an inconsistency with VxVM will occur when the Storage Server starts. (For cluster systems, this event will occur when the node fails over.) Accordingly, use the following procedure to create a backup log if backups are being made to both disk and tape.

1. Execute the pre-processing for the backup to disk.
2. Execute only the backup to the disk by specifying DISK for the -m option in the Backup command (acmbackup).
3. Execute the post-processing for the backup to disk.
4. Execute the pre-processing for the tape copy.
5. Execute the tape copy using the "Tape copy command (acmtphistcopy)".
6. Execute the post-processing for the tape copy.

Backups with only tape specified as the backup destination medium

The following table shows the pre- processing and post-processing that is performed before and after data is backed up to tape.

Table: Pre-processing and post-processing for backup to tape

Volume type	Pre-processing	Post-processing
Transaction volume	1. Prohibits access to all logical volumes in the disk group. 2. Unmounts any file systems in the disk group. 3. Imports the disk group.	1. Mounts any file system volumes that were unmounted as part of the pre-processing.

Backups to disk only

For information about backing up to disk, refer to "Backup operation for each physical disk in the disk group" under "LVM Volume Operation" in the "ETERNUS SF AdvancedCopy Manager Operator's Guide" for the relevant operating system.

5.9.2.2 Executing tape copies

Synchronize all of the physical disks in the disk group when using them.
Perform the necessary pre-processing and post-processing for each disk group before and after tape copy operations, and prevent pre- processing and post-processing from being performed when each physical disk is used.

Before making tape copies, reconfigure the disk group for the backup volume. This is necessary because if a tape copy is made from a backup volume where the disk group has not been reconfigured and the Storage Server restarts during the tape copy, the transaction volume and the backup volume will both have the same configuration, and an inconsistency with VxVM will occur when the Storage Server starts. (For cluster systems, this event will occur when the node fails over.)

The following table shows the pre-processing and post-processing that is performed before and after tape copies.

Table: Pre-processing and post-processing for tape copy

Volume type	Pre-processing	Post-processing
Backup volume	1. Prohibits access to all logical volumes in the disk group 2. Unmounts any file systems in the disk group.	1. If necessary, mounts any volumes that were unmounted as part of the pre-processing.

5.9.2.3 Executing restorations

Synchronize all of the physical disks in the disk group when using them.
Perform the necessary pre-processing and post-processing for each disk group before and after restoration, and prevent pre-processing and post-processing from being performed when each physical disk is used.

Only backup logs that have been taken using the following methods can be restored:
- Executing backups
- Executing tape copies

Restorations from tape

The following table shows the pre-processing and post-processing that is performed before and after restoration from tape.

Table: Pre-processing and post-processing for restoration from tape

Volume type	Pre-processing	Post-processing
Restoration destination volume	1. Prohibits access to all logical volumes in the disk group. 2. Unmounts any file systems in the disk group. 3. Deports the disk group.	1. Reconfigures the disk group. (*1) 2. Mounts any file system volumes that were unmounted as part of the pre-processing.

*1: The conditions for reconfiguring the disk group are as follows:

Table: Conditions for reconfiguring the disk group

Method for creating backup logs on the tape	Restoration destination	Reconfigure the disk group
Backup directly to tape	Transaction volumes	No
	Volumes other than transaction volumes	Yes
Tape copy	All volumes	Yes

Restorations with disk specified as the restoration source medium

For information about restoring from disks, refer to "Backup operations for each physical disk that makes up the disk group" under "LVM Volume Operations" in the "ETERNUS SF AdvancedCopy Manager Operator's Guide" for the relevant operating system.

Chapter 6 Backup Operations (Symfoware)

Backup Operations (Symfoware) is not supported in a Tape Backup environment.

Chapter 7 Backup Operations Using the QuickOPC Function

This chapter provides details of tape backup operation using the QuickOPC function.

7.1 Overview

The conventional snapshot high-speed backups using One Point Copy (OPC) must copy the entire transaction volume to the backup volume each time a backup (OPC) is started. However, by using the QuickOPC function, there is no need to physically copy the entire transaction volume every time as long as the same transaction volume/backup volume pair is used. The QuickOPC function copies only the "differential data" (the data that has changed since the previous backup), so a complete snapshot image can be created and the time required to physically copy the data can be greatly reduced.

The snapshot high-speed backups that use the QuickOPC function are called "differential snapshot high-speed backups" in this manual.

A comparison between conventional snapshot high-speed backups and differential snapshot high-speed backups is shown below.

To perform differential snapshot high-speed backups, you must use an ETERNUS storage system that supports the QuickOPC function.

The QuickOPC function can only be used for intra-cabinet copies (OPC), and cannot be used for inter-cabinet copies (ROPC).

The QuickOPC function cannot be used to back up SDX objects in units of logical volumes.

Using the QuickOPC function, updates that have occurred on the copy source and copy destination are recorded by the hardware after the OPC logical copy completes. The status in which update locations are recorded by the hardware is referred to as the "tracking status".

Figure: Comparison between conventional snapshot high-speed backups and differential snapshot high-speed backups
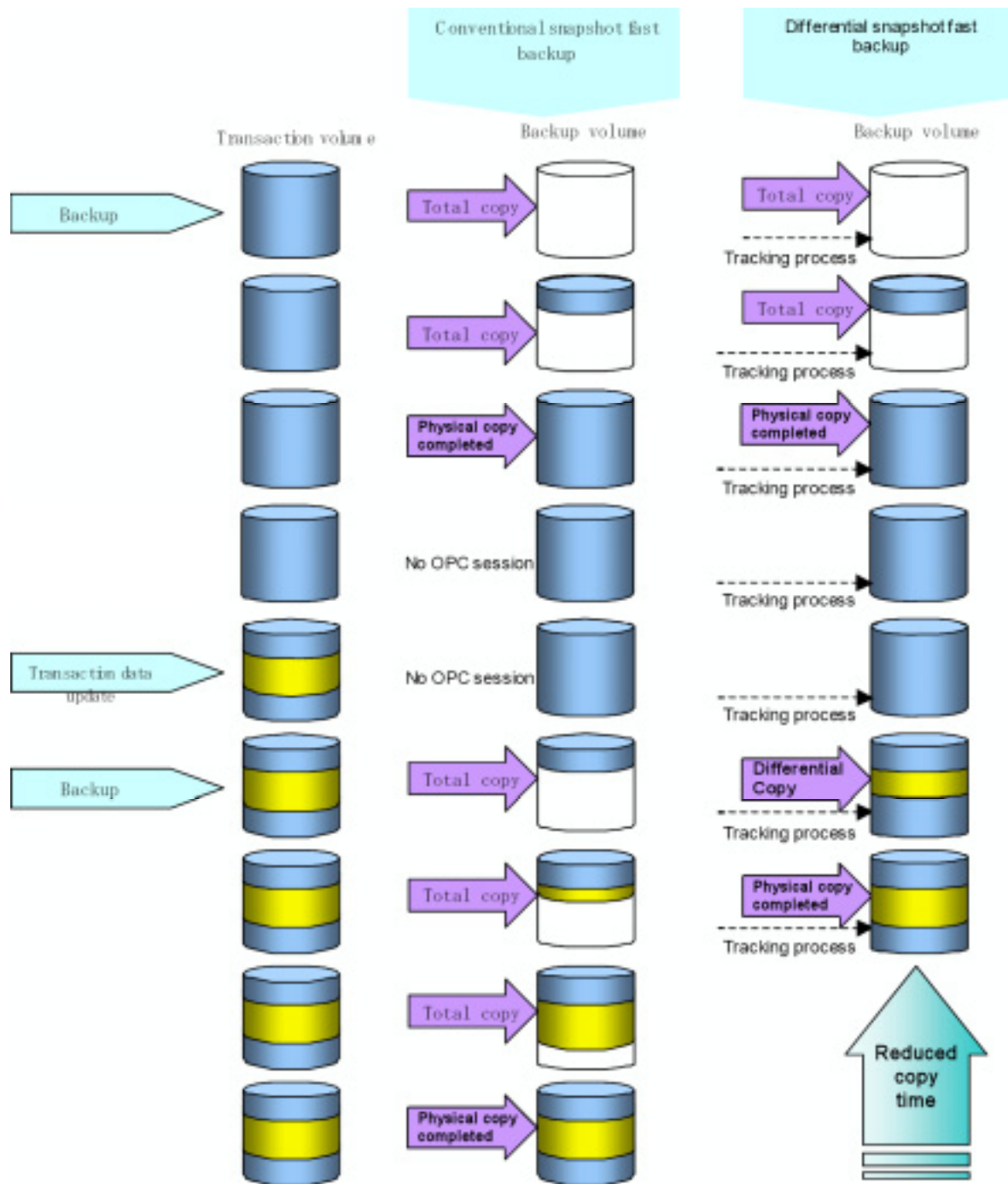
There is no difference between conventional snapshot high-speed backups and differential snapshot high-speed backups as far as backing up data to tape is concerned. The tape backup history is created from the backup volume, which is the copy destination for the QuickOPC. As a result, there is also no difference between conventional snapshot high-speed backups and differential snapshot high-speed backups as far as restoring data from tape is concerned.

7.2 Configuring Differential Backup Operations

Configure the differential backup operations by noting the following notes in addition to the information given in the "Designing the Backup Operation".

Consider the following when developing backup policies and preparing the backup volume:

- For backups that use QuickOPC, an OPC session still remains active even after the physical copy has been completed. Operators should specify the number of disk preservation generations so that it does not exceed the maximum number of OPC sessions that can be set for the same logical unit.
- The QuickOPC function can only be used for intra-cabinet copies (OPC). It cannot be used for inter-cabinet copies (ROPC). Prepare the backup volume in the same server as the transaction volume to be backed up.

7.3 Operation Flow

The flow of backup operations for differential snapshot high-speed backups is as follows:

1. Activate daemons
2. Register a Storage Server (first time only)
3. Fetch device information on a Storage Server (only the first time, or if the device has been changed)
4. Set up the environment for a backup operation server (only if operations are changed)
5. Set the operation type for the device (only if operations are changed)
6. Set backup policies (only if operations are changed)
7. Customize pre-processing and post-processing scripts (only if operations are changed)
8. Prepare a device map file (only if the backup destination is changed)
9. Operation
10. Stop the operation

7.4 Preparations

This section provides details of the preparations required when performing backup operations for differential snapshot high-speed backups.

7.4.1 Activating daemons

This involves the same steps that are required for preparing backup operations for a normal transaction volume.
Refer to "Activating daemons" in the "Backup Operations (Normal Transaction Volumes)" chapter.

7.4.2 Registering a Storage Server

This involves the same steps that are required for preparing backup operations for a normal transaction volume.
Refer to "Registering a Storage Server" in the "Backup Operations (Normal Transaction Volumes)" chapter.

7.4.3 Fetching device information on a Storage Server

This involves the same steps that are required for preparing backup operations for a normal transaction volume.
Refer to "Fetching device information on a Storage Server" in the "Backup Operations (Normal Transaction Volumes)" chapter.

7.4.4 Setting up the environment for a backup operation server

This involves the same steps that are required for preparing backup operations for a normal transaction volume.
Refer to "Setting the environment for a backup operation server" in the "Backup Operations (Normal Transaction Volumes)" chapter.

7.4.5 Setting the operation type for the device

Set up the following device operation type on a Storage Server before backing up. The operation type is set as follows:
- ● Define the volume to be backed up as a transaction volume.
- ● Prepare backup volumes. Prepare as many partitions, each with the same size as the transaction volume, as the number of generations to be maintained on the disk, and define them as the backup volumes.

Use the "Device information setting command (acmdevinfoset)" for this operation.
In the command execution example below, device "/dev/dsk/c1t1d0s6" has been registered as the transaction volume, and device "/dev/dsk/c1t2d1s6" has been registered as the backup volume.

[For Solaris]

```
# /opt/FJSVswstc/bin/acmdevinfoset -t /dev/dsk/c1t1d0s6
acmdevinfoset completed
# /opt/FJSVswstc/bin/acmdevinfoset -b /dev/dsk/c1t2d1s6
acmdevinfoset completed
#
```

Note

For notes on setting the operation type of the device, refer to "Setting the operation type for a device" in the "ETERNUS SF AdvancedCopy Manager Operator's Guide" for the operating system of the target Storage Server.

Point

Information about the registered transaction and backup volumes can be displayed using the "Device operating status display command (acmdevdisp)".
Information about volumes being tracked can be displayed using the "Tracking status display command (acmtrkstat)".

Note

— The settings for transaction volumes that are being tracked cannot be changed.
— The settings for backup volumes that are being tracked cannot be changed.

Point

By specifying the -b and -u options together with the "Device operating status display command (acmdevdisp)", backup volumes where the history has been deleted can be checked even if their status is "tracking status" or "suspended status".

7.4.6 Setting backup policies

This involves the same steps that are required for preparing backup operations for a normal transaction volume.
Refer to "Setting backup policies" in the "Backup Operations (Normal Transaction Volumes)" chapter.

7.4.7 Customizing pre-processing and post-processing scripts

This involves the same steps that are required for preparing backup operations for a normal transaction volume.
Refer to "Customizing pre-processing and post-processing scripts" in the "Backup Operations (Normal Transaction Volumes)" chapter.

7.4.8 Preparing a device map file

This involves the same steps that are required for preparing backup operations for a normal transaction volume.
Refer to "Preparing a device map file" in the "Backup Operations (Normal Transaction Volumes)" chapter.
If there is a backup volume being tracked when a backup destination is selected for snapshot high-speed backups, this device will be selected first and used as a backup destination.

7.4.9 Operation

This section describes tape backup operations for differential snapshot high-speed backups. For the information on disk backup operations, refer to "Operation" in "Backup Operation by the QuickOPC Function" in the "ETERNUS SF AdvancedCopy Manager Operator's Guide" for the operating system of the target Storage Server.

7.4.9.1 Executing backups

Differential snapshot high-speed backups are performed by specifying the -T option with the "Backup command (acmbackup)".
QuickOPC backup operations are performed as follows:
1. Execute the "Backup command (acmbackup)" with the -T option and the -m DISK option specified.
   When the command is executed, the physical copy and tracking processing starts. When the physical copy completes, the tracking processing continues to run alone.
2. Data updates (User operations) are performed on the transaction volume where the QuickOPC function was executed in step 1.
   Execute the "Backup command (acmbackup)" with the -T option and the -m DISK option specified
   When the command is executed the second and subsequent times, only differential data that has been updated since the previous OPC ran (the data updated in step 2) is physically copied to the disk.

If the -m BOTH option is also specified with the -T option, or if the -m option is not specified, after the disk is backed up, data will be copied to tape from the backup destination disk on a volume basis (that is, not just the differential data but the entire volume including the differential data).

[Command execution example]

```
# /opt/FJSVswstc/bin/acmbackup -T /dev/dsk/c1t0d1s1
/dev/dsk/c1t0d1s1 acmbackup completed
#
```

For tape backups, data is copied to tape from the backup destination disk of the transaction volume. Therefore, there is no difference between conventional snapshot high-speed backups and differential snapshot high-speed backups.

Note

The -m TAPE option cannot be specified when the -T option is specified, as the command will produce an error.

7.4.9.2 History management

Backup history information can be displayed using the "History information display command (acmhistdisp)".

To delete backup history information, use the "History information delete command (acmhistdel)".

There is no difference in tape history display and deletion operation between conventional snapshot high-speed backups and differential snapshot high-speed backups.

For disk histories, the OPC session is not released even if the history that was created for a differential snapshot high-speed backup is deleted. (While a physical copy is being performed, the physical copy will not be stopped.)

If a conventional snapshot high-speed backup has been performed, then the backup volume will be released when the history is deleted. "Backup (free)" will be displayed in the "Device-Mode" column when the "Device operating status display command (acmdevdisp)" is executed.

If a differential snapshot high-speed backup has been performed, then the backup volume will not be released even after the history is deleted. In this case, "Backup (used)" will be displayed in the "Device-Mode" column when the "Device operating status display command (acmdevdisp)" is executed. However, if the -u option is specified with the "Device operating status display command (acmdevdisp)", "Backup (used-T)" will be displayed in the "Device-Mode" column, making it possible to verify that the backup volume is in the tracking status and the history has been deleted.

7.4.9.3 Executing restoration

For differential snapshot high-speed backup operations, histories that have been backed up to tape are restored to the copy destination on a volume basis (that is, not just the differential data but the entire volume containing the differential data). This procedure for restoring data to the transaction volume is the same as the conventional restoration processing.

```
# /opt/FJSVswstc/bin/acmrestore /dev/dsk/c1t0d1s1
/dev/dsk/c1t0d1s1 acmrestore completed
#
```

For restoration from disk, refer to "Restoration" in "Backup Operation by the QuickOPC Function" in the "ETERNUS SF AdvancedCopy Manager Operator's Guide" for the operating system of the target Storage Server.

7.4.9.4 Displaying the execution status of tracking processing

The execution status of tracking processing for QuickOPC can be displayed using the "Tracking status display command (acmtrkstat)". Information for OPC sessions that are not currently tracking will not be displayed. Additionally, during tracking, the amount of data that has already been updated since the execution of the QuickOPC (logical copy) will be displayed as a percentage in the "Update" column.

```
# /opt/FJSVswstc/bin/acmtrkstat
Server Transaction-Disk Backup-Disk      Status    Execute Update
SV1    /dev/dsk/c1t0d1s1 /dev/dsk/c1t0d2s1 tracking  ----    12%
SV1    /dev/dsk/c1t0d4s1 /dev/dsk/c1t0d3s1 executing 75%     ----
SV1    /dev/dsk/c1t0d6s1 /dev/dsk/c1t0d7s1 executing 31%     ----
#
```

The relationship between the "Status" column and the OPC session is as follows:

Table: Status and OPC session status

Status column	OPC session status
"executing"	Physical copy and tracking both in progress
"tracking"	Tracking in progress

7.4.9.5 Stopping tracking processing

Stop tracking processing using the "Tracking cancel command (acmcanceltrk)".

```
# /opt/FJSVswstc/bin/acmcanceltrk /dev/dsk/c1t0d1s1 -bd /dev/dsk/c1t0d2s1
/dev/dsk/c1t0d1s1 acmcanceltrk completed
#
```

If the physical copy and tracking processing are both in progress, only the tracking processing will be stopped.

7.4.10 Stopping the operation

To cancel backup operations that use QuickOPC, perform the following procedure:

1. Delete history information.
2. Cancel the tracking processing (that includes the physical copy).
3. Delete the backup policies.
4. Delete the registrations for the transaction volume and the backup volume.

Chapter 8 Customization of Storage Pool after Start of Operation

This chapter explains how to customize the tape storage pools, which were defined during installation, after the start of operation.

All setup tasks are performed after the TSM management client command (dsmadmc) is started. If the "tsm>" prompt is displayed, activate the TSM management client command (dsmadmc) before performing operations.

The start and stop methods for the TSM management client command are described below.

1. Starting the TSM management client command
   — Move to the directory.

   ```
   # cd /opt/tivoli/tsm/client/ba/bin
   ```

   — Execute the TSM management client command (dsmadmc).

   ```
   # ./dsmadmc
   IBM Tivoli Storage Manager
   Command line management interface - Version 5, Release 5, Level 0.0
   (c) Copyright by IBM Corporation and other(s) 1990, 2007. All Rights Reserved.


   Enter User ID:  admin


   Enter password:


   Establish session and server:TAPESERVER1: Solaris SPARC
     Server version 5, release 5, level  0.0
     Server date/time: 04/02/2008 13:12:41  Last accessed: 04/02/2008 11:50:46



   tsm: TAPESERVER1>
   ```

   — At "Enter User ID", enter the TSM administrator ID, then press the Return key.
   — At "Enter password", enter the TSM administrator password, then press the Return key.

Point

The Tape Server must be activated for this procedure. If the TSM management client command fails to start, activate the Tape Server.

2. Stopping the TSM management client command

At the "tsm>" prompt, enter "quit" to stop the TSM management client command (dsmadmc).

```
tsm> quit
```

For details of the commands, refer to the "ETERNUS SF TSM Administrator's Reference".

8.1 Adding a Tape to the Storage Pool

If the storage pool runs short of tapes after the start of operation, add a tape as follows.

1. Check in a tape. Refer to "Tape Check in" for information on how to check in a tape.
2. For private operation, register the tape in the storage pool. Refer to "Registering a tape volume" for information on the tape registration procedure.

8.2 Deleting a Tape from Storage Pool

If a tape in the storage pool is no longer required, delete it as follows:

1. If the tape to be deleted contains backup data, delete the backup history information. Use the "History information delete command (acmhistdel)" to do this.
2. Check out the tape. Use the "checkout libvolume" command to do this. Checkout processing is performed in the background. For information on the processing results, refer to the log on the TSM server (dsmserv) or activity log.

```
tsm> checkout libvolume <library name> <volume name> checklabel=yes remove=yes
```

- Specify the "remove=yes" option to unload the tape to the entry port of the library. "remove=yes" is the default.
- If "remove=no" is specified, the tape is returned to the original cell but is deleted from the TSM database (the tape is no longer displayed by the query libvolume command).
- Checkout processing is performed in the background. For information on the processing results, reference the log on the TSM server (dsmserv) or activity log.

[Example] Check out volume DAT001 from library LT160.

```
tsm> checkout libvolume LT160 DAT001 checklabel=yes remove=yes
```

After the tape is unloaded to the entry port, the "reply" command is requested for the log on the TSM server. Entering the "reply" command completes TSM checkout.

8.3 Changing the Device Class Settings

To change an option defined in the device class, do the following.

```
tsm> update devclass <target device class name> <option to be added or changed>
```

[Example] Change mountretention in the device class LTO-DEVC to 5 minutes.

```
tsm> update devclass LTO-DEVC mountretention=5
```

8.4 Changing the Storage Pool Settings

To change the number of scratch volumes or the simultaneous write mode defined in a storage pool, do the following.

```
tsm> update stgpool <target storage pool name> <maxscratch or copystgpools>=<value after update>
```

[Example] Change the maximum number of scratch volumes for the LTO-POOL storage pool to 10.

```
tsm> update stgpool LTO-POOL maxscratch=10
```

[Example] Enable simultaneous write to COPYPOOL2 in addition to COPYPOOL that is already set in storage pool LTO-POOL.

```
tsm> update stgpool LTO-POOL copystgpools=COPYPOOL,COPYPOOL2
```

8.5 Backup and Restoration of Storage Pool

Backup of a storage pool means to copy the backup data in a storage pool to another storage pool in case of tape or other media failure.
The backup data can also be restored in the original storage pool.

8.6 Deletion of Settings

To delete storage pool or device class settings, use the "delete" command.

To delete the storage pool settings

```
tsm> delete stgpool <target storage pool name>
```

To delete the device class settings

```
tsm> delete devclass <target device class name>
```

> **Note**
>
> Do not use the TSM "delete" command to delete backup data. Otherwise, an
> inconsistency occurs in the management information between TSM and Tape Backup
> of AdvancedCopy Manager.
> To delete backup data, be sure to use the "History information delete command
> (acmhistdel)". Do not use the "delete" command.

Chapter 9 Operational Maintenance

This chapter provides information on maintaining a database, performing troubleshooting, and changing the operation information.

9.1 Database Maintenance

The Tape Backup function of AdvancedCopy Manager holds various repositories of management information on the usage of its. They are named generically and are referred to as a database in this chapter. They contain important information and you are recommended to periodically back up a database that is frequently updated, when the space available for repositories becomes insufficient after long-time usage of the database that is different from originally planned, as a safeguard against running out of space. Note that it differs from other types of database such as ORACLE etc.

The following table lists instances when the backup of the database is needed.

Table: Databases on Storage Management Server

Type	When backup should be created	Backup method (references)	Size
Database	A Storage Server has been added. The configuration information has changed as a result of loading of new device information or for some other reason. The information about backup management or replication management operation has changed.	Saving a database, or Making a package backup of databases	Refer to Saving a database.
Authentication management list	Authenticated data has been set.	Backing up an authentication management list, or Making a package backup of databases	Refer to Backing up an authentication management list.
Registry	DB setup has been performed on a Storage Management Server (a transaction on a Storage Management Server has been created in a cluster system) or the Storage Management Server information (server name, IP address, or port number) has changed.	Backing up a registry, or Making a package backup of databases	Refer to Backing up a registry.

Table: Databases on Storage Server

Type	When backup should be created	Backup method (reference)	Size
Registry	A Storage Server has been added or Storage Management Server information (server name, IP address, or port number) has changed.	Backing up a registry, or Making a package backup of databases	Refer to Backing up a registry.

Type	When backup should be created	Backup method (reference)	Size
Backup management list	A backup transaction has been completed.	Backing up a backup management list, or Making a package backup of databases	Refer to Backing up a backup management list.
Pre-processing and post-processing scripts for backup management	A pre-processing or post-processing script has changed.	Saving a database by using the copy command, or Making a package backup of databases	Check the size of the pre-processing and post-processing script file for backup management.
Pre-processing and post-processing scripts for tape copy	A pre-processing or post-processing script has changed.	Saving a database by using the copy command, or Making a package backup of databases	Check the size of the pre-processing and post-processing script file for tape copy.
Policy file for management information package backup	The policy file has changed.	Saving a database by using the copy command, or Making a package backup of databases	Check the size of the policy file for management information package backup.

Table: Databases on Tape Server

Type	When backup should be created	Backup method (reference)	Size
Registry	A Tape Server has been added or Storage Management Server information (server name, IP address, or port number) has changed.	Backing up a registry, or Making a package backup of databases	Refer to Backing up a registry.
Tape management information	After tape-backup operation has been completed.	Tape management information backup command, or Making a package backup of databases	See the description about tape management information backup.

Point

You can create backups of databases either individually or as a whole.

If a Storage Server also operates as a Storage Management Server, the Storage Server contains a database for the Storage Management Server as well as for the Storage Server.

9.1.1 Making individual backups of databases

9.1.1.1 Maintaining a backup a management list

This section provides information on the maintenance of a backup management list. A backup management list is maintained on the server that performs the backup.

9.1.1.1.1 Backing up a backup management list

For details on how a backup management list is backed up, refer to "Resource backup command (swstresback)" in the "ETERNUS SF AdvancedCopy Manager Operator's Guide" for the operating system of the target Storage Server.

Backup data size of backup management list

For details, refer to "Maintenance of Database" in the "ETERNUS SF AdvancedCopy Manager Operator's Guide" for the operating system of the target Storage Server.

9.1.1.1.2 Restoring a backup management list

For details on how a backup management list is restored, refer to "Resource restore command (swstresrest)" in the "ETERNUS SF AdvancedCopy Manager Operator's Guide" for the operating system of the target Storage Server.

9.1.1.2 Maintaining a database

This section describes the maintenance of a database used by a Storage Management Server.

9.1.1.2.1 Saving a database

Execute the database save command (stgdbdmp) on the Storage Management Server to save a database space. For details, refer to "Saving a database" in the "ETERNUS SF AdvancedCopy Manager Operator's Guide" for the operating system of the target Storage Management Server.

Point

● Use this save method only when configuration information is changed due to an addition of a Storage Server or fetching of device information. You are recommended to periodically save a database, for example, once a day.
● To prepare for an input-output error in an external file while save data is being acquired, you are recommended to keep at least two generations of saved data.

Backup data size of database

Calculate the backup data size using the following formula.

```
60 + (number of devices to be managed x 0.001) megabytes
```

9.1.1.2.2 Finding an error in a database

Refer to the RDBSWSTF.log file, and beginning from the last line, search for any message with "rdb: ERROR: qdgXXXXX-" in its contents (also check the messages output at the same time). Obtain the value of "qdgXXXXX" to determine the recovery mode.
For details of the pathname of RDBSWSTF.log file and the explanation of qdb messages, refer to "Finding an error in a database" in the "ETERNUS SF AdvancedCopy Manager Operator's Guide" for the operating system of the target Storage Management Server.

9.1.1.2.3 Recovering a database

Execute the database recovery command (stgdbrcv) on the Storage Management Server for database recovery if an input-output error occurs in a database space.
For details, refer to "Recovering a database" in the "ETERNUS SF AdvancedCopy Manager Operator's Guide" for the operating system of the target Storage Management Server.

> **Note**
>
> To execute the database recovery command, log in as a root user.

> **Note**
>
> — After the database recovery command ends normally, acquire the latest save data using the "Saving a database". Fujitsu recommends using a different save data storage directory than the save data storage directory used by the recovery command.
> — After the database recovery command ends normally, restart (start after stopping) the AdvancedCopy Manager daemons. For an explanation on restarting the daemons, see "Starting and Stopping Daemons".

9.1.1.3 Maintaining authentication management list

This section describes the maintenance of the authentication feature. Execute the command on the server (ie, the Storage Server) where the authentication feature is implemented.

9.1.1.3.1 Backing up an authentication management list

On the Storage Management Server, execute the /opt/FJSVswssc/bin/smmkbat command to extract authentication management information. The root user must execute this command.
For details, refer to "Backing up an authentication management list" in the "AdvancedCopy Manager Operator's Guide" for the operating system of the target Storage Management Server.

Backup data size of authentication management list

Calculate the backup data size using the following formula.

```
400 + (length of the account name with an access permission assigned + 29 (*1) ...) bytes
```

  *1 Add the lengths of all accounts with an access permission assigned.

9.1.1.3.2 Restoring an authentication management list

For details on restoring an authentication management list, refer to "Restoring an authentication management list" in the "ETERNUS SF AdvancedCopy Manager Operator's Guide" for the operating system of the target Storage Management Server.

9.1.1.4 Maintaining a registry

This section describes the maintenance of a registry. Perform this procedure on the Storage Management Server or the Storage Server.

9.1.1.4.1 Backing up a registry

Back up the registry file by executing the cp command.
For details, refer to "Backing up a registry" in the "ETERNUS SF AdvancedCopy Manager Operator's Guide" for the operating system of the target Storage Management Server and Storage Server.

Backup data size of registry

Check the size of the registry file to be backed up.
For details, refer to "Backing up a registry" in the "ETERNUS SF AdvancedCopy Manager Operator's Guide" for the operating system of the target Storage Management Server and Storage Server.

9.1.1.4.2 Restoring a registry

Restore the registry file by executing the cp command.
For details, refer to "Restoring a registry" in the "ETERNUS SF AdvancedCopy Manager Operator's Guide" for the operating system of the target Storage Management Server and Storage Server.

9.1.1.5 Maintaining tape management information

This section describes the maintenance of tape management information. Perform this maintenance on the Tape Server.

9.1.1.5.1 Backing up a tape management information

Execute the tape management information backup command after following the procedure explained below. Tape management information includes a TSM database.
For details of the command, refer to "Tape management information backup command (tboresback)".

Editing the TSM environment file to be backed up

To back up information on the environment files of the TSM database, back up the files specified in the backup target TSM environment file (/etc/opt/FJSVswstm/conf/tsmbkfile). If the database location has been changed from the default, the file must be edited. Edit the file as follows: By default, the following information is specified in the /etc/opt/FJSVswstm/conf/tsmbkfile file.

```
/opt/tivoli/tsm/server/bin/dsmserv.opt
/opt/tivoli/tsm/server/bin/dsmserv.dsk
/opt/tivoli/tsm/server/bin/nodelock
/opt/tivoli/tsm/server/bin/volhist.out
/opt/tivoli/tsm/server/bin/devconfig.out
/opt/tivoli/tsm/client/ba/bin/dsm.sys
/opt/tivoli/tsm/client/ba/bin/dsm.opt
```

1. If the database location has been changed, change the paths of the dsmserv.opt, dsmserv.dsk, and nodelock files.

2. If the contents of the following keys in the dsmserv.opt file have been modified, change the paths of the volhist.out and devconfig.out files. The contents of the keys are the paths specified in tsmbkfile.

Table: Keys for which file paths are to be changed

Key name	File name
VOLUMEHistory	volhist.out
DEVCONFig	Devconfig.out

Backup data size of tape management information

Check the size under the following directory.

```
/etc/opt/FJSVswstm/data/ctrl
```

In cluster operation mode, check the size under the following directory.

```
/etc/opt/FJSVswstm/<logical node name>/data/ctrl
```

Also check the sizes below as the free space of the TSM database.

```
Size of the files specified in /etc/opt/FJSVswstm/conf/tsmbkfile

30% of size of the DB names specified in /opt/tivoli/tsm/server/bin/dsmserv.dsk
```

9.1.1.5.2 Restoring a tape management information

For details of how to restore tape management information, refer to "Tape management information restore command (tboresrst)".

Because the tboresrst command overwrites the existing TSM database and log file, Fujitsu recommends saving these files in advance.
The procedure to save files is as follows:

1. Check the file names.

```
# cat /opt/tivoli/tsm/server/bin/dsmserv.dsk
/opt/tivoli/tsm/server/bin/log.dsm          <- Log file
/opt/tivoli/tsm/server/bin/db.dsm           <- Database
#
```

2. Copy the files to any directory.

```
# cp -p /opt/tivoli/tsm/server/bin/log.dsm /work/tsm_bkup
# cp -p /opt/tivoli/tsm/server/bin/db.dsm /work/tsm_bkup
#
```

9.1.2 Making a package backup of databases

AdvancedCopy Manager management information (including databases) can be backed up using one Storage Server, Storage Management Server, or Tape Server. This operation is referred to as a package backup of management information.

For details of the package backup method for management information, refer to "Making a package backup of databases" in the "ETERNUS SF AdvancedCopy Manager Operator's Guide" for the operating system of the Server on which a package backup is made.

9.2 Troubleshooting

9.2.1 Troubleshooting for insufficient free space in a repository

For details, refer to "Troubleshooting for insufficient free space in a repository" in the "ETERNUS SF AdvancedCopy Manager Operator's Guide" for the operating system of the target Storage Management Server.

9.2.2 Collecting maintenance information

9.2.2.1 Collecting information using a Web GUI

Collect information as follows:

1. Start the Java Plug-in control panel as follows:
2. Select [Settings] - [Control Panel] - [Java Plug-in].
   Perform the startup setting of the Java console.
3. Start the Web GUI of AdvancedCopy Manager.
4. The Java console will be started and a message will be displayed. Save the message to a file, and attach the file to your report.

9.2.2.2 Collecting error survey information

Log into the Storage Management Server, the Storage Server, and the Tape Server. Collect the following information. If one Server is also used as another type of Server, collect information on all Server types.

Table: Collecting error survey information

Type	Storage Management Server	Storage Server	Tape Server
System log	Must be collected.	Must be collected.	Must be collected.
Trace log	Refer to "Collecting error survey information" in the "AdvancedCopy Manager Operator's Guide" for the operating system of the target Storage Management Server.	Refer to "Collecting error survey information" in the "AdvancedCopy Manager Operator's Guide" for the operating system of the target Storage Server.	Acquire the files under the following directory: /var/opt/FJSVswstc/trc In addition, acquire the file when the following file exists: /tmp/f3cvtrc.log

Type	Storage Management Server	Storage Server	Tape Server
Backup management list	Need not be collected.	Refer to "Collecting error survey information" in the "AdvancedCopy Manager Operator's Guide" for the operating system of the target Storage Server.	Acquire the files under the following directory: /etc/opt/FJSVswstm /etc/opt/FJSVswstu/log (*1) /var/opt/FJSVswstm/adm In addition, acquire the execution results of TSM commands. For information on the commands to be executed, refer to "Collecting TSM survey information" below.
Common information	Refer to "Collecting error survey information" in the "AdvancedCopy Manager Operator's Guide" for the operating system of the target Storage Management Server.	Refer to "Collecting error survey information" in the "AdvancedCopy Manager Operator's Guide" for the operating system of the target Storage Server.	Acquire the files under the following directory: /var/opt/FJSVswstf (*2) /etc/opt/swstorage (*2)

*1: If the symptom is can be reproduced, follow the procedure below and collect information under /etc/opt/FJSVswstu/log.

The procedure to save files is as follows.

   1) Change the trace log level to 2.

```
# /opt/FJSVswstm/bin/tbomodlog 2
#
```

   2) Reproduce the symptom.

   3) Change the trace log level back to 1.

```
# /opt/FJSVswstm/bin/tbomodlog 1
#
```

*2: In cluster operation mode, a backup management list and common information are allocated to a shared disk and a symbolic link is set. Therefore, when collecting information, also collect information on the shared disk as shown below.

```
# cd /etc/opt
# tar -cvfh /tmp/FJSVswsts_node1.tar FJSVswsts swstorage
```

Collecting TSM survey information

1. Collect the output results of the dsmadmc command. This command needs to be executed several times by changing arguments. For this reason, set the command name as an environment variable as shown below.

```
[In the case of csh]
# set DSMCOM="dsmadmc -id=<TSM user ID> -password=<TSM user password>
-outfile=<information output directory>"
[In the case of sh or ksh]
# DSMCOM="dsmadmc -id=<TSM user ID> -password=<TSM user password>
-outfile=<information output directory>"
```

2. Execute the dsmadmc command. Use the shell variable that was set in step 1.

```
# $DSMCOM/query_status.txt query status
# $DSMCOM/query_library.txt query library F=D
# $DSMCOM/query_drive.txt query drive F=D
# $DSMCOM/query_path.txt query path F=D
# $DSMCOM/query_devclass.txt query devclass F=D
# $DSMCOM/query_stgpool.txt query stgpool F=D
# $DSMCOM/query_domain.txt query domain F=D
# $DSMCOM/query_policyset.txt query policyset F=D
# $DSMCOM/query_mgmtclass.txt query mgmtclass F=D
# $DSMCOM/query_copygroup.txt query copygroup F=D
# $DSMCOM/query_copygroup_archive.txt query copygroup type=archive F=D
# $DSMCOM/query_node.txt query node F=D
# $DSMCOM/query_libvol.txt query libvol F=D
# $DSMCOM/query_db.txt query db F=D
# $DSMCOM/query_log.txt query log F=D
# $DSMCOM/query_admin.txt query admin F=D
# $DSMCOM/query_dbvol.txt query dbvol F=D
# $DSMCOM/query_vol.txt query vol F=D
# $DSMCOM/query_license.txt query license
# $DSMCOM/query_system.txt query system F=D
# $DSMCOM/query_process.txt query process
# $DSMCOM/query_session.txt query session
# $DSMCOM/query_request.txt query request
# $DSMCOM/query_mount.txt query mount
# $DSMCOM/query_filespace.txt query filespace F=D
# $DSMCOM/query_actlog2.txt query actlog BEGINDate=today-30
# $DSMCOM/query_session.txt query session
# $DSMCOM/query_process.txt query process
# $DSMCOM/show_txnt.txt show txnt
# $DSMCOM/show_dbtxnt.txt show dbtxnt
# $DSMCOM/show_locks.txt show locks
# $DSMCOM/show_dbv.txt show dbv
# $DSMCOM/show_csv.txt show csv
# $DSMCOM/show_deadlock.txt show deadlock
# $DSMCOM/show_sss.txt show sss
```

3. Collect the file under "information output directory" on the command line as survey information.

9.2.3 Troubleshooting for a failure in access to a repository database

For details of how to find the cause of a failure in access to a repository database, and what to do in such a case, refer to "Troubleshooting for a failure in access to a repository database" in the "ETERNUS SF AdvancedCopy Manager Operator's Guide" for the operating system of the target Storage Management Server.

9.3 Troubleshooting for a Hardware Error during backup

This section describes for the actions to perform if a hardware error, etc. occurs during a backup using AdvancedCopy Manager.

9.3.1 Overview

If a hardware error occurs during backup, the following symptoms may be displayed:
- The backup execution status display command (swstbackstat) displays "failed" in the Status column.
- The synchronous backup operation status display command (acmsyncstat) displays "failed" in the Status column.
- The restoration execution status display command (swstreststat) displays "failed" in the Status column.
- The history information display command (acmhistdisp) displays "failed" in the Status column.
- The tracking status display command (acmtrkstat) displays "failed" in the Status column.
- Code swst0634, swst0719, or swst0740 is displayed during command execution.

If the execution status display command and history information display command display "failed" in the Status column, a hardware error has occurred during physical copying, and the copy processing has failed.

If swst0634, swst0719, or swst0740 is displayed during command execution and the same error occurs even if the command is re-executed, a hardware error has occurred, causing Advanced Copy to fail.

If a hardware error occurs during remote copying, the following symptoms may be displayed:
- The backup execution status display command (swstbackstat) displays "halt" in the Status column.
- The synchronous backup operation status display command (acmsyncstat) displays "halt" in the Status column.
- The restoration execution status display command (swstreststat) displays "halt" in the Status column.
- The history information display command (acmhistdisp) displays "halt" in the Status column.

If the execution status display command and history information display command display "halt" in the Status column, a hardware error has occurred during physical copying, and the remote copy processing has failed.

If any of these messages are generated, a hardware error may have occurred in the transaction volume or backup volume. Check the hardware status, and if a hardware error is found, fix the cause of the error, then re-execute the processing.

9.3.2 Troubleshooting

Refer to "Troubleshooting for a hardware error on tape media" for the action required when hardware errors occur for a tape.

When hardware errors other than those for a tape occur, take action as indicated in the following troubleshooting flow diagram.

Figure: Troubleshooting flow when hardware errors occur
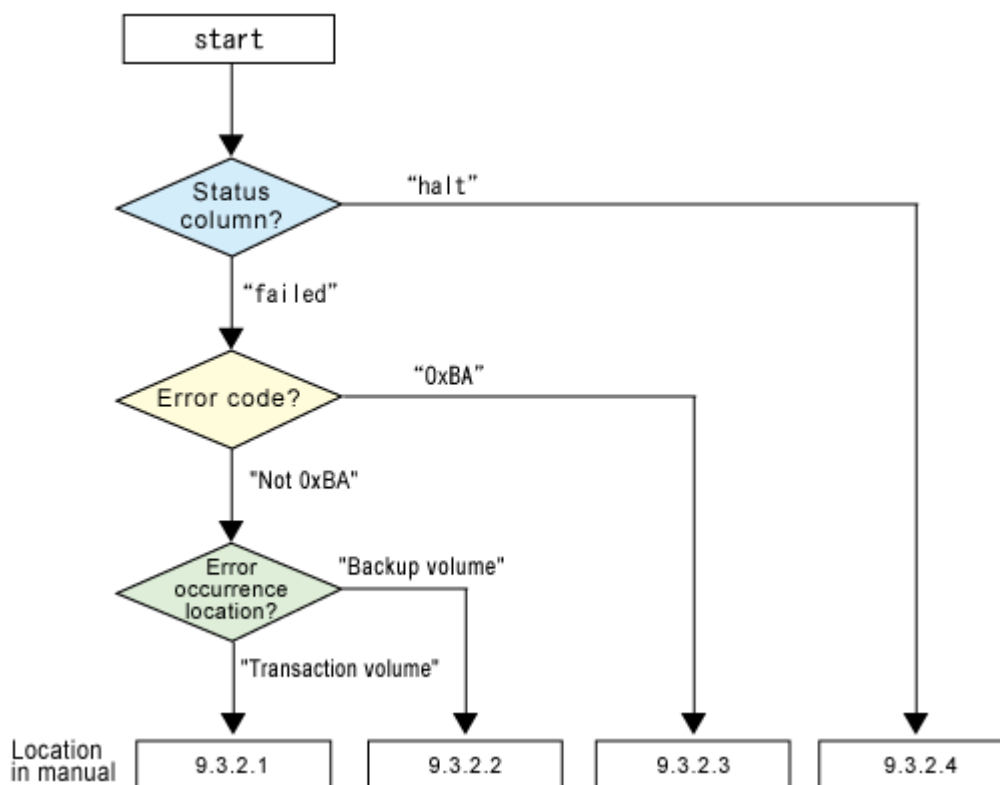
⚠ Note

● Refer to "Overview" for details of the "Status column" and "Error occurrence location".

● Use ETERNUSmgr to check the copy processing error codes. The method for checking error codes is as follows:

— On the [Display status] menu, click [Display AdvancedCopy status] in the status display section.

— At [Session status], click the "Number of active sessions" link of the appropriate copy type.

— Refer to the value in the "Error code" column of the appropriate copy processing.

The error code meanings are shown below.

[Table: Error code explanations]

Error code	Explanation
0xBA	If a) or b) below apply, a bad sector was created in the transaction volume. a)QuickOPC has not yet performed physical copy and tracking processing is in progress b)EC/REC is in the suspend status (replication establishment status) Note: If a bad sector is created in a transaction volume when a) or b) applies, the ETERNUS storage system automatically changes the copy processing to the error suspend state. This prevents restart of QuickOPC or EC/REC resume and prevents the backup volume from being overwritten with invalid transaction volume data.
Other than 0xBA	An error other than the above occurred.

Error code 0xBA is returned only for the following ETERNUS storage systems:

— ETERNUS4000/ETERNUS8000 (firmware versionV11L30-0000 or later)

— ETERNUS6000 (firmware version V31L40-0000 or later)

For ETERNUS storage systems other than the above, the event indicated by error code 0xBA does not occur. If either a) or b) above occurs, the copy status does not change even if a bad sector occurs in the copy source volume.

9.3.2.1 Troubleshooting for a hardware error, etc. on a transaction volume

When a hardware fault occurs in a transaction volume, perform repair work according to the following procedure:

1. Cancel the processing in which the error occurred.
   — If an error occurred during backup (OPC) physical copy use the acmhistdel command
   — If an error occurred during synchronous processing (EC) use the acmcancelsync command
   — If an error occurred during restoration (OPC) physical copy use the swstcancelrest command
   — If an error occurred during tracking processing (QuickOPC) use the acmcanceltrk command

2. Execute the execution status display commands (swstbackstat, acmsyncstat, swstreststat, acmtrkstat) and history information display command (acmhistdip) to verify that no other errors have occurred.

3. Fix the hardware error in the transaction volume.

4. Execute the Restoration execution command (acmrestore) to restore the transaction volume.

![Note]

● The backup history information for which copy has failed cannot be used to restore the volume.

● If there is no normal (status = "succeeded") backup history information, the volume cannot be restored.

9.3.2.2 Troubleshooting for a hardware error, etc. on a backup volume

When a hardware fault occurs in backup volume, perform repair work according to the following procedure:

1. Cancel the processing in which the error occurred.
   — If an error occurred during backup (OPC) physical copy use the acmhistdel command
   — If an error occurred during synchronous processing (EC) use the acmcancelsync command
   — If an error occurred during restoration (OPC) physical copy use the swstcancelrest command
   — If an error occurred during tracking processing (QuickOPC) use the acmcanceltrk command

2. If the processing cannot be canceled using the command, use ETERNUSmgr/GRmgr to cancel it.

3. Execute the resource match command (swstsrsemtch).

4. Cancel the processing in which the error occurred. At this point, the execution status display commands (swstbackstat, swstreststat) and history information display command (acmhistdisp) display "succeeded" in the Status column. However, because the copy processing is suspended, ensure that the commands are cancelled. If an error occurred in the synchronous processing (EC), the command has already been canceled, so no response is required.
   — If an error occurred during backup (OPC) physical copy use the acmhistdel command
   — If an error occurred during restoration (OPC) physical copy use the swstcancelrest command
5. Execute the execution status display commands (swstbackstat, acmsyncstat, swstreststat, acmtrkstat) and the history information display command (acmhistdisp) to verify that no other errors are found.
6. Use the device information setting command (acmdevinfoset) to delete the backup volume in which the error occurred.
7. Use the device information setting command (acmdevinfoset) to register a new backup volume. If the backup volume in which the error occurred is repaired and reused, the [Collect or reflect the information for a specific device] option from the initial window, and store the information again in the backup volume.
8. Re-execute the processing in which the error occurred.

9.3.2.3 Troubleshooting if a bad sector occurred in the transaction volume

If a bad sector occurred in the transaction volume, use the following procedure to restore the transaction volume:
1. Cancel the copy processing for which the bad sector occurred.
   — If the bad sector occurred during the suspend state of synchronous processing (EC): acmcancelsync command
   — If the bad sector occurred during QuickOPC tracking: acmcanceltrk command
2. Execute the execution status display commands (acmbackstat, acmsyncstat, swstreststat, and acmtrkstat) and the history information display command (acmhistdisp) to check for other errors.
3. Restoration is performed by overwriting the area containing the bad sector. Select the appropriate method, in accordance with the usage or use status of the transaction volume, from the restoration methods below and perform restoration.
   — Restoration method 1
     If the area can be reconstructed from high-level software (file system, DBMS, or similar), reconstruct the area.
   — Restoration method 2
     If the area containing the bad sector is an area that is not being used, such as an unused area or a temporary area, use a special-purpose tool (for example, the UNIX dd command) to write to the area.
   — Restoration method 3
     Use the restore command (acmrestore) to restore the transaction volume from a backup volume. (If the backup volume for the copy processing for which the bad sector occurred contains backup history information, restoration is also possible from that backup volume.)

Note

The transaction volume cannot be restored if there is no backup history information.

9.3.2.4 Troubleshooting for an error (halt) on a remote copy processing

1. Remove the hardware error.
2. Re-execute the suspended copy processing.

9.3.2.5 Troubleshooting for a hardware error on tape media

If a hardware error occurs on tape, follow the procedure below to troubleshoot.

1. Prevent the tape media on which the error occurred from being used for subsequent backup operations. To do this, use the TSM "update volume" command.

```
tsm>  update volume <volume name> access=readonly
```

2. Check in an alternate tape. For details, refer to "Tape Check in".
3. If expiration dates have been set, the backup histories for the data stored on the tape media in step 1 are deleted sequentially until they are all deleted. After all data is deleted from the tape, check out the tape. For details, refer to "Deleting a Tape from Storage Pool".

9.4 Changing the Operating Environment

9.4.1 Changing the operating environment for non-cluster operation

This section describes how to change the operating environment for non-cluster operations.

9.4.1.1 Changing the IP address of Storage Management Server

Change the IP address of a Storage Management Server as follows.
If only a physical IP address should be changed and the Storage Management Server uses a logical IP address, then perform only steps 2 and 7. Otherwise, perform all steps.

1. It checks whether the Storage Management Server being changed also serves as a Storage Server. If this is the case, and if the Storage Server is defined as a replication source or replication destination volume using a replication management function, delete the configuration of the source / replica volume with reference to "Deleting a source volume or replica volume" in the "ETERNUS SF AdvancedCopy Manager Operator's Guide" for the operating system of the target Storage Management Server.
2. On the Storage Management Server, change the system IP address.
3. On the Storage Management Server, execute the management server information change command. For details of this command, refer to "Management server information change command (stgcmmodnode)" in the "ETERNUS SF AdvancedCopy Manager Operator's Guide" for the operating system of the target Storage Management Server.
4. On all the Storage Servers managed by the Storage Management Server, execute the management server information change command. For details of this command, refer to "Management server information change command (stgcmmodnode)" in the "ETERNUS SF AdvancedCopy Manager Operator's Guide" for the operating system of the target Storage Server.
5. On all the Tape Servers managed by the Storage Management Server, execute the management server information change command. For details of this command, refer to "Management server information change command (stgcmmodnode)" in the "ETERNUS SF AdvancedCopy Manager Operator's Guide" for the operating system of the target Tape Server.
6. On the Storage Management Server, restart the daemons of AdvancedCopy Manager. For information on restarting daemons, refer to "Starting and Stopping Daemons".
7. If the Storage Management Server uses a logical IP address, use the GUI client to change the settings of authentication-related files.
   Change the definition of the logical IP address to a new logical IP address when the logical IP address is changed. Refer to the section called "Settings of authentication-related files" in the "ETERNUS SF AdvancedCopy Manager GUI User's Guide". This operation can also be applied to a physical IP address when it is changed.
8. If the replication management function is used, reconfigure the replication management environment.
   Refer to "Replication operations" in the "ETERNUS SF AdvancedCopy Manager Operator's Guide" that is applicable to the Storage Management Server operating system, and perform the tasks under "Preparations", starting with "Replication source volume settings and replication destination volume settings".

Note

For information on changes in cluster operation, refer to "Changing the IP address of Storage Management Server transaction".

9.4.1.2 Changing the IP address of Storage Server

Change the IP address of a Storage Server as follows.
This step is not necessary if the Storage Server uses a logical IP address and only a physical IP address is being changed.

1. If you have defined the Storage Server to be changed as a replication source or replication destination volume using a replication management function, delete the configuration of the source / replica volume by referring to "Deleting an original volume or replica volume" in the "ETERNUS SF AdvancedCopy Manager Operator's Guide" for the operating system of the target Storage Server.

2. On the Storage Server, stop the daemons of AdvancedCopy Manager. For information on stopping daemons, refer to "Starting and Stopping Daemons".

3. On the Storage Server, change the system IP address.

4. On the Storage Server, restart the daemons of AdvancedCopy Manager. For information on restarting daemons, refer to "Starting and Stopping Daemons".

5. On the Storage Management Server, change the IP address using the server information change command. For details of this command, refer to "Server information change command (stgxfwcmmodsrv)" in the "ETERNUS SF AdvancedCopy Manager Operator's Guide" for the operating system of the target Storage Management Server.

6. On the Tape Server that is associated with the relevant Storage Server, execute the server information change report command to reflect the change of the IP address to the Tape Server management information. For details of this command, refer to "Server information change report command (tbomodsrv)". The "Storage Server configuration information display command (acmsvrdisp)" can be used to check which Tape server is associated with the Storage Server.

7. If the replication management function is used, reconfigure the replication management environment.
   Refer to "Replication operations" in the "ETERNUS SF AdvancedCopy Manager Operator's Guide" that is applicable to the Storage Management Server operating system, and perform the tasks under "Preparations", starting with "Replication source volume settings and replication destination volume settings".

Note

For information on changes in cluster operation, refer to "Changing the IP address of Storage Server transaction".

9.4.1.3 Changing the IP address of Tape Server

Change the IP address of a Tape Server as follows.

1. Follow the procedure below according to the Tape Server operating mode.
   If the Tape Server is also operated as a Storage Management Server, refer to "Changing the IP address of Storage Management Server".
   If the Tape Server is also operated as a Storage Server, refer to "Changing the IP address of Storage Server".
   If the server is a dedicated Tape Server, the procedure is the same as that for the Storage Server. Refer to "Changing the IP address of Storage Server".

2. Execute the Storage Server configuration information setting command on all Storage Servers that are associated with the relevant Tape Server to update the Tape Server association information. For details of this command, refer to "Storage Server configuration information setting command (acmsvrset)".

9.4.1.4 Changing the port number of a Storage Management Server

Change the port number of a Storage Management Server as follows.

1. Checks whether the Storage Management Server operates as a Storage Server. If so, and if the Storage Server is defined as a replication source or replication destination volume using a replication management function, delete the configuration of the source / replica volume. For details of how to do this, refer to "Deleting an original volume or replica volume" in the "ETERNUS SF AdvancedCopy Manager Operator's Guide" for the operating system of the target Storage Management Server.

2. Change the port number of the communication daemon (stgxfws) of AdvancedCopy Manager indicated by /etc/services of the Storage Management Server. When the Storage Management Server is being operated in a cluster environment, change the port number of the communication daemon (stgxfws_<logic node name>) of the Storage Management Server transaction.

3. On the Storage Management Server, execute the management server information change command. For details of this command, refer to "Management server information change command (stgcmmodnode)" in the "ETERNUS SF AdvancedCopy Manager Operator's Guide" for the operating system of the target Storage Management Server.

4. On all the Storage Servers managed by the affected Storage Management Server, execute the management server information change command. For details of this command, refer to "Management server information change command (stgcmmodnode)" in the "ETERNUS SF AdvancedCopy Manager Operator's Guide" for the operating system of the target Storage Server.

5. On all the Tape Servers managed by the concerned Storage Management Server, execute the management server information change command. For details of this command, refer to "Management server information change command (stgcmmodnode)" in the "ETERNUS SF AdvancedCopy Manager Operator's Guide" for the operating system of the target Tape Server.

6. On the Storage Management Server, restart the daemons of AdvancedCopy Manager. For information on restarting daemons, refer to "Starting and Stopping Daemons".

7. If the replication management function is used, reconfigure the replication management environment.
   Refer to "Replication operations" in the "ETERNUS SF AdvancedCopy Manager Operator's Guide" that is applicable to the Storage Management Server operating system, and perform the tasks under "Preparations", starting with "Replication source volume settings and replication destination volume settings".

Note

For information on changes in cluster operation, refer to "Changing the port number of Storage Management Server transaction".

9.4.1.5 Changing the port number of a Storage Server

Change the port number of a Storage Server as follows.

1. If you defined the Storage Server as a replication source or replication destination volume using a replication management function, delete the configuration of the source / replica volume by referring to "Deleting an original volume or replica volume" in the "ETERNUS SF AdvancedCopy Manager Operator's Guide" for the operating system of the target Storage Server.

2. On the Storage Server, stop daemons of AdvancedCopy Manager. For information on stopping daemons, refer to "Starting and Stopping Daemons".

3. On the Storage Server, change the port number of the communications daemon (stgxfws) of AdvancedCopy Manager. When the Storage Server is being operated in a cluster environment, change the port number of the communication daemon (stgxfws_<logic node name>) of the Storage Server transaction.

4. On the Storage Server, restart the daemons of AdvancedCopy Manager. For information on restarting daemons, refer to "Starting and Stopping Daemons".

5. On the Storage Management Server, change the port number using the server information change command. For details of this command, refer to "Server information change command (stgxfwcmmodsrv)" in the "ETERNUS SF AdvancedCopy Manager Operator's Guide" for the operating system of the target Storage Management Server.

6. On the Tape Server that is associated with the relevant Storage Server, execute the server information change report command to reflect the change of the port number to the Tape Server management information. For details of this command, refer to "Server information change report command (tbomodsrv)". The "Storage Server configuration information display command (acmsvrdisp)" can be used to check which Tape server is associated with the Storage Server.

7. If the replication management function is used, reconfigure the replication management environment.
   Refer to "Replication operations" in the "ETERNUS SF AdvancedCopy Manager Operator's Guide" that is applicable to the Storage Management Server operating system, and perform the tasks under "Preparations", starting with "Replication source volume settings and replication destination volume settings".

Note

For information on changes in cluster operation, refer to "Changing the port number of Storage Server transaction".

9.4.1.6 Changing the port number of Tape Server

Change the port number of a Tape Server as follows.

1. Follow the procedure below according to the Tape Server operating mode.
   If the Tape Server is also operated as a Storage Management Server, refer to "Changing the port number of Storage Management Server".
   If the Tape Server is also operated as a Storage Server, refer to "Changing the port number of Storage Server".
   If the server is a dedicated Tape Server, the procedure is the same as that for the Storage Server. Refer to "Changing the port number of Storage Server".

2. Execute the Storage Server configuration information setting command on all Storage Servers that are associated with the relevant Tape Server to update the Tape Server association information. For details of this command, refer to "Storage Server configuration information setting command (acmsvrset)".

9.4.1.7 Changing the server name of Storage Management Server

Change the server name of a Storage Management Server as follows.

1. Check whether the target Storage Management Server is also operated as a Storage Server. If so, follow the instructions in "Changing the server name of Storage Server", then perform steps 3 and 4.

2. On the Storage Management Server, change the server name by using the server information change command. For details of this command, refer to "Server information change command (stgxfwcmmodsrv)" in the "ETERNUS SF AdvancedCopy Manager Operator's Guide" for the operating system of the target Storage Management Server.

3. On all the Storage Servers managed by the Storage Management Server, execute the management server information change command. For details of this command, refer to "Management server information change command (stgcmmodnode)" in the "ETERNUS SF AdvancedCopy Manager Operator's Guide" for the operating system of the target Storage Server.

4. On all the Tape Servers managed by the Storage Management Server, execute the management server information change command. For details of this command, refer to "Management server information change command (stgcmmodnode)" in the "ETERNUS SF AdvancedCopy Manager Operator's Guide" for the operating system of the target Tape Server.

Note

For information on changes in cluster operation, refer to "Changing the server name of Storage Management Server transaction".

9.4.1.8 Changing the server name of Storage Server

Change the server name of a Storage Server as follows.

1. If you defined the Storage Server as a replication source or replication destination volume using a replication management function, delete the configuration of the source / replica volume by referring to "Deleting an original volume or replica volume" in the "ETERNUS SF AdvancedCopy Manager Operator's Guide" for the operating system of the target Storage Server.

2. On the Storage Management Server, change the server name using the server information change command. For details of this command, refer to "Server information change command (stgxfwcmmodsrv)" in the "ETERNUS SF AdvancedCopy Manager Operator's Guide" for the operating system of the target Storage Management Server.

3. On the Tape Server that is associated with the relevant Storage Server, execute the server information change report command to reflect the change of the server name to the Tape Server management information. For details of this command, refer to "Server information change report command (tbomodsrv)". The "Storage Server configuration information display command (acmsvrdisp)" can be used to check which Tape server is associated with the Storage Server.

4. If the replication management function is used, reconfigure the replication management environment.
Refer to "Replication operations" in the "ETERNUS SF AdvancedCopy Manager Operator's Guide" that is applicable to the Storage Management Server operating system, and perform the tasks under "Preparations", starting with "Replication source volume settings and replication destination volume settings".

Note

For information on changes in cluster operation, refer to "Changing the server name of Storage Server transaction".

9.4.1.9 Changing the server name of Tape Server

Change the server name of a Tape Server as follows.

1. Follow the procedure below according to the Tape Server operating mode.

   If the Tape Server is also operated as a Storage Management Server, refer to "Changing the server name of Storage Management Server".

   If the Tape Server is also operated as a Storage Server, refer to "Changing the server name of Storage Server".

   If the server is a dedicated Tape Server, the procedure is the same as that for the Storage Server. Refer to "Changing the server name of Storage Server".

2. Execute the Storage Server configuration information setting command on all Storage Servers that are associated with the relevant Tape Server to update the Tape Server association information. For details of this command, refer to "Storage Server configuration information setting command (acmsvrset)".

9.4.1.10 Changing the device configuration

Changing the device configuration refers to any of the following:

● Mount name change
● Change from File System operation to RawDevice operation
● Capacity change of partitions (mainly for re-creation of LUN mapping)
● Start position for change of partitions (mainly for re-creation of LUN mapping)

Change the device configuration by the following procedure. This processing is executed for all volumes on the disk where the volume whose device configuration is to be changed is located.

1. Check whether there is a transaction volume on the target disk that needs to be backed up. If it does, delete the transaction volume. For information on deleting a transaction volume, refer to "Deleting a transaction volume".

2. Check whether a backup volume exists in the target disk. If it does, delete the backup volume. For information on deleting a backup volume, refer to "Deleting a backup volume".

3. Change the device configuration.

4. Because the post-change device configuration needs to be reflected in the AdvancedCopy Manager data set, execute device information change processing for AdvancedCopy Manager. For details on changing the device information, refer to "Fetching device information on a Storage Server".

5. Reset the deleted transaction volume or backup volume. For details on adding the transaction volume or backup volume, refer to "Setting the operation type for a device".

Point

If the device configuration is changed (step 3) before the transaction volume and backup volume are deleted (steps 1 and 2), history information cannot be deleted and synchronized backup processing cannot be cancelled, thereby possibly disabling deletion of the transaction volume and backup volume. In this event, set the emergency operation mode, and delete history information or cancel synchronized backup processing.

For details on the emergency operation mode, see "History information delete command (acmhistdel)" and "Backup synchronous processing cancel command (acmcancelsync)".

9.4.1.11 Changing the IP address for GUI connection of Storage Management Server

The Storage Management Server is equipped with two or more network cards.
The IP address for GUI connection (that was specified during Storage Management Server installation) can be changed using the GUI connection information setting command, in cases when a Web GUI screen communicates with a Storage Server via an IP address.

For details on the GUI connection information setting command, refer to "GUI connection information setting command (stgguiipset)".

> If the Storage Management Server is equipped with two or more network cards, the settings must be defined on the client side. For details of how to specify these setting, refer to "Settings of authentication-related files" in the "ETERNUS SF AdvancedCopy Manager GUI User's Guide" for the operating system of the target client.

9.4.1.12 Change of password or deletion of the repository access user

When a user is deleted who was specified as the "repository access user" in setup when AdvancedCopy Manager was installed, or when the user's password is changed by the operating system, the information of a "repository access user" must be reconfigured using the repository access user change command.
For details on the repository access user change command, refer to "Repository access user change command (stguserset)".

> For information on changes in cluster operation, refer to "Deleting the user who specified it as the repository access user, and changing the password".

9.4.2 Changing the configuration of cluster operation

This sub-section explains the changing the operating environment of the cluster operating.

9.4.2.1 Changing the IP address of Storage Management Server transaction

Change the IP address of a Storage Management Server transaction as follows.
1. Check whether the Storage Management Server is operating.
   If it is stopped, start up the Storage Management Server transaction.
   Refer to the relevant cluster software manual for details on how to do this.
2. Check whether the Storage Management Server transaction also functions as a Storage Server transaction. If it does, and is defined as a replication source or destination volume using a replication management function, delete the source / replica volume configuration. For details on how to do this, refer to "Deleting an original volume or replica volume" in the "ETERNUS SF AdvancedCopy Manager Operator's Guide" for the operating system of the target Storage Management Server.
3. Stop Storage Management Server transaction.
   For details on how to do this, refer to the relevant cluster software manual.
4. Change the IP address resource.
   For details on how to do this, refer to the relevant cluster software manual.

5. Check whether the Storage Management Server is operating.
   If it is stopped, start the Storage Management Server transaction.
   For details on how to do this, refer to the relevant cluster software manual.
6. On the node on which the Storage Management Server transaction is running, execute
   the management server information change command. For details of this command, refer
   to "Management server information change command (stgcmmodnode)" in the "ETERNUS SF
   AdvancedCopy Manager Operator's Guide" for the operating system of the target Storage
   Management Server.
7. On all the Storage Servers managed by the Storage Management Server, execute the
   management server information change command. For details of this command, refer to
   "Management server information change command (stgcmmodnode)" in the "ETERNUS SF
   AdvancedCopy Manager Operator's Guide" for the operating system of the target Storage
   Server.
8. On all the Tape Servers managed by the Storage Management Server, execute the
   management server information change command. For details of this command, refer to
   "Management server information change command (stgcmmodnode)" in the "ETERNUS SF
   AdvancedCopy Manager Operator's Guide" for the operating system of the target Tape
   Server.
9. Restart the Storage Management Server transaction.
   For details on how to do this, refer to the relevant cluster software manual.
10. Edit the authentication-related file (swstorage.policy).
    From the Web GUI, change authentication-related file settings. For details, refer to
    "Settings of authentication-related files" in the "ETERNUS SF AdvancedCopy Manager
    GUI User's Guide". Change the logical IP addresses of authentication-related files
    of all terminals that use the Web GUI to new logical IP addresses.
    If physical IP addresses are being changed, also change this in the same file.
11. When using the replication operation, reset the environment of replication operation.
    Refer to "Replication operations" in the "ETERNUS SF AdvancedCopy Manager Operator's
    Guide" that is applicable to the Storage Management Server operating system, and
    perform the tasks under "Preparations", starting with "Replication source volume
    settings and replication destination volume settings".

Note

The IP address displayed by the cluster setup command executed to delete the cluster
environment of the Storage Server transaction is not the IP address newly specified,
but the IP address specified by the cluster setup command.

9.4.2.2 Changing the IP address of Storage Server transaction

Change the IP address of a Storage Server transaction as follows.
1. Check whether the Storage Server transaction is operating.
   If it is not operating, start the Storage Server transaction.
   For details on how to do this, refer to the relevant cluster software manual.
2. When you define a replication source or replication destination volume using a
   replication management function, delete the source / replica volume configuration,
   referring to "Deleting an original volume or replica volume" in the "ETERNUS SF
   AdvancedCopy Manager Operator's Guide" for the operating system of the target Storage
   Server.
3. Stop the Storage Server transaction.
   For details on how to do this, refer to the relevant cluster software manual.
4. Change the IP address resource.
   For details on how to do this, refer to the relevant cluster software manual.

5. Check whether the Storage Server transaction is operating.
   If it is not operating, start the Storage Server transaction.
   For details on how to do this, refer to the relevant cluster software manual.

6. On the server list view of the AdvancedCopy Manager GUI, select the server whose information is to be changed, then select [Change of server...] on the [Operation] menu. Change the IP address and press [OK] on the "Change of server" dialog. Alternatively, change the IP address using the server information change command on the Storage Management Server. For the details on this command, refer to "Server information change command (stgxfwcmmodsrv)" in the "ETERNUS SF AdvancedCopy Manager Operator's Guide" for the operating system of the target Storage Management Server.

7. On the Tape Server that is associated with the relevant Storage Server transaction, execute the server information change report command to reflect the change of the server name to the Tape Server management information. For details of the server information change report command, see "Server information change report command (tbomodsrv)". The "Storage Server configuration information display command (acmsvrdisp)" can be used to check which Tape server is associated with the Storage Server.

8. To use the replication operation, reset the replication operation environment. Refer to "Replication operations" in the "ETERNUS SF AdvancedCopy Manager Operator's Guide" that is applicable to the Storage Management Server operating system, and perform the tasks under "Preparations", starting with "Replication source volume settings and replication destination volume settings".

9.4.2.3 Changing the port number of a Storage Management Server transaction

Change the port number of a Storage Management Server transaction as follows.

1. Check whether the Storage Management Server transaction is operating.
   When it is not operating, start the Storage Management Server transaction.
   For details on how to do this, refer to the relevant cluster software manual.

2. Check whether the Storage Management Server transaction is also operated a Storage Server transaction. If it does, and is defined as a replication source or replication destination volume using a replication management function, delete the source / replica volume configuration. Refer to "Deleting an original volume or replica volume" in the "ETERNUS SF AdvancedCopy Manager Operator's Guide" for the operating system of the target Storage Management Server.

3. Stop the Storage Management Server transaction.
   For details on how to do this, refer to the relevant cluster software manual.

4. On the primary and secondary nodes, change the port number of the communications daemon for Storage Management Server transaction (stgxfws_<logical node name>), described at /etc/services.

5. Check whether the Storage Management Server transaction is operating.
   If it is not operating, start the Storage Management Server transaction.
   For details on how to do this, refer to the relevant cluster software manual.

6. On the Storage Management Server transaction, execute the management server information change command. For details of this command, refer to "Management server information change command (stgcmmodnode)" in the "ETERNUS SF AdvancedCopy Manager Operator's Guide" for the operating system of the target Storage Management Server.

7. On all the Storage Servers managed by the Storage Management Server, execute the management server information change command. For details of this command, refer to "Management server information change command (stgcmmodnode)" in the "ETERNUS SF AdvancedCopy Manager Operator's Guide" for the operating system of the target Storage Server.

8. On all the Tape Servers managed by the Storage Management Server, execute the management server information change command. For details of this command, refer to "Management server information change command (stgcmmodnode)" in the "ETERNUS SF AdvancedCopy Manager Operator's Guide" for the operating system of the target Tape Server.

9. Restart the Storage Management Server transaction.
   For details on how to do this, refer to the relevant cluster software manual.

10. To use the replication operation, reset the replication operation environment.
   Refer to "Replication operations" in the "ETERNUS SF AdvancedCopy Manager Operator's Guide" that is applicable to the Storage Management Server operating system, and perform the tasks under "Preparations", starting with "Replication source volume settings and replication destination volume settings".

9.4.2.4 Changing the port number of a Storage Server transaction

Change the port number of a Storage Server transaction as follows.

1. Check whether the Storage Server transaction is operating.
   When it is not operating, start the Storage Server transaction.
   For details on how to do this, refer to the relevant cluster software manual.

2. When it is defined as a replication source or destination volume using a replication management function, delete the source / replica volume configuration. Refer to "Deleting an original volume or replica volume" in the "ETERNUS SF AdvancedCopy Manager Operator's Guide" for the operating system of the target Storage Server.

3. Stop the Storage Server transaction.
   For details on how to do this, refer to the relevant cluster software manual.

4. On the primary and secondary nodes, change the port number of the communications daemon for Storage Server transaction (stgxfws_<logical node name>), described at /etc/services.

5. Check whether the Storage Server transaction is operating.
   If it is not operating, start the Storage Server transaction.
   For details on how to do this, refer to the relevant cluster software manual.

6. On the server list view of the AdvancedCopy Manager GUI, select the server whose information is to be changed, then select [Change of server...] on the [Operation] menu. Change the port number and press [OK] on the "Change of server" dialog. Alternatively, change the port number using the server information change command on the Storage Management Server. For details on this command, refer to "Server information change command (stgxfwcmmodsrv)" in the "ETERNUS SF AdvancedCopy Manager Operator's Guide" for the operating system of the target Storage Management Server.

7. On the Tape Server that is associated with the Storage Server transaction, execute the server information change report command to reflect the change of the server name to the Tape Server management information. For details of this command, refer to "Server information change report command (tbomodsrv)". The "Storage Server configuration information display command (acmsvrdisp)" can be used to check which Tape server is associated with the Storage Server.

8. To use the replication operation, reset the replication operation environment.
   Refer to "Replication operations" in the "ETERNUS SF AdvancedCopy Manager Operator's Guide" that is applicable to the Storage Management Server operating system, and perform the tasks under "Preparations", starting with "Replication source volume settings and replication destination volume settings".

9.4.2.5 Changing the server name of a Storage Management Server transaction

Change the server name of a Storage Management Server transaction by performing the steps below. If you set the logical node name as the same as the server name (when you change a logical node name), see "Changing the logical node name".

1. Check whether the Storage Management Server transaction is operating.
   When it is not operating, start the Storage Management Server transaction.
   For details on how to do this, refer to the relevant cluster software manual.

2. Check whether the Storage Management Server transaction is also operated as a Storage Server transaction. If it does, and is defined as a replication source or destination volume using a replication management function, delete the source / replica volume configuration. Refer to "Deleting an original volume or replica volume" in the "ETERNUS SF AdvancedCopy Manager Operator's Guide" for the operating system of the target Storage Management Server.

3. On the server list view of the AdvancedCopy Manager GUI, select the server whose information is to be changed, then choose [Change of server...] from the [Operation] menu. Change the server name and press [OK] on the "Change of server" dialog. Alternatively, the server name can be changed using the server information change command on the Storage Management Server. For details on this command, refer to "Server information change command (stgxfwcmmodsrv)" in the "ETERNUS SF AdvancedCopy Manager Operator's Guide" for the operating system of the target Storage Management Server.

4. On all the Storage Servers managed by the Storage Management Server, execute the management server information change command. For details of this command, refer to "Management server information change command (stgcmmodnode)" in the "ETERNUS SF AdvancedCopy Manager Operator's Guide" for the operating system of the target Storage Server.

5. On all the Tape Servers managed by the Storage Management Server, execute the management server information change command. For details of this command, refer to "Management server information change command (stgcmmodnode)" in the "ETERNUS SF AdvancedCopy Manager Operator's Guide" for the operating system of the target Tape Server.

6. To use the backup operation, set the backup operation environment.
   To use the replication operation, set the replication operation environment.
   Refer to "Replication operations" in the "ETERNUS SF AdvancedCopy Manager Operator's Guide" that is applicable to the Storage Management Server operating system, and perform the tasks under "Preparations", starting with "Replication source volume settings and replication destination volume settings".

9.4.2.6 Changing the server name of a Storage Server transaction

Change the server name of a Storage Server transaction by performing the steps below. If you set the logical node name as the same as the server name (when you change a logical node name), see "Changing the logical node name".

1. Check whether the Storage Server transaction is operating.
   When it is not operating, start the Storage Server transaction.
   For details on how to do this, refer to the relevant cluster software manual.

2. Delete the environment of the Storage Server transaction.
   When it is defined as a replication source or destination volume using a replication management function, delete the source / replica volume configuration. Refer to "Deleting an original volume or replica volume" in the "ETERNUS SF AdvancedCopy Manager Operator's Guide" for the operating system of the target Storage Server.

3. On the server list view of the AdvancedCopy Manager GUI, select the server whose information is to be changed, then choose [Change of server...] from the [Operation] menu. Change the server name and press [OK] on the "Change of server" dialog. Alternatively, change the server name using the server information change command on the Storage Management Server. For details on this command, refer to "Server information change command (stgxfwcmmodsrv)" in the "ETERNUS SF AdvancedCopy Manager Operator's Guide" for the operating system of the target Storage Management Server.

4. On the Tape Server that is associated with the Storage Server transaction, execute the server information change report command to reflect the change of the server name to the Tape Server management information. For details of this command, refer to "Server information change report command (tbomodsrv)". The "Storage Server configuration information display command (acmsvrdisp)" can be used to check which Tape server is associated with the Storage Server.

5. To use the backup operation, set the backup operation environment.
   To use the replication operation, set the replication operation environment.
   Refer to "Replication operations" in the "ETERNUS SF AdvancedCopy Manager Operator's Guide" that is applicable to the Storage Management Server operating system, and perform the tasks under "Preparations", starting with "Replication source volume settings and replication destination volume settings".

9.4.2.7 Change of password or deletion of the repository access user

Change the repository access user by performing the following steps:

1. Check whether the Storage Management Server transaction is operating.
   When it is not operating, start the Storage Management Server transaction.
   For details on how to do this, refer to the relevant cluster software manual.

2. Change the repository access user. For details on how to do this, refer to "Deleting the user who specified it as the repository access user, and changing the password".

9.4.2.8 Changing the logical node name

For details on how to change the logical node name of a Storage Management Server transaction or Storage Server transaction, refer to "Changing the logical node name" in the "ETERNUS SF AdvancedCopy Manager Operator's Guide for cluster environment" for the operating system of the target Servers.
The server name will also need to be changed.
For a Storage Management Server transaction, follow steps 3 to 5 in "Changing the server name of Storage Management Server transaction".
For a Storage Server application, follow steps 3 and 4 in "Changing the server name of Storage Server transaction".

9.4.2.9 Changing the transaction name

For details on how to change the transaction name of a Storage Management Server transaction or Storage Server transaction, refer to "Changing the service name" in the "ETERNUS SF AdvancedCopy Manager Operator's Guide for cluster environment" for the operating system of the target Servers.
Add the following to the data to be backed up and restored:
● Pre-processing and post-processing scripts
   Pre-processing and post-processing scripts for tape copying

9.4.2.10 Changing the shared disk for AdvancedCopy Manager shared data

For details on how to change the shared disk for AdvancedCopy Manager (the mount point name of the physical disk or the shared disk for shared data), refer to "Changing the shared disk for AdvancedCopy Manager shared data" in the "ETERNUS SF AdvancedCopy Manager Operator's Guide for cluster environment" for the operating system of the target Servers.
Add the following to the data to be backed up and restored.

● Pre-processing and post-processing scripts
   Pre-processing and post-processing scripts for tape copying

9.4.2.11 Changing the shared disk for AdvancedCopy Manager repository

For details on how to change the shared disk for AdvancedCopy Manager, refer to "Changing the shared disk for AdvancedCopy Manager repository" in the "ETERNUS SF AdvancedCopy Manager Operator's Guide for cluster environment" for the operating system of the target Servers.
Add the following to the data to be backed up and restored.

● Pre-processing and post-processing scripts
   Pre-processing and post-processing scripts for tape copying

Chapter 10 Restoring from Tape when the Storage Server is Stopped

This chapter explains how to restore data from the Tape Server while the Storage Server is stopped.

10.1 Overview

The Tape Backup function of AdvancedCopy Manager can restore a backup history on tape media from the Tape Server even while the Storage Server is stopped.
Histories on a disk can be restored only while the Storage Server is active.

The table below lists the restoration functions that can be used while the Storage Server is stopped. All these functions can be executed on the Tape Server.

Table: Commands used for restoration

Function	Command name	Explanation
Tape history information display command	tbohistdisp	Displays backup histories on tape media.
Tape restore command	tborestore	Restores data from tape media.
Tape Server execution status display command	tboexecstat	Displays the execution status of restoration from tape media.

10.2 Displaying History Information on Tape

Display backup history information on tape media and determine the data to be restored. In an environment with multiple Tape Servers, only the backup history managed by the Tape Server on which the command is executed is displayed. Backup history information managed by other Tape Servers cannot be displayed.

For details of the command, refer to "Tape history information display command (tbohistdisp)".

10.3 Restoring from Tape

Restore from tape by specifying a backup data history stored on tape media.
This function implements restoration without pre-processing and post-processing on the Storage Server.
For details of the command, refer to "Tape restore command (tborestore)".

The tborestore command does not check whether the Storage Server is stopped. It restores data directly to the transaction volume without performing pre-processing and post-processing on the Storage Server. For this reason, restored data is not guaranteed if restoration is performed while the Storage Server is busy with transactions. Execute the tborestore command after making sure that the Storage Server is stopped or is not accessing the restoration target volume.

10.4 Displaying the Status of Restoration from Tape

Use the tboexecstat command to check the status of restoration from tape media.

The command shows the progress of reading from tape in the [Execute] field.

For details of the command, refer to "Tape Server execution status display command (tboexecstat)".

Chapter 11 Commands

This chapter provides information on using commands.

For Windows, the program directory must be specified as part of various commands described in this chapter. The default directory, in which these commands are installed for Windows, is the Win32app\AdvancedCopyManager directory of the C: drive

Note

The command execution examples in this chapter all assume a Solaris operating system.

11.1 Command List

This section describes classification of commands.

Backup Management of commands

Environment definition commands

Table: Environment definition command list

Function	Command name	Description
Storage Server configuration command	acmsvrset	Sets the configuration information of a Storage Server
Storage Server configuration information display command	acmsvrdisp	Displays the configuration information of a Storage Server
Device configuration command	acmdevinfoset	Sets the use of a device
Device usage status display command	acmdevdisp	Displays the information of a device
Disk backup policy setting command	acmbkpolset	Sets a disk backup policy
Disk backup policy display command	acmbkpoldisp	Displays a set disk backup policy
Disk backup policy delete command	acmbkpoldel	Deletes a set disk backup policy
Tape backup policy setting command	acmtpbkpolset	Sets a tape backup policy
Tape backup policy display command	acmtpbkpoldisp	Displays a set tape backup policy
Tape backup policy delete command	acmtpbkpoldel	Deletes a set tape backup policy
Tape backup management class setting command	acmtpmgmtclass set	Sets a tape backup management class
Tape backup management class display command	acmtpmgmtclass poldisp	Displays a set tape backup management class
Tape backup management class delete command	acmtpmgmtclass poldel	Deletes a set tape backup management class

Operation commands

Table: Operation command list

Function	Command name	Description
Backup execution command	acmbackup	Performs the synchronous high-speed backup or snapshot type high speed backup operation
Tape copy command	acmtphistcopy	Copies backup history information on a disk to tape
Tape backup cancel command	acmtpcancelback	Cancels backing up from a transaction volume directly to the tape or copying from a backup volume to the tape
Restore execution command	acmrestore	Performs restoration
Restore cancellation command	swstcancelrest	Cancels the execution of restoration
Tape restore cancellation command	acmtpcancelrest	Cancels the execution of restoration from the tape
Restore execution status display command	swstreststat	Displays the execution status of restoration
Tape execution history display command	acmtpreqstat	Displays the processing status by the tape server of the transaction volume
History information display command	acmhistdisp	Displays the history information that has been backed up
History information deletion command	acmhistdel	Deletes the history information that has been backed up
Backup synchronous processing start command	acmstartsync	Starts backup synchronous processing

Function	Command name	Description
Backup synchronous processing cancel command	acmcancelsync	Aborts backup synchronous processing
Backup synchronous processing progress display command	acmsyncstat	Displays the progress of the backup synchronous processing
Execution status display command	acmexecstat	Displays the execution status of a command executed on a transaction volume
Tracking cancel command	acmcanceltrk	Stops tracking processing for a QuickOPC
Tracking status display command	acmtrkstat	Displays the status of tracking processing for a QuickOPC
Drive letter allocation command	swstdrvset	Allocates a drive letter temporarily to a device (in Windows only)
Drive letter de-allocation command	swstdrvunset	The drive character currently assigned to the device is canceled. (in Windows only)
Dismount command	swstdismount	Dismounts a volume (in Windows only)
Volume unlock command	swstvolunlock	Unlocks a volume (in Windows only)
Locked-volume information display command	swstvollockstat	Displays information about a volume locked (in Windows only)

Maintenance commands

Table: Maintenance command list

Function	Command name	Description
Resource match command	swstsrsemtch	Recovers the consistency of information in backup management files.
Resource backup command	swstresback	Backs up backup management files.
Resource restore command	swstresrst	Restores backup management files.

Configuration management commands

Table: Configuration management command list

Function	Command name	Description
Management server information change command	stgcmmodnode	Changes Storage Management Server information Storage
Repository access user change command	stguserset	Changes a user name and/or password used to access a repository
GUI connection configuration command	stgguiipset	The Storage Management Server is equipped with two or more network cards, and this command is used when dividing and using the IP address specified in case the IP address and GUI client with a Storage Server which communicates with it are used.
Server information addition command	stgxfwcmaddsrv	Adds Storage Server information to be managed by AdvancedCopy Manager
Server information change command	stgxfwcmmodsrv	Changes information on servers managed by AdvancedCopy Manager
Server information deletion command	stgxfwcmdelsrv	Deletes Storage Server information of a server that AdvancedCopy Manager is currently managing
Device information colleciton/reflectin command	stgxfwcmsetdev	Collects the latest device information detected by the server and displays the difference between this and the information managed by AdvancedCopy Manager

Function	Command name	Description
Device informatino deletion command	stgxfwcmdeldev	deletes the device information currently being managed by AdvancedCopy Manager
Server information display command	stgxfwcmdispsrv	Displays the server information managed by AdvancedCopy Manager
Device information display command	stgxfwcmdispdev	Displays information on a device managed by AdvancedCopy Manager
Partition information display command	stgxfwcmdisppat	Displays the information for the partitions that comprise a device managed by AdvancedCopy Manager
Environment information display command	stgenvdisp	Displays the values of the environment settings in AdvancedCopy Manager
Management information package backup server registration/deletion command	stgmgrinfoset	Registers the management information package backup execution server
Management information package backup command	stgmgrinfobkup	Backs up the management information stored on the Storage Servers and the Storage Management Server
Management information package backup status display command	stgmgrinfodisp	Displays the status of execution of the management information package backup command
SDX object management unit setting command	stgxfwcmsetsdx	Specifies the management unit of SDX objects handled by AdvancedCopy Manager

Tape server commands

Table: Tape Server command list

Function	Command name	Description
Tape Server definition file check command	tbochkconf	Checks the validity of the Tape Server definition files (devpath.conf and tsm.conf).
Tape backup execution command	tbobackup	Backs up the transaction volume (disk) data to tape
Tape backup cancel command	tbocancelback	Cancels the execution of the tape backup
Tape restore command	tborestore	Restores backup history data stored on tape
Tape resotre cancel command	tbocancelrest	Cancels restoration from the tape
Tape Server execution status display command	tboexecstat	Displays the execution status of a tape backup operation
Tape execution history display command	tboreqstat	Displays the tape server processing status of each transaction volume
Tape history information display command	tbohistdisp	Displays history information that was backed up to tape.
Tape management information backup command	tboresback	Backs up tape management information to the specified directory
Tape management information restore command	tboresrst	Restores tape management information from the specified directory
Trace log output level setting command	tbomodlog	Changes the output level of a Tape Server trace log
Server information change report command	tbomodsrv	When the server name, IP address, or port number of a Storage Server is changed, reflects the change to the Tape Server management information

Function	Command name	Description
ETERNUS2000/ETERNUS3000/ETERNUS4000 information acquisition command	tbogetoluinfo	Obtains the information required for backing up the data of an ETERNUS2000/ETERNUS3000/ETERNUS4000 disk array unit to tape in a multi-path environment

Disaster recovery commands

Table: Disaster recovery command list

Function	Command name	Description
Tape backup history batch display command	tbodrhistdisp	Batch display of history that was backed up to tape
Disaster recovery data restoration command	tbodrrestore	Restores to disk the data that was backed up to tape

Starting and Stopping Daemons commands

Table: Starting and stopping daemons command list

Function	Command name	Description
Starting and stopping the communication daemon	stgfwcom	Starts and stops the communication daemon
Starting and stopping the RMI daemon	stgrmicom	Starts and stops the RMI daemon
Starting and stopping the RDB daemon	stgdbcom	Starts and stops the RDB daemon
Starting and stopping the authentication daemon	rc.smfwsec	Starts and stops the authentication daemon
Starting and stopping the AdvancedCopy Manager daemon	startacm stopacm	Starts and stops the AdvancedCopy Manager daemon
Starting and stopping the AdvancedCopy Manager tape daemon	FJSVswstm	Starts and stops the AdvancedCopy Manager tape daemon
Starting and stopping the TSM daemon	InitTSM	Starts and stops the TSM daemon

11.2 Backup Management Commands

This section describes operations using backup management commands.

For Solaris, Linux, HP-UX or AIX, the backup management commands must be executed by the root user. If a backup management command is executed by another user, the command outputs a message and terminates with an error.

For Windows, only users belonging to the Administrators group can execute all the commands of backup management. If command execution is carried out by other users, a message is displayed and the command terminates with an error.

When either of the following commands is executed on a server that is used as both a Storage Management Server and a Storage Server, information about only the server being used is displayed. The other display commands show information about all types of Storage Servers.

● History information display command
● Execution status display command

   In cluster operation

In cluster operation, execute a command by taking the following steps:

1) If necessary, specify the logical node name to the transaction in environment variable SWSTGNODE. For bsh, specify the environment variable as follows:

```
[For Solaris/Linux/HP-UX/AIX]
# SWSTGNODE=logical_node_name
# export SWSTGNODE
[For Windows]
set SWSTGNODE=logical_node_name
```

2) Execute the command.
The table below lists the commands available in cluster operation. It notes whether environment variables must be configured, and specifies the nodes on which commands are executable. For notes and cautions on command execution, refer to the Remarks column.

Table: Cluster operation command list

Command	Environment variable	Command execution node	Remarks
acmsvrset	Required	Active Cluster Server	–
acmsvrdisp	Required	Active Cluster Server	–
acmdevinfoset	Required	Active Cluster Server	–
acmdevdisp	Required	Active Cluster Server	–
acmbkpolset	Required	Active Cluster Server	–
acmbkpoldisp	Required	Active Cluster Server	–
acmbkpoldel	Required	Active Cluster Server	–
acmtpbkpolset	Required	Active Cluster Server	–
acmtpbkpoldisp	Required	Active Cluster Server	–
acmtpbkpoldel	Required	Active Cluster Server	–
Acmtpmgmtclassset	Required	Active Cluster Server	–
Acmtpmgmtclassdisp	Required	Active Cluster Server	–

Command	Environment variable	Command execution node	Remarks
Acmtpmgmtclassdel	Required	Active Cluster Server	-
acmbackup	Required	Active Cluster Server	-
acmtphistcopy	Required	Active Cluster Server	-
acmtpcancelback	Required	Active Cluster Server	-
swstbackstat	Required	Active Cluster Server	-
acmrestore	Required	Active Cluster Server	-
swstcancelrest	Required	Active Cluster Server	-
acmtpcancelrest	Required	Active Cluster Server	-
swstreststat	Required	Active Cluster Server	-
acmtpreqstat	Required	Active Cluster Server	-
acmhistdisp	Required	Active Cluster Server	-
acmhistdel	Required	Active Cluster Server	-
acmstartsync	Required	Active Cluster Server	-
acmcancelsync	Required	Active Cluster Server	-
acmsyncstat	Required	Active Cluster Server	-
acmexecstat	Required	Active Cluster Server	-
acmcanceltrk	Required	Active Cluster Server	-
acmtrkstat	Required	Active Cluster Server	-
swstdrvset	Required	Active Cluster Server	Windows only
swstdrvunset	Required	Active Cluster Server	Windows only
swstdismount	Required	Active Cluster Server	Windows only
swstvolunlock	Required	Active Cluster Server	Windows only
swstvollockstat	Required	Active Cluster Server	Windows only
swstsrsemtch	Required	Active Cluster Server	-
swstresback	Required	Active Cluster Server	-
swstresrst	Required	Active Cluster Server	-

11.2.1 Environment definition commands

This section describes environment definition commands for backup management.

Note

All environment definition commands require that a Tape Server and its daemon be started in advance. Otherwise, when one of the commands is executed, it outputs a message and terminates with an error.

11.2.1.1 Storage Server configuration command (acmsvrset)

This command sets configuration information of a Storage Server. Execute this command to declare that the Storage Server that executed this command is an associated participant in the backup operation.
This command associates the specified Tape Server with a Storage Server. The Tape Server specified by this command manages backup to tape. The tape backup function cannot be used on a Storage Server not associated with the Tape Server.
If the server name, IP address, or port number of the Tape Server is changed, this command must be executed again to associate the Tape Server with the Storage Server.

a.   Format

```
/opt/FJSVswstc/bin/acmsvrset [-c RecCtrlFile-Directory] [-w Work-Directory] [-t
Tape-Server]
```

[For HP-UX/AIX]

```
/opt/FJSVswstc/bin/acmsvrset [-t Tape-Server]
```

[For Windows]

```
program-directory\bin\acmsvrset [-t Tape-Server]
```

b.   Description of options

Option	Description
-t	Specifies the name of the Tape Server to be associated with the Storage Server. This option is required when this command is initially executed.

c.   End status

= 0: Normal end

> 0: Abnormal end

d.   Example

The command sets configuration information about the Storage Server and associates the server with the Tape Server (tpserver1).

```
# /opt/FJSVswstc/bin/acmsvrset -t tpserver1
acmsvrset completed
#
```


Note

The Storage Server configuration information cannot be set in the following cases:

● The -t option is omitted at the time of initial execution.

● The -t option is specified, Storage Server configuration information is already set, and a tape backup policy is set for an existing transaction volume.

● The specified Tape Server is not registered with the Storage Management Server.

Note

This command can be executed only while none of the following commands are running:

- ● Storage Server configuration command (acmsvrset)
- ● Backup policy setting command (acmbkpolset)
- ● Backup policy delete command (acmbkpoldel)
- ● Backup command (acmbackup)
- ● Restore command (acmrestore)
- ● Backup synchronous processing start command (acmstartsync)
- ● Backup synchronous processing cancel command (acmcancelsync)
- ● Device configuration command (acmdevinfoset)
- ● History information delete command (acmhistdel)
- ● Storage Server configuration command (swstsvrset)
- ● Backup policy setting command (swstbkpolset)
- ● Backup policy deletion command (swstbkpoldel)
- ● Backup execution command (swstbackup)
- ● Restore execution command (swstrestore)
- ● Restore cancellation command (swstcancelrest)
- ● Backup synchronous processing start command (swststartsync)
- ● Backup synchronous processing cancel command (swstcancelsync)
- ● Device configuration command (swstdevinfoset)
- ● History information deletion command (swsthistdel)
- ● Resource backup command (swstresback)
- ● Resource restore command (swstresrst)
- ● Resource match command (swstsrsemtch)
- ● Tracking cancel command (acmcanceltrk)

Note

If Tape Server functions are installed later in a Storage Server or Storage Management Server, that server is not recognized as a Tape Server. In order for it to be recognized as a Tape Server, the server information change command (stgxfwcmmodsrv) must be executed.

11.2.1.2 Storage Server configuration information display command (acmsvrdisp)

This command displays configuration information of a Storage Server, which has been set using the "Storage Server configuration command (acmsvrset)".

a. Format

[For Solaris/Linux/HP-UX/AIX]

```
/opt/FJSVswstc/bin/acmsvrdisp
```

[For Windows]

```
program-directory\bin\acmsvrdisp
```

b. End status

= 0: Normal end

> 0: Abnormal end

c. Example

This command displays Storage Server (srv1) configuration information.

```
# /opt/FJSVswstc/bin/acmsvrdisp
Storage-Server  = srv1
Tape-Server     = tpserver1(10.10.10.10:1226)
#
```

The following information will be displayed.

Title	Description
Storage-Server	Displays a Storage Server name.
Tape-Server	Displays a Tape Server name. The IP address and port number used for communication with the Tape Server are delimited by a colon (":") and displayed in parentheses. Tape-Server = "Tape-Server-Name"("IP-Address":"PORT-NUMBER")

11.2.1.3 Device Configuration command (acmdevinfoset)

Set a volume that has been allocated to the Fujitsu ETERNUS storage system as a transaction volume or backup volume.
A transaction volume refers to a volume that stores work data to be backed up.
A backup volume refers to a volume used to store a backup of this transaction data.
For details on devices that can be registered on Windows as transaction and backup volumes, refer to "Device configuration command (swstdevinfoset)" in the "ETERNUS SF AdvancedCopy Manager Operator's Guide [For Windows]".

a. Format

[For Solaris/Linux]

```
/opt/FJSVswstc/bin/acmdevinfoset { -t [-Xlu] | -b | -o } Device-Name
```

[For HP-UX/AIX]

```
/opt/FJSVswstc/bin/acmdevinfoset -t | -b | -o Device-Name
```

[For Windows]

```
program-directory\bin\acmdevinfoset { -t [-Xlu] | -b | -o } Device-Name
```

b. Description of options

Option	Description
-t	Registers the specified device as a transaction volume. Cannot be specified at the same time as the -b or -o options.
-b	Registers the specified device as a backup volume. Cannot be specified at the same time as the -t or -o options.
-o	Deregisters the specified device if it has been registered as a work or backup volume. Cannot be specified at the same time as the -t or -b options.
-Xlu	Specify when a LU (disk) is set as a transaction volume. If this option is not specified, a LU (disk) cannot be set as a transaction volume. This option can be specified only for LU (disk) volumes. An error occurs if this option is set for other volumes.

c. Description of operand

Operand	Description
Device-Name	If the Storage Server is Solaris, Linux, HP-UX or AIX, specifies a block device name of a transaction volume. If the Storage Server is Windows, specifies the AdvancedCopy Manager device name that corresponds to the transaction volume. For details on the AdvancedCopy Manager device name, refer to "Managing a Device on AdvancedCopy Manager" in the "ETERNUS SF AdvancedCopy Manager Operator's Guide [For Windows]".

d. End status

= 0: Normal end

> 0: Abnormal end

e. Example

1) For partition (slice) units

Register a device (/dev/dsk/c1t0d0s6) as a transaction volume.

```
# /opt/FJSVswstc/bin/acmdevinfoset -t /dev/dsk/c1t0d0s6
acmdevinfoset completed
#
```

Register a device (/dev/dsk/c1t0d2s6) as a backup volume.

```
# /opt/FJSVswstc/bin/acmdevinfoset -b /dev/dsk/c1t0d2s6
acmdevinfoset completed
#
```

Deregister a device (/dev/dsk/c1t0d0s6) that has been registered as a transaction volume.

```
# /opt/FJSVswstc/bin/acmdevinfoset -o /dev/dsk/c1t0d0s6
acmdevinfoset completed
#
```

2) For a LU (disk)

Register a Solaris LU (disk) device (/dev/dsk/c1t1d0s2) as a transaction volume.

```
# /opt/FJSVswstc/bin/acmdevinfoset -t -Xlu /dev/dsk/c1t1d0s2
```

Register a Linux LU (disk) device (/dev/sde) as a transaction volume.

```
# /opt/FJSVswstc/bin/acmdevinfoset -t -Xlu /dev/sde
```

Register a Windows LU (disk) device (g1d173) as a transaction volume.

```
C:\>C:\Win32app\AdvancedCopyManager\bin\acmdevinfoset -t -Xlu g1d173
```


Note

A device cannot be registered as a transaction volume if:

— Another device with the same logical volume information (cabinet identifier, OLU number, EXTENT start position, and EXTENT size) has already been registered as a transaction volume.

— The space of the device to be registered overlaps the space of an already registered transaction or backup volume.

Note

A device cannot be registered as a backup volume if:

— Another device with the same logical volume information (cabinet identifier, OLU number, EXTENT start position, and EXTENT size) has already been registered as a transaction volume.

— The space of the device to be registered overlaps the space of an already registered transaction or backup volume.

— The device to be set up is already mounted.

— The device is an SDX object.

— The device to be set up is registered as a replication destination volume of replication management.

— When the device to be set up is registered as replication source volume of the duplicate volume information in which the bi-directional copy of replication management is possible.

Note

You must delete related backup history information before:

— Changing a backup volume to a transaction volume

— Canceling the configuration of a backup volume

Note

You must delete a backup policy specified on a transaction volume before:

— Changing a transaction volume to a backup volume

— Canceling the setting of a transaction volume

Note

To perform the following changes, the related tracking processing (OPC session) must be canceled in advance:

— Changing the settings of a transaction volume in tracking processing

— Changing the settings of a backup volume in tracking processing

Note

The following changes are not possible unless the related synchronous processing (ie, the EC session) is cancelled:

— Changing a setting of a suspended transaction volume

— Changing a setting of a suspended backup volume

Note

For details on how to use SDX objects of GDS, refer to "Configuration and conditions of unsupported SDX objects" and "Notes on SDX Object Operations".

174

Note

This command can be executed only while none of the following commands are running:
— Storage Server configuration command (acmsvrset)
— Backup policy setting command (acmbkpolset)
— Backup policy delete command (acmbkpoldel)
— Backup command (acmbackup)
— Restore command (acmrestore)
— Backup synchronous processing start command (acmstartsync)
— Backup synchronous processing cancel command (acmcancelsync)
— Device configuration command (acmdevinfoset)
— History information delete command (acmhistdel)
— Storage Server configuration command(swstsvrset)
— Backup policy setting command (swstbkpolset)
— Backup policy deletion command (swstbkpoldel)
— Backup execution command (swstbackup)
— Restore execution command (swstrestore)
— Restore cancellation command (swstcancelrest)
— Backup synchronous processing start command (swststartsync)
— Backup synchronous processing cancel command (swstcancelsync)
— Device configuration command (swstdevinfoset)
— History information deletion command (swsthistdel)
— Resource backup command (swstresback)
— Resource restore command (swstresrst)
— Resource match command (swstsrsemtch)
— Tracking cancel command (acmcanceltrk)

11.2.1.4 Device operating status display command (acmdevdisp)

This command displays information on the transaction volumes, backup volumes, and other applicable devices that have been set up using the "Device configuration command (acmdevinfoset)".

a.   Format
    [For Solaris/Linux/HP-UX/AIX]

    /opt/FJSVswstc/bin/acmdevdisp [-t] [-b [-u]] [-o] [*Device-Name*]

    [For Windows]

    program-directory\bin\acmdevdisp [-t] [-b [-u]] [-o] [*Device-Name*]

b.   Description of options

Option	Description
-t	Displays information about a device that has been set as a transaction volume. Displays device information for all the transaction volumes, if the device name in an operand is omitted.
-b	Displays information about a device that has been set as a backup volume. Displays device information for all the backup volumes, if the device name in an operand is omitted.
-u	Changes the display format for the Device Mode column (normally "Backup (used)") for backup volumes in the suspend or tracking status for which history information was deleted.

Option	Description
-o	Displays information about all the devices other than those set as a transaction or backup volume.
	Displays information about all the devices other than those set as a transaction or backup volume, if the device name in an operand is omitted.

Information about a device that has been set as a transaction volume will be displayed if the t, b, and o options are all omitted.

c.   Description of operand

Operand	Description
Device-Name	For Solaris, Linux, HP-UX or AIX, specifies a block device name.
	For Windows, specifies the AdvancedCopy Manager device name. For details on the AdvancedCopy Manager device name, refer to "Managing a Device on AdvancedCopy Manager" in the "ETERNUS SF AdvancedCopy Manager Operator's Guide [For Windows]".
	If this operand and the options are omitted, device information on all the transaction volumes will be displayed.

d.   End status

    = 0: Normal end

    > 0: Abnormal end

e.   Example

    Display the use status of the registered devices.

```
# /opt/FJSVswstc/bin/acmdevdisp -tb
Server Device           Size          Device-Mode   Mount-Point (Method)
Backup-Engine
srv2 /dev/dsk/c1t0d0s6   1.0 Gbyte Transaction   /mnt/tran1 (ufs)
AdvancedCopy
srv2 /dev/dsk/c1t1d0s6   1.0 Gbyte Transaction   ---- (----)
AdvancedCopy
srv2 /dev/dsk/c1t0d2s6   1.0 Gbyte Backup (used) ---- (----)
AdvancedCopy
srv2 /dev/dsk/c1t0d2s3   1.0 Gbyte Backup (free) ---- (----)
AdvancedCopy
srv2 /dev/dsk/c1t0d7s6   2.0 Gbyte Backup (free) ---- (----)
AdvancedCopy
srv2 /dev/dsk/c1t0d7s3   2.0 Gbyte Backup (free) ---- (----)
AdvancedCopy
  :
#
```

The following information will be displayed.

Title	Description
Server	Displays a Storage Server name.
Device	For Solaris, Linux, HP-UX or AIX, displays a device name.
	For Windows, displays an AdvancedCopy Manager device name.
Size	Displays the size of a partition allocated to a device.

Title	Description
Device-Mode	Displays a character string by which a device can be identified. ● "Transaction": Represents a transaction volume. ● "Backup": Represents a backup volume. ● "Other": Represents a device that can be registered as a transaction or backup volume. A backup volume is indicated as "Backup (used)" if it is being used or "Backup (free)" if it is not being used. If a backup process is executed with -suspend specified, or if a differential snapshot backup is executed, the backup volume remains in use after history information is deleted. With the -u option specified, "Backup (used-S)" is displayed for a backup volume in the suspend status for which history information has been deleted. "Backup (used-T)" is displayed for a backup volume in the tracking status for which history information has been deleted.
Mount-Point (Method)	For Solaris, Linux, HP-UX, this displays the mount point of a device. The file system type of the mount point is displayed in parentheses. For Windows, displays the drive letter of a device. The file system type of the device is displayed in parentheses. For AIX, always displays "---- (----)".
Backup-Engine	Always displays the following: "AdvancedCopy": Indicates backup operation with AdvancedCopy Manager.

11.2.1.5 Disk backup policy setting command (acmbkpolset)

This command sets a backup policy (ie, numbers of preservation generations and interval days). The number of preservation generations means how many generations of backup data should be kept. The number of interval days means the number of days after the execution of backup that the next backup should be performed.
Unless a disk is used as backup media, this command is not required.

Note

Even if the number of interval days is specified, AdvancedCopy Manager does not automatically create a backup.

Note

When you specify a backup policy, there must be as many backup volumes in operation as specified in the policy.
To view information on the number of backup volumes required for an ordinary backup, refer to "Preparing a backup volume" in the "ETERNUS SF AdvancedCopy Manager Operator's Guide" for the operating system of the target Storage Server.

a. Format
[For Solaris/Linux]

```
/opt/FJSVswstc/bin/acmbkpolset [-i Interval-Days] [-s Save-Number][Device-Name]
```

[For HP-UX/AIX]

```
/opt/FJSVswstc/bin/acmbkpolset [-i Interval-Days] [-s Save-Number][Device-Name]
```

[For Windows]

```
program-directory\bin\acmbkpolset [-i Interval-Days] [-s Save-Number][Device-Name]
```

b.   Description of options

Option	Description
-I	Specifies the number of interval days. You can specify a value between 1 and 366. If this option is omitted during initial registration, 30 will be set as the default. If this option is omitted during update, the existing value will be inherited.
-s	Specifies the number of preservation generations. You can specify a value between 1 and 31. If this option is omitted during initial registration, 2 will be set as the default. If this option is omitted during update, the existing value will be inherited.

c.   Description of operand

Operand	Description
Device-Name	For Solaris, Linux, HP-UX or AIX, specifies a device name. For information about the devices that can be specified, refers to "Supported Devices of Tape Backup of AdvancedCopy Manager". For Windows, specifies the AdvancedCopy Manager device name. For details on the AdvancedCopy Manager device name, refer to "Managing a Device on AdvancedCopy Manager" in the "ETERNUS SF AdvancedCopy Manager Operator's Guide [For Windows]". If the device name is omitted, the backup policy will be set for all the transaction volumes.

d.   End status

    = 0: Normal end
    > 0: Abnormal end

e.   Example

To set 3 as the number of preservation generations for a transaction volume
(/dev/dsk/c1t0d5s3):

```
# /opt/FJSVswstc/bin/acmbkpolset -s 3 /dev/dsk/c1t0d5s3
/dev/dsk/c1t0d5s3 acmbkpolset completed
#
```


If this command is executed without a transaction volume name, the same backup policy is set for all transaction volumes.

You can change of the number of preservation generations as long as the history information count at the time is equal to or less than the number of preservation generations to be specified.

Ordinary transaction volumes must be backed up to ordinary backup volumes.
If the transaction volume is a GDS logical volume, the backup destination must be a backup volume of a GDS logical volume.

The backup policy cannot be set if:
— There are not as many backup volumes as the specified number of preservation generations.
— The specified number of preservation generations is greater than the maximum allowed.
— The specified number of interval days is greater than the maximum allowed.

This command can be executed only if none of the following commands is running:
— Resource match command (swstsrsemtch)
— Device configuration command (acmdevinfoset)
— Storage Server configuration command (acmsvrset)
— Device configuration command (swstdevinfoset)
— Storage Server configuration command (swstsvrset)
— Resource backup command (swstresback)
— Resource restore command (swstresrst)

For details on how to use SDX objects of GDS, refer to "Configuration and conditions of unsupported SDX objects" and "Notes on SDX Object Operations".

11.2.1.6 Disk backup policy display command (acmbkpoldisp)

This command displays a backup policy that has been set for a transaction volume.

a. Format
    [For Solaris/Linux]

    /opt/FJSVswstc/bin/acmbkpoldisp [*Device-Name*]

    [For HP-UX/AIX]

    /opt/FJSVswstc/bin/acmbkpoldisp [*Device-Name*]

    [For Windows]

    program-directory\bin\acmbkpoldisp [*Device-Name*]

b. Description of operand

Operand	Description
Device-Name	For Solaris, Linux, HP-UX or AIX, specifies the block device name of the transaction volume. For Windows, specifies the AdvancedCopy Manager device name. For details on the AdvancedCopy Manager device name, refer to "Managing a Device on AdvancedCopy Manager" in the "ETERNUS SF AdvancedCopy Manager Operator's Guide [For Windows]". If the device name is omitted, a backup policy for a transaction volume with a registered backup policy will be displayed.

c.   End status

    = 0: Normal end

    > 0: Abnormal end

d.   Example

    To display the backup policies of a transaction volume (/dev/dsk/c1t0d5s3):

```
# /opt/FJSVswstc/bin/acmbkpoldisp /dev/dsk/c1t0d5s3
Server      Device          Interval-Days Save-Number Mount-Point (Method)
Transaction2 /dev/dsk/c1t0d5s3 30            2           /stg(ufs)
#
```

    The following information will be displayed.

Title	Description
Server	Displays the Storage Server name.
Device	For Solaris, Linux, HP-UX or AIX, displays the device name.
	For Windows, displays the AdvancedCopy Manager device name.
Interval-Days	Displays the number of interval days.
Save-Number	Displays the number of preservation generations.
Mount-Point (Method)	For Solaris, Linux, HP-UX or AIX, displays the mount point of a device. The file system type of the mount point will be displayed in parentheses. For Windows, displays the drive letter of a device. The file system type of the device is displayed in parentheses.

11.2.1.7 Disk backup policy delete command (acmbkpoldel)

This command deletes a backup policy that has been set.

If the transaction volume to be deleted has backup history information, delete the backup
history information before executing this command.

a.   Format

    [For Solaris/Linux]

```
/opt/FJSVswstc/bin/acmbkpoldel Device-Name
```

    [For HP-UX/AIX]

```
/opt/FJSVswstc/bin/acmbkpoldel Device-Name
```

    [For Windows]

```
program-directory\bin\acmbkpoldel Device-Name
```

b.   Description of operand

Operand	Description
Device-Name	For Solaris, Linux, HP-UX or AIX, specify the block device name of the transaction volume. For Windows, specifies the AdvancedCopy Manager device name. For details on the AdvancedCopy Manager device name, refer to "Managing a Device on AdvancedCopy Manager" in the "ETERNUS SF AdvancedCopy Manager Operator's Guide [For Windows]".

c.   End status

    = 0: Normal end

    > 0: Abnormal end

d.   Example

To delete the backup policies of a transaction volume (/dev/dsk/c1t0d5s3):

```
# /opt/FJSVswstc/bin/acmbkpoldel /dev/dsk/c1t0d5s3
/dev/dsk/c1t0d5s3 acmbkpoldel completed
#
```

Note

A backup policy cannot be deleted if:

— The transaction volume to be deleted has backup history information.
— A transaction volume whose backup policies are to be deleted has already started backup synchronous processing.

Note

This command can only be executed when none of the following commands are running:

— Storage Server configuration command (swstsvrset)
— Device configuration command (swstdevinfoset)
— Resource match command (swstsrsemtch)
— Resource backup command (swstresback)
— Resource restore command (swstresrst)
— Device configuration command (acmdevinfoset)
— Storage Server configuration command (acmsvrset)

11.2.1.8 Tape backup policy setting command (acmtpbkpolset)

This command sets a tape backup policy for a transaction volume and log group.
No backup operation can be performed without a set tape backup policy.

Note

Even if the number of interval days is specified, Tape Backup of AdvancedCopy Manager does not automatically create a backup.

Note

To set a tape backup policy, create a tape backup management class in advance for the Storage Server for which the policy is to be set. Without a tape backup management class, a tape backup policy cannot be set.
For details, refer to "Tape backup management class setting command (acmtpmgmtclassset)".

a.   Format
      [For Solaris/Linux]

```
/opt/FJSVswstc/bin/acmtpbkpolset [-i backup-interval-days] [-d
archive-interval-days] [-c Management-Class-Name] Device-Name
```

```
/opt/FJSVswstc/bin/acmtpbkpolset [-i backup-interval-days] [-d
archive-interval-days] [-c Management-Class-Name] Device-Name
```

[For Windows]

```
program-directory\bin\acmtpbkpolset [-i backup-interval-days] [-d
 archive-interval-days] [-c Management-Class-Name] Device-Name
```

b.   Options

Option	Description
-i	Specifies the number of interval days for making a generation management backup. A number ranging from 1 to 366 can be specified. If this option is omitted in initial registration, 30 is used as the default. If the option is omitted in an update, the currently set value is used.
-d	Specifies the number of interval days for making a day management backup. A number ranging from 1 to 366 can be specified. If this option is omitted in initial registration, 30 is used as the default. If the option is omitted in an update, the currently set value is used.
-c	Specifies the name of a tape backup management class. A class name that is already set for another transaction volume can also be specified. This option must be specified in initial registration. If the option is omitted in an update, the tape backup management class that is already set is used.

c.   Operands

Operand	Description
Device-Name	For Solaris, Linux, HP-UX or AIX, specifies a device name. For information about the devices that can be specified, refer to "Supported Devices of Tape Backup of AdvancedCopy Manager". For Windows, specifies the AdvancedCopy Manager device name. For details on the AdvancedCopy Manager device name, refer to "Managing a Device on AdvancedCopy Manager" in the "ETERNUS SF AdvancedCopy Manager Operator's Guide [For Windows]".

d.   End status
   = 0: Normal end
   > 0: Abnormal end

e.   Example
   Set a tape backup policy with the specified transaction volume (/dev/dsk/c1t0d5s3).
   ACM_CLASS2 is specified as the tape backup management class, and 10 days is specified
   as the number of interval days (generation management).

```
# /opt/FJSVswstc/bin/acmtpbkpolset -i 10 -c ACM_CLASS2 /dev/dsk/c1t0d5s3
/dev/dsk/c1t0d5s3 acmtpbkpolset completed
#
```

![Note icon]

Note

A backup policy cannot be set in the following cases:
   — The number of interval days specified in an option exceeds the limit.
   — The -c option is omitted in initial registration.
   — The specified backup management class has not been created on the Storage Server.

This command cannot be executed if any of the following commands is being executed:

― Resource matching command (swstsrsemtch)

― Device configuration command (acmdevinfoset)

― Storage Server configuration command (acmsvrset)

― Device configuration command (swstdevinfoset)

― Storage Server configuration command (swstsvrset)

― Resource backup command (swstresback)

― Resource restore command (swstresrst)

11.2.1.9 Tape backup policy display command (acmtpbkpoldisp)

This command displays the tape backup policies that are set for transaction volumes.

a. Format

[For Solaris/Linux]

```
/opt/FJSVswstc/bin/acmtpbkpoldisp [Device-Name]
```

[For HP-UX/AIX]

```
/opt/FJSVswstc/bin/acmtpbkpoldisp [Device-Name]
```

[For Windows]

```
program-directory\bin\acmtpbkpoldisp [Device-Name]
```

b. Operands

Operand	Description
Device-Name	For Solaris, Linux, HP-UX or AIX, specifies the block device name. For Windows, specifies the AdvancedCopy Manager device name. For details on the AdvancedCopy Manager device name, refer to "Managing a Device on AdvancedCopy Manager" in the "ETERNUS SF AdvancedCopy Manager Operator's Guide [For Windows]". If the Device-Name operand is omitted, this command displays all the registered tape backup policies of transaction volumes.

c. End status

= 0: Normal end

> 0: Abnormal end

d. Example

Display the backup policy for a transaction volume (/dev/dsk/c1t0d5s3).

```
# /opt/FJSVswstc/bin/acmtpbkpoldisp /dev/dsk/c1t0d5s3
Server Device          Backup-Interval-Days  Archive-Interval-Days
ManagementClassName Mount-Point (Method)
srv2 /dev/dsk/c1t0d5s3  30                    2                      ACM-CLASS1
/stg(ufs)
#
```

The table below lists displayed information items.

Title	Description
Server	Displays the Storage Server name.
Device	Displays the device name.
Backup-Interval-Days	Displays the number of interval days for generation management.
Archive-Interval-Days	Displays the number of interval days for day management.

Title	Description
ManagementClassName	Displays the name of a tape backup management class.
Mount-Point (Method)	For Solaris, Linux, HP-UX or AIX, displays a device mount point name followed by the type of mount point file system, displayed in parentheses. For Windows, displays the AdvancedCopy Manager device name.

11.2.1.10 Tape backup policy delete command (acmtpbkpoldel)

This command deletes a set tape backup policy.

If there is backup history information for a transaction volume associated with the tape backup policy to be deleted, delete the backup history information before executing the command.

a. Format

   [For Solaris/Linux]

```
/opt/FJSVswstc/bin/acmtpbkpoldel Device-Name
```

   [For HP-UX/AIX]

```
/opt/FJSVswstc/bin/acmtpbkpoldel Device-Name
```

   [For Windows]

```
program-directory\bin\acmtpbkpoldel Device-Name
```

b. Operands

Operand	Description
Device-Name	Specifies the block device name.

c. End status

   = 0: Normal end

   > 0: Abnormal end

d. Example

   Delete the backup policies of a transaction volume (/dev/dsk/c1t0d5s3):

```
# /opt/FJSVswstc/bin/acmtpbkpoldel /dev/dsk/c1t0d5s3
/dev/dsk/c1t0d5s3 acmtpbkpoldel completed
#
```


Note

   A tape backup policy cannot be deleted in the following cases:

     — Tape backup history information remains for a transaction volume associated with the policy to be deleted.

     — A transaction volume associated with the policy to be deleted is being processed.

This command cannot be executed if any of the following commands is being executed:
— Resource matching command (swstsrsemtch)
— Device configuration command (acmdevinfoset)
— Storage Server configuration command (acmsvrset)
— Device configuration command (swstdevinfoset)
— Storage Server configuration command (swstsvrset)
— Resource backup command (swstresback)
— Resource restore command (swstresrst)

11.2.1.11 Tape backup management class setting command (acmtpmgmtclassset)

This command sets a tape backup management class.

The storage pools specified as the backup destinations must be created with TSM in advance.

a. Format

[For Solaris/Linux/HP-UX/AIX]

```
/opt/FJSVswstc/bin/acmtpmgmtclassset [-g gen_pool] [-d day_pool] [-s save-number]
[-t limit-day] Management-Class-Name
```

[For Windows]

```
program-directory\bin\acmtpmgmtclassset [-g gen_pool] [-d day_pool] [-s save-number]
[-t limit-day] Management-Class-Name
```

b. Options

Option	Description
-g	Sets the "generation management backup destination" specified in gen_pool. Specify the name of the primary storage pool used as the backup destination for generation management. The primary storage pool must be created with TSM in advance. Set it in a TSM backup copy group. This option must be specified in initial registration. If the option is omitted in an update, the currently set value is used.
-d	Sets the day management backup destination specified in day pool. Specify the name of the primary storage pool used as the backup destination for day management. The primary storage pool must be created with TSM in advance. Set it in a TSM backup copy group. The name of the primary storage pool specified as the backup destination for generation management can also be specified for this purpose. This option must be specified in initial registration. If the option is omitted in an update, the currently set value is used.
-s	Sets the number of preservation generations specified in save-number. Specify the number of generations to be backed up in generation management mode. An integer ranging from 1 to 9,999 or "NoLimit" can be specified in save-number. If this option is omitted in initial registration, 2 is used. If the option is omitted in an update, the currently set value is used. If "NoLimit" is specified, the "number of preservation generations" is set to "indefinite" (preserved indefinitely). Set the option in a TSM backup copy group.

Option	Description
-t	Sets the number of preservation days specified in limit-day. An integer ranging from 0 to 30,000 or "NoLimit" can be specified in limit-day. If this option is omitted in initial registration, 365 is used. If the option is omitted in an update, the currently set value is used. If "NoLimit" is specified, the number of preservation days is set to "indefinite" (preserved indefinitely). Set the option in a TSM backup copy group.

c.   Operand

Operand	Description
Management-Class-Name	Specifies a tape backup management class name. The class name can be up to 30 characters long. Valid characters are uppercase letters, digits, "_", ".", "-", "+", and "&".

d.   End status

> = 0: Normal end
>
> > 0: Abnormal end

e.   Example

Create tape backup management class ACM_CLASS1 for preserving five generations of each backup in COPYPOOL and preserving day management backups for 30 days in ARCPOOL.

```
# /opt/FJSVswstc/bin/acmtpmgmtclassset -g COPYPOOL -d ARCPOOL -s 5 -t 30 ACM_CLASS1
ACM_CLASS1 acmtpmgmtclassset completed
#
```


Note

Even if backup is only performed in either generation management mode or day management mode, the backup destination in the unused management mode must also be specified. In this case, specify the same storage pool for both the generation management backup destination and day management backup destination.

Note

To automatically delete generations when a specific number of preservation generations or days is exceeded, the number of generations or days must be specified in the TSM server option file. If either one is specified, the Tape Server is checked at a regular interval to determine whether the specified value has been exceeded. If it has been exceeded, the oldest history is deleted. For details, refer to "Setting of a Server Option File" in the "ETERNUS SF AdvancedCopy Manager Installation Guide".

The TSM command "expire" can delete the number of generations exceeding the limit.

For details, refer to the "ETERNUS SF Backup TSM Edition Administrator's Reference".

```
tsm> expire inventory wait=<yes/no>
```

If "yes" is specified for "wait," the command is executed in the foreground. If "no" is specified, it is executed in the background. The default is "no."

Note

When creating a storage pool, you can use lowercase letters in the storage pool name specified with a TSM command. Even in this case, TSM manages storage pool names with an assumption that all of the names are in uppercase letters. The storage pool name specified in acmtpmgmtclassset must be a name that is actually managed by TSM. No lowercase letters can be used.

Note

A tape backup management class cannot be set in the following cases:
- Backup destinations for generation management and day management are not set during initial registration.
- A specified backup destination was not created as a TSM storage pool.
- The maximum allowable number of preservation generations or days is exceeded by the value specified in the respective option.
- The character string specified for the tape backup management class contains an invalid character or more than 30 characters.

Note

This command cannot be executed if any of the following commands is being executed:
- Resource matching command (swstsrsemtch)
- Device configuration command (acmdevinfoset)
- Storage Server configuration command (acmsvrset)
- Device configuration command (swstdevinfoset)
- Storage Server configuration command (swstsvrset)
- Resource backup command (swstresback)
- Resource restore command (swstresrst)

11.2.1.12 Tape backup management class display command (acmtpmgmtclassdisp)

This command displays a set backup management class.

a. Format

[For Solaris/Linux/HP-UX/AIX]

```
/opt/FJSVswstc/bin/acmtpmgmtclassdisp [Management-Class-Name]
```

[For Windows]

```
program-directory\bin\acmtpmgmtclassdisp [Management-Class-Name]
```

b. Operand

Operand	Description
Management-Class-Name	Specifies the name of a tape backup management class. Only one tape backup management class name can be specified in this operand. If the operand is omitted, all tape backup management classes registered in the tape backup policy domain are displayed.

c. End status

= 0: Normal end

> 0: Abnormal end

d. Example

Display all set tape backup management classes.

```
# /opt/FJSVswstc/bin/acmtpmgmtclassdisp
Server  PolicyDomain              PolicySet                ManagementClass
BackupCopyGroup ArchiveCopyGroup BackupPool Save-Number ArchivePool Limit-Day
server01 ACM_DOMAIN               ACM_111102AA2C6_POLICY    ACM_CLASS1
standard        standard         COPYPOOL1  7               ARCHPOOL1   300
server01 ACM_DOMAIN               ACM_111102AA2C6_POLICY    ACM_CLASS2
standard        standard         COPYPOOL2  5               ARCHPOOL2   7
#
```

The table below lists displayed information items.

Title	Description
Server	Displays the Storage Server name.
PolicyDomain	Displays the tape backup policy domain name. ACM_DOMAIN is always displayed.
PolicySet	Displays the tape backup policy set in which the tape backup management class is set. The tape backup policy set is automatically assigned in such a way that it is unique among Storage Servers, when a tape backup management class is set.
ManagementClass	Displays the tape backup management class name.
BackupCopyGroup	Displays the backup copy group name.
ArchiveCopyGroup	Displays the archive copy group name.
BackupPool	Displays the name of the TSM primary storage pool of the generation management backup destination.
Save-Number	Displays the number of preservation generations. The unit is generations.
ArchivePool	Displays the name of the TSM primary storage pool of the day management backup destination.
Limit-Day	Displays the number of preservation days.

11.2.1.13 Tape backup management class delete command (acmtpmgmtclassdel)

This command deletes a set tape backup management class.

A tape backup management class that is defined in the tape backup policy for a transaction volume cannot be deleted.

If the last tape backup management class among those registered in the tape backup policy domain is deleted, the tape backup policy domain and set tape backup policies are automatically deleted at the same time.

a. Format

   [For Solaris/Linux/HP-UX/AIX]

/opt/FJSVswstc/bin/acmtpmgmtclassdel *Management-Class-Name*

   [For Windows]

program-directory\bin\acmtpmgmtclassdel *Management-Class-Name*

b. Operand

Operand	Description
Management-Cla ss-Name	Specifies the name of a tape backup management class. Only one tape backup management class name can be specified in this operand.

c. End status

   = 0: Normal end

   > 0: Abnormal end

d. Example

   Delete tape backup management class ACM_CLASS1.

/opt/FJSVswstc/bin/acmtpmgmtclassdel ACM_CLASS1 ACM_CLASS1 acmtpmgmtclassdel completed

Note

A tape backup management class cannot be deleted in the following case:
   — If the tape backup management class is defined in any tape backup policies.

Note

This command cannot be executed if any of the following commands is being executed:
   — Resource matching command (swstsrsemtch)
   — Device configuration command (acmdevinfoset)
   — Storage Server configuration command (acmsvrset)
   — Device configuration command (swstdevinfoset)
   — Storage Server configuration command (swstsvrset)
   — Resource backup command (swstresback)
   — Resource restore command (swstresrst)

11.2.2 Operation commands

This section describes operation commands for backup management.

Note

All operational commands require that a Tape Server and its daemon be active. If a command is issued when either is not active, the command outputs a message and terminates with an error.

11.2.2.1 Backup command (acmbackup)

This command backs up transaction volume data.

The command works differently depending on the specified backup destination media and the status of the advanced copy that is being executed:

- ● When only disk or both disk and tape are specified as the backup destination media
  - — When synchronous processing (EC) is not performed
  - — Snapshot processing (OPC) is performed and processing information, such as the date and backup volume of a copy target, is registered into backup history information. This is called snapshot type high speed backup.
  - — When synchronous processing (EC) is performed
  - — The state of synchronous processing is checked and, in the case of an equivalency maintenance state, backup synchronous processing is suspended. Information such as time and backup volume of a copy target is simultaneously registered into backup history information. Backup forming this manner is called synchronous high speed backup. The backup will abort if an equivalency maintenance state is not reached.
  - — To use the Suspend/Resume function for synchronous high speed backup, execute the backup command with -suspend specified, and suspend backup synchronous processing.

  In both cases, a backup is established and access to the backup volume is available immediately after the command execution.

- ● When only tape is specified as the backup destination media
  Data is backed up directly from a transaction volume to tape regardless of the state of synchronous processing. No backup volume is used.

Before performing backup, AdvancedCopy Manager executes the backup pre-processing shell script (OpcBackup.pre) and tape copy pre-processing script (TapeCopy.pre). When backup is completed, it executes the backup post-processing shell script (OpcBackup.post) and tape copy post-processing script (TapeCopy.post).

For information on customizing these shell scripts, refer to "Pre-processing and Post-processing of Backup, Restoration, and Tape Copy".

a. Format

[For Solaris/Linux]

```
/opt/FJSVswstc/bin/acmbackup [-suspend | -T] [-m Media] [-o] [-w] [-b Backup-Type]
Device-Name [-Xdevmap Device-Map-File]
```

[For HP-UX/AIX]

```
/opt/FJSVswstc/bin/acmbackup [-suspend | -T] [-m Media] [-o] [-w] [-b Backup-Type]
Device-Name [-Xdevmap Device-Map-File]
```

[For Windows]

```
program-directory\bin\acmbackup [-suspend | -T] [-m Media] [-o] [-w] [-b Backup-Type]
Device-Name [-Xdevmap Device-Map-File] [-Xflush]
```

b.   Description of options

Option	Description
-Xdevmap	Specifies a target backup volume to perform the snapshot fast backup. In the operand, specify a device map file in which a combination of a transaction volume and a target backup volume is described. If this option is not specified, the target backup volume will be automatically selected by the backup function. To execute this command on a remote basis using the -h option, specify a device map file (of a Storage Server) using an absolute pathname. A file name specified in Device-Map-File must not include any national characters.
-Xflush	Specifies the flushing of the file system buffer of the transaction volume instead of locking the transaction volume. Before this option is specified, all write processing on the transaction volume must be stopped. (During a backup process where the write processing is not stopped, the reliability of the transaction volume data is not guaranteed.) The file system buffer can be flushed by specifying 'on' for BufferFlushOnly in the transaction volume locking specification file for backups instead of this option. For details, refer to "Transaction volume locking specification file for backups" in the "ETERNUS SF AdvancedCopy Manager Operator's Guide [For Windows]".
-suspend	This results in synchronous high-speed backup using the Suspend/Resume function. This option cannot be specified if the -T option has been specified.
-T	Specifies that the differential snapshot high-speed backup be executed. This option cannot be specified during synchronous processing. This option is valid only for copying within a cabinet when the ETERNUS storage system supports the QuickOPC function. If this option is not specified, ordinary snapshot processing (OPC without using the QuickOPC function) is started. This option must always be specified to perform backup using differential snapshots. This option cannot be specified if TAPE has been specified in the -m option. This option cannot be specified if the -suspend option has been specified.
-b	Specifies the management mode for writing backup data to tape. ● Specify GEN for generation management backup. ● Specify DAY for day management backup. If this option is omitted, tape backup is performed in generation management mode. If DISK is specified in the -m option, this option cannot be specified. If BOTH is specified in the -m option, DAY cannot be specified in this option. (*1)
-m	Specifies the type of backup destination media. ● Specify DISK for backup to disk. ● Specify TAPE for backup to tape. ● Specify BOTH for backup to disk and tape. If this option is omitted, backup is performed to both disk and tape.
-o	Specifies that backup data be saved to tape without waiting for OPC copying to be completed. Because this function causes writing backup data to tape to begin as soon as copying begins, it affects job server performance in regard to transaction volume access. This option can be specified only if BOTH is specified in the -m option or the -m option is omitted. This option cannot be specified for synchronous backup. If the option is omitted, the command waits for OPC copying to be completed.

Option	Description
-w	Specifies that the command not wait for writing to tape to be completed. If DISK or TAPE is specified in the -m option, this option cannot be specified. If this option is omitted, the command is completed after waiting for writing to tape to be completed.

*1 For backup to both disks and tape, you may want to perform day management backup to tape. In this case, execute acmbackup with DISK specified in the -m option to perform backup to disk only, then execute acmtphistcopy with DAY specified in the -b option to create a day management tape history.

c.   Description of operand

Operand	Description
Device-Name	For Solaris, Linux, HP-UX or AIX, specifies the block device name. For Windows, specifies the AdvancedCopy Manager device name. For details on the AdvancedCopy Manager device name, refer to "Managing a Device on AdvancedCopy Manager" in the "ETERNUS SF AdvancedCopy Manager Operator's Guide [For Windows]".

d.   End status
   = 0: Normal end
   > 0: Abnormal end

e.   Example
   Back up a transaction volume (/dev/dsk/c1t0d5s3) to both disk and tape. Perform generation management backup to tape. The command returns when backup to disk is complete.

```
# /opt/FJSVswstc/bin/acmbackup -m BOTH -b GEN -w /dev/dsk/c1t0d5s3
 /dev/dsk/c1t0d5s3 acmbackup completed
#
```

Back up a transaction volume "dev/dsk/c1t1d0s6" to tape in day management mode:

```
# /opt/FJSVswstc/bin/acmbackup -m TAPE -b DAY /dev/dsk/c1t1d0s6
/dev/dsk/c1t1d0s6 acmbackup completed
#
```


Note

To guarantee data, this command performs backup after inhibiting access to transaction and backup volumes from other processes. Thus, the drive letters of devices are not assigned. This command terminates with an error if a drive letter of a transaction volume is assigned or if:
   — The mount point has directories to which other volumes are to be mounted.
   — The volume has a file in use.

Note

To mount a transaction volume from a server other than the server on which this command is entered, unmount the transaction volume, using the backup administrator authority. If the transaction volume must not be unmounted, create backup copies with the following procedure:

1.   Execute the sync command to synchronize the transaction volume and file system.
2.   Execute this command.
3.   Execute the fsck command for the backup volume, and check the file system.

192

Note

You cannot perform backup in the following cases. In these cases, do as described in [System Administrator's Response] in the message that will be output

- — No backup policy has been specified for the transaction volume.
- — An error is detected during writing to tape.
- — The OPC Backup executed one generation earlier was unsuccessful.
- — Restore is currently being executed for the transaction volume that is targeted for processing.
- — The mount point set at registration of a transaction volume has been changed.
- — A device containing SynfinityFILE resources consisting of multiple transaction volumes is mounted.
- — Restoration is being executed using backup history information that will cause a generation overflow.
- — An unused backup volume could not be acquired to be used as the copying destination.
- — Any of the cabinet information (cabinet identifier, OLU number, EXTENT start position, and EXTENT size) of a transaction volume has been changed.
- — A backup volume defined as the copy destination is mounted.
- — The specified transaction volume is busy performing backup to tape, restoration from tape, copying to tape, or deletion of history information from tape.
- — The -suspend option is specified when the state is other than synchronous processing.
- — The -T option is specified when SDX objects are backed up on a logical volume basis (for Solaris only).

Note

In the following cases backup cannot be performed:

- — When the backup volume specified by the device map file (in the 'to' column) cannot be used in a pair with the transaction volume. This occurs if:
  - 1- The specified backup volume is in use, or
  - 2- The partition sizes of the operating volume and the backup volume are different.
- — When the device map file contains an error (refer to "Describing a device map file").
- — When the device map file name includes a national character
- — When an ordinary volume is specified as the transaction volume and a GDS logical volume as the backup volume.
- — When a GDS logical volume is specified as the transaction volume and an ordinary volume as the backup volume

Point

At this time, if existing backup history information satisfies the condition of the number of saved generations specified by the backup policy setting command, then information on the oldest generation is automatically deleted from the backup history information during the backup process, and the backup volume is cleared. However, if -suspend or -T is specified for the backup history information, then a backup volume with the Suspend or tracking state is not cleared and remains in use.

Note

As a result of backup, tape backup history information may exceed the number of preservation generations specified by the tape backup management class command. In this case, unlike for a backup to disk, the excess backup history information on tape is not immediately deleted. The Tape Server is automatically checked at a regular interval to determine whether the specified number of preservation generations has been exceeded. If it has been exceeded, the oldest history is deleted. For the settings for this automatic check, refer to "Setting of a Server Option File" in the "ETERNUS SF AdvancedCopy Manager Installation Guide".

Note

If backup to disk fails when backup to both disk and tape is specified, the command terminates without performing backup to tape.

In contrast, if backup to tape fails, backup to disk can still succeed.

Note

The transaction volume on which the backup command is executed, one other transaction volume, and the suspended or tracking backup volume cannot be specified as backup destinations in the device map file.

Note

Refer to "General Notes" for additional information on executing backup,.

Note

This command can only be executed while none of the following commands are running:
— Resource match command (swstsrsemtch)
— Device configuration command (acmdevinfoset)
— Storage Server configuration command (acmsvrset)
— Storage Server configuration command (swstsvrset)
— Device configuration command (swstdevinfoset)
— Resource backup command (swstresback)
— Resource restore command (swstresrst)

Note

The processing scripts are not executed before and after in the following case:
— The mirror slice of the SDX object is TEMP.

Note

On Solaris, differential snapshot fast backups cannot be performed during GDS linkage.

Point

In the case of a SynfinityFILE file system whose transaction volume consists of more than one device (multipartition), backup cannot be performed using pre-processing and post-processing scripts to execute unmount/mount.

In the case of a SynfinityFILE file system that consists of more than one device (multipartition), unmount the file system before backup is performed and mount it after backup is completed.

When the SynfinityFILE and AdvancedCopy Manager configurations are as follows:

```
# sfxinfo /dev/dsk/c1t3d10s1
ID    special                       size     mount    Type
0     /dev/dsk/c1t3d10s1(800019)    25986    /mnt     META
0     /dev/dsk/c1t3d10s1(800019)    105751   /mnt     DATA
1     /dev/dsk/c1t3d15s3(800028)    5120     /mnt     LOG
2     /dev/dsk/c1t3d16s3(800030)    131736   /mnt     DATA


# /opt/FJSVswstc/bin/acmdevdisp -t
Server Device              Size          Device-Mode Mount-Point (Method)
Backup-Engine
SV1    /dev/dsk/c1t3d10s1   128.0 Mbyte Transaction /mnt (ufs)
AdvancedCopy
SV1    /dev/dsk/c1t3d15s3     5.0 Mbyte Transaction /mnt (ufs)
AdvancedCopy
SV1    /dev/dsk/c1t3d16s3   128.0 Mbyte Transaction /mnt (ufs)
AdvancedCopy
```

Backup procedure

```
# umount /mnt
# /opt/FJSVswstc/bin/acmbackup /dev/dsk/c1t3d10s1
/dev/dsk/c1t3d10s1 acmbackup completed
# /opt/FJSVswstc/bin/acmbackup /dev/dsk/c1t3d15s3
/dev/dsk/c1t3d15s3 acmbackup completed
# /opt/FJSVswstc/bin/acmbackup /dev/dsk/c1t3d16s3
/dev/dsk/c1t3d16s3 acmbackup completed
# mount -F sfxfs /dev/dsk/c1t3d10s1 /mnt
#
```


Note

For notes of the backup with Windows, refer to "Backup execution command (swstbackup)" in the "ETERNUS SF AdvancedCopy Manager Operator's Guide [For Windows]".

11.2.2.2 Tape copy command (acmtphistcopy)

This command copies backup history information from disk to tape.

Data in the backup volume storing the backup history data of the specified disk is copied to tape. The data is managed with the same absolute generation number as the backup history of the copy source disk.

Backup history information cannot be copied unless a tape backup policy has been set.

A backup data management mode (generation management or day management) can be set. The default is generation management.

If generation management history for the specified backup already exists on tape, copying to tape with generation management specified cannot be performed. In this case, perform copying to tape with day management specified. In day management mode, the same history information can be copied as many times as desired.

a. Format

[For Solaris/Linux]

```
/opt/FJSVswstc/bin/acmtphistcopy [-b Backup-Type] [-g Generation-No | -v Version-No]
Device-Name
```

[For HP-UX/AIX]

```
/opt/FJSVswstc/bin/acmtphistcopy [-b Backup-Type] [-g Generation-No | -v Version-No]
Device-Name
```

[For Windows]

```
program-directory\bin\acmtphistcopy [-b Backup-Type] [-g Generation-No | -v
Version-No] Device-Name
```

b. Options

Option	Description
-b	Specifies the management mode for the data copied to tape. ● Specify GEN for generation management. ● Specify DAY for day management. The default is generation management.
-g	Specifies a relative generation number for the data copied to tape. Relative generation numbers can be checked with the "History information display command (acmhistdisp)". This option cannot be specified together with the -v option.
-v	Specifies an absolute generation number for the data copied to tape. Absolute generation numbers can be checked with the "History information display command (acmhistdisp)". This option cannot be specified together with the -g option.

Note: If the -g and -v options are omitted, the latest disk history information is copied to tape.

c. Operands

Operand	Description
Device-Name	For Solaris, Linux, HP-UX or AIX, specifies the block device name. For Windows, specifies the AdvancedCopy Manager device name. For details on the AdvancedCopy Manager device name, refer to "Managing a Device on AdvancedCopy Manager" in the "ETERNUS SF AdvancedCopy Manager Operator's Guide [For Windows]".

d. End status
   = 0: Normal end
   > 0: Abnormal end

e. Example
   Copy the latest backup of transaction volume "/dev/dsk/c1t0d0s6" to tape.

```
# /opt/FJSVswstc/bin/acmtphistcopy /dev/dsk/c1t0d0s6
/dev/dsk/c1t0d0s6 acmtphistcopy completed
#
```

With day management specified, copy the backup history with relative generation number 2 in a transaction volume (/dev/dsk/c1t0d5s3) to tape.

```
# /opt/FJSVswstc/bin/acmtphistcopy -g 2 -b DAY /dev/dsk/c1t0d5s3
/dev/dsk/c1t0d5s3 acmtphistcopy completed
#
```

Note

Backup data cannot be copied to tape in the following cases:
— When a tape backup policy has not been set.
— When the specified transaction volume is busy with backup to tape, restoration from tape, copying to tape, or deletion of history information from tape
— When an error is detected during writing to tape.

Note

This command can be executed only while none of the following commands are running:
— Resource match command (swstsrsemtch)
— Device configuration command (acmdevinfoset)
— Storage Server configuration command (acmsvrset)
— Storage Server configuration command (swstsvrset)
— Device configuration command (swstdevinfoset)
— Resource backup command (swstresback)
— Resource restore command (swstresrst)

11.2.2.3 Tape backup cancel command (acmtpcancelback)

The command cancels backup of transaction volume data or backup volume data directly to the tape.

Note

As a result of tape backup being cancelled under the following conditions, the maximum number of backup generations may be exceeded.

-The same number of generations of backup history information as that set as the number of preservation generations that existed at the start of tape backup,

-The tape backup is executed without specifying the data management method or by specifying the generation management as the data management method.

This command does not delete exceeded old history information. Therefore, by canceling the operation, the number of preservation generations may be exceeded if the write operation to the tape has been completed. In this instance, the history information deletion command must be used to delete unnecessary history information and re-start the backup operation.

a. Format

[For Solaris/Linux/HP-UX/AIX]

```
/opt/FJSVswstc/bin/acmtpcancelback Device-Name
```

[For Windows]

```
program-directory\bin\acmtpcancelback Device-Name
```

b. Description of operand

Operand	Description
Device-Name	For Solaris, Linux, HP-UX or AIX, specifies the block device name. For Windows, specifies the AdvancedCopy Manager device name. For details on the AdvancedCopy Manager device name, refer to "Managing a Device on AdvancedCopy Manager" in the "ETERNUS SF AdvancedCopy Manager Operator's Guide [For Windows]".

c. End status

= 0: Normal end

> 0: Abnormal end

d. Example

Cancel the tape backup operation of a transaction volume (/dev/dsk/c1t1d0s6).

```
# /opt/FJSVswstc/bin/acmtpcancelback /dev/dsk/c1t1d0s6
/dev/dsk/c1t1d0s6 acmtpcancelback completed
#
```

The tape backup operation cannot be cancelled when the specified transaction volume has not been backed up to a tape or not copied to a tape.

In this instance, a notification message "swstm0157 The corresponding processing is not started or is already ended." will be displayed and will terminate the operation (the end status is a normal end.)_

11.2.2.4 Restore command (acmrestore)

This command restores the data covered by backup history information. For restoration of disk data, the OPC function is used. For restoration of tape data, the backup data on tape is written directly to the restoration destination volume, and the recovery control file saved to tape during backup is also restored simultaneously.

The user can specify disk or tape as the restoration data source. If this option is omitted, data is restored from a disk if the history information is on the disk or from tape if the history information is on tape.

Note

Because copying is performed in units of devices, backup data cannot be restored in units of files.

When the restore command is executed, AdvancedCopy Manager first executes the restoration pre-processing shell script (OpcRestore.pre), copies data, and then executes the restoration post-processing shell script (OpcRestore.post). For information on customizing these scripts, refer to "Pre-processing and Post-processing of Backup, Restoration, and Tape Copy".

Point

A device that can be specified as a restoration destination must:

- be at least the same size as the original transaction volume
- be a volume other than a transaction volume
- contain no backup data
- not be under synchronous processing
- not be under restoration
- be the same size as the original transaction volume if restoration from a disk is performed, or be the same size as or larger than the original transaction volume if restoration from tape is performed

a. Format
   [For Solaris/Linux]

```
/opt/FJSVswstc/bin/acmrestore [-g Generation-No | -v Version-No | -t Backup-Time] [-m
Media] [-r Restore-Device-Name] [-f PhysicalIP-File] [-Xgds-softcopy] Device-Name
```

   [For HP-UX/AIX]

```
/opt/FJSVswstc/bin/acmrestore [-g Generation-No | -v Version-No | -t Backup-Time] [-m
 Media] [-r Restore-Device-Name] [-f PhysicalIP-File] [-Xgds-softcopy] Device-Name
```

   [For Windows]

```
program-directory\bin\acmrestore [-g Generation-No | -v Version-No | -t Backup-Time]
 [-m Media] [-r Restore-Device-Name] [-f PhysicalIP-File] [-Xgds-softcopy]
 Device-Name
```

b. Description of options

Option	Description
-g	Specifies the relative generation number of the data to be restored. Only data whose generation is managed can be specified in this option. To check the relative generation number, execute the "History information display command (acmhistdisp)". When this option is specified, the -m option must also be specified. This option cannot be specified together with the -v or -t option.
-v	Specifies the absolute generation number of the data to be restored. Only data whose generation is managed can be specified in this option. To check the relative generation number, execute the "History information display command (acmhistdisp)". This option cannot be specified together with the -g or -t option.

Option	Description
-t	Specifies the day management start date and time of the data to be restored. Only data subject to day management can be specified in this option. To check the day management start date and time, execute the "History information display command (acmhistdisp)". Specify the backup date and time in the "YYYY/MM/DD hh:mm:ss" format. YYYY: Year (four digits) MM: Month (two digits) DD: Day (two digits) hh: Hour (two digits) mm: Minute (two digits) ss: Seconds (two digits) This option cannot be specified together with the -g or -v option. If DISK is specified in the -m option, this option cannot be specified.
-m	Specifies the media from which restoration is to be performed. Specify DISK for restoration from a disk. Specify TAPE for restoration from tape. If this option is omitted, restoration is performed from a disk if the history information is on the disk or from tape if the history information is on tape. If the -t option is specified, restoration is always performed from tape even if this option is omitted.
-r	Specifies the restoration destination device for restoration to a device other than a transaction volume. This option cannot be specified for GDS logical volumes.
-Xgds-softcopy	Specifies that restoration be performed by software-based copying in GDS Snapshot linkage mode. If this option is omitted, restoration is performed by OPC. This option cannot be specified for restoration of history information on tape.
-f	Specifies the absolute path of the file that contains the physical IP address of a Storage Server. The file specified in this option must be allocated to the server on which the command is executed. Specify the option only when the Storage Server satisfies the following conditions: - The Storage Server is in a cluster system. - The cluster service is stopped. For information on the file that contains the physical IP address, refer to "Restoration from Tape when the Cluster Service is Stopped".

Note: If the -g, -v, and -t options are not specified, the latest history information subject to generation management is restored.

c. Description of operand

Operand	Description
Device-Name	For Solaris, Linux, HP-UX or AIX, specifies the block device name of transaction volume. For Windows, specifies the AdvancedCopy Manager device name. For details on the AdvancedCopy Manager device name, refer to "Managing a Device on AdvancedCopy Manager" in the "ETERNUS SF AdvancedCopy Manager Operator's Guide [For Windows]".

d. End status
   = 0: Normal end
   > 0: Abnormal end

e. Example

Restore data with relative generation number 2. For information on the relative generation number, refer to the data displayed by the "History information display command (acmhistdisp)".

```
# /opt/FJSVswstc/bin/acmrestore -g 2 -m DISK /dev/dsk/c1t0d0s6
/dev/dsk/c1t0d0s6 acmrestore completed
#
```

Restore the data that was backed up at 06:12:55 on February 2, 2005 under day management.

```
# /opt/FJSVswstc/bin/acmrestore -t "2005/02/02 06:12:55" /dev/dsk/c1t1d0s6
/dev/dsk/c1t1d0s6 acmrestore completed
#
```

If the Suspend/Resume function is used for the backup on the transaction volume, the suspended synchronous processing is deleted and the restore command is executed. For synchronous processing during suspend control, refer to the data displayed by the "Backup synchronous processing progress display command (acmsyncstat)". Execute the backup synchronous processing cancel command to cancel the synchronous processing.

```
# /opt/FJSVswstc/bin/acmsyncstat /dev/dsk/c1t0d0s6
Server Transaction-Disk  Backup-Disk       Status    Execute
serv1  /dev/dsk/c1t0d0s6 /dev/dsk/c1t0d2s5 suspend   ----
serv1  /dev/dsk/c1t0d0s6 /dev/dsk/c1t0d2s6 executing 75%
# /opt/FJSVswstc/bin/acmcancelsync -all /dev/dsk/c1t0d0s6
/dev/dsk/c1t0d0s6 acmcancelsync completed
# /opt/FJSVswstc/bin/acmsyncstat /dev/dsk/c1t0d0s6
Server Transaction-Disk  Backup-Disk Status Execute
serv1  /dev/dsk/c1t0d0s6 ----        ----   ----
# /opt/FJSVswstc/bin/acmrestore /dev/dsk/c1t0d0s6
/dev/dsk/c1t0d0s6 acmrestore completed
#
```

![Point icon]

On a transaction volume on which a file system has been constructed, restore a specific file as follows:

1. Mount a backup volume. Confirm the backup volume using the backup history list screen or the "History information display command (acmhistdisp)".
2. Copy the file to be restored, for example by executing the cp command.
3. Unmount the backup volume.

For the SynfinityFILE file system, follow the procedure below:

1. Execute the following commands for a backup volume:

```
# sfxadm RAW-device-name-of-the-backup-volume
# fsck -F sfxfs -o f  RAW-device-name-of-the-backup-volume
```

2. Mount the backup volume:

```
# mount -F sfxsfs backup-volume-name  mount-point-name
```

3. Copy the file to be restored, for example by executing the cp command.
4. Unmount the backup volume:

```
# unmount backup-volume-name or mount-point-name
```

Note

If a transaction volume is mounted from a server other than the server on which this command is entered, execute this command after unmounting the transaction volume, using the authority of the backup administrator.

Note

You cannot perform restoration or recovery in the following cases. In these cases, do as described in [System Administrator's Response] in the message that will be output.

- Both relative and absolute generation numbers have been specified.
- The specified backup history is not found.
- A device registered as a transaction volume has been specified in the -r option.
- When a device registered as a backup volume has been specified in the -r option, and the device has been registered in the backup registration information of a certain transaction volume. If you restore data to a backup volume without registered backup data, and the backup volume has been used to back up a certain transaction volume, then data will be overwritten. You are recommended not to specify a backup volume as a restore destination device.
- A slice including VTOC is specified for the -r option.
- The restoration is performed immediately after backup (during actual OPC copying) is performed (except when the combination of transaction volume and backup volume used for backup and restore is the same). In this case, perform restoration after the copying using OPC is completed. Alternatively, on a transaction volume on which a file system has been constructed, perform restoration according to the method described in the Point above.
- If the SynfinityFILE file system is already mounted before restoration of devices of the SynfinityFILE file system consisting of multiple partitions, unmount the SynfinityFILE file system, and then restore all devices that make up the SynfinityFILE file system.
- A transaction volume in the process of synchronous backup processing is specified.
- Any of the cabinet information (cabinet identifier, OLU number, EXTENT start position, and EXTENT size) of a transaction volume to be restored has been changed.
- The mount point set at registration of a transaction volume has been changed.
- An SDX object has been specified in a parameter in the -r option.
- The -Xgds-softcopy option is specified for a device that is not a GDS logical volume.
- A GDS logical volume is specified as the restoration destination volume of an ordinary transaction volume.
- If an error is detected during reading from tape
- If the specified transaction volume is busy in restoration from a backup tape (excluding a case in which the restoration destination is different), copying to tape, or deletion of history information from tape

Note

A suspended or tracking backup volume cannot be used as a restore destination volume.

Note

The restore command cannot be executed on a transaction volume during the synchronous processing (during copying by EC, in the equivalency maintenance status, in the Suspend state).

If the following error occurs during restore processing, then execute the backup synchronous processing cancel command (with the -all option specified) to cancel all of the synchronous processing of the transaction volume, and execute the restore command.

"swst0639 This Command cannot be run. This is because a copy is running."

or

"swst0634 OPC cannot be run. (SCSI command busy)"

Note

Refer to "General Notes" for additional information on executing restoration.

Note

This command can be executed only while none of the following commands are running:
- Storage Server configuration command (swstsvrset)
- Device configuration command (acmdevinfoset)
- Storage Server configuration command (acmsvrset)
- Device configuration command (swstdevinfoset)
- Resource match command (swstsrsemtch)
- Resource backup command (swstresback)
- Resource restore command (swstresrst)

Point

In the case of a SynfinityFILE file system that consists of more than one device (multipartition), backup cannot be performed using pre-processing and post-processing scripts to execute unmount/mount.
In this case, unmount the file system before restoration is performed and mount it after the restoration is completed.

When the SynfinityFILE and AdvancedCopy Manager configurations are as follows:

```
# sfxinfo /dev/dsk/c1t3d10s1
ID    special                    size    mount   Type
0     /dev/dsk/c1t3d10s1(800019)  25986   /mnt    META
0     /dev/dsk/c1t3d10s1(800019)  105751  /mnt    DATA
1     /dev/dsk/c1t3d15s3(800028)  5120    /mnt    LOG
2     /dev/dsk/c1t3d16s3(800030)  131736  /mnt    DATA


# /opt/FJSVswstc/bin/acmdevdisp -t
Server Device            Size         Device-Mode Mount-Point (Method)
Backup-Engine
SV1    /dev/dsk/c1t3d10s1  128.0 Mbyte Transaction /mnt (ufs)
AdvancedCopy
SV1    /dev/dsk/c1t3d15s3    5.0 Mbyte Transaction /mnt (ufs)
AdvancedCopy
SV1    /dev/dsk/c1t3d16s3  128.0 Mbyte Transaction /mnt (ufs)
AdvancedCopy
```

Restore procedure

```
# umount /mnt
# /opt/FJSVswstc/bin/acmrestore /dev/dsk/c1t3d10s1
/dev/dsk/c1t3d10s1 acmrestore completed
# /opt/FJSVswstc/bin/acmrestore /dev/dsk/c1t3d15s3
/dev/dsk/c1t3d15s3 acmrestore completed
# /opt/FJSVswstc/bin/acmrestore /dev/dsk/c1t3d16s2
/dev/dsk/c1t3d16s3 acmrestore completed
# mount -F sfxfs /dev/dsk/c1t3d10s1 /mnt
#
```


Point

When the SynfinityFILE file system is restored, the restore destination device may not be able to be mounted. In this event, use the following procedure to mount the device:

1. Execute the following on the restore destination device:

```
# sfxadm raw-device-name-of-restore-destination-device
```

2. Mount the restore destination device as follows:

```
# mount -F sfxfs restore-destination-device-name mount-point-name
```


Note

For details on how to use SDX objects of GDS, refer to "Configuration and conditions of unsupported SDX objects" and "Notes on SDX Object Operations".

For notes of the restore with Windows, refer to "Restore execution command (swstrestore)" in the "ETERNUS SF AdvancedCopy Manager Operator's Guide [For Windows]".

11.2.2.5 Restore cancellation command (swstcancelrest)

This command cancels OPC-based restoration.
For more information, refer to "Restore cancellation command (swstcancelrest)" in the "ETERNUS SF AdvancedCopy Manager Operator's Guide" for the operating system of the target Server.

Restoration from tape cannot be canceled.

11.2.2.6 Tape restore cancel command (acmtpcancelrest)

This command cancels restoration from the tape.

Because a part of the data would have been copied before this command is used to cancel restoration of data from the tape, the status of the transaction volume will be incomplete and so it cannot be used. The data must be restored using the restore command (acmrestore) once again.

a. Format
    [For Solaris/Linux/HP-UX/AIX]

/opt/FJSVswstc/bin/acmtpcancelrest [-g Generation-No | -v Version-No | -t Backup-Time] [-r Restore-Device-Name] Device-Name

    [For Windows]

program-directory\bin\acmtpcancelrest [-g Generation-No | -v Version-No | -t Backup-Time] [-r Restore-Device-Name] Device-Name

b. Description of options

Option	Description
-g	Specifies the relative generation number of data being restored. This option cannot be specified together with the -v or -t option. To check the relative generation number, specify the -l option and execute the "tape execution history display command (acmtpreqstat)".
-v	Specifies the relative generation number of data being restored. This option cannot be specified together with the -g or -t option. To check the relative generation number, specify the -l option and execute the "tape execution history display command (acmtpreqstat)".

Option	Description
-t	Specifies the start date and time of the day management in the data to be restored. This option cannot be specified together with the -g or -v option. To check the start date and time of the day management, specify the -l option and execute the "tape execution history display command (acmtpreqstat)". Specify the start date and time of the day management in the "YYYY/MM/DD hh:mm:ss" format. The "YYYY/MM/DD hh:mm:ss" format is as follows: YYYY: Year (four digits) MM: Month (two digits) DD: Day (two digits) hh: Hour (two digits) mm: Minute (two digits) ss: Seconds (two digits)
-r	Specifies the name of the device when restored to a device other than a transaction volume. To check the device name, specify the -l option and execute the "tape execution history display command (acmtpreqstat)".

Note: If none of the -g, -v, and -t options is specified, restoration of the backup history that is managed by the generation will be cancelled.

c. Description of operand

Operand	Description
Device-Name	For Solaris, Linux, HP-UX or AIX, specifies the block device name of transaction volume. For Windows, specifies the AdvancedCopy Manager device name. For details on the AdvancedCopy Manager device name, refer to "Managing a Device on AdvancedCopy Manager" in the "ETERNUS SF AdvancedCopy Manager Operator's Guide [For Windows]".

d. End status
   =0: Normal end
   >0: Abnormal end

e. Example
   Cancel the tape restoration operation of history information with the absolute generation number 1 in the transaction volume (/dev/dsk/c1t1d0s6).

```
# /opt/FJSVswstc/bin/acmtpcancelrest -v 1 /dev/dsk/c1t1d0s6
/dev/dsk/c1t1d0s6 acmtpcancelrest completed
#
```


Note

The tape restore operation cannot be cancelled when the specified transaction volume has not been restored from a tape.
In this instance, a notification message "swstm0157 The corresponding processing is not started or is already ended." will be displayed and will terminate the operation (the end status is a normal end.)_

11.2.2.7 Restore execution status display command (swstreststat)

This command displays the progress of restoration from the disk.

For more information, refer to "Restore execution status display command (swstreststat)" in the "ETERNUS SF AdvancedCopy Manager Operator's Guide" for the operating system of the target Server.

The progress of restoration from tape is not displayed.

11.2.2.8 Tape execution history display command (acmtpreqstat)

The command displays the execution status of the processing by the tape manager currently in progress.

The command displays the execution status of the following:
- ● Direct tape backup from the transaction volume
- ● Copying data from the backup volume to the tape
- ● Restoration data from the tape
- ● Deletion of the backup history information on the tape

This command displays information on the executed processing from the latest.

a. Format

[For Solaris/Linux/HP-UX/AIX]

```
/opt/FJSVswstc/bin/acmtpreqstat [-l] [-v] [Device-Name]
```

[For Windows]

```
program-directory\bin\acmtpreqstat [-l] [-v] [Device-Name]
```

b. Description of options

Option	Description
-l	In addition to the tape execution history information, displays the command option specified when the command was executed
-v	Displays the details of the tape execution history information

c. Description of operand

Operand	Description
Device-Name	For Solaris, Linux, HP-UX, or AIX, specifies the block device name. For Windows, specifies the AdvancedCopy Manager device name. For details on the AdvancedCopy Manager device name, refer to "Managing a Device on AdvancedCopy Manager" in the "ETERNUS SF AdvancedCopy Manager Operator's Guide [For Windows]". If this operand is omitted, the tape execution history of all the transaction volumes will be displayed.

d. End status

=0: Normal end
>0: Abnormal end

e. Example

Display the tape execution history information of all transaction volumes.

```
# /opt/FJSVswstc/bin/acmtpreqstat
Server    Transaction-Volume  Request  Execute-Date      Status
server01  /dev/dsk/c1t1d22s1  Delete   2007/02/22 09:15  Deleting
```

207

```
server01  /dev/dsk/c1t1d20s1  Backup    2007/02/22 09:00  Preprocessing
server01  /dev/dsk/c1t1d23s1  Restore   2007/02/22 08:00  Reading( 90%)
#
```

Display the tape execution history information of the transaction volume
(/dev/dsk/c1t1d0s6) and the command options by specifying the -l option.

```
# /opt/FJSVswstc/bin/acmtpreqstat -l /dev/dsk/c1t1d23s1
Server    Transaction-Volume  Request  Execute-Date      Status        CmdOptions
server01  /dev/dsk/c1t1d23s1  Restore  2007/02/22 08:00  Reading( 90%) [-v 10 -r
/dev/dsk/c1t1d24s1]
#
```

Display the detailed tape execution history information of the transaction volume
(/dev/dsk/c1t1d0s6) by specifying the -v option.

```
# /opt/FJSVswstc/bin/ acmtpreqstat -v /dev/dsk/c1t1d20s1
Server    Transaction-Volume  Request  Execute-Date     End-Date  Status
Pool-Name Message
server01  /dev/dsk/c1t1d20s1  Backup  2007/02/22 09:00  ----/--/-- --:--
 Preprocessing  POOL01 ----
#
```

The contents displayed are as follows:

Key word	Description
Server	Displays the Storage Server name
Transaction-Volume	For Solaris, Linux, HP-UX or AIX, displays the device name
	For Windows, displays the AdvancedCopy Manager device name
Request	Displays the processing name with the character strings shown below:
	"Backup": Backup on the tape, copy to the tape
	"Restore": Restore from the tape
	"Delete": Delete the tape history information
Execute-Date	Displays the time and date when the tape manager accepted the processing
	Displays in the " YYYY/MM/DD hh:mm" format
	YYYYY indicates the year, MM indicates the month, DD indicates the day,
	hh indicates the hour and mm indicates the minute.
	The system time and date of the server will be displayed as the time and
	date.
End-Date	Displays the time and date when the tape manager ended the processing.
	Displays in the " YYYY/MM/DD hh:mm" format.
	YYYYY indicates the year, MM indicates the month, DD indicates the day,
	hh indicates the hour and mm indicates the minute.
	The system time and date of the server will be displayed as the time and
	date. Displays only when the -v option is specified.
	If the processing has not ended, displays "----/--/-- --:--"

Key word	Description
Status	Displays the execution status of the processing or the progress rate of the write operation to the tape or the read operation from the tape with the character strings shown below: "Preprocessing": Pre-processing of backup/restore is being executed "Writing(xxx%)": Progress status of the tape write operation "Reading(xxx%)": Progress status of the tape read operation "Waiting-tape(xxx%)": Progress status of the tape write/read operation before the tape wait status is reached "Postprocessing": Post-processing of backup/restore is being executed "Cancel": Canceling of backup/restore is being executed "Deleting": Deletion of tape history information is being executed
Pool-Name	Displays the storage pool name of the tape backup destination Displays when the processing name is "Backup" Displays "----" if the processing name is "Restore" and "Delete" or "Backup" but the tape write operation has not started Displays only when the -v option is specified
CmdOptions	Displays the option and the value of the option specified Displays only when the -l option is specified
Message	Displays a warning message or an error message "::" is displayed at the end of messages. If multiple messages are output, "::" is also displayed between messages. Displays "----" if the message doest not exist Displays only when the -v option is specified

11.2.2.9 History information display command (acmhistdisp)

This command displays history information that has been backed up.
Generation management information is displayed after "Generation Management Backup" is output. Day management information is displayed after "Day Management Backup" is output.

a. Format

[For Solaris/Linux]

```
/opt/FJSVswstc/bin/acmhistdisp [-l] [Device-Name]
```

[For HP-UX/AIX]

```
/opt/FJSVswstc/bin/acmhistdisp [-l] [Device-Name]
```

[For Windows]

```
program-directory\bin\acmhistdisp [-l] [Device-Name]
```

b. Description of options

Option	Description
-l	Displays detailed history information about a backup to tape.

c. Description of operand

Operand	Description
Device-Name	For Solaris, Linux, HP-UX or AIX, specifies the block device name. For Windows, specifies the AdvancedCopy Manager device name. For details on the AdvancedCopy Manager device name, refer to "Managing a Device on AdvancedCopy Manager" in the "ETERNUS SF AdvancedCopy Manager Operator's Guide [For Windows]". If this operand is omitted, the backup history information of all the transaction volumes will be displayed.

d. End status

   = 0: Normal end

   > 0: Abnormal end

e. Example

   Display the backup history information of all the transaction volumes.

```
# /opt/FJSVswstc/bin/acmhistdisp
Generation Management Backup
Server = StrgSV01 Device=/dev/dsk/c1t0d0s6 Mount-Point=/mnt/Tran1 (ufs)
Generation Version Backup-Date     Backup-Device     Status     Execute
Tape-Gen
   1          10    2004/11/12 22:00 /dev/dsk/c1t0d2s6 succeeded ----        1
   2          9     2004/11/11 22:00 /dev/dsk/c1t0d4s6 succeeded ----        2
   -          8     2004/11/10 22:00 -                 succeeded ----        3


Day Management Backup
Server=StrgSV01 Device=/dev/dsk/c1t0d0s6 Mount-Point=/mnt/Tran1 (ufs)
TapeCopy-Date         Backup-Date        Expiration-Date
2004/11/01 09:35:02  2004/11/01 09:30   2004/12/01 09:35:02
#
```

Display detailed backup history information for a transaction volume
(/dev/dsk/c1t1d10s1), using the -l option.

```
# /opt/FJSVswstc/bin/acmhistdisp -l /dev/dsk/c1t1d10s1
Generation Management Backup
Server = StrgSV01 Device=/dev/dsk/c1t1d10s1 Mount-Point=/work1 (ufs)
Generation Version Backup-Date     Backup-Device     Status     Execute
Tape-Gen CopyID Pool-Name  Backup-Tape
   1          10    2000/11/12 21:00 /dev/dsk/c1t0d2s6 executing  75          1
 1      TapePool4  LT00059
   2          9     2000/11/11 21:00 /dev/dsk/c1t0d4s6 succeeded ----        2
1      TapePool4  LT00059


Day Management Backup
Server = StrgSV01 Device=/dev/dsk/c1t1d10s1 Mount-Point=/work1 (ufs)
TapeCopy-Date         Backup-Date        Expiration-Date        Pool-Name
Backup-Tape
2004/03/01 10:35:02  2004/03/01 10:30   2004/03/08 10:35:02   TapePool5  LT00040
#
```

The table below lists displayed information items for a generation management backup.

Keyword	Description
Server	Displays a Storage Server name.
Device	For Solaris, Linux, HP-UX or AIX, displays a device name.
	For Windows, displays the AdvancedCopy Manager device name.
Mount-Point	For Solaris, Linux, HP-UX or AIX, displays the mount point name of the device and the file system type in parentheses.
	For Windows, displays the drive letter of a device. The file system type of the device is displayed inside the parentheses.

Keyword	Description
Generation	Displays the relative generation number of disk backup data. The most recent backup history of backups is "1", and the generation indicates how many generations earlier the target backup history is in relation to "1". This item is displayed only for backup data on a disk.
Version	Displays the absolute generation number.
Backup-Date	Displays the date and time of backup completion in the "YYYY/MM/DD hh:mm" format. YYYY is the year, MM is the month, DD is the day, hh is the hour, and mm is the minute. For a backup performed only to disk, or to both disk and tape, the system date and time of the Storage Server is displayed. For a backup performed only to tape, the system date and time of the Tape Server is displayed.
Backup-Device	Displays the backup volume name. This item is displayed only for backup data on a disk.
Status	The copying progress is indicated by one of the following character strings: "succeeded": OPC copying is completed. "executing": OPC copying is in progress. "failed": OPC copying has been interrupted by an error. "halt": OPC copying is in the halt state. "gds-error": GDS copying has ended abnormally. This item is displayed only for backup data on a disk.
Execute	Displays how much has been copied in percentage terms if "executing" is displayed in the Status field. If a string other than "executing" is displayed in the Status field, "----" is displayed. This item is displayed only for backup data on a disk.
Tape-Gen	Displays the relative generation number of backup data on tape. This option displays the relative number of the generation of the target backup history, assuming that the latest backup history is 1. This item is displayed only for backup data on tape.
CopyID	Displays the tape copy ID (fixed to 1). This item is displayed only for backup data on tape. The item is displayed only if the -l option is specified.
Pool-Name	Displays the name of the storage pool to which tape backup was performed. This item is displayed only for backup data on tape. The item is displayed only if the -l option is specified.
Backup-Tape	Displays the name of the tape volume to which backup was performed. If multiple tape volumes are applicable, their displayed names are delimited by a comma (,). This item is displayed only for backup data on tape. The item is displayed only if the -l option is specified.

The table below lists displayed information items for day management backup.

Keyword	Description
Server	Displays a Storage Server name.
Device	For Solaris, Linux, HP-UX or AIX, displays a device name. For Windows, displays the AdvancedCopy Manager device name.
Mount-Point	For Solaris, Linux, HP-UX or AIX, displays the mount point name of the device and shows the file system type in parentheses. For Windows, displays the drive letter of a device. The file system type of the device is displayed inside parentheses.

Keyword	Description
TapeCopy-Date	Displays the start date and time of day management backup to tape in the "YYYY/MM/DD hh:mm:ss" format. YYYY is the year, MM is the month, DD is the day, hh is the hour, mm is the minute, and ss is the seconds. The date and time of the Tape Server is displayed.
Backup-Date	Displays the date and time of completion of backup in the "YYYY/MM/DD hh:mm" format. YYYY is the year, MM is the month, DD is the day, hh is the hour, and mm is the minute. For a backup performed only to disk, or to both disk and tape, the system date and time of the Storage Server is displayed. For a backup performed only to tape, the system date and time of the Tape Server is displayed.
Expiration-Date	Displays the expiry date and time of day management backup to tape in the "YYYY/MM/DD hh:mm:ss" format. YYYY is the year, MM is the month, DD is the day, hh is the hour, mm is the minute, and ss is the seconds. The date and time of the Tape Server is displayed. If "NoLimit" is specified for the number of preservation days in the tape backup management class, "Never" is displayed.
Pool-Name	Displays the name of the storage pool to which tape backup was performed. This item is displayed only if the -l option is specified.
Backup-Tape	Displays the name of the tape volume to which backup was performed. If multiple tape volumes are applicable, their displayed names are delimited by a comma (,). This item is displayed only if the -l option is specified.

Note

If "failed" or "halt" is displayed in the "Status" field, a hardware error may have occurred. Refer to "Troubleshooting for a Hardware Error, etc. occurring during backup".

Note

If "gds-error" is displayed in the Status field, a problem with GDS is assumed to have occurred. Correct the cause of the GDS problem, and take action as follows:

— If backup synchronous processing is being executed, cancel it using the "Backup synchronous processing cancel command (acmcancelsync)".
— If snapshot backup is being executed, delete the backup history information using the "History information delete command (acmhistdel)".
— If restoration is in progress, execute the "Resource match command (swstsrsemtch)", and perform restoration again.

11.2.2.10 History information delete command (acmhistdel)

This command deletes backup history information.
In cases involving a disk backup history, deleting history information for a backup volume causes the volume to be released and become an empty backup volume.
In cases involving a tape backup history, deleting history information from a tape area causes the area to become free. If backup data remains after the tape area becomes free, the area cannot be reused.

If a backup history is on both disk and tape, the user can delete the backup history from either of them.

If "failed" is displayed in the "Status" field by the "History information display command (acmhistdisp)", a hardware failure is assumed. Refer to "Troubleshooting for a Hardware Error, etc. occurring during backup".

a.   Format
    [For Solaris/Linux]

```
/opt/FJSVswstc/bin/acmhistdel {-g Generation | -v Version | -z} -m DISK [-emergency]
 Device-Name
/opt/FJSVswstc/bin/acmhistdel {-g Generation | -v Version | -t TapeCopy-Date | -z}
 -m TAPE Device-Name
/opt/FJSVswstc/bin/acmhistdel {-g Generation | -v Version| -z} [-m BOTH] [-emergency]
 Device-Name
```

    [For HP-UX/AIX]

```
/opt/FJSVswstc/bin/acmhistdel {-g Generation | -v Version | -z} -m DISK [-emergency]
 Device-Name
/opt/FJSVswstc/bin/acmhistdel {-g Generation | -v Version | -t TapeCopy-Date | -z}
 -m TAPE Device-Name
/opt/FJSVswstc/bin/acmhistdel {-g Generation | -v Version| -z} [-m BOTH] [-emergency]
 Device-Name
```

    [For Windows]

```
program-directory\bin\acmhistdel {-g Generation | -v Version | -z} -m DISK
 [-emergency] Device-Name
program-directory\bin\acmhistdel {-g Generation | -v Version | -t TapeCopy-Date | -z}
-m TAPE Device-Name
program-directory\bin\acmhistdel {-g Generation | -v Version| -z} [-m BOTH]
 [-emergency] Device-Name
```

b.   Description of options

Option	Description
-g	Specifies the relative generation number of history information for the generation management backup to be deleted. When this option is specified, the -m option must also be specified. This option cannot be specified together with the -v, -z or -t option. To check the relative generation number, execute the "History information display command (acmhistdisp)".
-v	Specifies the absolute generation number of the history information for the generation management backup to be deleted. This option cannot be specified together with the -g, -z or -t option. To check the absolute generation number, execute the "History information display command (acmhistdisp)".

Option	Description
-t	Specifies the backup date and time of the day management backup history to be deleted. To check the backup date and time, execute the "History information display command (acmhistdisp)". Specify the backup date and time in the "YYYY/MM/DD hh:mm:ss" format. YYYY: Year (four digits) MM: Month (two digits) DD: Day (two digits) hh: Hour (two digits) mm: Minute (two digits) ss: Seconds (two digits) This option cannot be specified together with the -g, -v or -z option.
-z	Specifies that all backup history information be deleted. This option cannot be specified together with the -g, -v, -t or -c option.
-m	Specifies the media from which backup data is to be deleted. ● Specify DISK to delete the backup data and its history information from a disk. ● Specify TAPE to delete the backup data and its history information from tape. ● Specify BOTH to delete the backup data and its history from both disk and tape. If multiple backup data items have been saved to tape, all of them are deleted. If this option is omitted, the backup data and its history information saved to both disk and tape are deleted. BOTH can be specified only if the -v or -z option is specified.
-emergency	Specifies that the command be executed in emergency mode. OPC session confirmation is not performed in this mode. If TAPE is specified in the -m option, this option cannot be specified.

c.   Description of operand

Operand	Description
Device-Name	For Solaris, Linux, HP-UX or AIX, specifies the block device name. For Windows, specifies the AdvancedCopy Manager device name. For details on the AdvancedCopy Manager device name, refer to "Managing a Device on AdvancedCopy Manager" in the "ETERNUS SF AdvancedCopy Manager Operator's Guide [For Windows]".

d.   End status

    = 0: Normal end
    > 0: Abnormal end

e.   Example

    Delete the backup history of absolute generation number 10 in a transaction volume
    (/dev/dsk/c1t0d0s6).

```
# /opt/FJSVswstc/bin/acmhistdel -v 10 /dev/dsk/c1t0d0s6
/dev/dsk/c1t0d0s6 acmhistdel completed
#
```

Delete the disk backup history information with relative generation number 2 of a transaction volume (/dev/dsk/c1t0d0s6).

```
# /opt/FJSVswstc/bin/acmhistdel -g 2 -m DISK /dev/dsk/c1t0d0s6
/dev/dsk/c1t0d0s6 acmhistdel completed
#
```

Delete the backup history information whose day management start time is 06:12:55, February 2, 2005 in a transaction volume (/dev/dsk/c1t0d5s3).

```
# /opt/FJSVswstc/bin/acmhistdel -t "2005/02/02 06:12:55" c1t0d5s3
/dev/dsk/c1t0d5s3 acmhistdel completed
#
```

Note

You cannot delete backup history information if:
- — The backup history information specified by the -g, -v, -t or -z option is not found.
- — The specified backup history information is used in restoration.
- — The -t option is specified for deleting the history of a generation management backup.
- — The -v, -g or -m option is specified for deleting the history of a day management backup.
- — None of the -z, -g, -v, -t or -d options is specified.
- — The -m option is not specified and a relative generation number is specified.

Note

The user may simultaneously set copy storage pools and write history information to multiple storage pools. In this case, history information cannot be deleted in storage pool units.

Note

OPC sessions are neither confirmed nor cancelled by execution in emergency operation mode. If an OPC session is in the error suspended state or halt state, then unmanaged sessions remain. In this event, ETERNUSmgr or GRmgr must be used to cancel these sessions.

Execution is not possible in emergency operation mode for a transaction volume on a machine in the SP series.

Point

Deleting the suspended history information does not cancel the synchronous processing (EC session).

Deleting the tracking history information does not cancel the tracking processing (OPC session).

Point

In synchronous high-speed backup with -suspend specified, the backup volume remains in use even after the history information is deleted.

In differential snapshot high-speed backup with -T specified, the backup volume remains in use even after the history information is deleted.

Note

If history information for which the OPC physical copy has not completed is deleted during backups, (other than differential snapshot fast backups), the physical copy for the deleted history information will be terminated. Data in the backup volume is incomplete because of the unfinished copying.

The backup volume enters the unused state when the history information is deleted. It becomes available when the next backup is performed.

For differential snapshot fast backups, OPC physical copies continue even if their history information is deleted before they complete.

The backup volume remains in use even after the history information is deleted, and is still available for backing up the associated transaction volume.

Note

This command can be executed only while none of the following commands are running:

- Resource match command (swstsrsemtch)
- Device configuration command (acmdevinfoset)
- Storage Server configuration command (acmsvrset)
- Storage Server configuration command (swstsvrset)
- Device configuration command (swstdevinfoset)
- Resource backup command (swstresback)
- Resource restore command (swstresrst)

Note

For details on how to use SDX objects of GDS, refer to "Configuration and conditions of unsupported SDX objects" and "Notes on SDX Object Operations".

11.2.2.11 Backup synchronous processing start command (acmstartsync)

This command starts backup synchronous processing (disk-to-disk copy using EC).

For a GDS transaction volume, synchronous processing by software-copy is also possible.

a. Format

[For Solaris/Linux]

```
/opt/FJSVswstc/bin/acmstartsync [-Xgds-softcopy | -Xgds-selectcopy] Device-Name
  [-Xdevmap Device-Map-File]
```

[For HP-UX/AIX]

```
/opt/FJSVswstc/bin/acmstartsync [-Xgds-softcopy | -Xgds-selectcopy] Device-Name
  [-Xdevmap Device-Map-File]
```

[For Windows]

```
program-directory\bin\acmstartsync [-Xgds-softcopy | -Xgds-selectcopy] Device-Name
  [-Xdevmap Device-Map-File]
```

b.   Description of options

Option	Description
-Xdevmap	Specifies a target backup volume to perform the backup synchronous processing. In the operand, specify a device map file in which a combination of a transaction volume and a target backup volume is described. If this option is not specified, the target backup volume will be automatically selected. To execute this command on a remote basis using the -h option, specify a device map file (of a Storage Server) using an absolute pathname. A file name specified in Device-Map-File must not include any national characters.
-Xgds-softcopy	Specifies the start of backup synchronous processing of an SDX object and use of the software-copy function instead of the advanced copy function. If you specify this option to start differential copying when the advanced copy function is being used, advanced copy processing stops and software-copy processing starts. You can specify the option when the function in linkage with GDS Snapshot is being used.
-Xgds-selectcopy	Specifies that GDS select the copy processing method of an SDX object. You can specify the option when the function is being used in linkage with GDS Snapshot.

c.   Description of operand

Operand	Description
Device-Name	For Solaris, Linux, HP-UX or AIX, specifies the block device name. For Windows, specifies the AdvancedCopy Manager device name. For details on the AdvancedCopy Manager device name, refer to "Managing a Device on AdvancedCopy Manager" in the "ETERNUS SF AdvancedCopy Manager Operator's Guide [For Windows]".

d.   End status

   = 0: Normally end
   〉0: Abnormally end

e.   Example
   Start synchronous backup processing of a transaction volume (/dev/dsk/c1t0d0s6).

```
# /opt/FJSVswstc/bin/acmstartsync /dev/dsk/c1t0d0s6
/dev/dsk/c1t0d0s6 acmstartsync completed.
#
```

   Backup synchronous processing of a logical volume (/dev/sfdsk/CLS01/dsk/VOL01) of an SDX object is started. The copy processing method is software-copy.

```
# /opt/FJSVswstc/bin/acmstartsync -Xgds-softcopy /dev/sfdsk/CLS01/dsk/VOL01
/dev/sfdsk/CLS01/dsk/VOL01 acmstartsync completed.
#
```

   Backup synchronous processing of a logical volume (/dev/sfdsk/CLS01/dsk/VOL01) of an SDX object is started, and GDS selects the copy processing method.

```
# /opt/FJSVswstc/bin/acmstartsync -Xgds-selectcopy /dev/sfdsk/CLS01/dsk/VOL01
/dev/sfdsk/CLS01/dsk/VOL01 acmstartsync completed
#
```

Note

When you execute this command for a transaction volume to which the backup synchronous processing is being executed, the message, "swst0301 Backup synchronous processing is being executed" is output and then the command is terminated normally.

You cannot start backup synchronous processing in the following cases. In any of the cases below, take an action according to the "System administrator response" message that will be displayed.
  — A device that does not support the EC function (no linkage with GDS Snapshot) is specified.
  — When the backup volumes required to start backup synchronous processing cannot be obtained.
  — When specifying a device that is being restored by OPC.
  — When mounting the backup volume to which data is copied.
  — The -Xgds-softcopy option is specified for a device that is not a GDS logical volume. Alternatively, the -Xgds-selectcopy option is specified for a device that is not a GDS logical volume.
  — For Windows, when a backup volume could not be locked.
  — For Windows, when the backup volume locking specification file for backups is invalid.

If a suspended backup volume is the transaction volume at the start of the synchronous processing, then the suspended backup volume is selected as the backup destination with the highest priority, and the synchronous processing restarts (ie, differential copy starts). Otherwise, the synchronous processing starts (ie, a full copy is performed).

Even if already in use, the transaction volume where the synchronous processing started, and the suspended backup volume can be used as backup destinations.

Except for the transaction volume where the synchronous processing started, and the suspended backup volume, transaction volumes cannot be specified as backup destinations in the device map file.

In the following cases, backup synchronous processing with the output destination backup volume specified cannot be started:
  — The backup volume specified in the device map file cannot be used as the backup volume to be paired with the transaction volume. This occurs if either of the following conditions is not met:
    (ア) The specified backup volume is in the unused state.

218

（イ）The transaction volume and backup volume have the same partition size.
- ─ The target transaction volume is incorrectly described in the device map file (Refer to "Describing a device map file").
- ─ Any national language character is included in the device map file name.
- ─ An ordinary volume is specified as the transaction volume and a GDS logical volume as the backup volume.
- ─ A GDS logical volume is specified as the transaction volume and an ordinary volume as the backup volume.

Note

If any of the following commands is running, this command cannot be executed:
- ─ Resource match command (swstsrsemtch)
- ─ Device configuration command (acmdevinfoset)
- ─ Storage Server configuration command (acmsvrset)
- ─ Storage Server configuration command (swstsvrset)
- ─ Device configuration command (swstdevinfoset)
- ─ Resource backup command (swstresback)
- ─ Resource restore command (swstresrst)

Note

For details on how to use SDX objects of GDS, refer to "Configuration and conditions of unsupported SDX objects" and "Notes on SDX Object Operations".

11.2.2.12 Backup synchronous processing cancel command (acmcancelsync)

Backup synchronous processing may be canceled during copying by EC, under the equivalency maintenance status, or while the Suspend state is set. Specifying cancellation of all of the synchronous processing cancels all of the backup synchronous processing including those in the Suspended state.

If the system detects an error while backup synchronous processing is being executed, the copying being performed at that time terminates abnormally. In this case, use this command to cancel the backup synchronous processing. The "Backup synchronous processing progress display command (acmsyncstat)" can be used to check for errors.

a. Format
   [For Solaris/Linux]

   /opt/FJSVswstc/bin/acmcancelsync [-emergency] [-bd *Backup-Device-Name* | -all] *Device-Name*

   [For HP-UX/AIX]

   /opt/FJSVswstc/bin/acmcancelsync [-emergency] [-bd *Backup-Device-Name* | -all] *Device-Name*

   [For Windows]

   program-directory\bin\acmcancelsync [-emergency] [-bd *Backup-Device-Name* | -all] *Device-Name*

b. Description of options

Option	Description
-emergency	Specifies that the command should operate in emergency operation mode. In such cases, EC sessions are neither confirmed nor cancelled. If this option is specified for a volume on a machine in the SP-series it will be ignored.
-bd	The synchronous processing on a specific backup volume can be cancelled. To do so, specify the backup volume name in an operand. The backup volume name and -all option cannot be specified together.
-all	All of the synchronous processing of the transaction volume can be specified to be cancelled. This specification and the -bd option cannot be specified together.

c. Description of operand

Operand	Description
Device-Name	For Solaris, Linux, HP-UX, or AIX, specifies the block device name. For Windows, specifies the AdvancedCopy Manager device name. For details on the AdvancedCopy Manager device name, refer to "Managing a Device on AdvancedCopy Manager" in the "ETERNUS SF AdvancedCopy Manager Operator's Guide [For Windows]". The partition name is specified for the SDX object.
Backup-Device-Name	Specify the copy destination backup volume name. Specify the block device name for the specified device.

d. End status

   = 0: Normally end

   > 0: Abnormally end

e. Example

Cancel synchronous backup processing of a transaction volume (/dev/dsk/c1t0d0s6).

```
# /opt/FJSVswstc/bin/acmcancelsync /dev/dsk/c1t0d0s6
/dev/dsk/c1t0d0s6 acmcancelsync completed.
#
```

Backup synchronous processing of transaction volume (/dev/dsk/c1t0d0s6) is cancelled in emergency operation mode.

```
# /opt/FJSVswstc/bin/acmcancelsync -emergency /dev/dsk/c1t0d0s6
/dev/dsk/c1t0d0s6 acmcancelsync completed.
#
```

The backup synchronous processing of the backup volume (/dev/dsk/c1t0d2s6) can be specified to be canceled from the transaction volume (/dev/dsk/c1t0d0s6).

```
# /opt/FJSVswstc/bin/acmsyncstat /dev/dsk/c1t0d0s6
Server Transaction-Disk  Backup-Disk       Status   Execute
Work2  /dev/dsk/c1t0d0s6 /dev/dsk/c1t0d2s5 suspend   ----
Work2  /dev/dsk/c1t0d0s6 /dev/dsk/c1t0d2s6 executing 75%
# /opt/FJSVswstc/bin/acmcancelsync /dev/dsk/c1t0d0s6 -bd /dev/dsk/c1t0d2s6
/dev/dsk/c1t0d0s6 acmcancelsync completed.

# /opt/FJSVswstc/bin/acmsyncstat /dev/dsk/c1t0d0s6
Server Transaction-Disk  Backup-Disk       Status   Execute
Work2  /dev/dsk/c1t0d0s6 /dev/dsk/c1t0d2s5 suspend ----
#
```

All of the backup synchronous processing of the transaction volume (/dev/dsk/c1t0d0s6) can be specified to be cancelled.

```
# /opt/FJSVswstc/bin/acmsyncstat /dev/dsk/c1t0d0s6
Server Transaction-Disk  Backup-Disk       Status    Execute
Work2  /dev/dsk/c1t0d0s6 /dev/dsk/c1t0d2s5 suspend   ----
Work2  /dev/dsk/c1t0d0s6 /dev/dsk/c1t0d2s6 executing 75%
# /opt/FJSVswstc/bin/acmcancelsync /dev/dsk/c1t0d0s6 -all
/dev/dsk/c1t0d0s6 acmcancelsync completed.
# /opt/FJSVswstc/bin/acmsyncstat /dev/dsk/c1t0d0s6
Server Transaction-Disk  Backup-Disk Status Execute
Work2  /dev/dsk/c1t0d0s6 ----        ----   ----
#
```

Note

EC sessions are neither confirmed nor cancelled by execution in emergency operation mode. If an EC session is in the error suspended state or the halt state, then unmanaged sessions remain. In this event, ETERNUSmgr or GRmgr must be used to cancel these sessions.

Note

This command can be executed only while none of the following commands are running:

— Resource match command (swstsrsemtch)
— Device configuration command (acmdevinfoset)
— Storage Server configuration command (acmsvrset)
— Storage Server configuration command (swstsvrset)
— Device configuration command (swstdevinfoset)
— Resource backup command (swstresback)
— Resource restore command (swstresrst)

Note

For details on how to use SDX objects of GDS, refer to "Configuration and conditions of unsupported SDX objects" and "Notes on SDX Object Operations".

11.2.2.13 Backup synchronous processing progress display command (acmsyncstat)

The execution status of the backup synchronous processing is displayed (during copying, under the equivalency maintenance status, or in the suspended status).
If one transaction volume has multiple EC sessions, then the statuses of all of these EC sessions are displayed.

a.   Format
     [For Solaris/Linux]

```
/opt/FJSVswstc/bin/acmsyncstat [Device-Name]
```
     [For HP-UX/AIX]

```
/opt/FJSVswstc/bin/acmsyncstat [Device-Name]
```
     [For Windows]

```
program-directory\bin\acmsyncstat [Device-Name]
```

b.   Description of operand

Operand	Description
Device-Name	For Solaris, Linux, HP-UX, or AIX, specifies the block device name. For Windows, specifies the AdvancedCopy Manager device name. For details on the AdvancedCopy Manager device name, refer to "Managing a Device on AdvancedCopy Manager" in the "ETERNUS SF AdvancedCopy Manager Operator's Guide [For Windows]". When you omit the device name, the system displays the status of backup synchronous processing for all of the transaction volumes.

c.   End status

    = 0: Normally end
    > 0: Abnormally end

d.   Example

Display the synchronous backup processing status of a transaction volume
(/dev/dsk/c1t0d0s6).

```
# /opt/FJSVswstc/bin/acmsyncstat /dev/dsk/c1t0d0s6
Server Transaction-Disk  Backup-Disk      Status     Execute
Work1  /dev/dsk/c1t0d0s6 /dev/dsk/c1t0d2s5 suspend    ----
Work1  /dev/dsk/c1t0d0s6 /dev/dsk/c1t0d2s6 executing 75%
#
```

Display the synchronous backup processing status of all transaction volumes.

```
# /opt/FJSVswstc/bin/acmsyncstat
Server Transaction-Disk  Backup-Disk      Status     Execute
Work1  /dev/dsk/c1t0d0s3 /dev/dsk/c1t0d2s1 suspend     ----
Work1  /dev/dsk/c1t0d0s3 /dev/dsk/c1t0d2s3 executing   75%
Work1  /dev/dsk/c1t0d0s3 /dev/dsk/c1t0d3s3 suspend     ----
Work1  /dev/dsk/c1t0d1s3 /dev/dsk/c1t0d3s5 equivalent 100%
Work1  /dev/dsk/c1t0d0s6 /dev/dsk/c1t0d2s6 failed      ----
Work1  /dev/dsk/c1t0d1s4 ----              ----        ----
#
```

The table below lists the meaning of each title.

Title	Description
Server	Indicates the name of the Storage Server.
Transaction-Disk	Indicates the name of the transaction volume.
Backup-Disk	Indicates the name of the backup volume. When backup synchronous processing is not being executed, the system displays "----".

Title	Description
Status	Indicates the status of backup synchronous processing: ● "----": Backup synchronous processing is not being executed. ● "executing": Backup synchronous processing is being executed but equivalency maintenance status has not been established. ● "equivalent": Equivalency maintenance status is established. ● "suspend": Suspend status is established. ● "failed": Backup synchronous processing was abnormally terminated. ● "nosession": No session exists (inconsistent resource information). ● "halt": Backup synchronous processing is in the halt status. ● "gds-error": Copying with GDS ended abnormally.
Execute	Indicates the progress of the backup synchronous processing by EC or software-copy as a percentage (0 to 100%). "----" is displayed when the status is Suspend and when backup synchronous processing is not taking place.

Note

If "failed" or "halt" is indicated as the status of the backup synchronous processing (in the Status field), a hardware failure may have occurred. Correct the cause of the hardware problem, and take action according to "Troubleshooting for a Hardware Error, etc. occurring during backup".

Note

If "nosession" is indicated as the status of the backup synchronous processing (in the Status field)," resource information may be inconsistent. Use the "Resource match command (swstsrsemtch)" to remove the inconsistency from the resource information.

Note

If "gds-error" is the status displayed in the Status field, a problem with GDS is assumed to have occurred Correct the cause of the GDS problem, and take action as follows:
— If backup synchronous processing is being executed, cancel it using the "Backup synchronous processing cancel command (acmcancelsync)".
— If snapshot backup is being executed, delete the backup history information using the "History information delete command (acmhistdel)".
— If restoration is in progress, execute the "Resource match command (swstsrsemtch)", and perform restoration again.

11.2.2.14 Execution status display command (acmexecstat)

This command displays the execution status of other commands executed on a transaction volume. The execution status of OPC/EC will be displayed if OPC/EC is being executed. This command displays the progress of any current backup to or restoration from tape. Generation management information is displayed after "Generation Management Backup" is output. Day management information is displayed after "Day Management Backup" is output.

a. Format

[For Solaris/Linux]

```
/opt/FJSVswstc/bin/acmexecstat [Device-Name]
```

[For HP-UX/AIX]

```
/opt/FJSVswstc/bin/acmexecstat [Device-Name]
```

[For Windows]

```
program-directory\bin\acmexecstat [Device-Name]
```

b. Description of operand

Operand	Description
Device-Name	For Solaris, Linux, HP-UX, or AIX, specifies the block device name. For Windows, specifies the AdvancedCopy Manager device name. For details on the AdvancedCopy Manager device name, refer to "Managing a Device on AdvancedCopy Manager" in the "ETERNUS SF AdvancedCopy Manager Operator's Guide [For Windows]". If this operand is omitted, the execution statuses of all the transaction volumes will be displayed.

c. End status

= 0: Normal end

> 0: Abnormal end

d. Example

Display the execution statuses of transaction volumes.

```
# /opt/FJSVswstc/bin/acmexecstat
Generation Management Backup
Server Device          Last-Backup-Date DiskInterval Status Mount-Point (Method)
DiskExecute  TapeInterval  TapeExecute
server1 /dev/dsk/c1t0d0s3 2004/12/11 12:20 OK           IDLE   /usr1 (ufs)
----         OK     ----
server1 /dev/dsk/c1t0d0s4 2004/12/10 12:20 DELAY=1      EXEC   /usr2 (ufs)
sync(22%)    OK     Writing(50%)
server1 /dev/dsk/c1t0d0s5 2004/12/09 12:20 DELAY=2      EXEC   /usr3 (ufs)
snapshot(45%) OK     Writing(10%)


Day Management Backup
Server Device          Last-Backup-Date Status Mount-Point (Method)   TapeInterval
TapeExecute
server1 /dev/dsk/c1t0d0s3 2004/12/11 12:20 IDLE   /usr1 (ufs)          OK     ----
server1 /dev/dsk/c1t0d0s4 2004/12/10 12:20 IDLE   /usr2 (ufs)          OK     ----
server1 /dev/dsk/c1t0d0s5 2004/12/09 12:20 IDLE   /usr3 (ufs)          OK     ----
#
```

The following information will be displayed.

Keyword	Description
Server	Displays the Storage Server name.
Device	For Solaris, Linux, HP-UX, or AIX, displays the device name. For Windows, displays the AdvancedCopy Manager device name.
Last-Backup-Date	Displays the last backup date. * Displays the time when the backup execution command was accepted.

Keyword	Description
DiskInterval	Displays how many days have passed after the specified number of interval days since the last backup date has been exceeded. This item will be displayed as "DELAY=number-of-days-passing". "OK" will be displayed if the number of interval days has not been exceeded.
Status	Displays whether command execution is in progress on the transaction volume. If execution is in progress, "EXEC" is displayed; otherwise, "IDLE" is displayed.
Mount-Point (Method)	For Solaris, Linux, HP-UX, or AIX, displays the mount point name of a transaction volume followed by the file system type in parentheses. For Windows, displays the drive letter of a device. The file system type of the device is displayed in parentheses. If no existing mount point is applicable, " ---- (----)" is displayed.
DiskExecute	Displays the name of the command being executed or the progress of copying. "----" Neither a command nor OPC/EC is being executed. "swststartsync" The backup synchronous processing start command is being processed. "swstcancelsync" The backup synchronous processing cancel command is being processed. "swstbackup" This backup command is being processed. "swstrestore" This restore command is being processing. "swstcancelrest" The restore cancel command is being processed. "swstbkpolset" The backup policy setting command is being processed. "swstbkpoldel" The backup policy delete command is being processed. "swsthistdel" The history information delete command is being processed. "swstcanceltrk" The tracking cancel command is being processed "sync(xxx%)" The progress of backup synchronous processing "sync(failed)" EC ended abnormally. "sync(halt)" EC is in the halt state. "snapshot(xxx%)" The progress of OPC backup "snapshot(failed)" OPC backup ended abnormally. "snapshot(halt)" OPC backup is in the halt state. "restore(xxx%)" The progress of restoration "restore(failed)" OPC restoration ended abnormally. "restore(halt)" OPC restoration is in the halt state. "gds-error" GDS copying ended abnormally.
TapeInterval	If the number of days that have elapsed since the last backup is equal to or greater than the number of interval days defined in the tape backup policy, the number of days that have elapsed since the last day in the interval is displayed in the "DELAY=number-of-elapsed days" format. If the number of interval days has not elapsed, "OK" is displayed. (The number of interval days defined in the tape backup policy is the "number of interval days (generation management) for generation management" or "number of interval days (day management) for day management.")
TapeExecute	Displays the progress of writing to or reading from tape. "----" Neither writing to tape nor reading from tape is being performed. "Writing(xxx%)" Shows the progress of writing to tape (0% to 100%) "Reading(xxx%)" Shows the progress of reading from tape (0% to 100%)

Keyword	Description
	"Waiting-tape(xxx%)"	Waiting for tape. The progress of writing to or reading from tape is displayed (0% to 100%)

When multiple types of processing are executed for a transaction volume (such as when the backup synchronous processing start command is entered during copying of a snapshot high-speed backup), the DiskExecute and TapeExecute column displays conform to the following rules:

— The display of a command name takes priority if both copying and command are in progress.

— When a disk copy of snap-shot backup and a disk copy of backup synchronous processing are being handled simultaneously, the progress of the disk copy of the backup synchronous processing is displayed. (A disk copy for restoration is not performed during disk copy for snap-shot backup or backup synchronous processing due to a restriction of the Fujitsu ETERNUS storage system.)

— If multiple tape restore operations are executed for the same transaction volume, the progress of the processing executed last is displayed. (Multiple restore operations that specify the same transaction volume can be performed concurrently if the restoration destinations are different.)

The table below lists the displayed items for day management backup.

Keyword	Description
Server	Displays a Storage Server name.
Device	For Solaris, Linux, HP-UX, or AIX, displays a device name. For Windows, displays the AdvancedCopy Manager device name.
Last-Backup-Date	Displays the last backup date. * Displays the time when the backup execution command was accepted.
Status	Displays whether execution for a transaction volume is in progress. If execution is in progress, "EXEC" is displayed; otherwise, "IDLE" is displayed.
Mount-Point (Method)	For Solaris, Linux, HP-UX, or AIX, displays the mount point name of a transaction volume followed by an FSType in parentheses. If no existing mount point is applicable, " ---- (----)" is displayed.
TapeInterval	If the number of days that have elapsed since the date of the last backup is equal to or greater than the number of interval days defined in the tape backup policy, the number of days that have elapsed since the last day in the interval is displayed in the "DELAY=number-of-elapsed days" format. If the number of interval days has not elapsed, "OK" is displayed. (The number of interval days defined in the tape backup policy is the "number of interval days (generation management) for generation management" or "number of interval days (day management) for day management.")
TapeExecute	Displays the progress of writing to or reading from tape. "----" — Neither writing to tape nor reading from tape is being performed. "Writing(xxx%)" — Shows the progress of writing to tape (0% to 100%) "Reading(xxx%)" — Shows the progress of reading from tape (0% to 100%) "Waiting-tape(xxx%)" — Waiting for tape. The progress of writing to or reading from tape is displayed (0% to 100%)

Point

226

During synchronous high-speed backup with -suspend specified, no operation ("----")
is indicated in the DiskExecute field.

If "sync (failed)", "snapshot(failed)", "restore(failed)", "sync (halt)",
"snapshot(halt)" or "restore(halt)" is displayed in the "DiskExecute" field, a
hardware error may have occurred. After removing the cause of the hardware error, do
as follows:
- For "sync (failed)"
  To cancel backup synchronous processing, execute the "Backup synchronous
  processing cancel command (acmcancelsync)".
- If "snapshot(failed)" is displayed
  To delete backup history information, execute the "History information delete
  command (acmhistdel)".
- If "restore(failed)" is displayed
  Cancel restoration using the "Restore cancellation command (swstcancelrest)".

The executed command is displayed in the "DiskExecute" field with the prefix "swst"
even though the prefix of the command is actually "acm".

If "gds-error" is the status displayed in the Status field, a problem with GDS is
assumed to have occurred. Correct the cause of the GDS problem, and take action as
follows:
- If backup synchronous processing is being executed, cancel it by executing the
  "Backup synchronous processing cancel command (acmcancelsync)".
- If snapshot backup is being executed, delete the backup history information by
  executing the "History information delete command (acmhistdel)".
- If restoration is in progress, execute the "Resource match command
  (swstsrsemtch)", and perform restoration again.

11.2.2.15 Tracking cancel command (acmcanceltrk)

This command stops tracking processing for QuickOPC.
a. Format
   [For Solaris/Linux/HP-UX/AIX]

```
/opt/FJSVswstc/bin/acmcanceltrk [-copy | -emergency] Device-Name {-bd
 Backup-Device-Name | -all}
```

   [For Windows]

```
program-directory\bin\acmcanceltrk [-copy | -emergency] Device-Name {-bd
 Backup-Device-Name | -all}
```

b. Description of options

Option	Description
-copy	Specifies that physical copying, if active, should also be stopped (that is, the OPC session should be canceled). This option cannot be specified for a backup volume that has already been a

Option	Description
	backup history. For a volume whose copy destination volume has been a backup history, delete the history information in advance using the history information delete command (acmhistdel).
-emergency	Specifies that the command should operate in emergency operation mode. The command does not check tracking processing and does not stop tracking processing and the OPC session.
-bd	Stops tracking processing for the specified backup volume. Specify the target backup volume name as an operand. This option cannot be specified together with the -all option.
-all	Stops the entire tracking processing specified for the transaction volumes. This option cannot be specified together with the -bd option.

c. Description of operand

Operand	Description
Device-Name	For Solaris, Linux, HP-UX, or AIX, specifies the block device name. For Windows, specifies the AdvancedCopy Manager device name. For details on the AdvancedCopy Manager device name, refer to "Managing a Device on AdvancedCopy Manager" in the "ETERNUS SF AdvancedCopy Manager Operator's Guide [For Windows]".
Backup-Device-Name	Specifies a backup volume name.

d. End status

= 0: Normal end

> 0: Abnormal end

e. Example

The following example stops the tracking processing.

```
# /opt/FJSVswstc/bin/acmcanceltrk /dev/dsk/c1t0d1s1 -bd /dev/dsk/c1t0d2s1
/dev/dsk/c1t0d1s1 acmcanceltrk completed
#
```

The following example stops tracking processing and physical copying.

```
/opt/FJSVacms/bin/acmdevdisp -t -b -u
Server Device          Size      Device-Mode    Mount-Point (Method)
Backup-Engine
SV1    /dev/dsk/c1t0d1s1 1.0 Gbyte Transaction    /mnt/tran1 (ufs)    AdvancedCopy
SV1    /dev/dsk/c1t0d2s1 1.0 Gbyte Backup (used-T) ---- (----)         AdvancedCopy
:
# /opt/FJSVswstc/bin/acmtrkstat /dev/dsk/c1t0d1s1
Server Transaction-Disk Backup-Disk      Status    Execute Update
SV1    /dev/dsk/c1t0d1s1 /dev/dsk/c1t0d2s1 executing 33%      -----
# /opt/FJSVswstc/bin/acmcanceltrk -copy /dev/dsk/c1t0d1s1 -bd /dev/dsk/c1t0d2s1
/dev/dsk/c1t0d1s1 acmcanceltrk completed


#
```

Note

Tracking processing cannot be stopped under the following condition:

— Tracking processing is not performed for the specified copy source and
destination volumes.

This command cannot be executed if any of the following commands are running:
— Storage Server configuration command (acmsvrset)
— Device configuration command (acmdevinfoset)
— Resource match command (swstsrsemtch)
— Resource backup command (swstresback)
— Resource restore command (swstresrst)

11.2.2.16 Tracking status display command (acmtrkstat)

This command displays the status of tracking processing.
When multiple types of tracking processing exist for one transaction volume, the command
displays the statuses of all types of tracking processing.

Execution status information cannot be displayed for transaction volumes that are
linked to GDS snapshot.

a. Format

[For Solaris/Linux]

/opt/FJSVswstc/bin/acmtrkstat [*Device-Name*]

[For HP-UX/AIX]

/opt/FJSVswstc/bin/acmtrkstat [*Device-Name*]

[For Windows]

program-directory\bin\acmtrkstat [*Device-Name*]

b. Description of operand

Operand	Description
Device-Name	For Solaris, Linux, HP-UX, or AIX, specifies the block device name. For Windows, specifies the AdvancedCopy Manager device name. For details on the AdvancedCopy Manager device name, refer to "Managing a Device on AdvancedCopy Manager" in the "ETERNUS SF AdvancedCopy Manager Operator's Guide [For Windows]". If this operand is omitted, the command displays the statuses of tracking processing for all transaction volumes.
Log-Group-Name	Specifies the log group name.

c. End status

= 0: Normal end

> 0: Abnormal end

d. Example

The following example displays the status of tracking processing.

/opt/FJSVswstc/bin/acmtrkstat
Server Transaction-Disk Backup-Disk   Status   Execute Update

```
SV1    /dev/dsk/c1t0d1s1 /dev/dsk/c1t0d2s1 tracking  ----    12%
SV1    /dev/dsk/c1t0d2s1 /dev/dsk/c1t0d4s1 executing 75%     ----
SV1    /dev/dsk/c1t0d5s1 ----              ----      ----    ----
SV1    /dev/dsk/c1t0d6s1 /dev/dsk/c1t0d7s1 executing 31%     ----
#
```

The displayed data is explained below.

Title	Description
Server	Displays the Storage Server name.
Transaction-Disk	Displays the transaction volume name.
Backup-Disk	Displays the backup volume name. Displays "----" when the volume is not in the tracking status.
Status	Displays the execution status. "----": Not in the process of tracking "executing": In the process of physical copying and tracking "tracking": In the process of tracking "failed": Physical copying or tracking terminated abnormally "nosession": No session exists (eg, resource information is inconsistent)
Execute	Displays the progress of copying as a percentage when "executing" is displayed in the Status column. "----" is displayed when "tracking" is displayed in the Status column.
Update	When "tracking" is displayed in the Status column, displays the amount of updated data after QuickOPC (logical copying) as a percentage,. "----" is displayed when "executing" is displayed in the Status column.

When the execution status (displayed in the "Status" column) is "failed," a hardware problem is assumed to have occurred. Fix the cause of the problem and then re-execute the differential snapshot backup.

When the execution status (displayed in the "Status" column) is "nosession," the resource information is probably inconsistent. Use the resource matching command (swstsrsemtch) to remove any inconsistencies from the resource information.

The execution status of tracking processing cannot be displayed under the following conditions:
[For Solaris]
— When the transaction volume or backup volume is a VxVM logical volume, and the volume configuration of the logical volume has been changed to one that is not supported by AdvancedCopy Manager.
— When the transaction volume or backup volume is a VxVM logical volume, and the logical volume has been deleted from VxVM.
[For HP-UX]

— When the logical disk configuration is changed to a configuration that is not supported by AdvancedCopy Manager.

— When a volume group is specified and the volume group is inactive.

11.2.2.17 Drive letter allocation command (swstdrvset)

For Windows, allocate a drive letter temporarily to a device.
For details on the command, refer to "Drive letter allocation command (swstdrvset)" in the "ETERNUS SF AdvancedCopy Manager Operator's Guide [For Windows]".

11.2.2.18 Drive letter de-allocation command (swstdrvunset)

For Windows, the drive character currently assigned to the device is canceled.
For details on the command, refer to "Drive letter de-allocation command (swstdrvunset)" in the "ETERNUS SF AdvancedCopy Manager Operator's Guide [For Windows]".

11.2.2.19 Dismount command (swstdismount)

For Windows, this command dismounts the specified volume.
For details on the command, refer to "Dismount command (swstdismount)" in the "ETERNUS SF AdvancedCopy Manager Operator's Guide [For Windows]".

11.2.2.20 Volume unlock command (swstvolunlock)

For Windows, this command unlocks a volume.
For details on the command, refer to "Volume unlock command (swstvolunlock)" in the "ETERNUS SF AdvancedCopy Manager Operator's Guide [For Windows]".

11.2.2.21 Locked-volume information display command (swstvollockstat)

For Windows, this command displays information about a locked volume.
For details on the command, refer to "Locked-volume information display command (swstvollockstat)" in the "ETERNUS SF AdvancedCopy Manager Operator's Guide [For Windows]".

11.2.3 Maintenance commands

This section describes maintenance commands for backup management.

11.2.3.1 Resource match command (swstsrsemtch)

This command recovers resource information if a system failure, etc., has made the resource information inconsistent.
For details on the command, refer to "Resource match command (swstsrsemtch)" in the "ETERNUS SF AdvancedCopy Manager Operator's Guide" for the operating system of the target Server.

11.2.3.2 Resource backup command (swstresback)

This command backs up backup management files to a specified directory.
For details on the command, refer to "Resource backup command (swstresback)" in the "ETERNUS SF AdvancedCopy Manager Operator's Guide" for the operating system of the target Server.

11.2.3.3 Resource restore command (swstresrst)

Backup management files are restored from the specified directory.

● Managed resource information

Management books, such as Storage Server configuration information.

For details on the command, refer to "Resource restore command (swstresrst)" in the "ETERNUS SF AdvancedCopy Manager Operator's Guide" for the operating system of the target Server.

11.3 Configuration Management Commands

This section explains the configuration management commands, which manage the information of the servers and their devices for backup management or replication management.

11.3.1 Management server information change command (stgcmmodnode)

This command changes Storage Management Server information.
For details on this command, refer to "Management server information change command (stgcmmodnode)" in the "ETERNUS SF AdvancedCopy Manager Operator's Guide" for the operating system of the target Storage Management Server.
For details on making changes using this command, refer to the following:
● Changing the IP address of a Storage Management Server
● Changing the port number of a Storage Management Server
● Changing the server name of a Storage Management Server

11.3.2 Repository access user change command (stguserset)

This command changes a user name and/or password used to access a repository. This command must be executed on the Storage Management Server.
For details on this command, refer to "Repository access user change command (stguserset)" in the "ETERNUS SF AdvancedCopy Manager Operator's Guide" for the operating system of the target Storage Management Server.

11.3.3 GUI connection configuration command (stgguiipset)

The Storage Management Server is equipped with two or more network cards, and this command is used when dividing and using the IP address specified in case the IP address (the IP address specified when the database was created at the time o initialization of the Storage Management Server) and GUI client with a Storage Server which communicates with it are used.
For details on this command, refer to "GUI connection configuration command (stgguiipset)" in the "ETERNUS SF AdvancedCopy Manager Operator's Guide" for the operating system of the target Storage Management Server.

11.3.4 Server information addition command (stgxfwcmaddsrv)

This command adds Storage Server information to be managed by AdvancedCopy Manager. It can only be executed on the Storage Management Server.
For details on this command, refer to "Server information addition command (stgxfwcmaddsrv)" in the "ETERNUS SF AdvancedCopy Manager Operator's Guide" for the operating system of the target Storage Management Server.

11.3.5 Server information change command (stgxfwcmmodsrv)

This command changes information on servers managed by AdvancedCopy Manager.
For details on this command, refer to "Server information change command (stgxfwcmmodsrv)" in the "ETERNUS SF AdvancedCopy Manager Operator's Guide" for the operating system of the target Storage Management Server.

11.3.6 Server information deletion command (stgxfwcmdelsrv)

This command deletes Storage Server information that AdvancedCopy Manager is currently managing.
For details on this command, refer to "Server information deletion command (stgxfwcmdelsrv)" in the "ETERNUS SF AdvancedCopy Manager Operator's Guide" for the operating system of the target Storage Management Server.

11.3.7 Device information collection/reflection command (stgxfwcmsetdev)

This command collects the latest device information detected by the server and displays the difference between this and the information managed by AdvancedCopy Manager.
For details on this command, refer to "Device information collection/reflection command (stgxfwcmsetdev)" in the "ETERNUS SF AdvancedCopy Manager Operator's Guide" for the operating system of the target Storage Management Server.

11.3.8 Device information deletion command (stgxfwcmdeldev)

This command deletes the device information currently being managed by AdvancedCopy Manager.
For details on this command, refer to "Device information deletion command (stgxfwcmdeldev)" in the "ETERNUS SF AdvancedCopy Manager Operator's Guide" for the operating system of the target Storage Management Server.

11.3.9 Server information display command (stgxfwcmdispsrv)

This command displays the server information managed by AdvancedCopy Manager.
For details on this command, refer to "Server information display command (stxfwcmdispsrv)" in the "ETERNUS SF AdvancedCopy Manager Operator's Guide" for the operating system of the target Storage Management Server.

11.3.10 Device information display command (stgxfwcmdispdev)

This command displays information on a device managed by AdvancedCopy Manager.
For details on this command, refer to "Device information display command (stgxfwcmdispdev)" in the "ETERNUS SF AdvancedCopy Manager Operator's Guide" for the operating system of the target Storage Management Server.

11.3.11 Partition information display command (stgxfwcmdisppat)

This command displays the information for the partitions that comprise a device managed by AdvancedCopy Manager.
For details on this command, refer to "Partition information display command (stgxfwcmdisppat)" in the "ETERNUS SF AdvancedCopy Manager Operator's Guide" for the operating system of the target Storage Management Server.

11.3.12 Environment information display command (stgenvdisp)

This command displays the values of the environment settings in AdvancedCopy Manager.
For details on this command, refer to "Environment information display command (stgenvdisp)" in the "ETERNUS SF AdvancedCopy Manager Operator's Guide" for the operating system of the target Storage Management Server.

11.3.13 Management information package backup server registration/deletion command (stgmgrinfoset)

This command registers the management information package backup execution server (the server on which the management information package backup command is executed).
The command deletes the management information package backup execution server.
The command displays information about the management information package backup execution server.
For details on this command, refer to "Management information package backup server registration/deletion command (stgmgrinfoset)" in the "ETERNUS SF AdvancedCopy Manager Operator's Guide" for the operating system of the target Server.

11.3.14 Management information package backup command (stgmgrinfobkup)

This command backs up the management information stored on the Storage Servers and the Storage Management Server.
For details on this command, refer to "Management information package backup command (stgmgrinfobkup)" in the "ETERNUS SF AdvancedCopy Manager Operator's Guide" for the operating system of the target Server.

11.3.15 Management information package backup status display command (stgmgrinfodisp)

This command displays the status of execution of the management information package backup command.
For details on this command, refer to "Management information package backup status display command (stgmgrinfodisp)" in the "ETERNUS SF AdvancedCopy Manager Operator's Guide" for the operating system of the target Server.

11.3.16 SDX object management unit setting command (stgxfwcmsetsdx)

This command specifies the management unit of SDX objects handled by AdvancedCopy Manager.
The unit of operation of the SDX object is also displayed.
For details on this command, refer to "SDX object management unit setting command (stgxfwcmsetsdx)" in the "ETERNUS SF AdvancedCopy Manager Operator's Guide" for the operating system of the target Server.

11.4 Commands of the Tape Server

This section explains the commands that are executed on a Tape Server.

To execute the following commands on the Tape Server, the Tape Server and its daemon must be active. Otherwise, when one of the commands is executed, it outputs a message and terminates with an error.

— Tape backup execution command
— Tape backup cancel command
— Tape restore command
— Tape restore cancel command
— Tape execution history display command
— Tape history information display command
— Tape execution status display command
— Trace log output level setting command
— Server information change notification command

If multiple Tape Servers are installed, the only Storage Server that can be used with one of these commands is the one associated with the Tape Server on which the command is executed.

11.4.1 Tape Server definition file check command (tbochkconf)

This command checks the validity of the Tape Server definition files (devpath.conf and tsm.conf). The command can be executed even if the Tape backup daemon is inactive.

a.   Format

```
/opt/FJSVswstm/bin/tbochkconf
```

b.   Example

Check the validity of the Tape Server definition files.

```
# /opt/FJSVswstm/bin/tbochkconf
tbochkconf completed
#
```

c.   End status

= 0: Normal end
〉0: Abnormal end

The command fails to make this check in the following cases:

— The definition files (devpath.conf and tsm.conf) are not found in /etc/opt/FJSVswstm/conf.
— A definition file contains a specification error. For information on the definition files, refer to "Customization of Tape Server" in the "ETERNUS SF AdvancedCopy Manager Installation Guide".

11.4.2 Tape backup execution command (tbobackup)

The command backs up to tape the data on a transaction volume (disk).
If this command is used to back up data, pre-processing and post-processing is not performed on the Storage Server. Backup must be performed when the Storage Server is in the stopped state or when there is no access to the transaction volume.

a. Format

```
/opt/FJSVswstm/bin/tbobackup -h Storage-Server -b DAY Device-Name
```

b. Description of options

Option	Description
-h	Specifies the Storage Server name
-b	Specifies the management method of the data backed up to tape. Specify "DAY". This performs backup in day management mode. This option cannot be omitted.

c. Description of operand

Operand	Description
Device-Name	If the Storage Server is Solaris/Linux/HP-UX/AIX, specify the block device name of the transaction volume (disk). If the Storage Server is Windows, specify the AdvancedCopy Manager device name that corresponds to the transaction volume. For details of AdvancedCopy Manager device names, refer to "AdvancedCopy Manager device management methods" in the "ETERNUS SF AdvancedCopy Manager Operator's Guide (Windows)".

d. End status
   = 0: Normal end
   > 0: Abnormal end

e. Example
   Execute day management backup of transaction volume (/dev/dsk/c1t1d0s2).

```
# /opt/FJSVswstm/bin/tbobackup -h server01 -b DAY /dev/dsk/c1t1d0s2
```

11.4.3 Tape backup cancel command (tbocancelback)

The command cancels backup of transaction volume data and backup volume data directly to the tape.

Note

When tape backup is cancelled under the following conditions, the maximum number of generation management backup generations may be exceeded.

-The same number of generations of backup history information as that set as the number of preservation generations that existed at the start of tape backup,

-The tape backup is executed without specifying the data management method or by specifying the generation management as the data management method.

This command does not delete exceeded old history information. Therefore, by canceling the operation, the number of preservation generations may be exceeded if the write operation to the tape was completed. In this instance, the history information deletion command must be used to delete unnecessary history information and re-start the backup operation.

a.   Format

```
/opt/FJSVswstm/bin/tbocancelback -h Server Device-Name
```

b.   Description of option

Option	Description
-h	Specifies the Storage Server name

c.   Description of operand

Operand	Description
Device-Name	When the Storage Server is Solaris, Linux, HP-UX or AIX, this specifies the block device name of a transaction volume. When the Storage Server is Windows, it specifies an AdvancedCopy Manager device name corresponding to a transaction volume. For details on the AdvancedCopy Manager device name, refer to "Managing a Device on AdvancedCopy Manager" in the "ETERNUS SF AdvancedCopy Manager Operator's Guide [For Windows]".

d.   End status
> = 0: Normal end
> \> 0: Abnormal end

e.   Example
> Cancel the tape backup operation of a transaction volume (/dev/dsk/c1t1d0s6).

```
# /opt/FJSVswstm/bin/tbocancelback -h server01 /dev/dsk/c1t1d0s6
/dev/dsk/c1t1d0s6 tbocancelback completed
#
```

The tape backup operation cannot be cancelled when the specified transaction volume has not been backed up to a tape or not copied to a tape.

In this instance, a notification message "swstm0157 The corresponding processing is not started or is already ended." will be displayed and will the operation (the end status is a normal end.)

11.4.4 Tape restore command (tborestore)

Data stored on tape is restored using this command.
When the command is used for restoration, neither pre-processing nor post-processing is executed on the Storage Server. Therefore, it must be executed while the Storage Server is either stopped or not accessing the applicable transaction volume.

Restoration can be performed to any device other than transaction volumes. Devices specified as a restoration destination must be:
― a volume other than a transaction volume.

— the same size or larger than the original transaction volume.

When this command is used for restoration, neither pre-processing nor post-processing is performed on the Storage Server. If the command is executed while the transaction volume is being accessed, the data restoration is not guaranteed.

When the command is executed with a restoration destination volume specified, restoration is performed even if the specified volume contains backup data or synchronous processing is being executed. Performing restoration under this condition damages backup data. Therefore, when specifying a backup volume for the restoration destination, specify one that is not used.

a.　Format

```
/opt/FJSVswstm/bin/tborestore -h Storage-Server [-g Generation-No | -v Version-No |
-t Backup-Time] [-r Restore-Device-Name] [-d Restore-Storage-Server] Device-Name
```

b.　Description of options

Option	Description
-h	Specifies a Storage Server name.
-g	Specifies the relative generation number of the data to be restored. Only data whose generation is managed can be specified in this option. To check the relative generation number, execute the "Tape history information display command (tbohistdisp)". The option cannot be specified together with the -v or -t option.
-v	Specifies the absolute generation number of the history information for the generation management backup to be deleted. This option cannot be specified together with the -g, -z, or -t option. To check the absolute generation number, execute the "Tape history information display command (tbohistdisp)".
-t	Specifies the day management start date and time of the data to be restored. Only data subject to day management can be specified in this option. To check the day management start date and time, execute the "Tape history information display command (tbohistdisp)". Specify the backup date and time in the "YYYY/MM/DD hh:mm:ss" format. YYYY: Year (four digits) MM: Month (two digits) DD: Day (two digits) hh: Hour (two digits) mm: Minute (two digits) ss: Seconds (two digits) This option cannot be specified together with the -g and -v options.
-r	Specifies the restoration destination device for restoration to a device other than a transaction volume. This option cannot be specified for a GDS logical volume.
-d	Specifies the restoration destination Storage Server name for restoration to a volume on a Storage Server different from that containing the original transaction volume.

Note: If none of the -g, -v, and -t options is specified, the latest information among the backup history data subject to generation management is restored.

c. Description of operand

Operand	Description
Device-Name	When the Storage Server is Solaris, Linux, HP-UX or AIX, this specifies the block device name of a transaction volume. When the Storage Server is Windows, it specifies an AdvancedCopy Manager device name corresponding to a transaction volume. For details on the AdvancedCopy Manager device name, refer to "Managing a Device on AdvancedCopy Manager" in the "ETERNUS SF AdvancedCopy Manager Operator's Guide [For Windows]".

d. End status

   = 0: Normal end
   > 0: Abnormal end

e. Example

   Restore the data with relative generation number 2. For the relative generation numbers, refer to the data displayed by the "Tape history information display command (tbohistdisp)".

```
# /opt/FJSVswstm/bin/tborestore -h server01 -g 2 /dev/dsk/c1t0d0s6
/dev/dsk/c1t0d0s6 tborestore completed
#
```

   Restore the data that was backed up at 06:12:55 on February 2, 2005 under day management.

```
# /opt/FJSVswstm/bin/tborestore -h server01 -t "2005/02/02 06:12:55"
/dev/dsk/c1t1d0s6
/dev/dsk/c1t1d0s6 tborestore completed
#
```


Note

   If any of the following events occurs, restoration will fail. In this case, take the appropriate action according to the "System administrator response" in the output message.
   — Both relative and absolute generation numbers are specified.
   — A device registered as a transaction volume is specified for a parameter of the -r option.
   — An SDX object is specified for a parameter of the -r option.
   — A GDS logical volume is specified as the restoration destination volume of a normal transaction volume.
   — An error is detected during reading from tape.

11.4.5 Tape restore cancel command (tbocancelrest)

   This command cancels restoration from the tape.

Note

Because a part of the data would have been copied before this command is used to cancel restoration of data from the tape, the status of the transaction volume will be incomplete and so it cannot be used. The data must be restored using the restore command (tborestore) once again.

a. Format

```
/opt/FJSVswstm/bin/ tbocancelrest -h Server [-g Generation-No | -v Version-No | -t
Backup-Time] [-r Restore-Device-Name] [-d Restore-Storage-Server] Device-Name
```

b. Description of options

Option	Description
-h	Specifies the Storage Server name
-g	Specifies the relative generation number of data being restored. This option cannot be specified together with the -v or -t option. To check the relative generation number, specify the -l option and execute the "tape execution history display command (tboreqstat)".
-v	Specifies the relative generation number of data being restored. This option cannot be specified together with the -g or -t option. To check the relative generation number, specify the -l option and execute the "tape execution history display command (tboreqstat)".
-t	Specifies the start date and time of the day management in the data to be restored. This option cannot be specified together with the -g or -v option. To check the start date and time of the day management, specify the -l option and execute the "tape execution history display command (acmtpreqstat)". Specify the start date and time of the day management in the "YYYY/MM/DD hh:mm:ss" format. The "YYYY/MM/DD hh:mm:ss" format is as follows: YYYY: Year (four digits) MM: Month (two digits) DD: Day (two digits) hh: Hour (two digits) mm: Minute (two digits) ss: Seconds (two digits)
-r	Specifies the name of the device when restoring to a device other than a transaction volume. To check the device name, specify the -l option and execute the "tape execution history display command (tboreqstat)".
-d	Specifies the restoration destination device when restoring to a device other than a transaction volume of a Storage Server that is not the Storage server of the original transaction volume. To check the Storage Server name, specify the -l option and execute the "tape execution history display command (tboreqstat)".

Note: If none of the -g, -v, and -t options is specified, restoration of the backup history that is managed by the generation will be cancelled.

c. Description of operand

Operand	Description
Device-Name	When the Storage Server is Solaris, Linux, HP-UX or AIX, this specifies the block device name of a transaction volume. When the Storage Server is Windows, it specifies an AdvancedCopy Manager device name corresponding to a transaction volume. For details on the AdvancedCopy Manager device name, refer to "Managing a Device on AdvancedCopy Manager" in the "ETERNUS SF AdvancedCopy Manager Operator's

Operand	Description
	Guide [For Windows]".

d. End status

   =0: Normal end

   >0: Abnormal end

e. Example

   Cancel the tape restoration operation of history information with the absolute
   generation number 1 in the transaction volume (/dev/dsk/c1t1d0s6).

```
# /opt/FJSVswstm/bin/tbocancelrest -h server01 -v 1 /dev/dsk/c1t1d0s6
/dev/dsk/c1t1d0s6 tbocancelrest completed
#
```


The tape restore operation cannot be cancelled when the specified transaction volume has
not been restored from a tape.
In this instance, a notification message "swstm0157 The corresponding processing is not
started or is already ended." will be displayed and will terminate the operation (the end
status is a normal end.)

11.4.6 Tape Server execution status display command (tboexecstat)

This command displays the execution status of a tape backup operation. During backup to or
restoration from tape, the command displays the progress of processing. Generation management
information is displayed after "Generation Management Backup" is output. Day management
information is displayed after "Day Management Backup" is output.

a. Format

```
/opt/FJSVswstm/bin/tboexecstat -h Storage-Server [Device-Name]
```

b. Description of options

Option	Description
-h	Specifies a Storage Server name.

c. Description of operands

Operand	Description
Device-Name	When the Storage Server is Solaris, Linux, HP-UX or AIX, this specifies the block device name of a transaction volume. When the Storage Server is Windows, it specifies an AdvancedCopy Manager device name corresponding to a transaction volume. For details on the AdvancedCopy Manager device name, refer to "Managing a Device on AdvancedCopy Manager" in the "ETERNUS SF AdvancedCopy Manager Operator's Guide [For Windows]". If this option is omitted, the execution statuses of all transaction volumes are displayed.

d. End status

   = 0: Normal end

> 0: Abnormal end

e. Example

The execution status of a transaction volume is displayed.

```
# /opt/FJSVswstm/bin/tboexecstat -h server01
Generation Management Backup
Server Device           Last-Backup-Date Interval Status Mount-Point (Method)
Execute
Server01 /dev/dsk/c1t0d0s3 2004/12/11 12:20 OK           IDLE   /usr1 (ufs)
----
Server01 /dev/dsk/c1t0d0s4 2004/12/10 12:20 DELAY=1      IDLE   /usr2 (ufs)
Writing(50%)
Server01 /dev/dsk/c1t0d0s5 2004/12/09 12:20 DELAY=2      IDLE   /usr3 (ufs)
Writing(10%)

Day Management Backup
Server Device           Last-Backup-Date Interval Status Mount-Point (Method)
Execute
Server01 /dev/dsk/c1t0d0s3 2004/12/11 12:20 OK       IDLE   /usr1 (ufs)
----
Server01 /dev/dsk/c1t0d0s4 2004/12/10 12:20 OK       IDLE   /usr2 (ufs)
----
Server01 /dev/dsk/c1t0d0s5 2004/12/09 12:20 OK       IDLE   /usr3 (ufs)
----
#
```

The table below lists the displayed items.

Keyword	Description
Server	Displays the Storage Server name.
Device	When the Storage Server is Solaris, Linux, HP-UX or AIX, this displays a device name. When the Storage Server is Windows, it displays an AdvancedCopy Manager device name.
Last-Backup-Date	Displays the date and time of the last backup. * The time at which the backup command was accepted is displayed.
Interval	If the number of days that have elapsed since the date of the last backup is equal to or greater than the number of interval days defined in the tape backup policy, the number of days that have elapsed since the last day in the interval is displayed in the "DELAY=number-of-elapsed days" format. If the number of interval days has not elapsed, "OK" is displayed. (The number of interval days defined in the tape backup policy is the "number of interval days (generation management) for generation management" or "number of interval days (day management) for day management.")
Status	Displays whether tape-related execution for a transaction volume is in progress. If execution is in progress, "EXEC" is displayed; otherwise, "IDLE" is displayed.
Mount-Point (Method)	When the Storage Server is Solaris, Linux, HP-UX or AIX, this displays the mount point name of a transaction volume followed by the file system type in parentheses. When the Storage Server is Windows, it displays the drive letter of a device. The file system type of the device is displayed in parentheses. If no existing mount point is applicable, " ---- (----)" is displayed.
Execute	Displays the progress of writing to or reading from tape.

Keyword		Description
	"____"	Neither writing to tape nor reading from tape is being performed.
	"Writing(xxx%)"	Shows the progress of writing to tape (0% to 100%)
	"Reading(xxx%)"	Shows the progress of reading from tape (0% to 100%)
	"Waiting-tape(xxx%)"	Waiting for tape. The progress of writing to or reading from tape is displayed (0% to 100%)

When multiple types of processing are executed for a transaction volume, the Execute column display conforms to the following rule:

- If multiple tape restore operations are performed for the same transaction volume, the progress of the processing executed last is displayed. (Multiple restore operations that specify the same transaction volume can be performed concurrently if the restoration destinations are different.)

11.4.7 Tape execution history display command (tboreqstat)

The command displays the execution status of the processing by the tape manager currently in progress.
The command displays the execution status of the following:

● Direct tape backup from the transaction volume
● Copying data from the backup volume to the tape
● Restoration data from the tape
● Deletion of the backup history information on the tape

This command displays information on the executed processing from the latest.

a. Format

```
/opt/FJSVswstm/bin/tboreqstat -h Server [-l] [-v] [Device-Name]
```

b. Description of options

Option	Description
-h	Specifies the Storage Server name
-l	In addition to the tape execution history information, displays the command option specified when the command was executed
-v	Displays the details of the tape execution history information

c. Description of operand

Operand	Description
Device-Name	When the Storage Server is Solaris, Linux, HP-UX or AIX, this specifies the block device name of a transaction volume. When the Storage Server is Windows, it specifies an AdvancedCopy Manager device name corresponding to a transaction volume. For details on the AdvancedCopy Manager device name, refer to "Managing a Device on AdvancedCopy Manager" in the "ETERNUS SF AdvancedCopy Manager Operator's Guide [For Windows]". If this option is omitted, the tape execution history of all transaction volumes are displayed.

d. End status
     =0: Normal end
     >0: Abnormal end

e. Example

Display the tape execution history information of all transaction volumes.

```
# /opt/FJSVswstm/bin/tboreqstat -h server01
Server    Transaction-Volume  Request  Execute-Date      Status
server01  /dev/dsk/c1t1d22s1  Delete   2007/02/22 09:15  Deleting
server01  /dev/dsk/c1t1d20s1  Backup   2007/02/22 09:00  Preprocessing
server01  /dev/dsk/c1t1d23s1  Restore  2007/02/22 08:00  Reading( 90%)
#
```

Display the tape execution history information of the transaction volume
(/dev/dsk/c1t1d0s6) and the command options by specifying the -l option.

```
# /opt/FJSVswstm/bin/tboreqstat -h server01 -l /dev/dsk/c1t1d23s1
Server    Transaction-Volume  Request  Execute-Date      Status       CmdOptions
server01  /dev/dsk/c1t1d23s1  Restore  2007/02/22 08:00  Reading( 90%) [-v 10 -r
/dev/dsk/c1t1d24s1]
#
```

Display the detailed tape execution history information of the transaction volume
(/dev/dsk/c1t1d0s6) by specifying the -v option.

```
# /opt/FJSVswstm/bin/tboreqstat -h server01 -v /dev/dsk/c1t1d20s1
Server    Transaction-Volume  Request  Execute-Date       End-Date
 Status        Pool-Name  Message
server01  /dev/dsk/c1t1d20s1  Backup   2007/02/22 09:00  ----/--/-- --:--
 Preprocessing  POOL01     ----
#
```

The contents displayed are as follows:

Key word	Description
Server	Displays the Storage Server name
Transaction-Volume	For Solaris, Linux, HP-UX or AIX, displays the device name For Windows, displays the AdvancedCopy Manager device name
Request	Displays the processing name with the character strings shown below: "Backup": Backup to the tape, copy to the tape "Restore": Restore from the tape "Delete": Delete the tape history information
Execute-Date	Displays the time and date when the tape manager accepted the processing Displays in the " YYYY/MM/DD hh:mm" format YYYY indicates the year, MM indicates the month, DD indicates the day, hh indicates the hour and mm indicates the minute. The system time and date of the server will be displayed as the time and date.
End-Date	Displays the time and date when the tape manager ended the processing. Displays in the " YYYY/MM/DD hh:mm" format. YYYYY indicates the year, MM indicates the month, DD indicates the day, hh indicates the hour and mm indicates the minute. The system time and date of the server will be displayed as the time and date. If the processing has not ended, displays "----/--/-- --:--" Displays only when the -v option is specified

Key word	Description
Status	Displays the execution status of the processing or the progress rate of the write operation to the tape or the read operation from the tape with the character strings shown below: "Preprocessing": Pre-processing of backup/restore is being executed "Writing(xxx%)": Progress status of the tape write operation "Reading(xxx%)": Progress status of the tape read operation "Waiting-tape(xxx%)": Progress status of the tape write/read operation before the tape wait status is reached "Postprocessing": Post-processing of backup/restore is being executed "Cancel": Canceling of backup/restore is being executed "Deleting": Deletion of tape history information is being executed
Pool-Name	Displays the storage pool name of the tape backup destination Displays when the processing name is "Backup" Displays "----" if the processing name is "Restore" and "Delete" or "Backup" but the tape write operation has not started Displays only when the -v option is specified
CmdOptions	Displays the option and the value of the option specified and the time to processing execution Displays only when the -l option is specified
Message	Displays a warning message or an error message "::" is displayed at the end of messages. If multiple messages are output, "::" is also displayed between messages. Displays "----" if the message doest not exist Displays only when the -v option is specified

11.4.8 Tape history information display command (tbohistdisp)

This command displays history information that was backed up to tape.
Generation management information is displayed after "Generation Management Backup" is output. Day management information is displayed after "Day Management Backup" is output.

a.   Format

```
/opt/FJSVswstm/bin/tbohistdisp -h Storage-Sarver [-l] [Device-Name]
```

b.   Description of options

Option	Description
-h	Specifies a Storage Server name.
-l	Displays detailed history information for a backup to tape.

c.   Description of operands

Operand	Description
Device-Name	When the Storage Server is Solaris, Linux, HP-UX or AIX, this specifies the block device name of transaction volume. When the Storage Server is Windows, it specifies the AdvancedCopy Manager device name. For details on the AdvancedCopy Manager device name, refer to "Managing a Device on AdvancedCopy Manager" in the "ETERNUS SF AdvancedCopy Manager Operator's Guide [For Windows]". If this option is omitted, the backup history information of all transaction volumes are displayed.

d.   End status

= 0: Normal end

> 0: Abnormal end

e.   Example

Display detailed backup history information for transaction volume
"/dev/dsk/c1t1d10s1" on Storage Server server01 by specifying the -l option.

```
# /opt/FJSVswstm/bin/tbohistdisp -h server01 -l /dev/dsk/c1t1d10s1
Generation Management Backup
Server=StrgSV01 Device=/dev/dsk/c1t1d10s1 Mount-Point=/work1 (ufs)
Generation Version CopyID Backup-Date      Pool-Name  Backup-Tape
    1        10      1 2000/11/12 21:00 TapePool4  LT00059
    2         9      1 2000/11/11 21:00 TapePool4  LT00059


Day Management Backup
Server=StrgSV01 Device=/dev/dsk/c1t1d10s1 Mount-Point=/work1 (ufs)
TapeCopy-Date        Backup-Date        Expiration-Date      Pool-Name
Backup-Tape
2004/03/01 10:35:02  2004/03/01 10:30   2004/03/08 10:35:02  TapePool5  LT00040
#
```

The table below lists the information items displayed for a generation management
backup.

Keyword	Description
Server	Displays a Storage Server name.
Device	When the Storage Server is Solaris, Linux, HP-UX or AIX, this displays a device name. When the Storage Server is Windows, it displays an AdvancedCopy Manager device name.
Mount-Point	When the Storage Server is Solaris, Linux, HP-UX or AIX, this displays the mount point name of the device and the file system type in parentheses. When the Storage Server is Windows, it displays the drive letter of a device. The file system type of the device is displayed in parentheses.
Generation	Displays the relative generation number of backup data.
Version	Displays an absolute generation number.
Backup-Date	Displays the date and time of completion of backup in the "YYYY/MM/DD hh:mm" format. YYYY is the year, MM is the month, DD is the day, hh is the hour, and mm is the minute.
CopyID	Displays the tape copy ID (fixed at 1). This item is displayed only if the -l option is specified.
Pool-Name	Displays the name of the storage pool to which tape backup was performed. This item is displayed only if the -l option is specified.
Backup-Tape	Displays the name of the tape volume to which backup was performed. If multiple tape volumes are applicable, the displayed names are delimited by a comma (,). This item is displayed only if the -l option is specified.

The table below lists the displayed information items for a day management backup.

Keyword	Description
Server	Displays a Storage Server name.
Device	When the Storage Server is Solaris, Linux, HP-UX or AIX, this displays a device name. When the Storage Server is Windows, it displays an AdvancedCopy Manager device name.

Keyword	Description
Mount-Point	When the Storage Server is Solaris, Linux, HP-UX or AIX, this displays the mount point name of the device and the file system type in parentheses. When the Storage Server is Windows, it displays the drive letter of a device. The file system type of the device is displayed in parentheses.
TapeCopy-Date	Displays the day management start date and time of a day management backup to tape in the "YYYY/MM/DD hh:mm:ss" format. YYYY is the year, MM is the month, DD is the day, hh is the hour, mm is the minute, and ss is the seconds. The date and time of the Tape Server is displayed.
Backup-Date	Displays the date and time of completion of backup in the "YYYY/MM/DD hh:mm" format. YYYY is the year, MM is the month, DD is the day, hh is the hour, and mm is the minute.
Expiration-Date	Displays the expiry date and time of a day management backup to tape in the "YYYY/MM/DD hh:mm:ss" format. YYYY is the year, MM is the month, DD is the day, hh is the hour, mm is the minute, and ss is the seconds. The date and time of the Tape Server is displayed. If "NoLimit" is specified for the number of preservation days in the tape backup management class, "Never" is displayed.
Pool-Name	Displays the name of the storage pool to which tape backup was performed. This item is displayed only if the -l option is specified.
Backup-Tape	Displays the name of the tape volume to which backup was performed. If multiple tape volumes are applicable, their displayed names are delimited by a comma (,). This item is displayed only if the -l option is specified.

11.4.9 Tape management information backup command (tboresback)

This command backs up tape management information to the specified directory. The tape management information includes TSM databases.

a.   Format

```
/opt/FJSVswstm/bin/tboresback Backup-Directory
```

b.   Description of operands

Operand	Description
Backup-Directory	Specifies the name of the destination directory for backing up tape management information.

c.   Example

Back up tape information to /home/backup:

```
# /opt/FJSVswstm/bin/tboresback /home/backup
tboresback completed
#
```

![Note]

Backup cannot be performed if:

— The specified directory does not exist.

- Copying of data to the specified directory failed, for example, because of insufficient free space.
- A file specified in the backup source TSM environment file (/etc/opt/FJSVswstm/conf/tsmbkfile) is not found. For information on the backup source TSM environment file, refer to "Backing up tape management information".

The tape management information backup command cannot be executed while a request related to tape backup is being processed on the Tape Server.

11.4.10Tape management information restore command (tboresrst)

This command restores tape management information from the specified directory. The tape management information includes TSM databases.

a. Format

```
/opt/FJSVswstm/bin/tboresrst Backup-Directory
```

b. Description of operands

Operand	Description
Backup-Directory	Specifies the name of the directory in which to save the backup management files.

c. Example

Restore tape management information from /home/backup:

```
# /opt/FJSVswstm/bin/tboresrst /home/backup
tboresrst completed
#
```


Restoration cannot be performed if:
- The specified directory does not exist.
- The tape management information is not found in the specified directory.
- Copying of data from the specified directory for restoration failed, for example, because of insufficient free space.

The tape management information restore command cannot be executed when the Tape daemon is active. For information on how to stop the Tape Server daemon, refer to "Starting and stopping the AdvancedCopy Manager Tape daemon".

11.4.11Trace log output level configuration command (tbomodlog)

This command changes the output level of a Tape Server trace log.

A trace log is a record of received commands and information on how they were processed. It is written to a dedicated file. The log provides information required for analyzing error causes in the event that an error is detected during tape backup. Changing the trace log output level can change the amount of output information. The setting of the output level need not be changed for a normal backup operation.

    a.   Format

```
/opt/FJSVswstm/bin/tbomodlog Log-Level
```

    b.   Description of operands

Operand	Description
Log-Level	Specifies the trace log output level. The following levels can be specified in LogLevel: 1: General information level 2: Detailed information level The default is 1.

    c.   Example

    Change the trace log output level to the detailed information level.

```
# /opt/FJSVswstm/bin/tbomodlog 2
tbomodlog completed
#
```

Note

Performing a normal backup operation with the trace log level set to the detailed information level affects backup performance. To prevent this problem, perform the operation with the output log level set to the general information level, except when collecting error survey information after an error occurrence.

11.4.12 Server information change report command (tbomodsrv)

When the server name, IP address, or port number of a Storage Server is changed, this command reflects the change to the Tape Server management information.

    a.   Format

```
/opt/FJSVswstm/bin/tbomodsrv server name
```

    b.   Description of operands

Operand	Description
Server name	Specifies a Storage Server name. If the server name has been changed, specify the new server name.

    c.   Example

    After changing the Storage Server name from srv1 to node1, reflect the change to a Tape Server.

```
# /opt/FJSVswstm/bin/tbomodsrv node1
tbomodsrv completed
#
```

For details on making changes using this command to change server information, refer to the following:

- "Changing the IP address of a Storage Server"
- "Changing the port number of a Storage Server"
- "Changing the server name of a Storage Server"

11.4.13ETERNUS2000/ETERNUS3000/ETERNUS4000 information acquisition command (tbogetoluinfo)

This command obtains the information required for backing up the data of an ETERNUS2000/ETERNUS3000/ETERNUS4000 disk to tape in a multi-path environment. The command obtains this information from the ETERNUS2000/ETERNUS3000/ETERNUS4000.

This command must be executed when the following occur:

- Initial installation of a Tape Server
- Upgrading of the Tape Server
- Upgrading of the Tape Server operating system
- Changing of the ETERNUS2000/ETERNUS3000/ETERNUS4000 RAID configuration
- Addition of a new ETERNUS2000/ETERNUS3000/ETERNUS4000

a. Format

```
/opt/FJSVswstm/bin/tbogetoluinfo -l ETERNUSIPaddress [ETERNUSIPaddress ...]
```

b. Description of options

Option	Description
-l	Specifies that ETERNUS2000/ETERNUS3000/ETERNUS4000 information be obtained from the ETERNUS2000/ETERNUS3000/ETERNUS4000 specified by *ETERNUSIPaddress* via a LAN This option cannot be omitted.

c. Description of operand

Operand	Description
ETERNUSIPaddress	Specifies the IP address of the ETERNUS2000/ETERNUS3000/ETERNUS4000 from which information is to be obtained. The only applicable IP addresses are "IPv4."

d. End status

    = 0: Normally end
    > 0: Abnormally end

e. Example

Obtain information from the ETERNUS4000 specified by ETERNUSIPaddress (200.30.40.30).

```
# /opt/FJSVswstm/bin/tbogetoluinfo -l 200.30.40.30
200.30.40.30 completed. [total olu = 100]
The configuration file of CM information was update.
#
```

The following message is posted if the Tape Server is upgraded from ACM13.1 or earlier to ACM13.2 or later and the Tape Server upgrade settings command (tboactmplbext) is executed:

```
# /opt/FJSVswstm/bin/tbogetoluinfo -l 200.30.40.30
200.30.40.30 completed. [total olu = 100]
```

```
/var/opt/FJSVmplb/mplb_ext.conf was update.
#
```

Note

If this command was executed in an environment where the GR multi-path driver is installed, also execute the command below. However, do not execute the command while the RAID device is processing the migration. This command need not be executed in the ETERNUS multi-path driver is installed.

```
# mplbconfig -q
#
```

Note

To execute this command, the following conditions must be satisfied:

— The ETERNUS3000 firmware version is the following or later:

Model	Firmware version
M100/M200/M400/M600	V20L32
M300/M500/M700	V10L10

— For ETERNUS2000/ETERNUS4000, execute this command regardless of the firmware version.
— The Tape Server and the ETERNUS2000/ETERNUS3000/ETERNUS4000 are connected to a LAN.
— The Tape Server and the ETERNUS2000/ETERNUS3000/ETERNUS4000 are FC-connected.
— An ETERNUS multi-path driver or a GR multi-path driver is installed on the Tape Server.
— The tbochkconf command has been executed with the ETERNUS2000/ETERNUS3000/ETERNUS4000 access path written in the /etc/opt/FJSVswstm/conf/devpath.conf file.

Note

— The command is not used in a configuration without the ETERNUS2000/ETERNUS3000/ETERNUS4000.
— If an IP address of a device other than the ETERNUS2000/ETERNUS3000/ETERNUS4000 is specified, no information is obtained.
— After the ETERNUS2000/ETERNUS3000/ETERNUS4000 RAID configuration is changed (including an addition of LUNV) or a new ETERNUS2000/ETERNUS3000/ETERNUS4000 is added, backup to tape or restoration from tape fails unless this command has been executed.
— /var/opt/FJSVmplb/mplb_ext.conf is a file in which the GR multi-path driver is set. Do not edit the file manually because it affects multi-path driver operation.
— If this command is executed and the Tape Server upgrade settings command (tboactmplbext) was not executed during an upgrade, information collection fails in a configuration that does not have two access paths set for each CM.
— Note that, if the Tape Server upgrade settings command (tboactmplbext) has been executed, the /etc/opt/FJSVswstm/conf/mplb_ext_active file exists. Execute the following command to check if this file exists:

```
# ls -l /etc/opt/FJSVswstm/conf/mplb_ext_active
```

11.4.14 Tape Server upgrade settings command (tboactmplbext))

This command is executed when performing a version upgrade from Softek AdvancedCopy Manager and a level upgrade from ETERNUS SF AdvancedCopy Manager. This command performs the following setup at the Tape Server:

● For performing operations that use of GR multi-path drivers after the upgrade
● For pperforming operations that inherit the pre-upgrade access path configuration without any changes

    a. Format

```
/opt/FJSVswstm/bin/tboactmplbext
```

    b. End status
      = 0: Normally end
      > 0: Abnormally end

    c. Example
      Set such that the upgrade uses GR multi-path drivers with the pre-upgrade access path configuration.

```
# /opt/FJSVswstm/bin/tboactmplbext
/etc/opt/FJSVswstm/conf/mplb_ext_active was created.
#
```

Note

Setup fails in the following cases:
    — The /etc/opt/FJSVswstm/conf/mplb_ext_active file already exists.
    — The /etc/opt/FJSVswstm/conf directory does not exist.
    — There is no free area under the /etc/opt/FJSVswstm/conf directory.
    — The command execution user is not a superuser.
    — The ETERNUS2000/ETERNUS3000/ETERNUS4000 information collection command (tbogetoluinfo) is executed to collect information.

Note

This command is required only when a Tape Server is upgraded. If this command is accidentally executed, take the action indicated below. If this action is not taken, backup operations may be abnormal.
    1) Execute the following command to delete the setup file for Tape Server upgrading:

```
# rm -i /etc/opt/FJSVswstm/conf/mplb_ext_active
```

        3- Re-execute the Tape Server upgrade procedures. (Refer to "Upgrading a Tape Server" in the "ETERNUS SF AdvancedCopy Manager Installation Guide".)

11.5 Disaster recovery commands

11.5.1 Tape backup history batch display command (tbodrhistdisp)

The command displays as a batch the history backed up to tape.
This command is executed only when recovering user data as part of disaster recovery.

Note

Transaction volumes that have no backup history are not displayed.

a. Format

```
/opt/FJSVswstm/bin/tbodrhistdisp Tape-DB-Dir
```

b. Description of operands

・Operand	・Description
・Tape-DB-Dir	・Specifies the directory path to the directory containing the ACM management information that was restored as described in "ACM management information recovery". ・[Example] ・If the ACM management information storage directory that was restored to the local disk at the disaster countermeasure site is /var/tmp/ACMBkupDir and the Tape Server name at the active site is "Tapesvr", the value specified for this operand is "/var/tmp/ACMBkupDir/Tapesvr/TapeData/FJSVswstm/data/Tapesvr".
・Tape-Server	・Specify the name of the Tape Server running at the active site.

c. End status

= 0: Normally end

> 0: Abnormally end

d. Example

ACM management information storage directory path:

/var/tmp/ACMBkupDir/Tapesvr/TapeData/FJSVswstm/data/Tapesvr

```
# /opt/FJSVswstm/bin/tbodrhistdisp
/var/tmp/ACMBkupDir/Tapesvr/TapeData/FJSVswstm/data/Tapesvr
Generation Management Backup
Server=StrgSV01 Device=/dev/dsk/c1t1d10s1 Mount-Point=/work1 (ufs) Platform=Solaris
Capacity(MB)=1024
Generation Version CopyID Backup-Date       Pool-Name  Backup-Tape
    1        10        1 2000/11/12 21:00   TapePool4  LT00059
    2         9        1 2000/11/11 21:00   TapePool4  LT00059


Day Management Backup
Server=StrgSV01 Device=/dev/dsk/c1t1d10s1 Mount-Point=/work1 (ufs) Platform=Solaris
Capacity(MB)=2048
TapeCopy-Date          Backup-Date          Expiration-Date        Pool-Name
Backup-Tape
2004/03/01 10:35:02    2004/03/01 10:30     2004/03/08 10:35:02    TapePool5
LT00040
```

The following table shows the contents displayed in relation to generation managed backup.

• Keyword	• Description
• Server	• Displays the name of the Storage Server that was used by the backed up device
• Device	• Displays the name of the backed up device. • If the device used a Windows server, the AdvancedCopy Manager device name is displayed.
• Mount-Point	• If the Storage Server is Solaris/Linux/HP-UX/AIX, the device mount-point name is displayed, and the file system type is displayed in parentheses. • For a Windows Storage server, the drive letter of the device is displayed, and the file system type of the device is displayed in parentheses.
• Generation	• Displays the relative generation number of the tape backup data
• Version	• Displays the absolute generation number
• Backup-Date	• Displays the date and time of backup completion. • The display format is "YYYY/MM/DD hh:mm". • YYYY = year, MM = month, DD = day, hh = hour, and mm = minutes
• CopyID	• Displays the tape copy ID (1 is fixed)
• Pool-Name	• Displays the name of the storage pool that was backed up to tape
• Backup-Tape	• Displays the name of the tape at the tape backup destination. If there are multiple tapes, the names are displayed delimited by commas (,).
• Platform	• Displays the platform of the Storage Server used for the backed up device
• Capacity(MB)	• Displays the size of the backed up device. • The size is displayed in megabytes.

The following table shows the contents displayed in relation to day managed backup.

• Keyword	• Description
• Server	• Displays the name of the Storage Server that was used by the backed up device
• Device	• Displays the name of the backed up device. • If the device used a Windows server, the AdvancedCopy Manager device name is displayed.
• Mount-Point	• If the Storage Server is Solaris/Linux/HP-UX/AIX, the device mount point name is displayed, and the file system type is displayed in parentheses. • For a Windows Storage Server, the drive letter of the device is displayed, and the file system type of the device is displayed in parentheses.
• TapeCopy-Date	• Displays the start date and time of the day managed tape backup. • The display format is "YYYY/MM/DD hh:mm". • YYYY = year, MM = month, DD = day, hh = hour, and mm = minutes. The date and time at the Tape Server is applied.
• Backup-Date	• Displays the date and time of backup completion. • The display format is "YYYY/MM/DD hh:mm". • YYYY = year, MM = month, DD = day, hh = hour, and mm = minutes
• Expiration-Date	• Displays the date and time at which day managed tape backup expires. • The display format is "YYYY/MM/DD hh:mm:ss". • YYYY = year, MM = month, DD = day, hh = hour, mm = minutes, and ss = seconds.

• Keyword	• Description
	• The date and time at the Tape Server is applied. • If "NoLimit" was specified as the preservation days for the tape backup management class, "Never" is displayed.
• Pool-Name	• Displays the name of the storage pool that was backed up to tape
• Backup-Tape	• Displays the name of the tape at the tape backup destination. If there are multiple tapes, the names are displayed delimited by commas (,).
• Platform	• Displays the platform of the Storage Server used for the backed up device
• Capacity(MB)	• Displays the size of the backed up device. • The size is displayed in megabytes.

11.5.2 Restore command for disaster recoveries using tape (tbodrrestore)

The command restores to disk the data that was backed up to tape.
The device specified as the restoration destination must have the same volume size of larger than the original transaction volume.
This command is executed only during user data recovery as part of disaster recoveries.

Note

Data for which day managed tape backup has expired cannot be restored.

a. Format

```
For restoring a transaction volume:
# /opt/FJSVswstm/bin/tbodrrestore -h Storage-Server [-g Generation-No | -v Version-No
| -t Backup-Time] -d Restore-Storage-Server -r Restore-Device-name Device-Name
Tape-DB-Dir Access-Path Data-Record-Dir
```

b. Description of options

・Option	・Description
・-h	・Specifies the Storage Server name. ・Specify a server name that is displayed in the "Server" column for the devices scheduled for recovery displayed by the tape backup history batch display command (tbodrhistdisp).
・-g	・Specifies the relative generation number of the data to be restored. ・Restoration of only generation managed data can be specified. ・Use the tape backup history batch display command (tbodrhistdisp) to check the relative generation number. ・The -v and -t options cannot be specified concurrently with the -g option.
・-v	・Specifies the absolute generation number of the data to be restored. ・Restoration of only generation managed data can be specified. ・Use the tape backup history batch display command (tbodrhistdisp) to check the absolute generation number. ・The -g and -t options cannot be specified concurrently with the -v option.
・-t	・Specifies the day managed start date and time of the data to be

・ Option	・ Description
	restored. ・ Restoration of only day managed data can be specified. ・ Use the tape backup history batch display command (tbodrhistdisp) to check the day managed start date and time. ・ The -v and -t options cannot be specified concurrently with the -g option. ・ Specify the backup date and time in the "YYYY/MM/DD hh:mm:ss format." ・ The "YYYY/MM/DD hh:mm:ss" format is as follows: ・ YYYY: Year (4 digits) ・ MM: Month (2 digits) ・ DD: Day (2 digits) ・ hh: Hour (2 digits) ・ mm: Minutes (2 digits) ・ ss: Seconds (2 digits) ・ The -g and -v options cannot be specified concurrently with the -t option.
・ -d	・ Specifies the Storage Server name at the restore destination
・ -r	・ Specifies the restoration destination device name. ・ Configuration information for the specified device name must be in the recovery destination device information file specified for the "Data-Record-Dir" operand. ・ Restoration processing terminates with an error if configuration information for the device specified in this parameter is not in the above file.

Note: If none of options -g, -v, and -t are specified, the latest information from the generation managed backup history is restored.

c. Description of operands

・ Operand	・ Description
・ Device-Name	・ Specifies the name of the device targeted for restoration. ・ Specify a device name that is displayed in the "Device" column for the devices scheduled for recovery displayed by the tape backup history batch display command (tbodrhistdisp). ・ If the Storage Server is Solaris/Linux/HP-UX/AIX, specify the block device name of the transaction volume. ・ Multiple device names cannot be specified in this parameter. ・ If the Storage Server is Windows, specify the AdvancedCopy Manager device name that corresponds to the transaction volume. For details of the AdvancedCopy Manager device names, refer to "AdvancedCopy Manager device management methods" in the "ETERNUS SF AdvancedCopy Manager Operator's Guide (Windows)".
・ Tape-DB-Dir	・ Specifies the path for the directory that contains the ACM management information restored as described in "ACM management information recovery". ・ [Example] ・ If the ACM management information storage directory that was restored to the local disk at the disaster recovery site is /var/tmp/ACMBkupDir and the Tape Server name at the active site is "Tapesvr", the value specified for this operand is "/var/tmp/ACMBkupDir/*Tapesvr*/TapeData/FJSVswstm/data/*Tapesvr*".
・ Access-Path	・ Specifies the access path to the same ETERNUS storage system

・Operand	・Description
	as the recovery destination device prepared at the Storage Server. ・For this access path, specify the access path name created in step 2 of "Customizing the Tape Manager". ・Do not specify an access path that is set for other processing that is on progress for this command. ・Specify the name of the Storage Server used by the restoration target device.
・Data-Record-Dir	・Specifies the name of the directory that contains the file which stores the configuration information for the recovery destination device that corresponds to this device scheduled for recovery which was created in step 3 of "Recovery destination device definitions". ・Note that, if this file contains configuration information for multiple recovery destination devices, the information coded in the first record of this file is used.

d. End status
   = 0: Normally end
   > 0: Abnormally end

e. Example
   The example shows a user data recovery request for the following case:
   — Storage Server name
     "gyoumu01"
   — Storage Server name of restoration destination
     "Stgsvr01"
   — Backup type
     Generation managed backup
     Relative generation number: 1
   — Restore destination device
     "/dev/dsk/c2t10d1s1"
   — Device targeted for restoration
     "/dev/dsk/c1t0d0s1"
   — Path for ACM management information storage destination directory
     "/var/tmp/ACMBkupDir/Tapesvr/TapeData/FJSVswstm/data/Tapesvr"
   — Access path
     "/dev/FJSVmplb/rdsk/mplb2053s2"
   — Directory path for the file where configuration information for the recovery destination device is stored
     "/var/tmp/tsm_data"

```
# /opt/FJSVswstm/bin/tbodrrestore -h gyoumu01 -d Stgsvr01 -r /dev/dsk/c2t10d1s1
/dev/dsk/c1t0d0s1 /var/tmp/ACMBkupDir/Tapesvr/TapeData/FJSVswstm/data/Tapesvr
/dev/FJSVmplb/rdsk/mplb2053s2 /var/tmp/tsm_data
#
```

11.6 Starting and Stopping Daemons

The daemons of AdvancedCopy Manager can be started in the ways explained in this section.

A note on this command is as follows:
— Make sure that the SWSTGNODE environment variable is not set.
— Execute this command using the same LANG environment variable as that of the code system used by the system.
— Only a root user can execute this command.
— For information on cluster operation, refer to "Starting and Stopping a Daemon" in the "ETERNUS SF AdvancedCopy Manager Operator's Guide for cluster environment" corresponding to the cluster system.

11.6.1 Starting and stopping the communication daemon

Refer to "Starting and stopping the communication daemon" in the "ETERNUS SF AdvancedCopy Manager Operator's Guide" for the operating system of the target Server.

11.6.2 Starting and stopping the RMI daemon

Refer to "Starting and stopping the RMI daemon" in the "ETERNUS SF AdvancedCopy Manager Operator's Guide" for the operating system of the target Server.

11.6.3 Starting and stopping the RDB daemon

Refer to "Starting and stopping the RDB daemon" in the "ETERNUS SF AdvancedCopy Manager Operator's Guide" for the operating system of the target Server.

11.6.4 Starting and stopping the authentication daemon

Refer to "Starting and stopping the authentication daemon" in the "ETERNUS SF AdvancedCopy Manager Operator's Guide" for the operating system of the target Server.

11.6.5 Starting and stopping AdvancedCopy Manager daemons

Refer to "Starting and stopping the AdvancedCopy Manager daemons" in the "ETERNUS SF AdvancedCopy Manager Operator's Guide" for the operating system of the target Server.

11.6.6 Starting and stopping the AdvancedCopy Manager Tape daemon

● Starting the Tape daemon
Execute the following command to start the Tape daemon.

```
# /etc/init.d/FJSVswstm start
```

● Checking that the Tape daemon has started

Execute the following command. If the tbod character string is displayed in the execution results, the daemon is already started.

```
# ps -ef | grep tbod
```

● Stopping the Tape daemon

Execute the following command to stop the Tape daemon.

```
# /etc/init.d/FJSVswstm stop
```

Only the Tape Server has the Tape daemon.

11.6.7 Starting and stopping the TSM daemon

● Starting the TSM daemon

Execute the following command to start the TSM daemon.

```
# /etc/init.d/initTSM start
```

● Checking that the TSM daemon has started

Execute the following command. If the dsmserv character string is displayed in the execution results, the daemon is already started.

```
# ps -ef | grep dsmserv
```

● Stopping the TSM daemon

Execute the following command to stop the TSM daemon.

```
# /etc/init.d/initTSM stop
```

The TSM daemon runs only on the Tape Server.

Chapter 12 GUI Client Functions

This chapter explains the GUI Client functions of Tape Backup of AdvancedCopy Manager.

12.1 Configuration Management

The configuration management functions of Tape Backup of AdvancedCopy Manager can use the GUI Client functions.

For details, refer to the "ETERNUS SF AdvancedCopy Manager GUI User's Guide".

Chapter 13 Notes on Operations

This chapter provides notes on the Tape Backup operations of AdvancedCopy Manager.

13.1 Notes on Backup Operation

This section provides notes on backup operation.

13.1.1 General Notes

For general notes, refer to "Notes on Operations" in the "ETERNUS SF AdvancedCopy Manager Operator's Guide" for the operating system of the target Servers.

13.1.2 Notes on Snapshot High-speed Backup

This section provides notes on snapshot high-speed backup.

Number of Required Backup Volumes

Snapshot high-speed backup requires as many backup volumes as the number of specified backup generations. Thus, snapshot backup is disabled if:
- — All the specified number of generations have been backed up, and
- — No new volume that can be used as a backup volume exists.

Simultaneous Backup

Performing snapshot high-speed backup simultaneously with the same transaction volume specified will perform two backup operations in parallel.

However, performing snapshot high-speed backup simultaneously more often than the number of preservation generations will cancel the backup operations starting from the oldest one. In other words, you cannot perform more simultaneous backups than the specified number of generations.

13.1.3 Notes on Synchronous High-speed Backup

This section provides notes on synchronous high-speed backup.

Backup Processing

The backup command (acmbackup) cannot be executed until the transaction and backup volumes are in the equivalency maintenance state.

Backup Policy Setting

Backup policies can be set if the number of registered backup volumes is enough for snapshot high-speed backup operation, even if the number is not enough for synchronous high-speed backup. In this event, synchronous high-speed backup cannot be performed.

13.1.4 Notes on Restoration

This section provides notes on restoration.

Timing of Restoration

If data on a transaction volume has been updated since the latest backup, then if a restore is performed from the backup volume, recently updated data will be lost.

Figure: Notes on restoration of AdvancedCopy Manager
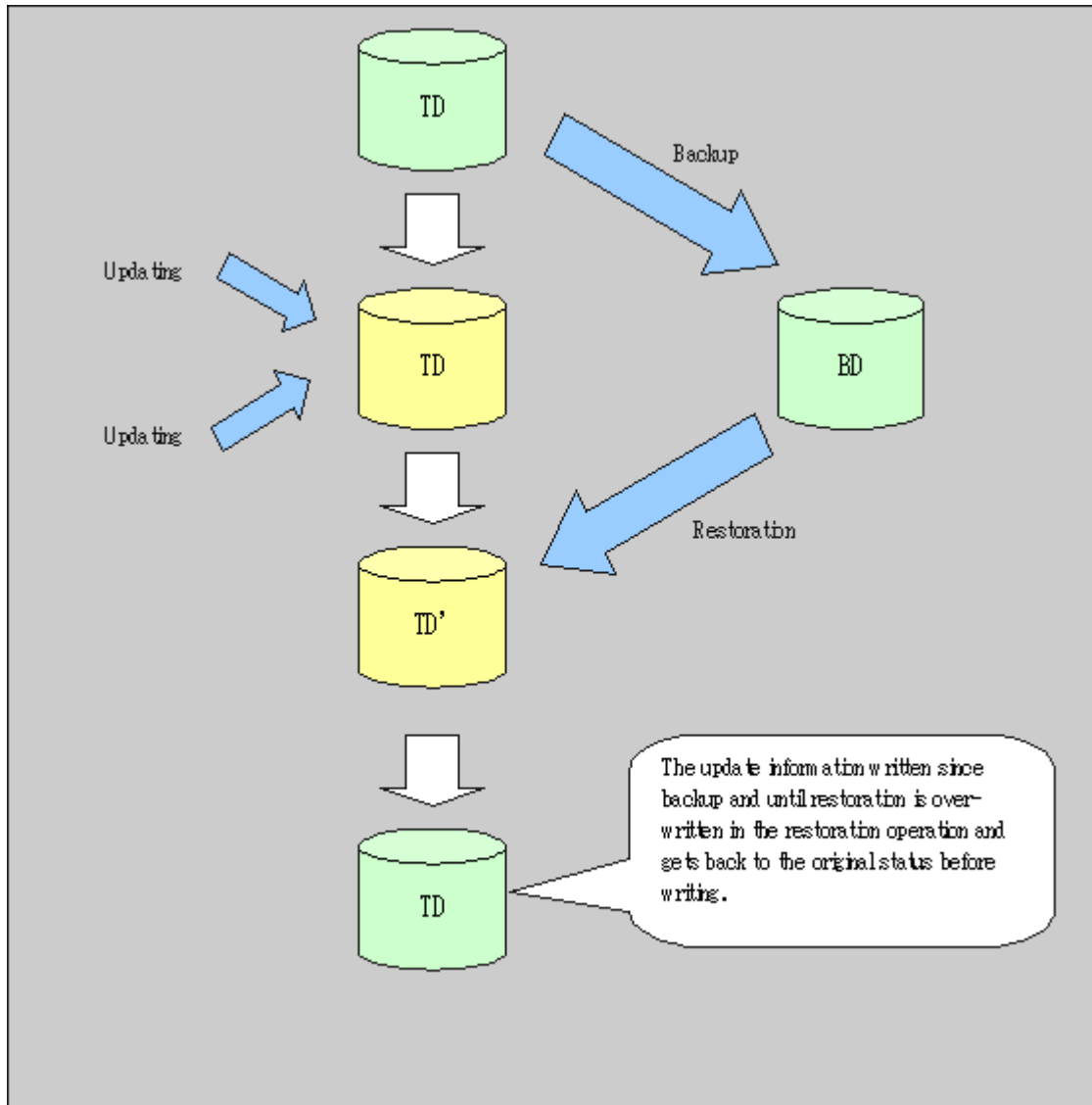
TD: Transaction volume
BD: Backup volume

Restore Priority

Restore is set up with a higher priority than backup for drive allocation and tape access.
For example, if a restore command is executed while all drives are being backed up, the backup
will be cancelled and the restore will start.
Before performing a restore, use the following method to check the ETERNUS tape library drive
or tape usage status.

● Execute the tape execution history display command (tboreqstat) to check the backup process that is
in progress.

● Check the detailed display of the tape history information display command (tbohistdisp) to see on which
tape the backup data of the transaction volume to be restored exists.

● Check the drive or tape usage status of the ETERNUS tape library using the ETERNUS tape library panel.

For information on how to operate the ETERNUS tape library panel, refer to the manual that accompanies the unit.

If there is no space in the drive, or if the tape that you want to restore is being used by a backup, use the following procedures to secure a vacant drive and the required tape, or restore after all backup processes that are executed with commands are completed.

1. Use the tape backup cancel command (tbocancelback) to cancel all backup processes awaiting a vacant drive.
2. Use the tape backup cancel command (tbocancelback) to cancel a backup that is currently writing to the tape to be used by the restore.
3. Use the tape backup cancel command (tbocancelback) to cancel a backup that is using a drive.

For details on tbocancelback command, refer to "Tape backup cancel command"
The restore priority order can be disabled by specifying NOPREEMPT in the TSM server option file (dsmserv.opt). If disabled, even if backup and restore command are executed at the same time, processing will be performed in the order that commands are executed.
For details on the server option file, refer to the "Tivoli Storage Manager for Sun Solaris Administrator's Guide" or the "Tivoli Storage Manager for Sun Solaris Administrator's Reference Guide".

13.1.5 Notes on SDX Object Operations

Note the following about the backup operation of SDX objects.

Backup execution command (acmbackup)

Note the following about operation with an SDX object in units of slices

In the following cases, backup cannot be executed. In these cases, take appropriate action according to [System administrator's action] in the output message.
Backup cannot be executed if the SDX object does not satisfy the following conditions:
— The state of the mirror volume is ACTIVE.
— The state of the SDX disk is ENABLE.
— The state of the mirror slice is ACTIVE or TEMP.
In the following case, the pre-processing and post-processing scripts are not executed:
— The state of the SDX object slice is TEMP.

Restoration execution command (acmrestore)

Note the following about operation with an SDX object in units of slices.

If the transaction volume is a slice of an SDX object and it is not a single volume, restoration using this command cannot be performed. This is the case because Advanced Copy cannot be performed on a mirror volume.
For restoration to the transaction volume of an SDX object, follow the procedure below.

1) Confirm the backup volume by using the backup history list view or the history information display command.
2) For restoration, use the dd command to copy data to the volume.

13.1.6 Notes on Restarting a Tape Library System

A tape library system may be turned off while a tape is mounted. In this case, the tape and drive are disabled and are unusable when the tape library system is started.

This state can be confirmed by activating the TSM dsmadmc command and executing the "query volume format=detail" command. If "disabled" is displayed for the access status, the above state is confirmed.

For recovery, execute the following procedure:

1. Execute a TSM management client command.
2. Execute the "dsmadmc" command.
3. Check whether the drive is disabled.
4. Execute the "query drive" command to check whether the drive is disabled.
5. If the drive is disabled (and "yes" is not displayed for the online state), execute the following command.
6. "update drive library-name drive-name online=yes"
7. Confirm that the drive is enabled.
8. Execute the "query drive" command to check whether the drive is enabled.
9. Check the tape status.
10. Execute the "query volume format=detail" command to check the status.
11. If the tape is disabled, execute the following command to enable the tape.
12. "update volume tape-name access=readwrite"
13. Confirm that the tape is enabled.
14. Execute the "query volume format=detail" command to check that the tape is enabled.
15. If the access status has returned to the read/write status, the tape is enabled.

13.2 Notes on the GUI Client

For notes on the Web GUI client environment, refer to "Setting up a client" in the "ETERNUS SF AdvancedCopy Manager GUI User's Guide".

Chapter 14 Disaster Recovery Restore Function Using Tape Media

This chapter explains the method of data recovery in a time of disaster, using tape media.

14.1 Function Overview

This function (referred to as the disaster recovery restore function using tape media) provides a means to recover user data from operational sites to ETERNUS storage system located at disaster recovery sites, for data of the types listed below.

- ● Backup tapes of user data stored on the ETERNUS storage system
- ● ACM management information backed up in a package
- ● Management information of TSM that controls tape backup operations

Point

Arrange for the following units at the disaster recovery site.

— A server for data restoration (a Solaris server referred to as a tape server)
— A server that uses the restored data (referred to as the storage server)
— Tape unit
— ETERNUS storage system

Note

The storage server arranged to process restored data must be of the same platform as the server used at the operation site.

Because the data is restored from tape media, you must restore only the TSM backup/restore environment included in ACM Tape Manager and not the entire ACM backup environment that includes processing between disks, and then restore the user data to the ETERNUS storage system according to the backup history information in the ACM management information.

Figure: Flow of data restoration at the operation site and the disaster recovery site

【Operation site environment】 　　　　　　　　【Disaster Recovery site environment】

Storage admin server

Storage server　　　Tape server

Data copy　　　Portable data copy

DAT
Portable media

TSM important files

Tape server
TSM server
TSM client

Storage server

SAN

ETERNUS　　　Tape library

SAN

Tape library　　　ETERNUS

Transport, store

Restore data

Backup data
・User data
・ACM management
information
・TSM DB data
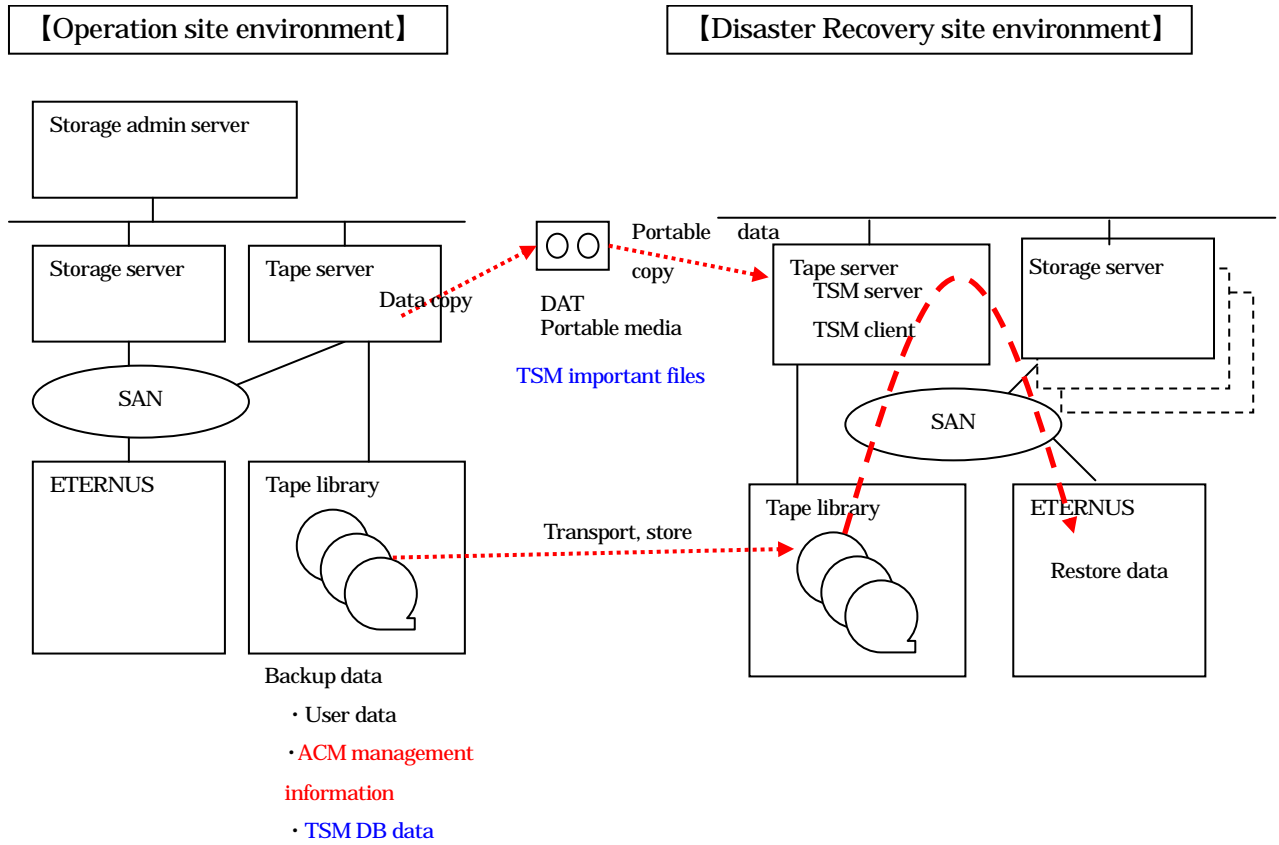
14.2 Restorable Data

The function restores data backed up to tapes during the ACM backup operation and that managed by the number of days and/or by generation

Table: Restorable data

	Data restorable by the disaster-control restore function using tape media
Restorable data	Backup data in units of slices
	Backup data in units of LUs

14.3 Operational Requirements

Requirements for operating this function at the disaster recovery site are explained below.

14.3.1 Hardware requirements

Hardware requirements for restoring user data with this function at the disaster recovery site are explained below.

Because data is transferred from the operation site to the disaster recovery site using portable media (DAI etc.) that store TSM related files described in "Saving TSM related files", the tape server at the operation site and that at the disaster recovery site must be able to access the same portable media.

Table: Hardware requirements at the disaster recovery site

Environment	Target	Hardware resource
Operation site	Tape server	Portable media access device
The disaster recovery site	Tape server	SUN server with Solaris installed
		Portable media access device
	Storage server	A server of the same platform as that of the storage server that is to process the data to be restored from the operation site
	ETERNUS storage system/ETERNUS tape library	Hardware as described in "Hardware Requirements" in the "ETERNUS SF AdvancedCopy Manager Installation Guide". The ETERNUS tape library at the disaster recovery site must be able to read at the tapes used in the backup process at the operation site.

Figure: Hardware diagram of the disaster recovery site

273
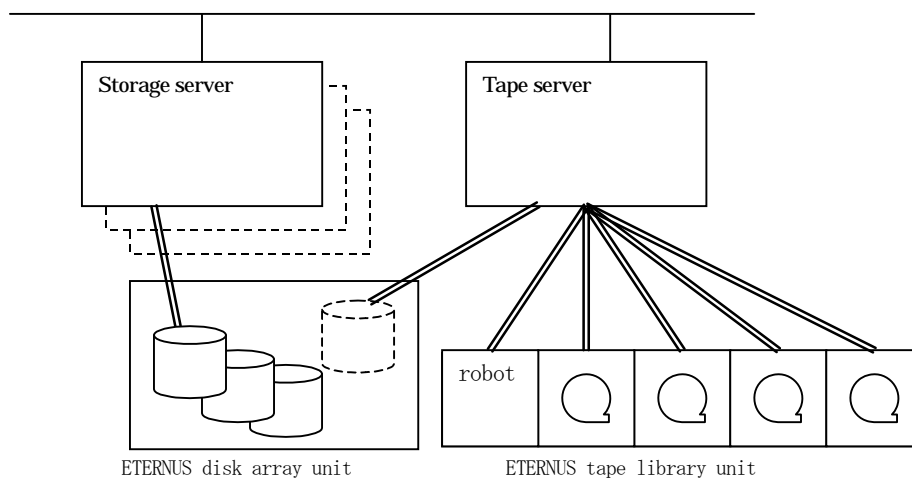
14.3.2 Software requirements

ACM Tape Manager must be installed on the tape server at the disaster recovery site to run the disaster recovery restore function using tape media.

The tape server at the disaster recovery site that will be used to restore user data using this function has the same software requirements as those required when ACM Tape Manager is installed.

The storage server at the disaster recovery site has the same software requirements as those required when ACM Agent is installed.

Refer to "Software Requirements" in the "ETERNUS SF AdvancedCopy Manager Installation Guide" for the requirements of respective software.

14.3.3 Required resources

The tape server at the disaster recovery site that will be used to restore user data using this function requires the same resources as those required to install ACM Tape Manager.

Refer to "Required Resources" in the "ETERNUS SF AdvancedCopy Manager Installation Guide" for the resources required when ACM Tape Manager is installed.

The storage server at the disaster recovery site requires the same resources as those required when ACM Agent is installed.

Refer to "Required Resources" in the "ETERNUS SF AdvancedCopy Manager Installation Guide" for the resources required to install ACM Agent.

14.4 Restoration Flow

A flow of actions from normal operation to data restoration in the event of a disaster is explained below.

1. Actions when building of the ACM backup environment has been completed

   At the operation site, after the ACM backup environment has been built, save information files that will be required for data restoration.

   Refer to "Tasks after completing the ACM backup environment build" for details.

2. Actions at normal times

   At the operation site, after the ACM backup operation, save information files that will be required for data restoration.

   Refer to "Tasks after ACM Backup Operation" for details.

3. Actions in the case of a disaster

   Transport information files mentioned in step 1 and 2 above and the backup tapes from the ETERNUS tape library at the operation site to the disaster recovery site.

   Refer to "Actions in case of a disaster" for details.

4. Actions at the disaster recovery site

   Restore data using the units at the disaster recovery site and information transported as shown in Item 3.

   Refer to "Building the restoration environment at the disaster recovery site" and "Procedures for data restoration" for details.

Figure: Data restoration flow

【Operation site】   【Disaster Recovery site】

1)
```
┌ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ┐
  Processing  after  completing  the  ACM
  backup environment build
└ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ┘
```
┌──────────────────────────────────────┐
│ Collecting information required to restore │
└──────────────────────────────────────┘

2)
```
┌ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ┐
  Processing at normal times
└ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ┘
```
┌──────────────────────────────────────┐
│ Regular ACM backup operation   │
│ with   due   consideration   to   │
│ transactions   │
└──────────────────────────────────────┘

┌──────────────────────────────────────┐
│ Collecting information required to restore │
└──────────────────────────────────────┘

Transport

3)
```
┌ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ┐
  Processing in the case of a disaster
└ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ┘
```
┌──────────────────────────────────────┐
│ Transport information required for restoration │
│ and collected in Steps 1) and 2) and user data │
│ backup tapes to the disaster recovery site │
└──────────────────────────────────────┘

4)
```
┌ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ┐
  Processing   at   the   disaster
  recovery site
└ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ┘
```
┌──────────────────────────────────────┐
│ Restore   data   using   the   │
│ information transported and the   │
│ devices arranged for at the   │
│ disaster recovery site   │
└──────────────────────────────────────┘

14.5 Tasks in Preparation for Disasters

In this section, tasks required to be prepared for a disaster are explained.

14.5.1 Tasks after completing the ACM backup environment build

Information to be collected in the event of a disaster and the procedures required after building the ACM backup environment at the operation site are explained below.

14.5.1.1 Setting TSM information

This section describes how to set the TSM information required for performing disaster recovery restoration procedures.
Enter these settings at the operation site.

14.5.1.1.1 Naming standards

The naming standards for TSM are as follows.
Note that the names described in this section are reference standards, and any names can be used.
The purpose of these naming standards is to differentiate this information from other similar information. Therefore, adjust setting names in accordance with the command specifications for each setting.

1. Name of the node for disaster recovery restoration
   This is the node name specified when instructing the backup of target data to the tape server
   The naming standard for this node name is: servername_FILE_NODE
   The following characters are permitted: single-byte alphanumeric, the minus sign (-), the underscore (_), the hash sign (#), and a period (.). The name must start with a single-byte alphanumeric character, double-byte characters will cause errors and it is not case-sensitive.
   — Server name
     This is the tape server name at the operation site.
   — FILE_NODE
     This is a fixed character string.
     [Example]
     If the tape server host name is "TAPESERVER", the name is as follows:
     TAPESERVER_FILE_NODE
2. Other names for TSM
   Other names used with TSM in addition to the one above are as follows.
   — The name of the storage pool used for generation managed backup
     "FILE_SPOOL"
   — The name of the storage pool used for day managed backup
     "FILE_NPOOL"
   — The Policy domain name
     "FILE_DOMAIN"
   — The Policy set name
     "FILE_POLICY"
   — The Management class name
     "FILE_MCLASS"

If multiple names need to be created for particular operation scenarios, use the following format to distinguish them from the above:
Additional TSM information name: TSM information name_identification characters
[Example]
Additional policy domain for monthly backup: FILE_DOMAIN_MONTHLY

14.5.1.1.2 Setting TSM information

This section describes how to set the TSM information required for performing disaster recovery restoration procedures.

The AdvancedCopy Manager tape daemon and the TSM daemon must be activated at the tape server before the settings shown below are made. Start the daemons if they are not yet activated.
Refer to "Starting and stopping the AdvancedCopy Manager tape daemon" for details on how to start the AdvancedCopy Manager tape daemon.
Refer to "Starting and stopping the TSM daemon" for details on how to start the TSM daemon.

The setup tasks are all performed after the TSM management client command (dsmadmc) has been activated.
If the "tsm>" prompt is displayed, start the TSM management client command (dsmadmc), then perform the operations.
For details on the commands below refer to their respective sections in the "ETERNUS SF TSM Administrator's Handbook".

1. Starting the TSM management client command
— Change the directory.

```
# cd /opt/tivoli/tsm/client/ba/bin
```

— Execute the TSM management client command (dsmadmc).

```
# ./dsmadmc
IBM Tivoli Storage Manager
Command line management interface - Version 5, Release 3, Level 4.0.
(c) Copyright by IBM Corporation and other(s) 1990, 2006. All Rights Reserved.


Enter User ID: admin


Enter password:


Session establishment, server: *****: Solaris 8/9
  :
   :
  tsm >
```

— At "Enter User ID", type in the TSM Administrator's ID, then press the Enter key.
— At "Enter password", type in the TSM Administrator's password, then press the Enter key.

Point

      The tape server must be active for this step. If the TSM management client command fails to start, activate the tape server.

2. Storage pool settings

Enter the settings for the storage pool that is used.

```
tsm> define stgpool FILE_SPOOL <device classname > maxscratch=<maximum number
of scratch volumes >
```

- Device classname
  This is the device class name that was defined as described in "Setting a Device Class".
  The following command can be used to check the device classes that have been defined.

  ```
  tsm> query devclass format=detail
  ```

- Maximum number of scratch volumes
  This is the maximum number of scratch volumes that can be registered for this storage pool.

In the following example, "DRIVECLASS1" is set as the device class, and "50" is set as the maximum number of scratch volumes.

```
tsm> define stgpool FILE_SPOOL DRIVECLASS1 maxscratch=50
```

3. Policy domain settings

Set the policy domain for disaster recovery restoration.

```
tsm> define domain FILE_DOMAIN description=' Policy domain for Disaster RECOVERY'
```

4. Policy set settings

Set the policy set for disaster recovery restoration.

```
tsm> define policyset FILE_DOMAIN FILE_POLICY
```

5. Management class settings

Set the management class for disaster recovery restoration.

```
tsm> define mgmtclass FILE_DOMAIN FILE_POLICY FILE_MCLASS
tsm> assign defmgmtclass FILE_DOMAIN FILE_POLICY FILE_MCLASS
```

6. Copy group settings

Set the copy group for disaster recovery restoration.

```
tsm> define copygroup FILE_DOMAIN FILE_POLICY FILE_MCLASS
verexists=<preservation generations> retextra=<number of days old generations
are saved > destination=FILE_SPOOL type=backup
```

- Preservation generations
    This refers to the number of generations of backed up data that are kept.
- Number of days old generations are saved
    This refers to the number of days that data which is not in the latest
    generation is kept.

In the following example, "3" is set as the number of preservation generations,
and "7" is set as the number of days old generations are saved.

```
tsm> define copygroup FILE_DOMAIN FILE_POLICY FILE_MCLASS verexists=3
retextra=7 destination=FILE_SPOOL type=backup
```

7. Activating the policy set name

Activate the policy information that has been set up to this point for disaster recovery
restoration.

```
tsm> activate policyset FILE_DOMAIN FILE_POLICY
```

8. Node settings

Set the node for disaster recovery restoration.

```
tsm> register node <node name> <password> passexp=0 domain=FILE_DOMAIN
maxnummp=<maximum number of mount points >
```

— Node name
    Refer to "Naming standards" for the naming standards for node names.
— Password
    This is the password attached to the node name that is set.
— Maximum number of mount points
    Specify the maximum number of tape drive units that this node can use for disaster
    recovery restoration.

In the following example, "TAPESERVER_FILE_NODE" is set as the node name, "NODE1" is
set as the password, and "2" is set as the maximum number of mount points.

```
tsm> register node TAPESERVER_FILE_NODE NODE1 passexp=0 domain=FILE_DOMAIN
maxnummp=2
```

9. Tape check-in

Load the tape into the unit that is to used for disaster recovery restoration.

Refer to "Loading a Tape (CHECKIN)"for information on the tape check-in method.

10. Registration to storage pool

If the tape is for private operation, the tape must be registered in advance to the appropriate storage pool.
The registration method is described below.

```
tsm> define volume <storage pool name> <volume name>
```

— Storage pool name
    This is the storage pool name set in step 2 above.
— Volume name
    This is the name of the volume that you want to register to the storage pool.
In the following example, "FILE_SPOOL" is set as the storage pool, and "FIL000" is set as the volume name.

```
tsm> define volume FILE_SPOOL FIL000
```

11. Stopping the TSM management client command
Enter "quit" at the "tsm>" prompt to stop the TSM management client command (dsmadmc).

```
tsm> quit
```

14.5.1.2 Saving TSM related files

You must save the TSM related files listed below to local disks on the tape server.
Once the ACM backup environment is built and information collected, information only needs to be collected again when the configuration of the ETERNUS tape library unit is changed. Collection is required at no other times.

Table: TSM related files

File	Explanation
devconfig file	This file stores ETERNUS tape library information set by TSM. It is used during restoration processing of the TSM log files and database.
dsm.sys and dsm.opt files	These are TSM client option files.

1. Preparing the directory where data is saved

   Create the directory where the data will be saved on local disks of the tape server at the operation site.

   Example:

   ```
   # mkdir /var/tmp/tsm_data
   ```

2. Saving the devconfig file

   Save the devconfig file using the cp –p operating system command onto local disks of the tape server at the operation site.

   The devconfig file refers to a file in the dsmserv.opt files and is specified in the DEVCONFig item.

The dsmserv.opt file is located under "$DIR4" ("DB storage directory") the size of which was estimated as described in "Dynamic disk resources" of the "ETERNUS SF AdvancedCopy Manager Installation Guide".

3. Saving the dsm.sys and dsm.opt files

Save the /usr/bin/dsm.sys and /usr/bin/dsm.opt files stored on the tape server at the operation site using the cp –p operating system command onto local disks of the tape server at the operation site.

4. Saving files saved in steps 2 and 3 above onto the portable media

Save all the files that have been saved in steps 1 and 2 above onto portable media. Use a function other than TSM (OS function etc.) perform this step.

14.5.2 Tasks after ACM backup operation

After completing ACM tape backup operations at the operation site, to be prepared for a disaster the following tasks must be performed in the order in which they are written:

1. Saving ACM management information

Save ACM management information on the tape server at the operation site by following the procedures shown in "Making a package backup of databases".

ACM management information to be saved refers to that created when a backup is specified (as a part of tape backup management for the tape server) where "Yes" is specified for the key name TapeData and the above procedure is followed.

The entire ACM management information saved must be backed up to tape using the backup function of TSM.

Refer to the "ETERNUS SF TSM Backup/Archive Client Installation and User Guide" for details of the dsmc incremental command.

```
# cd /opt/tivoli/tsm/client/ba/bin
# ./dsmc incremental <backup target> -virtualnodename=<node name>
-password=<password> -subdir=yes
```

— Backup target
   Specify the path to the file to be backed up
   Ensure "/" is added to the end of the directory path.

— node name/password

   A name of the node for disaster countermeasure restoration and the corresponding password

Example:
ACM management information directory path: /var/ACMBkupData/sftk-ssm2/
Node name for disaster countermeasure restoration: TAPESERVER_FILE_NODE
Password: filenode

```
# cd /opt/tivoli/tsm/client/ba/bin
# ./dsmc incremental /var/ACMBkupData/sftk-ssm2/
-virtualnodename=TAPESERVER_FILE_NODE -password=filenode -subdir=yes
```

2. Backing up TSM database

   Back up the TSM database.

   a) Prepare the tapes to be used to back up the TSM database

      Tape media registered in the storage pool cannot be used as the TSM
      database backup tapes.

      The status of tape media on the ETERNUS tape library can be checked using
      the query libvolume command. If the status column of the tape to be used
      shows "Scratch", change it to "Private".

      Use the update libvolume command to change the status to "Private".

      Refer to the section on respective command in the "ETERNUS SF TSM
      Administrator's Handbook" for details of the query libvolume command and
      the update libvolume command.

```
# cd /opt/tivoli/tsm/client/ba/bin
# ./dsmadmc -id=<TSM Administrator's ID> -password=<TSM Administrator's
password> query libvolume
:
# ./dsmadmc -id=<TSM Administrator's ID> -password=<TSM Administrator's
password> update libvolume <library name> <volume name> status=private
```

      - TSM Administrator's ID
        Specify the TSM Administrator's ID.

      - TSM Administrator's password
        Specify the TSM Administrator's password.

      - Library name
        Specify the name of the library where the tape to be changed is loaded.
        The library name can be checked in "Library Name" of the query
        libvolume command.

      - Volume name
        Specify the volume name of the tape to be changed.

Example:
TSM Administrator's ID: admin
TSM Administrator's password: admnpass
Library name: LT160
Volume name: LTO123

```
# cd /opt/tivoli/tsm/client/ba/bin
# ./dsmadmc -id=admin -password=admnpass update libvolume LT160 LTO123
status=private
```

b) Execute TSM database backup processing

Confirm that backup/restore processing for the tape is not active, and
execute the command from the command line on the tape server.

Refer to the backup db command section in the "ETERNUS SF TSM
Administrator's Handbook" for details about this command.

```
# cd /opt/tivoli/tsm/client/ba/bin
# ./dsmadmc -id=<TSM Administrator's ID> -password=<TSM Administrator's
password> backup db devclass=<device class name> type=full volumenames=<volume
name> scratch=no
```

    – TSM Administrator's ID
      Specify the TSM Administrator's ID.

    – TSM Administrator's password
      Specify the TSM Administrator's password.

    – Device class name
      Select the device class that corresponds to the ETERNUS tape library
      to be used, from the execution results of the TSM query devclass
      format=detail command.

      Refer to the query devclass command section in the "ETERNUS SF
      TSM Administrator's Handbook" for details about this command.

    – Volume name
      Specify the volume name of the tape to be used for the TSM database
      backup.

      The tape specified must be used only for the TSM database backup
      and no other backup process.

Example:
TSM Administrator's ID: admin
TSM Administrator's password: admnpass
Device class name: DRIVECLASS1
Volume name: LTO123

```
# cd /opt/tivoli/tsm/client/ba/bin
```

```
# ./dsmadmc -id=admin -password=admnpass backup db devclass=DRIVECLASS1
type=full volumenames=LTO123 scratch=no
```

14.6 Actions in case of a Disaster

Perform the following processing in a time of disaster.

1. Retrieve the backup tapes

   Following a disaster retrieve the backup tapes that were loaded in the ETERNUS tape library at the operation site.

2. Preparing portable media

   Prepare the portable media that has TSM related files saved as described in Item 4 of "Saving TSM related files".

3. Transporting to the disaster recovery site

   Transport the following materials prepared as described in the above Items 1 and 2 to the disaster recovery site.

   ● Backup tapes (backup tapes collected during the backup operation)
   ● Backup tapes (ACM management information collected as described in "Tasks after ACM Backup Operation")
   ● Backup tapes (TSM database collected as described in "Tasks after ACM Backup Operation")
   ● Portable media (TSM related files collected as described in the "Saving TSM related files")

14.7 Building the Restoration Environment at the Disaster Recovery Site

This section explains the procedures for building the restoration environment at the disaster recovery site.

14.7.1 Preparing the restoration environment

Set up the environment as described in "Operation Requirements".

14.7.1.1 Installing Tape Manager

AdvancedCopy Manager Tape Manager must be installed on the tape server.

For details on the installation of Tape Manager, refer to "Installing Tape Manager" in the "ETERNUS SF AdvancedCopy Manager Installation Guide".

14.7.1.2 Customizing Tape Manager

Set up according to the following procedures.

For details on the setup procedures, refer to "Customizing the tape server" in the "ETERNUS SF AdvancedCopy Manager Installation Guide".

1. Set the server up as the storage server or the storage admin server
2. Create a partition for the access path
3. Allocate the port number
4. Tune the kernel parameters
5. Perform the initial setting of the tape server
6. Set up TSM (setup to be performed before setting the daemon to automatically start).
   a) Set the ETERNUS tape library driver
   b) Set the server option files
   c) Set the client system option files
   d) Format the database and the log files
7. Set the daemon to automatically start
   — TSM server daemon

Note

● TSM database requires more space at the disaster recovery site than its size on the tape server at the operation site. The TSM database size at the operation site can be checked using the query db command.
●
● Refer to the "ETERNUS SF TSM Administrator's Guide" for details on how to use the query db command.
●
● The above procedures are not required if all items described in "Customizing the Tape Server" of the "ETERNUS SF AdvancedCopy Manager Installation Guide" have been implemented. If this is the case, start implementing from "Preparing TSM management information".

14.7.2 Preparing TSM management information

The TSM environment settings must be restored from the data saved in portable media as described in 4 of "Saving TSM related files".

1. devconfig file

   Copy the devconfig file to the install directory of the TSM server (/opt/tivoli/tsm/server/bin).

2. dsm.sys and zsm.opt files

   Copy the dsm.sys and dsm.opt files to the install directory of the TSM client (/opt/tivoli/tsm/client/ba/bin).

3. Editing the TSM server option file

   Edit the TSM server option file (dsmserv.opt) located in the install directory (/opt/tivoli/tsm/server/bin).

   An example of editing the dsmserv.opt file is described below.

   ```
   VOLUMEHistory      /opt/tivoli/tsm/server/bin/volhist.out
   DEVCONFig          /opt/tivoli/tsm/server/bin/devconfig.out
   EXPInterval        1
   COMMmethod         SHAREDMEM
   SHMPort            1510
   MAXSessions        30
   LANGuage           AMENG
   ```

   The file specified in the DEVCONFig option must be the one copied in Item 1 above.

   Refer to "Setting the server option file" of the "ETERNUS SF AdvancedCopy Manager Installation Guide" for details.

14.7.3 Restoring the TSM backup environment

Restore the TSM backup/restore environment at the disaster recovery site.

The controller part and the drive part of the ETERNUS tape library unit at the disaster recovery site must be recognized (create /dev/rmt/*st and /dev/rmt/*lb files).

Refer to "Setting the ETERNUS tape library driver" of the "ETERNUS SF AdvancedCopy Manager Installation Guide" for details.

14.7.3.1 Editing the devconfig file

The devconfig file restored as described in Item 1 of "Preparing TSM management information" will be used in the TSM database restoration process.

The contents, therefore, must be edited to match the configuration of the ETERNUS tape library used at the disaster recovery site.

Do not change areas other than shaded or boxed areas of each command.

The details of changes are as followed.

1. Changing the library definition

   Change the library type of the DEFINE LIBRARY command from SCSI to MANUAL, and delete operands that come after the LIBTYPE operand.

   The library name of this command may not be changed.

   Delete the DEFINE PATH command where DESTTYPE=LIBRARY is specified.

   Subsequent to the above actions, the library control function may not be used during the restoration process of the TSM database.

   Figure: Example of editing the devconfig file at the operation site

2. Changing the drive definition

   Change the DEFINE DRIVE and DEFINE PATH commands defined in this file to that applicable to a single drive unit.

   Even if the ETERNUS tape library is a model with multiple drive units, this drive unit definition must be set as a single unit.

   Do not change the library name and drive name.

   Delete the operands that come after the drive name parameters in the DEFINE DRIVE command.

   In the device parameter of the DEFINE PATH command, define the device file of the drive unit connected to the tape server of the disaster recovery site that was recognized as described in "Restoring the TSM backup environment".

Figure: Example of editing the devconfig file at the operation site

```
/* Device Configuration */
:
DEFINE   DRIVE   LT270-A   DRV0   ELEMENT=500   ONLINE=Yes   WWN="201000E0000E100C"
SERIAL="1210021100"
DEFINE   DRIVE   LT270-A   DRV1   ELEMENT=501   ONLINE=Yes   WWN="201100E0000E100C"
SERIAL="1210039450"
DEFINE   PATH   TSM_SERVER   DRV0   SRCTYPE=SERVER   DESTTYPE=DRIVE   LIBRARY=LT270-A
DEVICE=/dev/rmt/3st
DEFINE   PATH   TSM_SERVER   DRV1   SRCTYPE=SERVER   DESTTYPE=DRIVE   LIBRARY=LT270-A
DEVICE=/dev/rmt/4st
:
:
```

Specify the device file recognized as described in "13.7.3 Restoring the TSM backup environment".

▢ : Delete

3. Deleting library inventory information

    Delete the library inventory information (storage volume information) defined in this file.

Figure: Example of editing the devconfig file at the operation site

```
/* Device Configuration */
 :
/* LIBRARYINVENTORY SCSI LT270-A LT0044 1100 101*/
/* LIBRARYINVENTORY SCSI LT270-A LT0057 1097 101*/
/* LIBRARYINVENTORY SCSI LT270-A LT0063 1099 101*/
/* LIBRARYINVENTORY SCSI LT270-A LT0091 1098 101*/
/* LIBRARYINVENTORY SCSI LT270-A LT0092 1096 101*/
 :
```

▢ : Delete the library inventory information

An example of the change is described below.

Example:

— ETERNUS tape library used at the operation site
Library unit type: ETERNUS LT270
Drive model: LTO G3
Number of drive units : 2

— ETERNUS tape library connected to the disaster recovery site
Library unit type: ETERNUS LT130
Drive model: LTO G2
Number of drive units: 2

An example of changing the devconfig file in this instance is described below.

Figure: Example of editing the devconfig file at the operation site

```
/* Device Configuration */
DEFINE    DEVCLASS    DRIVECLASS1    DEVTYPE=LTO    FORMAT=DRIVE    MOUNTLIMIT=DRIVES
MOUNTRETENTION=60 LIBRARY=LT270-A
SET  SERVERNAME TSM_SERVER
DEFINE LIBRARY LT270-A LIBTYPE=SCSI  WWN="200000E0000E100C"  SERIAL="0006L0"  SHARED=NO
AUTOLABEL=NO RESETDRIVE=NO
DEFINE    DRIVE    LT270-A    DRV0    ELEMENT=500    ONLINE=Yes    WWN="201000E0000E100C"
SERIAL="1210021100"
DEFINE    DRIVE    LT270-A    DRV1    ELEMENT=501    ONLINE=Yes    WWN="201100E0000E100C"
SERIAL="1210039450"
/* LIBRARYINVENTORY SCSI LT270-A LT0044 1100 101*/
/* LIBRARYINVENTORY SCSI LT270-A LT0057 1097 101*/
/* LIBRARYINVENTORY SCSI LT270-A LT0063 1099 101*/
/* LIBRARYINVENTORY SCSI LT270-A LT0091 1098 101*/
/* LIBRARYINVENTORY SCSI LT270-A LT0092 1096 101*/
DEFINE PATH TSM_SERVER LT270-A SRCTYPE=SERVER DESTTYPE=LIBRARY DEVICE=/dev/rmt/1lb
DEFINE    PATH    TSM_SERVER    DRV0    SRCTYPE=SERVER    DESTTYPE=DRIVE    LIBRARY=LT270-A
DEVICE=/dev/rmt/3st
DEFINE    PATH    TSM_SERVER    DRV1    SRCTYPE=SERVER    DESTTYPE=DRIVE    LIBRARY=LT270-A
DEVICE=/dev/rmt/4st
```

Change to MANUAL

☐ : Delete

Define for one drive unit.

Specify the device file recognized as described in "13.7.3 TSM Restoring the TSM backup environment"

Figure: Example of devconfig file after editing

```
/* Device Configuration */
DEFINE DEVCLASS DRIVECLASS1 DEVTYPE=LTO FORMAT=DRIVE MOUNTLIMIT=DRIVES MOUNTRETENTION=60
LIBRARY=LT270-A
SET  SERVERNAME TSM_SERVER
DEFINE LIBRARY LT270-A LIBTYPE=MANUAL
DEFINE DRIVE LT270-A DRV0
DEFINE    PATH    TSM_SERVER    DRV0    SRCTYPE=SERVER    DESTTYPE=DRIVE    LIBRARY=LT270-A
DEVICE=/dev/rmt/5mt
```

14.7.3.2 Restoring TSM database

The following section explains the procedures for restoring data in the TSM database, that were backed up to tapes, to the TSM database and the log files as described in "Formatting database and log files" in the "ETERNUS SF AdvancedCopy Manager Installation Guide".

Restoration processing of a TSM database must be executed using the latest backup tapes first.

Point

The panel operations for these procedures are different for different ETERNUS tape library. Refer to the relevant unit manuals for details.

1. Insert TSM database backup tapes into the drive unit

   Insert the backup tapes created as described in Item 2 of "Tasks after ACM backup operation" into the drive unit (making sure the unit has been defined in the devconfig file as described in "Edit devconfig files") via the loading point (CAS) operating the panel of the ETERNUS tape library.

2. Restoring TSM database

   Restore TSM database data from the tapes inserted into the drive unit.

   ```
   # cd /opt/Tivoli/tsm/server/bin
   # ./dsmserv restore db devclass=<Device class name> volumenames=<Volume name>
   commit=yes
   ```

   — Device class name

      Specify the device class that corresponds to the ETERNUS tape library as defined in the DEFINE DEVCLASS command of the devconfig file that was edited as described in "Edit devconfig files".

   — Volume name

      Specify the volume name of the tape inserted into the drive.

      For details of the dsmserv restore db command, refer to "DSMSERV RESTGORE DB (Restore database)" in "IBM Tivoli Storage Manager Utility" of the "ETERNUS SF TSM Administrator's Handbook".

   Example:
   Device class name: DRIVERCLASS1
   Volume name: LTO005

   ```
   # cd /opt/tivoli/tsm/server/bin
   # ./dsmserv restore db devclass=DRIVECLASS1 volumenames=LTO005 commit=yes
   ```

3. Retrieve the tapes loaded onto the drive unit

   Move the tape loaded onto the drive unit to the unloading point (CAS) by operating the ETERNUS tape library panel, and remove it.

14.7.3.3 Setting TSM after restoring TSM database

Start the TSM server, and make the following settings.

Starting daemons on the TSM server

Start daemons on the TSM server by executing the /etc/init.d/initTSM file set as described in Item 7 "Set daemon automatic start" of "Customizing Tape Manager".

```
# /etc/init.d/initTSM start
```

Starting the TSM management client

Start the TSM management client to update tape library information.

```
# cd /opt/tivoli/tsm/client/ba/bin
# ./dsmadmc
IBM Tivoli Storage Manager
command line management interface - version 5, release 5, level 0.0
(c) Copyright by IBM Corporation and other(s) 1990, 2006. All Rights Reserved.


Input user ID:  admin


input password  :


  Establish a session and server:TAPESERVER1: Solaris SPARC
    Server version 5, release 5, level  0.0
    Server date/time: 04/02/2008 13:12:41  Last accessed: 04/02/2008 11:50:46



  tsm: TAPESERVER1>
```

● Input the TSM Administrator's ID to "Input user ID" and press the [Return] key.

● Input the TSM Administrator's password to "Input password" and press the [Return] key.

●

Note

From now on, when the " TSM: TSM_SERVER >" prompt is displayed, perform operations after the TSM management client is activated (after executing the dsmadmc command).

To deactivate the TSM management client, execute the following command:

```
TSM: TSM_SERVER > quit
```

License registration

Perform the license registration for TSM. This procedure is performed only once after starting the TSM management client for the first time. The procedure is described below.

1. Resister the license

```
TSM: TSM_SERVER > register license file=<license file name> number=<number of
licenses>
```

2. Specify tsmee.lic   in <license file name>.

3. Specify 1 in <number of licenses>.

4. Example of registration is described below.

```
TSM: TSM_SERVER > register license file=tsmee.lic number=1
```

5. Confirm the license information registered.

```
TSM: TSM_SERVER > query license
```

Note

For details on license registration, refer to "Managing server operations" in the "ETERNUS SF TSM Administrator's Guide".

Updating tape library information

After the TSM server has started, the connected ETERNUS tape library information must be defined.

To do so, perform the tasks by following the procedures below.

This process must be executed using commands on the TSM server at the command prompt.

1. Deleting tape library information and drive information at the operation site

   a) Deleting drive information

      Execute the process as many times as the number of drives defined

      Confirm the path information defined using the QUERY PATH command.

      Confirm the drive information defined using the QUERY DRIVE command.

      For details of each command, refer to the explanation on commands in the "ETERNUS SF TSM Administrator's Handbook".

```
TSM: TSM_SERVER > delete path <TSM server name> <drive name> srctype=<source
type> desttype=drive library=<library name>
TSM: TSM_SERVER > delete drive <library name> <drive name>
```

   – TSM server name
      Specify the TSM server name.

      The TSM server name refers to the name displayed in the "Server name" column displayed after executing the QUERY STATUS command on the TSM server.

      For details of the QUERY STATUS command, refer to the explanation in the "ETERNUS SF TSM Administrator's Handbook".

- Drive name
  Specify the drive name to be deleted.

- Library name
  Specify the name of the library that has the drive to be deleted.

- Source type
  Specify "server".

Example:
Tape library information at the operation site
TSM server name: TSM_SERVER
Library name: LT270-A
Source type: server
Drive name: DRV0
Drive name: DRV1

```
TSM: TSM_SERVER > delete path TSM_SERVER DRV0 srctype=server desttype=drive
library=LT270-A
TSM: TSM_SERVER > delete drive LT270-A DRV0
TSM: TSM_SERVER > delete path TSM_SERVER DRV1 srctype=server desttype=drive
library=LT270-A
TSM: TSM_SERVER > delete drive LT270-A DRV1
```

b) Deleting library information

The library information defined can be confirmed using the QUERY LIBRARY command.

For details of the QUERY LIBRARY command, refer to the explanation on in the "ETERNUS SF TSM Administrator's Handbook".

```
TSM: TSM_SERVER > delete path <TSM server name> <library name> srctype=server
desttype=library
TSM: TSM_SERVER > delete library <library name>
```

- TSM server name

  Specify the TSM server name.

  The TSM server name refers to the name displayed in the "Server name" column displayed after executing the QUERY STATUS command on the TSM server prompt.

  For details of the QUERY STATUS command, refer to the explanation in the "ETERNUS SF TSM Administrator's Handbook".

- Library name

  Specify the name of the library to be deleted.

Example:

Library information on the operation site
TSM server name: TSM_SERVER
Library name: LT270-A

```
TSM: TSM_SERVER > delete path TSM_SERVER LT270-A srctype=server
desttype=library
TSM: TSM_SERVER > delete library LT270-A
```

2. Defining tape library information connected and drive information to the disaster recovery site

   a) Defining library information

```
TSM: TSM_SERVER > define library <library name> libtype=scsi
TSM: TSM_SERVER > define path <TSM server name> <library name> srctype=server
desttype=library device=<Device file name>
```

   − TSM server name

   Specify the TSM server name.

   The TSM server name refers to the name displayed in the "Server name" column displayed after executing the QUERY STATUS command on the TSM server prompt.

   For details of the QUERY STATUS command, refer to the explanation in the "ETERNUS SF TSM Administrator's Handbook".

   − Library name

   Specify the name of the library to be used.

   − Device file name

   The device file name refers to the device files of the ETERNUS tape library created as described in the "Restoring the TSM backup environment" section.

   Example:
   Tape library information at the disaster recovery site
   TSM server name: TSM_SERVER
   Library name: LT130-B
   Device file name: /dev/rmt/5lb

```
TSM: TSM_SERVER > define library LT130-B libtype=scsi
TSM: TSM_SERVER > define path TSM_SERVER LT130-B srctype=server
desttype=library device=/dev/rmt/5lb
```

b） Defining drive information

Execute this procedure as many times as the number of drives defined.

```
TSM: TSM_SERVER > define drive <library name> <drive name>
TSM: TSM_SERVER > define path <TSM server name> <drive name> srctype=server
desttype=drive library=<library name> device=<Device file name>
```

- TSM server name

    Specify the TSM server name.

    The TSM server name refers to the name displayed in the "Server name" column displayed after executing the QUERY STATUS command on the TSM server at the command prompt.

    For details of the QUERY STATUS command, refer to the explanation in the "ETERNUS SF TSM Administrator's Handbook".

- Library name

    Specify the library name of the drive to be used.

- Device file name

    The device file name refers to the device files of the tape library unit created as described in the "Restoring the TSM backup environment" section.

Example:
Drive information of the disaster recovery site
TSM server name: TSM_SERVER
Library name: LT130-B
Drive name: DRVA
Device file name: /dev/rmt/6st
Drive name: DRVB
Device file name: /dev/rmt/7st

```
TSM: TSM_SERVER > define drive LT130-B DRVA
TSM: TSM_SERVER > define path TSM_SERVER DRVA srctype=server desttype=drive
library=LT130-B device=/dev/rmt/6st
TSM: TSM_SERVER > define drive LT130-B DRVB
TSM: TSM_SERVER > define path TSM_SERVER DRVB srctype=server desttype=drive
library=LT130-B device=/dev/rmt/7st
```


Note

Changes in the operation environment may cause some command options to change. Refer to the "ETERNUS SF TSM Administrator's Handbook" for details of each command.

Updating a device class

The device class defined previously relates to the tape library information at the operation site. This must be updated to match the ETERNUS tape library information newly defined for the disaster recovery site.

Execute this process for all the device classes displaying "LT0" in the "Unit Type" column of the QUERY DEVCLASS F=D command.

For details of the QUERY DEVCLASS command, refer to the explanation in "ETERNUS SF TSM Administrator's Handbook".

This processing must be executed on the TSM server at the command prompt.

```
TSM: TSM_SERVER > update devclass <Device class name> library=<library name>
```

- ● Device class name

  Specify the class name of the changed device.
- ● Library name

  Specify the library name for the disaster recovery site

Example:
Device class namev: DRIVECLASS1
Library name at the counter-disaster site: LT130-B

```
TSM: TSM_SERVER > update devclass DRIVECLASS1 library=LT130-B
```

Establishing a TSM client session

Prepare to start a session between the TSM server and the client.

Start and stop the TSM client using the TSM client node specified in the nodename option of the/opt/tivoli/tsm/client/ba/bin/dsm.sys file and the password corresponding to that TSM client node.

This process is executed in order to have TSM remember the password used in sessions between the TSM server and the client using the relevant TSM client node.

This task must be performed while the TSM server daemons are active.

```
# cd /opt/tivoli/tsm/client/ba/bin
# ./dsmc
IBM Tivoli Storage Manager
command line backup/archive client interface
  client version 5, release 5, level 0.0
    client data/time:  04/02/2008 13:34:29
  (c) Copyright by IBM Corporation and other(s) 1990, 2006. All Rights Reserved.


  Node name: TAPESERVER1
  Establish session and server:TAPESERVER1: Solaris SPARC
    Server version 5, release 5 and level 0.0
    Server date/time: 04/02/2008 13:34:29  Last accessed : 04/02/2008 13:32:52tsm> quit
  #
```

14.8 Procedures for Data Restoration

This section explains the procedure to recover user data from backup tapes.

14.8.1 Checking integrity of backup tapes

When the ETERNUS tape library unit used at the operation site is different to the one used at the disaster recovery site, the method of managing volume names may also be different. Therefore, check the integrity of backup tapes for each case. Refer to the "Table: Differences in volume names between tape library units", and check if the methods of managing volume names between the operation site and the disaster recovery site are the same.

Table: Differences in volume names between tape library units

Group A	Group B
ETERNUS LT160 ETERNUS LT250 ETERNUS LT270	ETERNUS LT130 ETERNUS LT220 ETERNUS LT230

Check the integrity of backup tapes using the procedures described in "The volume name management method is the same as the operation site" when units from the same group are used at both the operation and disaster recovery site.

Check integrity of backup tapes using the procedures described in "The volume name management method is different from the operation site" when units of different groups are used at each site.

● The volume name management method is the same as the operation site

Load the backup tapes transported as described in "Actions in case of a disaster" of "Transporting to the disaster recovery site" into the ETERNUS tape library unit.

Check the integrity of the tapes by executing the commands below. The command must be executed on the TSM server at the command prompt.

When executing these commands TSM tape storage information is read and displayed to show inconsistencies.

```
TSM: TSM_SERVER > audit library <library name> checklabel=barcode
TSM: TSM_SERVER > checkin libvolume <library name> search=yes status=private
checklabel=barcode
```

— Library name
Specify the library name.

Example:
Library name: LT130-B

```
TSM: TSM_SERVER > audit library LT130-B checklabel=barcode
TSM: TSM_SERVER > checkin libvolume LT130-B search=yes status=private
checklabel=barcode
```

● The volume name management method is different from the operation site

Load the backup tapes transported as described in "Actions in case of a disaster" of "Transporting to the disaster recovery site" via the Checkin/Checkout port of the ETERNUS tape library unit.

Check the integrity of the tapes by executing the commands below. The commands must be executed on the TSM server at the command prompt.

This method of checking tape integrity checks volume labels therefore it will take some time to complete.

The checkin libvolume command is started using background processes, therefore, the operation status must be checked using the query process command.

Time is needed to wait for the loading of the tape immediately after executing the checkin libvolume command. Therefore, specify the request ID and execute the REPLY command.

```
TSM: TSM_SERVER > audit library <library name> checklabel=barcode
TSM: TSM_SERVER > checkin libvolume <library name> search=bulk status=private
checklabel=yes
TSM: TSM_SERVER >
```

— Library name

Specify the library name.

Example:
Library name: LT160-A

```
TSM: TSM_SERVER > audit library LT160-A checklabel=barcode
TSM: TSM_SERVER > checkin libvolume LT160-A search=bulk status=private checklabel=yes
TSM: TSM_SERVER > query process
:
TSM: TSM_SERVER > reply 005
ANR8499I Command accepted.
```

14.8.2 Restoring ACM management information

14.8.2.1 Restoring ACM management information

Data saved on tapes as shown in Item 1 of "Tasks after ACM backup operation" must be restored to local disks on the tape server at the disaster recovery site.

Check whether the tape media to which ACM management information was collected before restoration is in the available status. The status of tape media can be checked using the QUERY VOLUME command. If the status is unavailable, change it to available.

For details of the QUERY VOLUME command, refer to the explanation in the "ETERNUS SF TSM Administrator's Handbook".

```
TSM: TSM_SERVER > query volume <Volume name> format=detail
```

● Volume name

Specify the volume name to be checked.

Example:
Volume name: CJR019

```
TSM: TSM_SERVER > query volume CJR019 format=detail
                  Volume Name: CJR019
            Storage Pool Name: FILE_SPOOL
            Device Class Name: LT270DEV
           Estimated Capacity: 762,938.0
       Scaled Capacity Applied:
                     Pct Util: 0.0
                Volume Status: Filling
                       Access: Unavailable     <- Check here
        Pct. Reclaimable Space: 0.0
               Scratch Volume?: No
               In Error State?: No
        :
  TSM: TSM_SERVER >
```

Access: If the status is Unavailable, execute the UPDATE VOLUME command, and change the status to available.

For details of the UPDATE VOLUME command, refer to the explanation in the "ETERNUS SF TSM Administrator's Handbook".

```
TSM: TSM_SERVER > update volume <Volume name> access=<access status>
```

● Volume name

Specify the volume name to be changed.

● Access status

Specify access permissions for the files stored under the volume name.

readwrite: Files can be read and written to.
readonly: Files can be read only.
unavailable: Files cannot be accessed.
destoryed: Files cannot be accessed due to damage to the volume.
offsite: The volume is at an offsite location where it cannot be mounted.

Example:
Volume name: CJR019
Access status: readwrite

```
TSM: TSM_SERVER > update volume CJR019 access=readwrite

    ANR2207I Volume CJR019 updated.
TSM: TSM_SERVER >
```

Restore ACM management information data.

For details of the dsmc restore command, refer to the explanation in the "ETERNUS SF TSM Backup/Archive Client Installation and User Guide".

```
# cd /opt/tivoli/tsm/client/ba/bin
# ./dsmc restore <restore target> <restore destination> -virtualnodename=<node name>
-password=<password>  -subdir=yes
```

● Restore target

   Specify the path name used when the backup was processed.

   Ensure "/" is added at the end of the path name.

● Restore destination

   Specify the destination to which the backed up data is to be restored.

● Node name/password

   Specify the node name and password for the node for disaster countermeasure restoration specified at the time of backup

Example
Storage directory path for ACM management information at the operation site:
/var/ACMBkupData/sftk-ssm2/
Directory path for data restoration destination local disk: /var/tmp/
Name of the node for disaster countermeasure restoration: TAPESERVER_FILE_NODE
Password: filenode

```
# cd /opt/tivoli/tsm/client/ba/bin
# ./dsmc restore /var/ACMBkupData/sftk-ssm2/ /var/tmp/
-virtualnodename=TAPESERVER_FILE_NODE -password=filenode -subdir=yes
```

14.8.2.2 Expanding ACM management information

You must expand archive files restored to the local disk of the data restoration destination as described in "Restoring ACM management information".

The following files must be expanded.

● /*data restoration destination directory*/*Tapesvr*/TapeData/acm_tape_backup.tar

— *Data restoration destination directory*
The data restoration destination directory refers the directory specified as the restoration destination as described in "Restoring ACM management information".

— *Tapesvr*
Tapesvr refers to the name of the tape server where ACM management information is collected.

Example: The following files will be restored when following the example described in "Restoring ACM management information".
● /var/tmp/sftk-ssm2/TapeData/acm_tape_backup.tar

The following directories are expanded by acm_tape_backup.tar.

```
FJSVswstm/data/Tapesvr/TboFiles/etc/opt/FJSVswstm/data/ctrl/
FJSVswstm/data/Tapesvr/TboFiles/etc/opt/FJSVswstm/conf/
FJSVswstm/data/Tapesvr/TboFiles/etc/opt/FJSVswstm/log/
FJSVswstm/data/Tapesvr/TSMBackupDir/
```

14.8.3 Restoring data backed up in units of slices/LUs

This section explains restoration of data backed up in units of slices/LUs.

14.8.3.1 Displaying and selecting the restoration data

Execute the tape backup history package display command (tbodrhistdisp) on the tape server to select the device on the ETERNUS storage system to which data is restored according to the information displayed.

When selecting the device for data restoration, take into account the disk capacity of the ETERNUS storage system at the disaster recovery site.

For details of the tape backup history package display command, refer to "tape backup history package display command (tbodrhistdisp)".

14.8.3.2 Preparing a device as the restoration destination

Prior to restoring data, define partitions (slices) or LUs on the ETERNUS storage system as the restoration destination device (for the data selected in "Displaying and selecting the restoration data").

14.8.3.2.1 Processing overview

Arrange for a storage server with the same platform as that displayed in "Platform" when the tape backup history package display command (tbodrhistdisp) is executed, and then define partitions (slices) or LUs.

Figure: "Summary of the restore destination device definition" and "Example of the tbodrhistdisp command execution"

```
# /opt/FJSVswstm/bin/tbodrhistdisp /var/tmp/Tapesvr1/TapeData/FJSVswstm/data/Tapesvr1
Generation Management Backup
Server=StrgSV01 Device=/dev/dsk/c1t1d10s1 Mount-Point=/work1 (ufs) Platform=Solaris Capacity(MB)=1024
Generation Version CopyID Backup-Date      Pool-Name  Backup-Tape
    1        10       1 2000/11/12 21:00 TapePool4  LT00059
    2         9       1 2000/11/11 21:00 TapePool4  LT00059
```

Display of information on devices under restoration

Defines a restoration destination device according to the platform and capacity of the server that used the device being restored.

Solaris
Storage server

Obtain device configuration information

Transfer

Tape server

GR-API

Definition of partitions (slices) or LUs

ETERNUS LT library units

ETERNUS disk array units
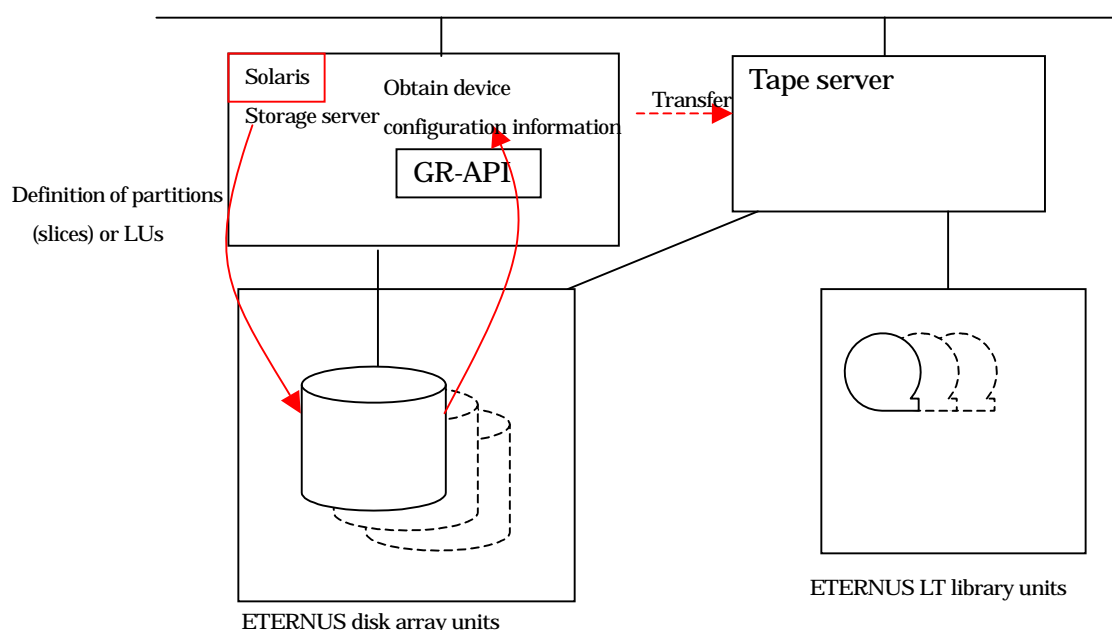
14.8.3.2.2 Preparing storage server

Prepare the storage server and define the restoration destination device.

Follow the procedures below to build the storage server.

1. Installing the agent

   Install the AdvancedCopy Manager agent.

   For details of the installation procedure, refer to "Installing the agent" in "ETERNUS SF AdvancedCopy Manager Installation Guide".

2. Customizing the storage server

   Customize the storage server.

   For details of customizing the storage server, refer to "Customizing the storage server" in the "ETERNUS SF AdvancedCopy Manager Installation Guide"

14.8.3.2.3 Procedures for defining the restoration destination devices

The procedures for defining the restoration destination devices are explained as follows.

Execute this processing as many times as the number of devices selected as described in "Displaying and selecting the restoration data".

1. Obtaining information required to define the devices

   Obtain "Platform" information and "Capacity (MB)" information from the result of the tape backup history package display command (tbodrhistdisp) executed for the devices selected for restoration.

2. Defining devices on the storage server

   Define partitions (slices) or LUs as the restoration destination devices on the storage server using information obtained in Item 1 above.

3. Creating configuration information files of the restoration destination devices

   Record configuration information of devices defined in Item 2 above in the definition files.

   [File name]
   servername.cnf

   ― *servername*

       Specify the name of the storage server that is the restoration destination at the disaster recovery site.

   [Location of file storage]
   On the tape server

   [Explanation on the files]
   The file must be created for each storage server.

   The file format is shown below.

   ```
   <Blockdevice name> <BoxID> <LU number> <Start extent> <Size>
   ```

   Details of the definition information are explained below.

Table: Details of definition information

Item	Explanation
Blockdevice name	Block device name
BoxID	BOXID hexadecimal expression (Explained in "How to create the statement"* according to the STXGetvol output.)
LU number	For LU number, attach hexadecimal "h". (Explained in"How to create the statement"* according to the STXGetvol output.)
Start extent	For the start position, attach hexadecimal "h". (Explained in"How to create the statement"* according to the STXGetvol output.)

Item	Explanation
Size	For size, attach hexadecimal "h". (Explained in"How to create the statement"* according to the STXGetvol output.)

— Lines starting with '#'in the first column are comment lines.
— A delimiter between columns is a null or a tab.
— Only alphanumeric and special characters can be used. Characters that are language dependent cannot be used.
— The line feed code is UNIX.

An example is shown below.

```
# Volume BOXID LUN EXTENT SIZE
/dev/dsk/c1t1d1s3
303047523734302323232323232347523734433031232323232323434134372323232323232323232323
ceh fc000h 64000h
```

Note

When the file contains a description error, the restore command for disaster recovery using tape (tbodrrestore) will result in an error.

[How to create]
Create the servername.cnf file on the storage server by following the procedures below.

a) Set the following environment variables according to the platform of the storage server.

Table: Environment variables

Platform	Environment variable	Setting value
Solaris 8 operating system Solaris 9 operating system Solaris 10 operating system	LD_LIBRARY_PATH	/opt/FJSVgrapi/64/lib
Red Hat Enterprise Linux AS (v.3 for x86) Red Hat Enterprise Linux ES (v.3 for x86) Red Hat Enterprise Linux AS (v.4 for x86) Red Hat Enterprise Linux ES (v.4 for x86) Red Hat Enterprise Linux AS (v.4 for EM64T) Red Hat Enterprise Linux ES (v.4 for EM64T) Red Hat Enterprise Linux 5 (for x86) Red Hat Enterprise Linux 5 (for Intel64)	LD_LIBRARY_PATH	/opt/FJSVgrapi/32/lib
Red Hat Enterprise Linux AS (v.4 for Itanium) Red Hat Enterprise Linux 5 (for Itanium)	LD_LIBRARY_PATH	/opt/FJSVgrapi/64/lib
HP-UX 11.0, 11i v1, 11i v2 (PA-RISC) HP-UX 11i v2 (Itanium) HP-UX 11i v3(Itanium)	SHLIB_PATH	/opt/FJSVgrapi/lib
AIX 5L 5.1, 5.2, 5.3	LIBPATH	/opt/FJSVgrapi/lib

Platform	Environment variable	Setting value
Microsoft (R) Windows (R) 2000 Server SP4or later version Microsoft (R) Windows (R) 2000 Advanced Server SP4or later version Microsoft (R) Windows Server (R) 2003, Standard Edition SP1, SP2 Microsoft (R) Windows Server (R) 2003, Enterprise Edition SP1, SP2 Microsoft (R) Windows Server (R) 2003, Standard x64 Edition Microsoft (R) Windows Server (R) 2003, Standard x64 Edition SP2 Microsoft (R) Windows Server (R) 2003, Enterprise x64 Edition Microsoft (R) Windows Server (R) 2003, Enterprise x64 Edition SP2 Microsoft (R) Windows Server (R) 2003 R2, Standard Edition Microsoft (R) Windows Server (R) 2003 R2, Standard Edition SP2 Microsoft (R) Windows Server (R) 2003 R2, Enterprise Edition Microsoft (R) Windows Server (R) 2003 R2, Enterprise Edition SP2 Microsoft (R) Windows Server (R) 2003 R2, Standard x64 Edition Microsoft (R) Windows Server (R) 2003 R2, Standard x64 Edition SP2 Microsoft (R) Windows Server (R) 2003 R2, Enterprise x64 Edition Microsoft (R) Windows Server (R) 2003 R2, Enterprise x64 Edition SP2 Microsoft (R) Windows Server (R) 2003, Enterprise Edition for Itanium-based Systems Microsoft (R) Windows Server (R) 2003, Enterprise Edition for Itanium-based Systems SP2	PATH	Program directory\bin of AdvancedCopy Manager

b) Specify the work volume (raw device) in the STXGetVol command and execute the command to collect information to set in the servername.cnf file. Refer to the following table for the STXGetVol command path.

When a Windows storage server is used, specify a drive in the format of "\\.\drive-letter (for example: \\.\E:)" for the work volume .

Table: STXGetVol command paths

Platform	Command path
Solaris 8 operating system Solaris 9 operating system Solaris 10 operating system	/opt/FJSVgrapi/64/bin/STXGetVol
Red Hat Enterprise Linux AS (v.3 for x86) Red Hat Enterprise Linux ES (v.3 for x86) Red Hat Enterprise Linux AS (v.4 for x86) Red Hat Enterprise Linux ES (v.4 for x86) Red Hat Enterprise Linux AS (v.4 for EM64T) Red Hat Enterprise Linux ES (v.4 for EM64T) Red Hat Enterprise Linux 5 (for x86) Red Hat Enterprise Linux 5 (for Intel64)	/opt/FJSVgrapi/32/bin/STXGetVol
Red Hat Enterprise Linux AS (v.4 for Itanium) Red Hat Enterprise Linux 5 (for Itanium)	/opt/FJSVgrapi/64/bin/STXGetVol
HP-UX 11.0, 11i v1, 11i v2 (PA-RISC) HP-UX 11i v2 (Itanium) HP-UX 11i v3(Itanium)	/opt/FJSVgrapi/bin/STXGetVol
AIX 5L 5.1, 5.2, 5.3	/opt/FJSVgrapi/bin/STXGetVol
Microsoft (R) Windows (R) 2000 Server SP4 or later version Microsoft (R) Windows (R) 2000 Advanced Server SP4 or later version Microsoft (R) Windows Server (R) 2003, Standard Edition SP1, SP2 Microsoft (R) Windows Server (R) 2003, Enterprise Edition SP1, SP2 Microsoft (R) Windows Server (R) 2003, Standard x64 Edition Microsoft (R) Windows Server (R) 2003, Standard x64 Edition SP2 Microsoft (R) Windows Server (R) 2003, Enterprise x64 Edition Microsoft (R) Windows Server (R) 2003, Enterprise x64 Edition SP2 Microsoft (R) Windows Server (R) 2003 R2, Standard Edition Microsoft (R) Windows Server (R) 2003 R2, Standard Edition SP2 Microsoft (R) Windows Server (R) 2003 R2, Enterprise Edition Microsoft (R) Windows Server (R) 2003 R2, Enterprise Edition SP2 Microsoft (R) Windows Server (R) 2003 R2, Standard x64 Edition Microsoft (R) Windows Server (R) 2003 R2, Standard x64 Edition SP2 Microsoft (R) Windows Server (R) 2003 R2, Enterprise x64 Edition Microsoft (R) Windows Server (R) 2003 R2, Enterprise x64 Edition SP2 Microsoft (R) Windows Server (R) 2003, Enterprise Edition for Itanium-based Systems Microsoft (R) Windows Server (R) 2003, Enterprise Edition for Itanium-based Systems SP2	AdvancedCopy Manager program directory\bin\STXGetVol

The following uses Solaris as an example.

Example:

```
# LD_LIBRARY_PATH=/opt/FJSVgrapi/64/lib
# export LD_LIBRARY_PATH
# /opt/FJSVgrapi/64/bin/STXGetVol /dev/rdsk/c1t1d1s3
BoxID OLU EXTENT SIZE
3030475237343023232323232323475237344330312323232323434134372323232323232323
32323 ceh fc000h 64000h
Device information Dump
0000 : 00000000 00000000 00000000 00000000
0010 : 00080100 00010100 00080100 00010100
0020 : 00000000 00000000 00000000 00000000
0030 : 00000000 00000000 00000000 00000000
0040 : 00000000 00000007 00000000 00000003
0050 : 00000000 00010003 00000000 00010003
0060 : 00000000 00000000 00000000 00000000
0070 : 00000000 00000000 00000000 00000000
0080 : 00000000 00000000 00000000 00000000
0090 : 00000000 00000000 00000000 00000000
00a0 : 00000000 00000000 00000000 00000000
00b0 : 00000000 00000000 00000000 00000000
00c0 : 00000000 00000000 00000000 00000000
00d0 : 00000000 00000000 00000000 00000000
00e0 : 00000000 00000000 00000000 00000000
00f0 : 00000000 00000000 00000000 00000000
```

c） Open the servername.cnf file using a Text Editor.

d） Add the block device of the work volume specified as shown in the above Item b) at the beginning of a line followed by nulls or tabs. Add the following line as it is and then insert a line feed.

An example is shown below.

```
# Volume BOXID LUN EXTENT SIZE
/dev/dsk/c1t1d1s3
3030475237343023232323232323475237344330312323232323434134372323232323232323
32323 ceh fc000h 64000h
```

e） Repeat the above Items b) and d) as many times as the number of restoration destination volumes that need to have information added.

An example of entering four volumes is shown below.

```
# Volume BOXID LUN EXTENT SIZE
/dev/dsk/c1t1d1s3
303047523734302323232323232347523734433031232323232323434134372323232323232323
32323 ceh fc000h 64000h
/dev/dsk/c2t16d3s4
3030453830303040d3923232323232345383930533230412323232340b4f3430373036333930303
32323 88h c0000h 40000h
/dev/dsk/c2t16d3s3
3030453830303040d3923232323232345383930533230412323232340b4f3430373036333930303
32323 88h 80000h 40000h
/dev/dsk/c2t16d3s5
3030453830303040d3923232323232345383930533230412323232340b4f3430373036333930303
32323 88h 100000h 40000h
```

f) Transfer the servername.cnf file thus created in /var/tmp/tsm_data on the tape server.

Note

Take note of the following differences when specifying devices.

- Device name to specify for the command: special device name (Example: /dev/rdsk/c1t1d1s3)

- Device name to specify for the file: block device name (Example: /dev/dsk/c1t1d1s3)

4. Dismount the defined devices from the storage server.

Note

Do not connect the devices defined in this process to the tape server.

14.8.3.3 Restoring user data

This section explains the procedure for data recovery from backup tapes.

The TSM server must be started before using the restore command for disaster recovery using tape (tbodrrestore).

Refer to "Starting and stopping the TSM daemons" to check and start TSM if necessary.

14.8.3.3.1 Restoring work volume data

Data is restored using the Restore command for disaster recovery using tape (tbodrrestore).

An example of restoring user data is shown below.

● Name of the storage server at the restoration destination

Stgsvr01
● Backup type

Generation management backup
Relative generation number: 2

● Restoration destination device

/dev/dsk/c2t0d0s1

● Restoration target device

/dev/dsk/c1t0d0s1

● Path to the ACM management information storage destination directory

/var/tmp/Tapesvr01/TapeData/FJSVswstm/data/Tapesvr01

● Access path
/dev/FJSVmplb/rdsk/mplb2053s2

● Path to the directory storing configuration information of the restoration destination device

/var/tmp/tsm_data

Specify the files that define the restoration destination device configuration created in Item 3 of Procedures for defining the restoration destination devices.

```
# /opt/FJSVswstm/bin/tbodrrestore -h StrgSV01 -g 2 -d Stgsvr01 -r /dev/dsk/c2t0d0s1
/dev/dsk/c1t0d0s1 /var/tmp/Tapesvr01/TapeData/FJSVswstm/data/Tapesvr01
/dev/FJSVmplb/rdsk/mplb2053s2 /var/tmp/tsm_data
#
```

Devices to be specified as restoration destination devices in the restore command for disaster recovery using tape (tbodrrestore) must be arranged for in advance according to the procedures in "Preparing a device as the restoration destination".

For details on this command, refer to "restore command (tbodrrestore) for disaster recovery using tape".

Execute this procedure as many times as the number of devices selected in Displaying and selecting the restoration data.

14.8.3.4 Checking restored data

To check the data restored in "Restoring user data", you must mount the restoration destination device on the storage server of the platform indicated for that data in the displayed results of the tape backup history package display command (tbodrhistdisp).

Appendix A Pre-processing and Post-processing of Backup, Restoration, and Tape Copy

This appendix provides information on shell scripts used for pre-processing and post-processing of backup, restoration, and tape copy.
Note that a shell script described in this appendix has different linefeed positions due to the formatting of this manual.

A.1 Overview

The shell scripts used for backup, restoration, and tape copy pre-processing and post-processing are started before or after backup, restoration, or tape copying when the backup execution command (acmbackup), restoration execution command or tape copy command (acmtphistcopy) are executed.

These shell scripts contain the processing required by Tape Backup of AdvancedCopy Manager for backup, restoration, or tape copying of a transaction volume.

This appendix describes the setup of pre-processing and post-processing.

A.2 Pre-processing and Post-processing of Backup

Backup pre-processing and post-processing is always performed when the backup execution command (acmbackup) is executed.

For information on backup pre-processing and post-processing, refer to appendix "Pre-processing and Post-processing of Backup" in the "ETERNUS SF AdvancedCopy Manager Operator's Guide" for the operating system of the target Storage Server.

A.3 Pre-processing and Post-processing of Restoration

Restoration pre-processing and post-processing is always performed when the restoration execution command (acmrestore) is executed.

For information on restoration pre-processing and post-processing, refer to appendix "Pre-processing and Post-processing of Restoration" in the "ETERNUS SF AdvancedCopy Manager Operator's Guide" for the operating system of the target Storage Server.

A.4 Pre-processing and Post-processing of Tape Copy

Tape copy pre-processing and post-processing is performed by a tape backup process that takes place when the backup execution command (acmbackup) is executed as follows:

- ● With the -m BOTH option specified
- ● With the -m option omitted

It is also performed whenever the tape copy command (acmtphistcopy) is executed.

When the Storage Server is a single system

Solaris, Linux, HP-UX and AIX:

Tape copying by AdvancedCopy Manager must generally be performed while the backup volume subject to the tape copying is unmounted.

Normally, the pre-processing shell script obtains the mount status of the backup volume from the backup history and takes action according to the status, as described below:

Table: Pre-processing of the backup volume

Backup volume status	Pre-processing
Mounted	Unmounts the backup volume
Unmounted	Takes no action

The post-processing shell script does nothing during tape copying. Therefore, the backup volume that was mounted before tape copying is left unmounted after the tape copying.

When you need to add user-specific processes to pre-processing and post-processing, add the processes to the tape copy pre-processing and post-processing scripts.

Windows:

When performing backups with AdvancedCopy Manager, it is usually necessary to prevent the transaction volume from being accessed by other processes during backup.

For this reason, the backup volume is usually locked during pre-processing. It is then unlocked during post-processing.

Locking and unlocking is performed by a program and can be modified by creating a setup file called a "backup volume lock specification file for tape copying

When you need to add user-specific processes to pre-processing and post-processing, add the processes to the tape copy pre-processing and post-processing scripts.

These scripts are written in JScript and run on the Windows Scripting Host (WSH).

When the Storage Server is a cluster system

Solaris, Linux, HP-UX and AIX:

It is necessary to modify the pre-processing shell script for a cluster system environment.

On single system, as shown in above, tape copying by AdvancedCopy Manager must be performed while the backup volume subject to the tape copying is unmounted. However, on cluster system, the offline operation must be used instead of unmounting the backup volume.

For example, if the VERITAS Cluster Service for Solaris is used as the cluster system, modify the pre-processing shell script (TapeCopy.pre described in "Pre-processing of tape copy") as follows.

Current	(lines 74) /usr/sbin/umount $cur_mount_point 2>/dev/null
	(lines 83) /usr/sbin/umount $cur_mount_point > $err_log_path/$dev.umount 2>&1
After modification	/opt/VRTSvcs/bin/hares -offline *resouce_name* -sys *system_name*

After the offline command is issued there will be a delay before volumes are actually unmounted.

The sleep or df commands can be used to delay the unmount until after the process that sets the volumes offline has completed.

In TapeCopy.pre, described in "Pre-processing of tape copy", add the following line between lines 102 and 103.

```
while /usr/sbin/df -l "$device">/dev/null 2>&1; do :; done
```

> For more information if the Storage Server is operated in a cluster system environment, refer to the following sections in the "ETERNUS SF AdvancedCopy Manager Operator's Guide" for the operating system of the target Storage Server.
> — "Notes on cluster operation"
> — "Notes on backup operation in cluster operation"

Windows:
    This is the same as when the Storage Server is in a single-server configuration.

A.4.1 Tape copy pre-processing in Solaris

The name of the shell script for pre-processing before tape copy processing is as follows.
● In the case of non-cluster operation:
```
/etc/opt/FJSVswsts/sh/TapeCopy.pre
```
● In the case of cluster operation:
```
/etc/opt/FJSVswsts/<logical node name>/sh/TapeCopy.pre
```

```
 1  #!/bin/sh
 2
 3  # AdvancedCopy Manager
 4  # All Rights Reserved, Copyright FUJITSU LIMITED, 2005-2007
 5
 6  #
 7  #   Pre-processing of tape copy processing
 8  #
 9  #       Argument: $1 Device name of backup disk
10  #                 $2 Reserve
11  #
12  #       Error number
13  #                 2: Argument error
14  #                 10: umount error
15
16
17  # Argument check
18  case $# in
19  1)
20          ;;
21  2)
22          ;;
23  *)
24          exit 2
25          ;;
```

```
26  esac
27
28  device="`echo $1`"
29
30  # Determine post-processing file name
31
32  if [ "$SWSTGNODE" != "" ]
33  then
34          swstg_node="/`echo $SWSTGNODE`"
35  else
36          swstg_node=""
37  fi
38
39  err_log_path="/var/opt/FJSVswsts"$swstg_node"/log"
40
41  if [ "`echo $device | /usr/bin/grep "/dev/dsk/"`" != "" ]
42  then
43          # /dev/dsk/c?t?d?s? -> c?t?d?s?
44          dev="`echo $device | /usr/bin/sed "s/\/dev\/dsk\///"`"
45  elif [ "`echo $device | /usr/bin/grep "/dev/FJSV"`" != "" ]
46  then
47          # /dev/FJSVmphd/dsk/mplb?s? -> /dev/FJSVmphd/dsk/mplb?s?
48          # /dev/FJSVmphd/dsk/mphd?s? -> /dev/FJSVmphd/dsk/mphd?s?
49          dev="`echo $device | /usr/bin/cut -d/ -f5`"
50  elif [ "`echo $device | /usr/bin/grep "/dev/sfdsk/"`" != "" ]
51  then
52          # /dev/sfdsk/class/dsk/volume -> _gds_class_volume
53          dev="_gds_`echo $device | /usr/bin/sed "s/\/dev\/sfdsk\///"`"
54          dev="`echo $dev | /usr/bin/sed "s/\/dsk\//_/"`"
55  elif [ "`echo $device | /usr/bin/grep "/dev/vx/dsk/"`" != "" ]
56  then
57          # /dev/vx/dsk/volume -> _vx_rootdg_volume
58          # /dev/vx/dsk/disk-group/volume -> _vx_disk-group_volume
59          dev=_vx_"`echo $device | /usr/bin/awk -F\/ ' { if (NF == 6) { print
$5"_"$6 } else print "rootdg_"$5 }'`"
60  elif [ "`echo $device | /usr/bin/grep "/dev/vx/dmp/"`" != "" ]
61  then
62          # /dev/vx/dmp/device -> _vx_pv_device
63          dev=_vx_pv_"`echo $device | /usr/bin/cut -d/ -f5`"
64  else
65          exit 0
66  fi
67  post_file="/etc/opt/FJSVswsts"$swstg_node"/data/DEFAULT/"$dev".pre"
68
69  # Device unmount process.
70  #
71  cur_mount_point=`/usr/sbin/mount | grep "$device " | cut -f1 -d' '`
72  if [ "$cur_mount_point" != "" ]
73  then
74          /usr/sbin/umount $cur_mount_point 2>/dev/null
75          if [ $? != 0 ]
76          then
77                  retry_count=3
78                  sleep_time=1
```

```
     79              result_flag=1
     80
     81              while [ $retry_count -gt 0 ]
     82              do
     83                      /usr/sbin/umount $cur_mount_point >
$err_log_path/$dev.umount 2>&1
     84                      if [ $? != 0 ]
     85                      then
     86                              retry_count=`expr $retry_count - 1`
     87                              /usr/bin/sleep $sleep_time
     88                      else
     89                              /usr/bin/rm -f $err_log_path/$dev.umount
     90                              result_flag=0
     91                              break
     92                      fi
     93              done
     94
     95              if [ $result_flag != 0 ]
     96              then
     97                      /usr/sbin/fuser -cu $cur_mount_point>
$err_log_path/$dev.fuser 2>&1
     98                      /usr/bin/ps -ef > $err_log_path/$dev.ps 2>&1
     99
    100                      exit 10
    101              fi
    102      fi
    103      echo "mount" > $post_file
    104
    105  # When device was not mounted
    106  #
    107  else
    108      echo "none" > $post_file
    109  fi
    110  exit 0
```

A.4.2 Tape copy post-processing in Solaris

The name of the shell script for post-processing after tape copy processing is as follows.

● In the case of non-cluster operation:

```
/etc/opt/FJSVswsts/sh/TapeCopy.post
```

● In the case of cluster operation:

```
/etc/opt/FJSVswsts/<logical node name>/sh/TapeCopy.post
```

```
     1  #!/bin/sh
     2
     3  # AdvancedCopy Manager
     4  # All Rights Reserved, Copyright FUJITSU LIMITED, 2005-2007
     5
     6  #
     7  #   Post-processing of tape copy processing
     8  #
```

```
 9  #        Argument: $1 Device name of backup disk
10  #                  $2 Reserve
11  #
12  #        Error number
13  #                  2: Argument error
14
15  # Argument check
16  case $# in
17  1)
18          ;;
19  2)
20          ;;
21  *)
22          exit 2
23          ;;
24  esac
25
26  device="`echo $1`"
27
28  # Determine of post-processing file name
29
30  if [ "$SWSTGNODE" != "" ]
31  then
32          swstg_node="/`echo $SWSTGNODE`"
33  else
34          swstg_node=""
35  fi
36
37  err_log_path="/var/opt/FJSVswsts"$swstg_node"/log"
38
39  if [ "`echo $device | /usr/bin/grep "/dev/dsk/"`" != "" ]
40  then
41          # /dev/dsk/c?t?d?s? -> c?t?d?s?
42          dev="`echo $device | /usr/bin/sed "s/\/dev\/dsk\///"`"
43  elif [ "`echo $device | /usr/bin/grep "/dev/FJSV"`" != "" ]
44  then
45          # /dev/FJSVmphd/dsk/mplb?s? -> /dev/FJSVmphd/dsk/mplb?s?
46          # /dev/FJSVmphd/dsk/mphd?s? -> /dev/FJSVmphd/dsk/mphd?s?
47          dev="`echo $device | /usr/bin/cut -d/ -f5`"
48  elif [ "`echo $device | /usr/bin/grep "/dev/sfdsk/"`" != "" ]
49  then
50          # /dev/sfdsk/class/dsk/volume -> _gds_class_volume
51          dev="_gds_`echo $device | /usr/bin/sed "s/\/dev\/sfdsk\///"`"
52          dev="`echo $dev | /usr/bin/sed "s/\/dsk\//_/"`"
53  elif [ "`echo $device | /usr/bin/grep "/dev/vx/dsk/"`" != "" ]
54  then
55          # /dev/vx/dsk/volume -> _vx_rootdg_volume
56          # /dev/vx/dsk/disk-group/volume -> _vx_disk-group_volume
57          dev=_vx_"`echo $device | /usr/bin/awk -F/ '{ if (NF == 6) { print
$5"_"$6 } else print "rootdg_"$5 }'`"
58  elif [ "`echo $device | /usr/bin/grep "/dev/vx/dmp/"`" != "" ]
59  then
60          # /dev/vx/dmp/device -> _vx_pv_device
61          dev=_vx_pv_"`echo $device | /usr/bin/cut -d/ -f5`"
```

```
62  else
63          exit 0
64  fi
65  post_file="/etc/opt/FJSVswsts"$swstg_node"/data/DEFAULT/"$dev".pre"
66
67  # Confirmation of post-processing
68  if [ ! -r $post_file ]
69  then
70          exit 0
71  fi
72
73  /usr/bin/rm -f $post_file 2> /dev/null
74  exit 0
```

A.4.3 Tape copy pre-processing in Linux

The names of the pre-processing shell scripts used for tape copying are:

● For non-cluster operation:

```
/etc/opt/FJSVswsts/sh/TapeCopy.pre
```

● For cluster operation:

```
/etc/opt/FJSVswsts/<logical node name >/sh/TapeCopy.pre
```

```
 1:   #!/bin/sh
 2:
 3:   # AdvancedCopy Manager
 4:   # All Rights Reserved, Copyright FUJITSU LIMITED, 2005-2007
 5:
 6:   #
 7:   #   Pre-processing of tape copy processing
 8:   #
 9:   #       Argument: $1 Device name of backup disk
10:   #                 $2 Reserve
11:   #
12:   #   Error number
13:   #            2: Argument error
14:   #           10: umount error
15:   #           13: Illegal mount type (bind/stack mount)
16:
17:
18:   # Argument check
19:   case $# in
20:   1)
21:       ;;
22:   2)
23:       ;;
24:   *)
25:       exit 2
26:       ;;
27:   esac
28:
29:   device="`echo $1`"
```

```
30:
31:   # Determination post-processing file name
32:
33:   if [ "$SWSTGNODE" != "" ]
34:   then
35:   swstg_node="/`echo $SWSTGNODE`"
36:   else
37:   swstg_node=""
38:   fi
39:
40:   err_log_path="/var/opt/FJSVswsts"$swstg_node"/log"
41:
42:   if [ "`echo $device | /bin/grep "/dev/sd"`" != "" ]
43:   then
44:       # /dev/sd? -> sd?
45:       dev="`echo $device | /bin/sed "s/\/dev\///"`"
46:   elif [ "`echo $device | /bin/grep "/dev/FJSV"`" != "" ]
47:   then
48:       # /dev/FJSVmphd/dsk/mplb?s? -> mplb?s?
49:       # /dev/FJSVmphd/dsk/mphd?s? -> mphd?s?
50:       dev="`echo $device | /bin/cut -d/ -f5`"
51:   elif [ "`echo $device | /bin/grep "/dev/sfdsk/"`" != "" ]
52:   then
53:       # /dev/sfdsk/class/dsk/volume -> _gds_class_volume
54:       dev="_gds_`echo $device | /bin/sed "s/\/dev\/sfdsk\///"`"
55:       dev="`echo $dev | /bin/sed "s/\/dsk\//_/"`"
56:   elif [ "`echo $device | /bin/grep "/dev/disk/by-id/"`" != "" ]
57:   then
58:       # "/dev/disk/by-id/<device>" -> "_by-id_<device>"
59:       dev="_by-id_`echo $device | /bin/sed "s/\/dev\/disk\/by-id\///"`"
60:   elif [ "`echo $device | /bin/grep "/dev/disk/by-path/"`" != "" ]
61:   then
62:       # "/dev/disk/by-path/<device>" -> "_by-path_<device>"
63:       dev="_by-path_`echo $device | /bin/sed "s/\/dev\/disk\/by-path\///"`"
64:   else
65:       exit 0
66:   fi
67:   post_file="/etc/opt/FJSVswsts"$swstg_node"/data/DEFAULT/"$dev".pre"
68:
69:   if [ "`echo $device | /bin/grep "/dev/disk/by-id/"`" != "" \
70:       -o "`echo $device | /bin/grep "/dev/disk/by-path/"`" != "" ]
71:   then
72:       cdevice="/dev/`/usr/bin/readlink $device | /bin/sed "s/..\/..\///"`"
73:       cur_mount_point=`/bin/mount | grep "$cdevice " | cut -f3 -d' '`
74:   else
75:       cur_mount_point=`/bin/mount | grep "$device " | cut -f3 -d' '`
76:   fi
77:   if [ "$cur_mount_point" != "" ]
78:   then
79:
80:       if [ `/bin/cat /proc/mounts |/bin/cut -d' ' -f 2|/bin/grep
"^$cur_mount_point\$"|/usr/bin/wc -w` != 1 ]; then
81:                  # stack mount (multi device on $cur_mount_point)
82:                  /bin/mount  > $err_log_path/$dev.umount 2>&1
```

```
 83:            exit 13
 84:        fi
 85:        if [ `/bin/cat /proc/mounts |/bin/cut -d' ' -f 1|/bin/grep
"^$device\$"|/usr/bin/wc -w` != 1 ]; then
 86:                # bind mount (device has multi mount point)
 87:                /bin/mount  > $err_log_path/$dev.umount 2>&1
 88:                exit 13
 89:        fi
 90:
 91:        /bin/umount $cur_mount_point 2>/dev/null
 92:        if [ $? != 0 ]
 93:        then
 94:                retry_count=3
 95:                sleep_time=1
 96:                result_flag=1
 97:
 98:                while [ $retry_count -gt 0 ]
 99:                do
100:                        /bin/umount $cur_mount_point >
$err_log_path/$dev.umount 2>&1
101:                        if [ $? != 0 ]
102:                        then
103:                                retry_count=`expr $retry_count - 1`
104:                                /bin/sleep $sleep_time
105:                        else
106:                                /bin/rm -f $err_log_path/$dev.umount
107:                                result_flag=0
108:                                break
109:                        fi
110:                done
111:
112:                if [ $result_flag != 0 ]
113:                then
114:                        /sbin/fuser -vu $cur_mount_point>
$err_log_path/$dev.fuser 2>&1
115:                        /bin/ps -ef > $err_log_path/$dev.ps 2>&1
116:
117:                        exit 10
118:                fi
119:        fi
120:    echo "mount" > $post_file
121:
122: # When device was not mounted
123: #
124: else
125:    echo "none" > $post_file
126: fi
127:
128: exit 0
```

A.4.4 Tape copy post-processing in Linux

The names of the post-processing shell scripts used for tape copying are:

● For non-cluster operation:

```
/etc/opt/FJSVswsts/sh/TapeCopy.post
```

● For cluster operation:

```
/etc/opt/FJSVswsts/<logical node name >/sh/TapeCopy.post
```

```
 1:   #!/bin/sh
 2:
 3:   # AdvancedCopy Manager
 4:   # All Rights Reserved, Copyright FUJITSU LIMITED, 2005-2007
 5:
 6:   #
 7:   #   Post-processing of tape copy processing
 8:   #
 9:   #         Argument: $1 Device name of backup disk
10:   #                   $2 Reserve
11:   #
12:   #   Error number
13:   #          2: Argument error
14:
15:   # Argument check
16:   case $# in
17:   1)
18:       ;;
19:   2)
20:       ;;
21:   *)
22:       exit 2
23:       ;;
24:   esac
25:
26:   device="`echo $1`"
27:
28:   # Determination of post-processing file name
29:
30:   if [ "$SWSTGNODE" != "" ]
31:   then
32:   swstg_node="/`echo $SWSTGNODE`"
33:   else
34:   swstg_node=""
35:   fi
36:
37:   err_log_path="/var/opt/FJSVswsts"$swstg_node"/log"
38:
39:   if [ "`echo $device | /bin/grep "/dev/sd"`" != "" ]
40:   then
41:       # /dev/sd? -> sd?
42:       dev="`echo $device | /bin/sed "s/\/dev\///"`"
43:   elif [ "`echo $device | /bin/grep "/dev/FJSV"`" != "" ]
44:   then
45:       # /dev/FJSVmphd/dsk/mplb?s? -> mplb?s?
46:       # /dev/FJSVmphd/dsk/mphd?s? -> mphd?s?
47:       dev="`echo $device | /bin/cut -d/ -f5`"
48:   elif [ "`echo $device | /bin/grep "/dev/sfdsk/"`" != "" ]
49:   then
```

```
50:     # /dev/sfdsk/class/dsk/volume -> _gds_class_volume
51:     dev="_gds_`echo $device | /bin/sed "s/\/dev\/sfdsk\///"`"
52:     dev="`echo $dev | /bin/sed "s/\/dsk\//_/"`"
53: elif [ "`echo $device | /bin/grep "/dev/disk/by-id/"`" != "" ]
54: then
55:     # "/dev/disk/by-id/<device>" -> "_by-id_<device>"
56:     dev="_by-id_`echo $device | /bin/sed "s/\/dev\/disk\/by-id\///"`"
57: elif [ "`echo $device | /bin/grep "/dev/disk/by-path/"`" != "" ]
58: then
59:     # "/dev/disk/by-path/<device>" -> "_by-path_<device>"
60:     dev="_by-path_`echo $device | /bin/sed "s/\/dev\/disk\/by-path\///"`"
61: else
62:     exit 0
63: fi
64: post_file="/etc/opt/FJSVswsts"$swstg_node"/data/DEFAULT/"$dev".pre"
65:
66: # Confirmation of post-processing
67: if [ ! -r $post_file ]
68: then
69:     exit 0
70: fi
71: /bin/rm -f $post_file 2> /dev/null
72:
73: exit 0
```

A.4.5 Tape copy pre-processing in HP-UX

The names of the pre-processing shell scripts used for tape copying are:
● For non-cluster operation:

```
/etc/opt/FJSVswsts/sh/TapeCopy.pre
```

● For cluster operation:

```
/etc/opt/FJSVswsts/<logical node name >/sh/TapeCopy.pre
```

```
1:  #!/bin/sh
2:
3:  # AdvancedCopy Manager
4:  # All Rights Reserved, Copyright FUJITSU LIMITED, 2005-2008
5:
6:  #
7:  #   Preprocessing of tape copy processing
8:  #
9:  #       Argument: $1 Device or VG name of backup disk
10: #                 $2 Reserve
11: #
12: #       Error number
13: #               2: Argument error
14: #              10: umount error
15:
16:
17: # Argument check
18: case $# in
19: 1)
20:         ;;
```

326

```
21:  2)
22:          ;;
23:  *)
24:          exit 2
25:          ;;
26:  esac
27:
28:  device=$1
29:
30:  # Determination post-processing file name
31:  if [ "$SWSTGNODE" != "" ]
32:  then
33:          swstg_node="/`echo $SWSTGNODE`"
34:  else
35:          swstg_node=""
36:  fi
37:
38:  err_log_path="/var/opt/FJSVswsts"$swstg_node"/log"
39:
40:  # Device type check
41:  trans="`echo $device | /usr/bin/grep -e "/dev/dsk/" -e "/dev/disk/"`"
42:  lvmtrans="`echo $device | /usr/bin/grep "/dev/"`"
43:  vxpvtrans="`echo $device | /usr/bin/grep "/dev/vx/dmp/"`"
44:  if [ "$trans" != "" ]
45:  then
46:          dev="`echo $device | /usr/bin/sed -e "s/\/dev\/dsk\///" -e
"s/\/dev\/disk\//_hppv_/"`"
47:  elif [ "$vxpvtrans" != "" ]
48:  then
49:          dev_type="vxvm_pv"
50:          # /dev/vx/dmp/XXXX -> XXXX
51:          dev="`echo $device | /usr/bin/awk -F\/ '{ print $5 }'`"
52:  elif [ "$lvmtrans" != "" ]
53:  then
54:          # /dev/XXXX -> XXXX
55:          dev="`echo $device | /usr/bin/awk -F\/ '{ print $3 }'`"
56:  else
57:          exit 0
58:  fi
59:
60:  post_file="/etc/opt/FJSVswsts"$swstg_node"/data/DEFAULT/"$dev".pre"
61:
62:  if [ "$trans" != "" ]
63:  then
64:      # Physical volume
65:      cur_mount_list=`/usr/sbin/mount | grep " $device" | cut -f1 -d' '`
66:  elif [ "$vxpvtrans" != "" ]
67:  then
68:      # VxVM PV
69:      cur_mount_list=""
70:  else
71:      # Logical volume
72:      cur_mount_list=`/usr/sbin/mount | grep " $device/" | cut -f1 -d' '`
73:  fi
```

```
 74:   # Device unmount process.
 75:   #
 76:   if [ "$cur_mount_list" != "" ]
 77:   then
 78:       for cur_mount in $cur_mount_list
 79:       do
 80:           /usr/sbin/umount $cur_mount 2>/dev/null
 81:           if [ $? != 0 ]
 82:           then
 83:               retry_count=3
 84:               sleep_time=1
 85:               result_flag=1
 86:
 87:               while [ $retry_count -gt 0 ]
 88:               do
 89:                   /usr/sbin/umount $cur_mount > $err_log_path/$dev.umount 2>&1
 90:                   if [ $? != 0 ]
 91:                   then
 92:                       retry_count=`expr $retry_count - 1`
 93:                       /usr/bin/sleep $sleep_time
 94:                   else
 95:                       /usr/bin/rm -f $err_log_path/$dev.umount
 96:                       result_flag=0
 97:                       break
 98:                   fi
 99:               done
100:
101:               if [ $result_flag != 0 ]
102:               then
103:                   /usr/sbin/fuser -cu $cur_mount> $err_log_path/$dev.fuser 2>&1
104:                   /usr/bin/ps -ef > $err_log_path/$dev.ps 2>&1
105:                   exit 10
106:               fi
107:           fi
108:       done
109:       echo "mount" > $post_file
110:
111: # When device was not mounted
112: #
113: else
114:     echo "none" > $post_file
115: fi
116:
117: exit 0
```

A.4.6 Tape copy post-processing in HP-UX

The names of the post-processing shell scripts used for tape copying are:

● For non-cluster operation:

```
/etc/opt/FJSVswsts/sh/TapeCopy.post
```

● For cluster operation:

```
/etc/opt/FJSVswsts/<logical node name >/sh/TapeCopy.post
```

```
1:   #!/bin/sh
2:
3:   # AdvancedCopy Manager
4:   # All Rights Reserved, Copyright FUJITSU LIMITED, 2005-2008
5:
6:   #
7:   #   Post-processing of tape copy processing
8:   #
9:   #              Argument: $1 Device or VG name of backup disk
10:  #                       $2 Reserve
11:  #
12:  #       Error number
13:  #               2: Argument error
14:
15:  # Argument check
16:  case $# in
17:  1)
18:          ;;
19:  2)
20:          ;;
21:  *)
22:          exit 2
23:          ;;
24:  esac
25:
26:  device=$1
27:
28:  # Determination of post-processing file name
29:
30:  if [ "$SWSTGNODE" != "" ]
31:  then
32:          swstg_node="/`echo $SWSTGNODE`"
33:  else
34:          swstg_node=""
35:  fi
36:
37:  err_log_path="/var/opt/FJSVswsts"$swstg_node"/log"
38:
39:  # Device type check
40:  trans="`echo $device | /usr/bin/grep -e "/dev/dsk/" -e "/dev/disk/"`"
41:  lvmtrans="`echo $device | /usr/bin/grep "/dev/"`"
42:  vxpvtrans="`echo $device | /usr/bin/grep "/dev/vx/dmp/"`"
43:  if [ "$trans" != "" ]
44:  then
45:          dev="`echo $device | /usr/bin/sed -e "s/\/dev\/dsk\///" -e
"s/\/dev\/disk\/_hppv_/"`"
46:  elif [ "$vxpvtrans" != "" ]
47:  then
48:          dev_type="vxvm_pv"
49:          # /dev/vx/dmp/XXXX -> XXXX
50:          dev="`echo $device | /usr/bin/awk -F/ '{ print $5 }'`"
51:  elif [ "$lvmtrans" != "" ]
52:  then
53:          # /dev/vgXX -> vgXX
```

```
54:         dev="`echo $device | /usr/bin/awk -F\/ '{ print $3 }'`"
55: else
56:         exit 0
57: fi
58: post_file="/etc/opt/FJSVswsts"$swstg_node"/data/DEFAULT/"$dev".pre"
59:
60: # Confirmation of postprocessing
61: if [ ! -r $post_file ]
62: then
63:         exit 0
64: fi
65: /usr/bin/rm -f $post_file 2> /dev/null
66:
67: exit 0
```

A.4.7 Tape copy pre-processing in AIX

The names of the pre-processing shell scripts used for tape copying are:

● For non-cluster operation:

```
/etc/opt/FJSVswsts/sh/TapeCopy.pre
```

● For cluster operation:

```
/etc/opt/FJSVswsts/<logical node name >/sh/TapeCopy.pre
```

```
1    #!/bin/sh
2
3    # AdvancedCopy Manager
4    # All Rights Reserved, Copyright FUJITSU LIMITED, 2005-2007
5
6    #
7    #   Pre-processing of tape copy processing
8    #
9    #       Argument: $1 VG name of backup disk
10   #                $2 Reserve
11   #
12   #       Error number
13   #              2: Argument error
14   #             10: umount error
15
16   # Argument check
17   case $# in
18   1)
19           ;;
20   2)
21           ;;
22   *)
23           exit 2
24           ;;
25   esac
26
27   device=$1
28
```

```
29    if [ "$SWSTGNODE" != "" ]
30    then
31            swstg_node="/`echo $SWSTGNODE`"
32    else
33            swstg_node=""
34    fi
35
36    err_log_path="/var/opt/FJSVswsts"$swstg_node"/log"
37
38    # Determination of post-processing file name
39    if [ "`echo $device | /usr/bin/grep "/dev/hdisk"`" != "" ]
40    then
41        dev_type="lvm_pv"
42        # /dev/hdisk? -> hdisk?
43        dev="`echo $device | /usr/bin/awk -F\/ '{ print $3 }'`"
44
45    elif [ "`echo $device | /usr/bin/grep "/dev/vx/dmp/"`" != "" ]
46    then
47        dev_type="vxvm_pv"
48        # /dev/vx/dmp/device -> device
49        dev="`echo $device | /usr/bin/awk -F\/ '{ print $5 }'`"
50
51    elif [ "`echo $device | /usr/bin/grep "/dev/"`" != "" ]
52    then
53        dev_type="lvm_vg"
54        # /dev/VG_Name -> VG_Name
55        dev="`echo $device | /usr/bin/awk -F\/ '{ print $3 }'`"
56
57    else
58        # Other Volume
59        exit 0
60    fi
61
62    post_file="/etc/opt/FJSVswsts"$swstg_node"/data/DEFAULT/"$dev".pre"
63
64    # When the backup disk is a volume group
####################################
65    if [ "$dev_type" = "lvm_vg" ]
66    then
67
68            # Devices is volume group and script not customize
69            exit 99
70
71    # When devices of volume group was mounted
72    #       # Specify the name of volume group to unmount
73    #       if [ "$device" = "/dev/vgXX" ]
74    #       then
75    #
76    #               # Unmount all logical volumes of the volume group
77    #               mount_point="/XX"
78    #               /usr/sbin/umount $mount_point 2>/dev/null
79    #               if [ $? != 0 ]
80    #               then
81    #                       retry_count=3
```

```
    82    #                    sleep_time=1
    83    #                    result_flag=1
    84    #
    85    #                    while [ $retry_count -gt 0 ]
    86    #                    do
    87    #                        /usr/sbin/umount $mount_point >
$err_log_path/$dev.umount 2>&1
    88    #                        if [ $? != 0 ]
    89    #                        then
    90    #                            retry_count=`expr $retry_count - 1`
    91    #                            /usr/bin/sleep $sleep_time
    92    #                        else
    93    #                            /usr/bin/rm -f $err_log_path/$dev.umount
    94    #                            result_flag=0
    95    #                            break
    96    #                        fi
    97    #                    done
    98    #
    99    #                    if [ $result_flag != 0 ]
   100    #                    then
   101    #                        /usr/sbin/fuser -cu $mount_point>
$err_log_path/$dev.fuser 2>&1
   102    #                        /usr/bin/ps -ef > $err_log_path/$dev.ps 2>&1
   103    #
   104    #                        exit 10
   105    #                    fi
   106    #                fi
   107    #                echo "mount" > $post_file
   108    #        fi
   109
   110    # When the backup disk is a VxVM physical volume
############################
   111    elif [ "$dev_type" = "vxvm_pv" ]
   112    then
   113            # Nothing is done to VxVM physical volume.
   114            echo "none" > $post_file
   115
   116    # When the backup disk is a LVM physical volume
############################
   117    elif [ "$dev_type" = "lvm_pv" ]
   118    then
   119            # Nothing is done to LVM physical volume.
   120            echo "none" > $post_file
   121
   122    fi
   123    exit 0
```

Volume group backup

Change the 69th line of the pre-processing script (TapeCopy.pre) as follows, if the volume group is subject to the tape copy.

(Before change)	exit 99
(After change)	echo "none" > $post_file

A.4.8 Tape copy post-processing in AIX

The names of the post-processing shell scripts used for tape copying are:
- ● For non-cluster operation:

```
/etc/opt/FJSVswsts/sh/TapeCopy.post
```

- ● For cluster operation:

```
/etc/opt/FJSVswsts/<logical node name>/sh/TapeCopy.post
```

```
1     #!/bin/sh
2
3     # AdvancedCopy Manager
4     # All Rights Reserved, Copyright FUJITSU LIMITED, 2005-2007
5
6     #
7     #   Post-processing of tape copy processing
8     #
9     #              Argument: $1 VG name of backup disk
10    #                       $2 Reserve
11    #
12    #       Error number
13    #                2: Argument error
14
15    # Argument check
16    case $# in
17    1)
18            ;;
19    2)
20            ;;
21    *)
22            exit 2
23            ;;
24    esac
25
26    device=$1
27
28    if [ "$SWSTGNODE" != "" ]
29    then
30            swstg_node="/`echo $SWSTGNODE`"
31    else
32            swstg_node=""
33    fi
34
35    err_log_path="/var/opt/FJSVswsts"$swstg_node"/log"
36
37    # Determination of post-processing file name
38    if [ "`echo $device | /usr/bin/grep "/dev/hdisk"`" != "" ]
39    then
40        dev_type="lvm_pv"
41        # /dev/hdisk? -> hdisk?
42        dev="`echo $device | /usr/bin/awk -F\/ '{ print $3 }'`"
43
44    elif [ "`echo $device | /usr/bin/grep "/dev/vx/dmp/"`" != "" ]
45    then
```

```
 46        dev_type="vxvm_pv"
 47        # /dev/vx/dmp/device -> device
 48        dev="`echo $device | /usr/bin/awk -F\/ '{ print $5 }'`"
 49
 50    elif [ "`echo $device | /usr/bin/grep "/dev/"`" != "" ]
 51    then
 52        dev_type="lvm_vg"
 53        # /dev/VG_Name -> VG_Name
 54        dev="`echo $device | /usr/bin/awk -F\/ '{ print $3 }'`"
 55
 56    else
 57        # Other Volume
 58        exit 0
 59    fi
 60
 61    post_file="/etc/opt/FJSVswsts"$swstg_node"/data/DEFAULT/"$dev".pre"
 62
 63    # Confirmation of post-processing
 64    if [ ! -r $post_file ]
 65    then
 66            exit 0
 67    fi
 68
 69    /usr/bin/rm -f $post_file 2> /dev/null
 70    exit 0
```

A.4.9 Tape copy pre-processing in Windows

The names of the pre-processing script files used for tape copying are:
- ● For non-cluster operation:
  "environment settings directory"\etc\backup\scripts\TapeCopyPre.js
- ● For cluster operation:
  <shared disk>:\etc\opt\swstorage\etc\backup\scripts\TapeCopyPre.js

```
  1    // AdvancedCopy Manager for Windows
  2    // All Rights Reserved, Copyright FUJITSU LIMITED, 2005-2007
  3    //
  4    // TapeCopyPre.js: Pre-Processing Script for tape copy
  5    //
  6    // [Parameters]
  7    // 1st argument: device name of backup volume
  8    //
  9    // [Return Values]
 10    // 0: The script ended normally.
 11    // 2: The number of the arguments is incorrect.
 12    // 4: An error other than the above occurred.
 13
 14    try {
 15        // create global objects
 16        var WshShell = WScript.CreateObject("WScript.Shell");
// create Shell object
 17        var WshEnv = WshShell.Environment("PROCESS");
// create Environment object
```

```
    18          var fsObj     = WScript.CreateObject("Scripting.FileSystemObject");
// create FileSystemObject object
    19
    20          // create SwstTapeCopyPreProc object
    21          var proc = new SwstTapeCopyPreProc();
    22
    23          // there is nothing to do if the pre/post-processing is not customized
    24          proc.doNothingForDriveLetter();
    25
    26          SwstQuit(0);
    27      } catch (e) {
    28          SwstQuit(4);
    29      }
    30
    31      function SwstTapeCopyPreProc()
    32      {
    33          // member variables
    34          this.bvName       =
WScript.Arguments.length!=1?SwstQuit(1):WScript.Arguments.Item(0); // device name
of transaction volume
    35          this.postFileName = getDataPathName() + "\\" +
getPutFileName(this.bvName) + ".pre";   // name of postprocessing file
    36
    37          // member functions
    38          this.doNothingForDriveLetter = doNothingForDriveLetter; //
self-explanatory
    39          this.writePostFile         = writePostFile;          //
self-explanatory
    40      }
    41
    42      function doNothingForDriveLetter()
    43      {
    44          this.writePostFile(this.postFileName, "none");
    45      }
    46
    47      function writePostFile(postfile, postdata)
    48      {
    49          var overwrite = true; // means to overwrite a file if it exists.
    50          var postFileStream = fsObj.CreateTextFile(postfile, overwrite);
    51          postFileStream.Write(postdata);
    52          postFileStream.Close();
    53      }
    54
    55      function SwstQuit(exitStatus)
    56      {
    57          switch(exitStatus) {
    58          case 0:
    59              WScript.Quit(0);
    60          case 1:
    61              WScript.Echo("[Tape copy Preprocessing] The number of the
arguments is incorrect.");
    62              WScript.Quit(2);
    63          default:
```

```
    64            WScript.Echo("[Tape copy Preprocessing] The script exited
abnormally.");
    65            WScript.Quit(4);
    66        }
    67    }
    68
    69    function getDataPathName()
    70    {
    71        return WshShell.RegRead(getSetupInfoKey() + "\\etcPathName") +
"\\etc\\backup\\data\\DEFAULT";
    72    }
    73
    74    function getSetupInfoKey()
    75    {
    76        var nodeName = WshEnv.Item("SWSTGNODE");
    77        if( nodeName != "" ){
    78            return "HKEY_LOCAL_MACHINE\\SOFTWARE\\Fujitsu\\AdvancedCopy
Manager\\CurrentVersion\\" + nodeName;
    79        }
    80        return "HKEY_LOCAL_MACHINE\\SOFTWARE\\Fujitsu\\AdvancedCopy
Manager\\CurrentVersion";
    81    }
    82
    83    function getPutFileName(deviceName){
    84        var fileName;
    85        fileName = deviceName;
    86        return(fileName);
    87    }
    88
```

A.4.10 Tape copy post-processing in Windows

The names of the post-processing script files used for tape copying are as follows:
● For non-cluster operation:
  "environment settings directory"\etc\backup\scripts\TapeCopyPost.js
● For cluster operation:
  <shared disk>:\etc\opt\swstorage\etc\backup\scripts\TapeCopyPost.js

```
     1    // AdvancedCopy Manager for Windows
     2    // All Rights Reserved, Copyright FUJITSU LIMITED, 2005-2007
     3    //
     4    // TapeCopyPost.js: Post-Processing Script for tape copy
     5    //
     6    // [Parameters]
     7    // 1st argument: device name of backup volume
     8    //
     9    // [Return Values]
    10    // 0: The script ended normally.
    11    // 2: The number of the arguments is incorrect.
    12    // 4: An error other than the above occurred.
    13
    14    try {
    15        // create global objects
```

```
    16          var WshShell = WScript.CreateObject("WScript.Shell");
// create Shell object
    17          var WshEnv = WshShell.Environment("PROCESS");
// create Environment object
    18          var fsObj    = WScript.CreateObject("Scripting.FileSystemObject");
// create FileSystemObject object
    19
    20          // create SwstTapeCopyPostProc object
    21          var proc = new SwstTapeCopyPostProc();
    22
    23          // do nothing if postprocessing file exists
    24          if (fsObj.FileExists(proc.postFileName) == false) {
    25              SwstQuit(0);
    26          }
    27
    28          // get postprocessing type
    29          var postProcType = proc.getPostProcData(proc.postFileName);
    30          switch(postProcType) {
    31          case "none":
    32              proc.doNothing();
    33              break;
    34          }
    35
    36          // clear temporary files
    37          proc.deletePostFile(proc.postFileName);
    38          SwstQuit(0);
    39      } catch (e) {
    40          SwstQuit(6);
    41      }
    42
    43      function SwstTapeCopyPostProc()
    44      {
    45          // member variables
    46          this.bvName         =
WScript.Arguments.length!=1?SwstQuit(1):WScript.Arguments.Item(0); // device name
of transaction volume
    47          this.postFileName = getDataPathName() + "\\" +
getPutFileName(this.bvName) + ".pre";   // name of postprocessing file
    48
    49          // member functions
    50          this.getPostProcData     = getPostProcData;              //
self-explanatory
    51          this.doNothing           = doNothing;                    //
self-explanatory
    52          this.deletePostFile      = deletePostFile;               //
self-explanatory
    53      }
    54
    55      function getPostProcData(postfile)
    56      {
    57          var iomode = 1;     // means read-only mode
    58          var create = false; // means not to create a file
    59          var postFileStream = fsObj.OpenTextFile(postfile, iomode, create);
    60          var postData = postFileStream.ReadAll();
```

```
61          postFileStream.Close();
62          return postData;
63      }
64
65      function doNothing()
66      {
67          // do nothing
68      }
69
70      function deletePostFile(postfile)
71      {
72          if (fsObj.FileExists(postfile) == true) {
73              fsObj.DeleteFile(postfile);
74          }
75      }
76
77      function SwstQuit(exitStatus)
78      {
79          switch(exitStatus) {
80          case 0:
81              WScript.Quit(0);
82          case 1:
83              WScript.Echo("[Tape copy Post-processing] The number of the
arguments is incorrect.");
84              WScript.Quit(2);
85          default:
86              WScript.Echo("[Tape copy Post-processing] The script exited
abnormally.");
87              WScript.Quit(4);
88          }
89      }
90
91      function getDataPathName()
92      {
93          return WshShell.RegRead(getSetupInfoKey() + "\\etcPathName") +
"\\etc\\backup\\data\\DEFAULT";
94      }
95
96      function getSetupInfoKey()
97      {
98          var nodeName = WshEnv.Item("SWSTGNODE");
99          if( nodeName != "" ){
100             return "HKEY_LOCAL_MACHINE\\SOFTWARE\\Fujitsu\\AdvancedCopy
Manager\\CurrentVersion\\" + nodeName;
101         }
102         return "HKEY_LOCAL_MACHINE\\SOFTWARE\\Fujitsu\\AdvancedCopy
Manager\\CurrentVersion";
103     }
104
105     function getPutFileName(deviceName) {
106         var fileName;
107         fileName = deviceName;
108         return(fileName);
109     }
```

The backup volume is locked and unlocked by programs, not scripts. This means that the tape copy pre-processing script is executed immediately before the volume is locked, and the tape copy post-processing script is executed immediately after the volume is unlocked. The pre-processing and post-processing scripts for tape copying do not perform any actual processing.

Diagram: Relationship between backup volume locking/unlocking and pre-processing and post-processing of the script
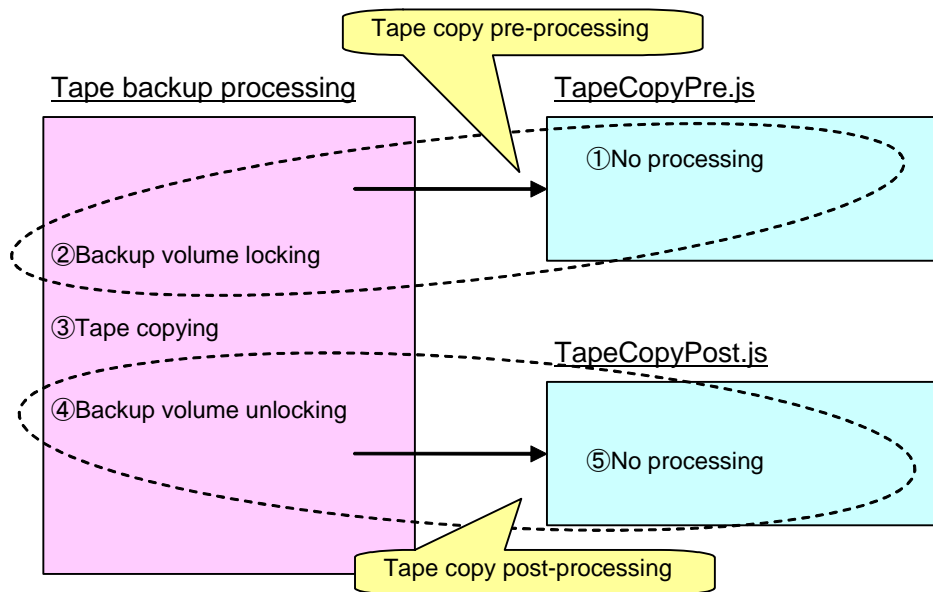
If, during tape copy pre-processing, the locking process fails because of the need to avoid a temporary access conflict with another application, the locking process will be retried. If the specified number of retries is exceeded, the command terminates abnormally. This indicates that one or more processes are still using the backup volume. The user should take appropriate measures such as terminating applications or services to prevent the volume from being used by other processes. Note that the specified number of retries can be changed by creating a setup file called a "backup volume lock specification file". (Refer to "Backup volume lock specification file for tape copying in Windows" for details.)
Note that if the measures to prevent other processes from using the target volume are correctly implemented while the tape copying process is being performed, there is usually no need to create this file.

A.4.11 Backup volume lock specification file for tape copying in Windows

If, during tape copy pre-processing in Windows, the locking process fails because of the need to avoid a temporary conflict with another application trying to access the backup volume, the locking process will be retried.
The standard retry process is as follows:

● If the locking process fails, it is attempted again after 1 second has elapsed.
● If a lock cannot be established after 20 retries (making a total of 21 attempts), the process is interrupted and the command is forced to terminate abnormally.

The maximum number of retries (20 by default) and the retry interval (1 second by default) can be modified by creating a setup file called a "backup volume lock specification file for tape copying".
This setup file can also be used to direct tape copy pre-processing to perform the following operations:

● To disable all file handles within a volume before retrying the locking process (Forced locking function)
● To skip locking/unlocking during tape copy pre-processing

The backup volume lock specification file for tape copying is not backed up by the resource backup command (swstresback). If the backup volume lock specification file for tape copying is being used, you will need to back it up using a command such as copy.

Creating the backup volume lock specification file for tape copying

To create a backup volume lock specification file for tape copying, use the following file names.

File name	For non-cluster operation:
	environment settings directory \etc\backup\data\TCBACKLOCK.INI
	For cluster operation:
	\<shared disk\>:\etc\opt\swstorage\etc\backup\data\TCBACKLOCK.INI

The following sample settings are for a backup volume lock specification file for tape copying.

```
[g1d2p1]
LockForceMode=on
LockRetryNumber=10
LockRetryInterval=10
[g1d2p2]
NoPrePost=on
[ANY]
LockForceMode=off
LockRetryNumber=20
LockRetryInterval=100
```

The backup volume lock specification file for tape copying is created as follows:
● Create a section corresponding to the volume for which the locking operation will be changed, then enter the desired parameters. (In the above example, two sections, g1d1p1 and g1d2p2, have been created.) The four parameters shown in the following table can be changed, but it is not necessary to specify all four parameters. Specify only the parameters that need to be changed; the parameters that are not specified will assume their default values.
● To change the default locking operation, create a section called "ANY" and specify the appropriate parameters. The "ANY" section can be used to change the locking

operation of all volumes other than those explicitly specified in the backup volume lock specification file for tape copying. (In the above example, the locking operation of all volumes other than g1d1p1 and g1d2p2 will obey the values in the "ANY" section.)

TCBACKLOCK.INI setup items

Table: Description of "Key" to be set in the TCBACKLOCK.INI file

Key	Description
LockForceMode	If locking of a backup volume fails, the locking process will be retried. This parameter specifies that the volume will be unmounted before the retry process begins. off (default) = Do not unmount the volume before the retry process on = Unmount the volume before the retry process When a volume is unmounted, all open handles on that volume will be disabled. Note: If a volume is in use soon after it has been unmounted, it may not be possible to lock it. This parameter is disabled if NoPrePost is set to on.
LockRetryNumber	If locking of a backup volume fails, the locking process will be retried. This parameter specifies the number of retries to be performed. Any interval between 1 and 10,000 can be specified. The default value is 20 retries. If a backup volume cannot be locked after the specified number of retries has been performed, the process is suspended and the command is forced to terminate abnormally. This parameter is disabled if NoPrePost is set to on.
LockRetryInterval	If locking of a backup volume fails, the locking process will be retried. This parameter specifies the interval (in milliseconds) between each retry operation. Any interval between 1 and 600,000(10 minutes) can be specified. The default value is 1,000 (1 second). This parameter is disabled if NoPrePost is set to on.
NoPrePost	This parameter specifies that tape copy pre-processing will not be performed. off (default) = Perform tape copy pre-processing and post-processing on=Do not perform tape copy pre-processing and post-processing When NoPrePost is set to on, all other parameters (LockForceMode, LockRetryNumber and LockRetryInterval) are disabled.

Appendix B Restoring from the Tape when the Cluster Service is Stopped

This chapter explains the procedure for restoration when the cluster service of a Storage server is stopped.

B.1 Overview

If the restoration destination volume is registered as a cluster resource, the cluster service of the Storage Server must be stopped in order to perform restoration. To restore backup data that is stored on tape media, the "physical IP address file" must be specified.

B.2 Restoration procedure

The following procedure restores data from tape to the restoration destination volume that is registered as a cluster resource in the AdvancedCopy Manager Tape backup operation.

1. Create the "Physical IP address file" on the Storage server. Specify any file name and file path. An example is shown below.

   The following is an example of the file.

   ```
   STGSRV_PHYS_IP=10.124.6.236
   ```

   The following is the description of the item.

   Table: Description of the item

Item	Description
STGSRV_PHYS_IP	Specifies the physical IP address of the node of the Storage Server subject to restoration.

2. Stop the cluster services of both nodes.

3. Logon to the node of the Storage server to restore.

4. For restoration, specify the file created in Step 1 in the -f option of the Restore command(acmrestore) and then execute it.

   The following examples illustrate the command execution.
   [Solaris/Linux/HP-UX/AIX]

   ```
   # /opt/FJSVswstc/bin/acmrestore -g 2 -m TAPE -f /home/acm/serverA_physIP
   /dev/sfdsk/CLS1/dsk/vol1:mplb48

   /dev/sfdsk/CLS1/dsk/vol1:mplb48 acmrestore completed

   #
   ```

   [Windows]

   ```
   C:\> C:\Win32app\AdvancedCopyManager\bin\acmrestore -g 2 -m TAPE -f D:\serverA_physIP
   g1d1p2

   g1d1p2 acmrestore completed

   C:\>
   ```

5. Start the cluster services.

Appendix C Backup and Restoration of System Volumes

This appendix explains how AdvancedCopy Manager can be used to back up and restore system volumes.

The unit of the backup volume that is to be backed up or restored is considered to be a partition or a logical disk unit.

C.1 Overview

In an environment where the system volume is allocated to a machine in the Fujitsu ETERNUS storage system, the system volume can be backed up and restored using the two methods described below.

1. Backup and restoration using a backup volume
   — The replication function can be used to backup the system volume to the backup volume, and the system volume can be restored from the backup volume.
   — The system volume's backup destination volume can be registered as a transaction volume for the tape backup operation. When the volume is registered, the backup data copied from the system volume can be managed on tape media. The backup data on tape can be restored to the backup volume or the system volume.

2. Backup and restoration using tape directly
3. The system volume can be backed up directly to tape in LU (disk) units, and can be restored directly from tape.

Figure: Overview of backup and restoration
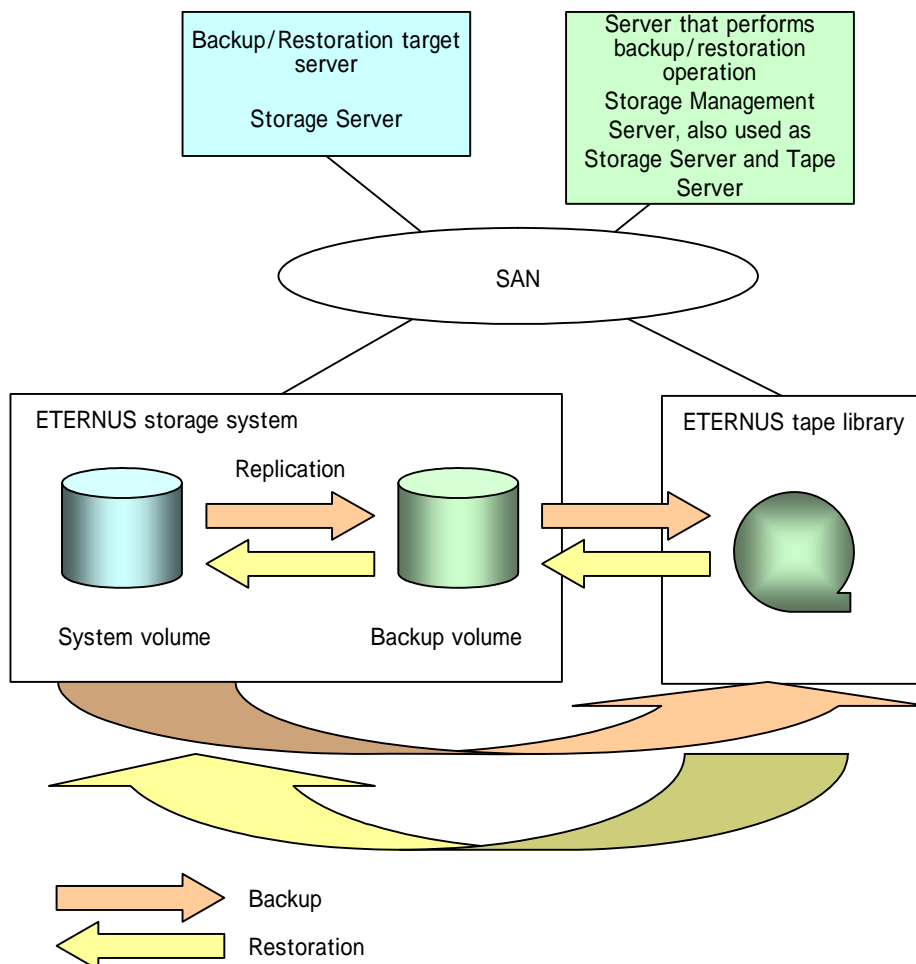
> **Point**
>
> To allocate the system volume to the ETERNUS storage system, a hardware device (server) that supports system startup from an external ETERNUS storage system is required.

Note

Updates to system data during backup processing will cause inconsistencies between the system data and backup data. Therefore, system volume backup/restoration must be performed while the backup target system (server) is in the stopped state.

Note

The replication function is used to copy system volumes and backup volumes. A backup function is not supported.

Note

If the server to be backed up is running on the Linux OS, and if the root partition of the backup server /etc/grub.conf or /etc/fstab is specified using the volume label name (i.e. LABEL=/ or /boot), this will cause multiple partitions to exist with the specified volume labels.

This will cause the volume labels to be duplicated or to obscure the root partitions that must be specified, and the system may not operate correctly. Because of this, the device names (i.e.: /dev/sda1) should be used to specify the root partitions of /etc/grub.conf and /etc/fstab.

C.2 Preparation

The system (server) must be stopped in order to back up or restore its system volume, so a separate server is required for backup operations. That is, at least two servers are required for this operation.

A configuration example for backup and restoration of a system volume is shown below.

1. Backup/restoration using a backup volume
   A backup volume must be prepared.

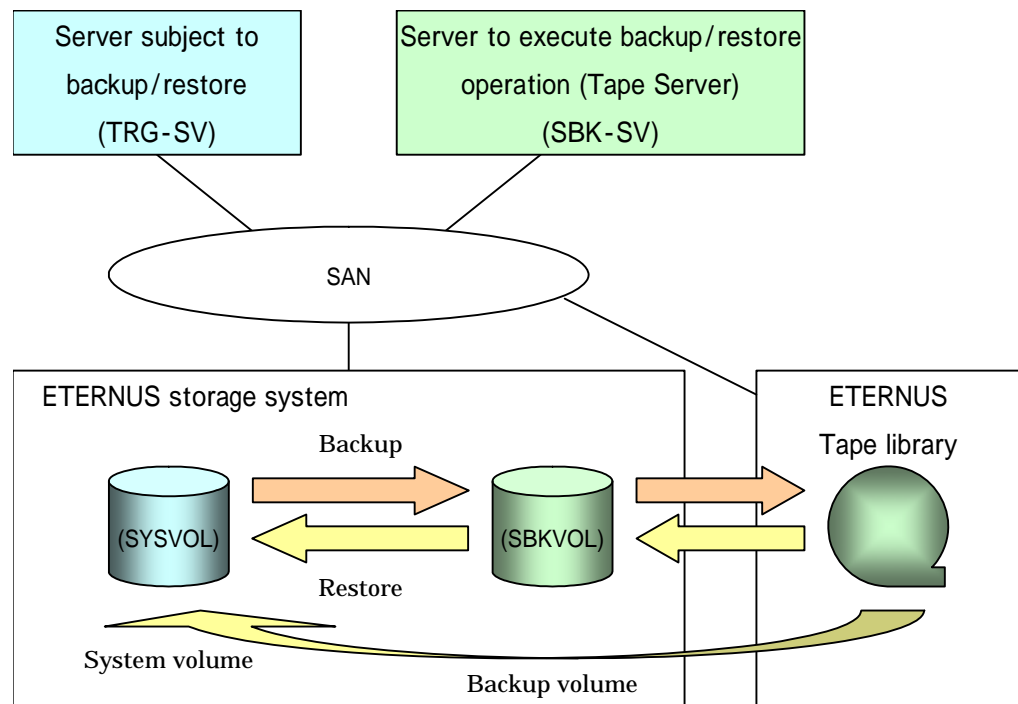### Figure: Configuration example for backup to a backup volume
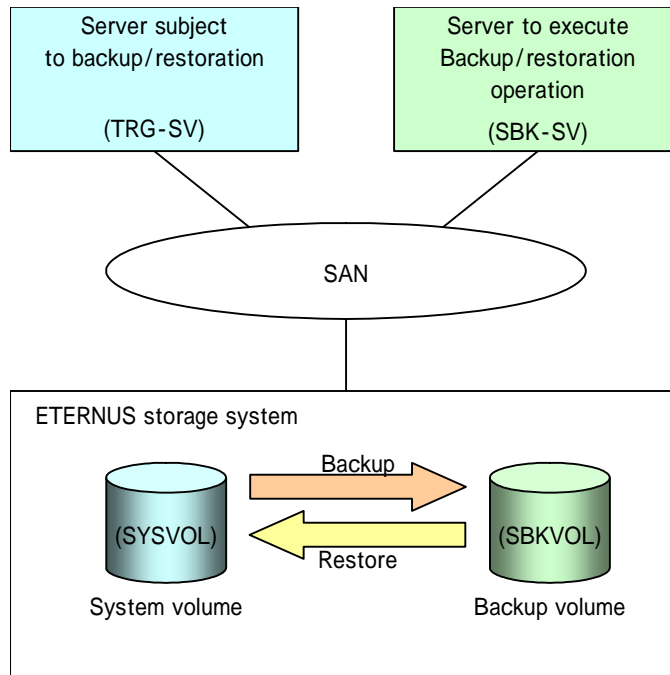
![Note]

If the backup source server and the server used for backup operations have different operating systems, the backup volume may not be the same size as the system volume. If so, make the backup volume larger than the system volume. Allocate a slice on the backup volume as the system volume copy destination.

2. Backup/restoration using a backup volume and tape
   A backup volume and an ETERNUS tape library must be prepared.
   To manage the backup data on tape media, install software (TSM) for operating an ETERNUS tape library on the server used for backup operations and use it as a Tape Server.

Figure: Configuration example when a backup volume is used to backup to tape media

Point

If the backup source server and the server used for backup operations have different operating systems, the backup volume may not be the same size as the system volume. If so, make the backup volume larger than the system volume. Allocate a slice on the backup volume as the system volume copy destination. The backup to tape operations backs up the system volume data that was copied to the slice.
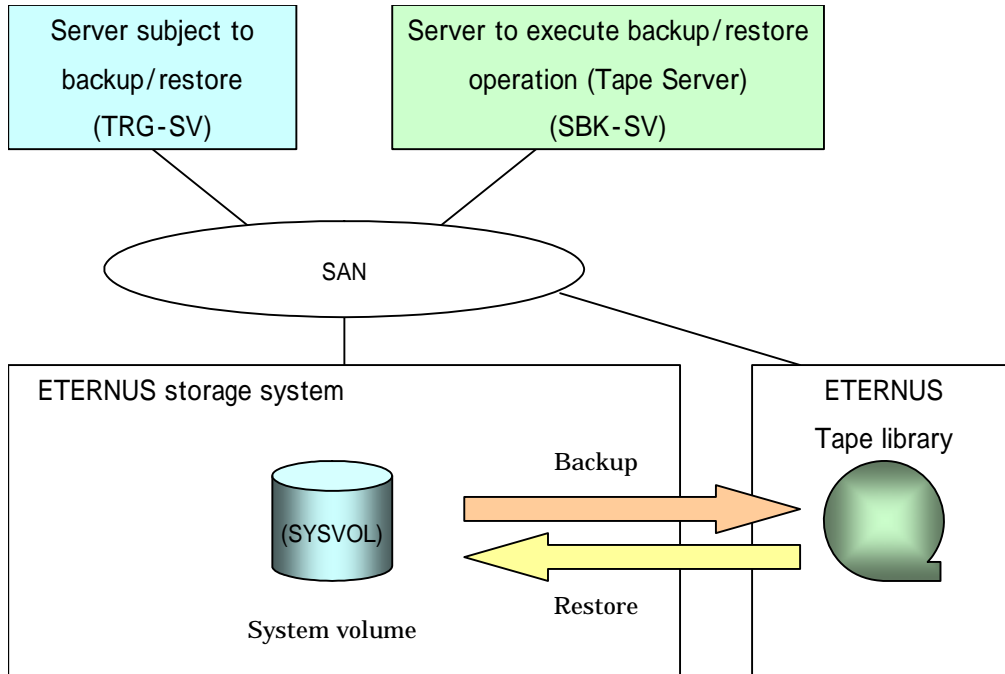
Note

In the configuration example above, the server that performs the backup/restore operation is also used as a Tape Server, but the operating system supported as a Tape Server is Solaris.

Therefore, if the operating system of the server that performs the backup/restore operations is not Solaris, a separate Tape Server is required.

3. Backup and restoration using tape directly
   An ETERNUS tape library must be provided.
   To manage the backup data on tape media, install software (TSM) for operating an ETERNUS
   tape library on the server used for backup operations and use it as a Tape Server.

Figure: Configuration example for backup directly to tape media

Note

When the system volume is backed up or restored directly to or from tape, the
backup/restoration must be in LU (disk) units.

Note

In the above configuration example, the server that performs the
backup/restoration operation is also used as a Tape Server, but the only
operating system that supports use as a Tape Server is Solaris.
Therefore, if the operating system of the server that performs
backup/restoration is not Solaris, a separate Tape Server is required.

C.2.1 Registration of Storage Server

The server whose system volume is being backed up and the server used for backup operations
for this system volume must be registered as Storage Servers.
For information on how to register a Storage Server, refer to "Registering a Storage Server"
in the "Replication Operation" chapter of the "ETERNUS SF AdvancedCopy Manager Operator's
Guide" for the operating system of the target Storage Server.

C.2.2 Registration of device information

The system volume on the server being backed up and the backup volume on the server used for backup operations must be registered in the repository.
For information on how to register a Storage Server, refer to "Incorporating information concerning devices under a Storage Server" in the "Replication Operation" chapter of the "ETERNUS SF AdvancedCopy Manager Operator's Guide" for the operating system of the target Storage Server.

> To back up a system volume that is a GDS logical volume, the SDX object operation unit on the server must be slices.

C.2.3 Device name expression

The device name expression for LU (disk) units specified to commands is as shown below.
Note that PRIMECLUSTER GDS and SafeDISK SDX object LUs (disks) are not supported.

- ● Solaris
- ● Solaris standard special file: /dev/dsk/c*t*d*s2 (*)
- ● mplb special file: /dev/FJSVmplb/dsk/mplb*s2 (*)
- ● Windows
- ● AdvancedCopy Manager device: g?d?
- ● Linux
- ● Normal device: /dev/sd*
- ● Multi-path device: /dev/sd*
- ● udev device: /dev/disk/by-id/xxxxxxxx (where xxxxxxxx is information generated from the disk identification information)
- ● /dev/disk/by-path/yyyyyyyy (where yyyyyyyy is information generated from the disk unit information)

(*):
For operations with a Solaris 10 operating system under an ETERNUS multi-path driver (hereafter referred to as ETMPD) environment, some functions provided by AdvancedCopy Manager may not be usable, depending on the ETMPD environment settings.

For a system volume, the following can be specified:

- — For Solaris 10 with ETERNUS multi-path driver and VTOC disk format:
  Mplb special file: /dev/FJSVmplb/dsk/mplb*s2
- — For Solaris 10 with ETERNUS multi-path driver and EFI disk format:
  System volume backup operation is not possible
- — Other than the above:
  Solaris standards special file: /dev/dsk/c*t*d*s2
  Mplb special file: /dev/FJSVmplb/dsk/mplb*s2

Refer to the "ETERNUS SF AdvancedCopy Manager Operator's Guide 13.3 -Solaris", "Notes on Operation", "General notes", "Operations in an ETERNUS multi-path driver environment" for details.

```
Udev device examples
      [Example 1]
          -  If the by-id name is scsi-3600e000000cb00000000000100000000
          -  /dev/disk/by-id/scsi-3600e000000cb00000000000100000000
      [Example 2]
          -  If the by-path name is
             pci-0000:02:01.0-fc-0x20010000138402a0:0x0001000000000000
          -  /dev/disk/by-path/pci-0000:02:01.0-fc-0x20010000138402a0:0x0001000000
             000000
```

C.2.4 Settings of replication volume information

In replication volume information, the system volume to be backed up must be set as the source volume and the backup destination volume as the replica volume.

For information on how to specify replication volume information, refer to "Setting the source volume and replica volume" in the "Replication Operation" chapter of the "ETERNUS SF AdvancedCopy Manager Operator's Guide" for the operating system of the target Storage Server.

Register the backup volume as a volume without a mount point.
Specify the server used for backup operations as the replication destination.

```
# /opt/FJSVswsrp/bin/swsrpsetvol -o REP SYSVOL@TRG-SV SBKVOL@SBK-SV
```

When Solaris is the operating system of the server being backed up

If the system volume is allocated to a slice that includes VTOC, check the notes in "Slices that include VTOC" under "General notes" in the "ETERNUS SF AdvancedCopy Manager Operator's Guide".

When the system volume operates as a Logical Unit (disk unit)

If the system volume operates as a Logical Unit (disk unit), refer to "Notes on executing Logical Unit (disk unit) copy" under "General notes," in the "ETERNUS SF AdvancedCopy Manager Operator's Guide".

C.2.5 Settings of tape backup

To manage the backup data on tape media, the appropriate Tape Server settings must be made. For information on how to make the settings for the Tape Server, refer to "Operational flow" in the "Backup Operations (Normal Transaction Volumes)".

Make the settings for backup/restoration of a system volume in LU (disk) units directly to tape as follows:

1. From the Storage Management Server, execute the stgxfwcmaddsrv command to register the Storage Server (first time only).

```
# /opt/FJSVswstf/bin/stgxfwcmsetdev -n TRG-SV -i IP address -p PORT number
```

2. From the Storage Management Server, execute the stgxfwcmsetdev command to incorporate the information concerning the devices under the Storage Server.

```
# /opt/FJSVswstf/bin/stgxfwcmsetdev -n TRG-SV -d device name
```

3. From the server targeted for backup, execute the acmsvrset command to setup the environment at the server that performs the backup operation.

```
# /opt/FJSVswstc/bin/acmsvrset -t SBK-SV
```

4. From the server targeted for backup, execute the acmdevinfoset command to set the LU (disk) device system volume as a transaction volume.

```
# /opt/FJSVswstc/bin/acmdevinfoset -t -Xlu device name
```

5. From the server targeted for backup, execute the acmtpmgmtclassset command to set the tape backup management class.

```
# /opt/FJSVswstc/bin/acmtpmgmtclassset -g day management backup destination -d day
 management backup destination [-t preservation days] tape backup management class
 name
```

Note: Set the same backup destination as the g option and the d option.

6. From the server targeted for backup, execute the acmtpbkpolset command to set the tape backup policy for the LU (disk) device.

```
# /opt/FJSVswstc/bin/acmtpbkpolset -d day management interval days -c tape backup
management class name device name
```

Point

The AdvancedCopy Manager tape backup daemon must be activated at the Storage Management Server, the Tape Server, and the Storage Server.

Note

The above example applies when Solaris commands are used. Adjust command path names, and so on, to suit the operating system that is being used.

Note Notes on registering a LU (disk) to a transaction volume

Only an LU (disk) or only the slices included in that LU (disk) can be registered to a transaction volume.
If a LU (disk) is registered to a transaction volume, the slices included in that LU (disk) cannot be registered to a transaction volume.
If a slice is registered to a transaction volume, the LU (disk) that contains that slice cannot be registered to a transaction volume.

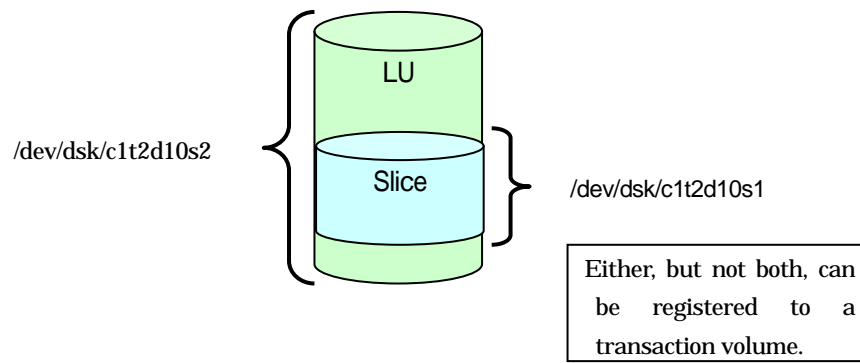## Figure: Example of LU (disk) and a slice in the same device

/dev/dsk/c1t2d10s2

LU

Slice

/dev/dsk/c1t2d10s1

Either, but not both, can be registered to a transaction volume.

Table: Device types specifiable in backup command units

Command Name	Transaction volume	
	LUN	Slice
tbobackup	y	n
acmbackup	n	y

y: Can be specified

n: Cannot be specified

Table: Device types specifiable in backup command units

Command name	Transaction volume		Other volumes (*)	
	LUN	Slice	LUN	Slice
tborestore	y	y	y	y
acmrestore	n	y	n	y

*: If the restore destination volume is changed when restoring from tape

y: Can be specified

n: Cannot be specified

C.3 Backing up the system volume

Stop the server that is to be backed up before performing system volume backup.

Note

If backup is performed while the backup target server is running, the backup may take place while a data update is in progress and without maintaining data consistency. Even though backup is completed, the correct data may not have been backed up. If the incorrect backed up data is restored, the system may not operate correctly.

C.3.1 Backing up to a backup volume

The replication function can be used to back up the system volume to a backup volume.

Figure: Backing up to a backup volume
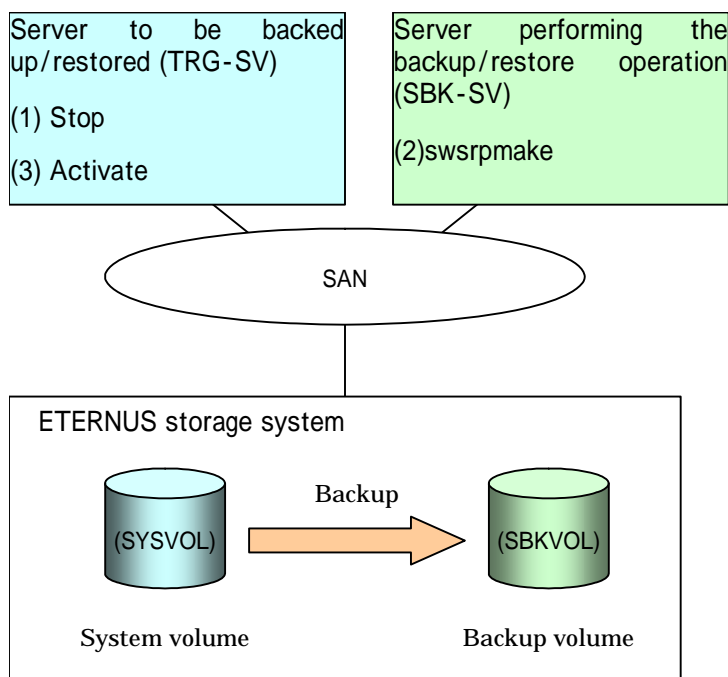
The backup procedure is as follows:

1. Stop the backup target server.
    After the server stops, check that the server power is off.
2. Execute the replication creation command (swsrpmake) on the server used for backup.

    ```
    # /opt/FJSVswsrp/bin/swsrpmake -m SYSVOL@TRG-SV SBKVOL@SBK-SV
    ```

    (*) The command operand was specified in the format "volume name@storage server name", as shown in the examples below.
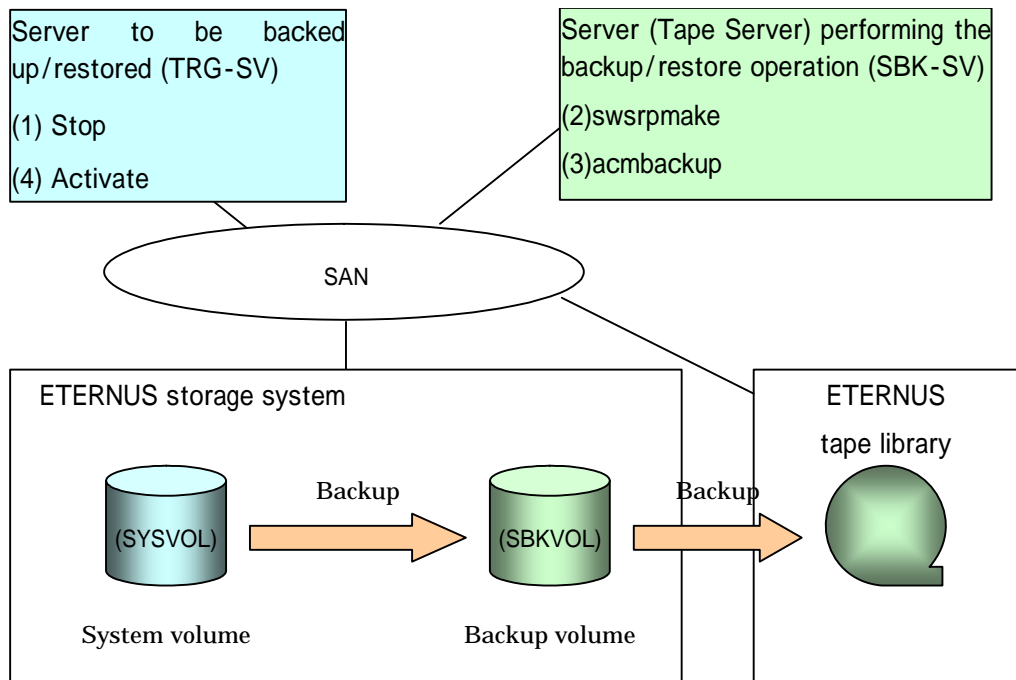   - name of backup/restore target server: TRG-SV
    - name of system volume: SYSVOL
    - name of server that performs the backup/restore operation: SBK-SV
    - name of backup volume: SBKVOL
3. Activate the backup target server.

C.3.2 Backing up to tape using a backup volume

The replication function can be used to backup the system volume to a backup volume.
The data can be backed up to tape from a backup volume.

Figure: Backing up to tape using a backup volume

The backup procedure is as follows:

1. Stop the backup target server.

   After the server stops, check that the server power is off.
2. Execute the replication creation command (swsrpmake) on the server used for backup.

   ```
   # /opt/FJSVswsrp/bin/swsrpmake -m SYSVOL@TRG-SV SBKVOL@SBK-SV
   ```

   (∗) The command operand was specified in the format "volume name@storage server name", as shown in the examples below.
   - name of backup/restore target server: TRG-SV
   - name of system volume: SYSVOL
   - name of server that performs the backup/restore operation: SBK-SV
   - name of backup volume: SBKVOL
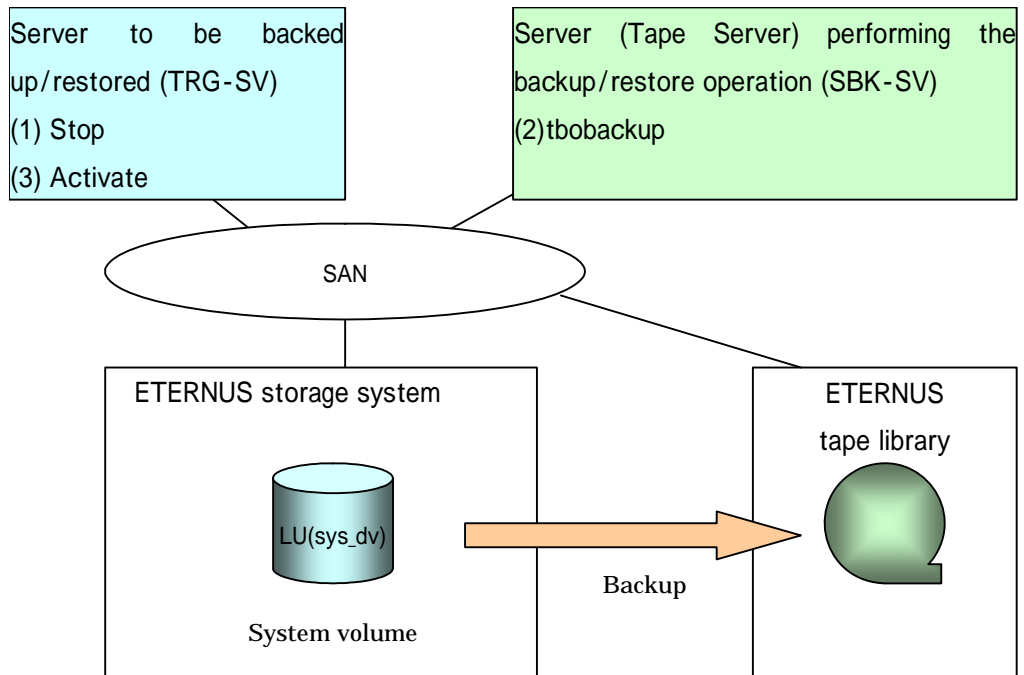3. For backup to tape media, back up the replica volume to tape media.

   ```
   # /opt/FJSVswstc/bin/acmbackup -b DAY -m TAPE SBKVOL
   ```

4. Activate the backup target server.

C.3.3 Backing up directly to tape

If the system volume is a LU (disk) unit, it can be backed up directly to tape.

Figure: Backing up directly to tape

The backup procedure is as follows:

1. Stop the backup target server in order to maintain replication data consistency.

2. From the Tape Server, enter the tbobackup command to back up the backup volume (LU)
    to tape.

    ```
    /opt/FJSVswstm/bin/tbobackup -h TRG-SV -b DAY sys_dv
    ```
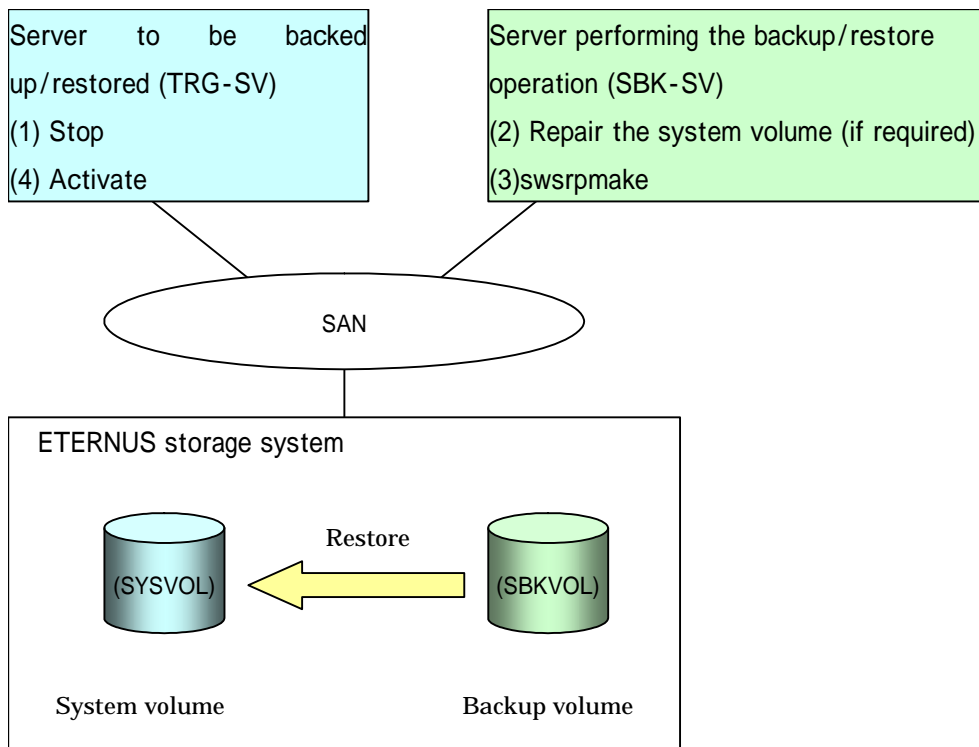
3. Activate the backup target server and resume transactions.

C.4 Restoring a system volume

C.4.1 Restoring from a backup volume

The replication function can be used to restore a system volume from a backup volume.

Figure: Restoring from a backup volume

The restoration procedure is as follows:

1. Stop the restoration target server.
   After the server stops, check that the server power is off.
2. If the system volume on the backup source server is unusable because of a hardware failure, recover the system volume so that the data can be restored.

3. On the server used for backup operations, execute the Replication creation command (swsrpmake) with replication in the reverse direction.

   ```
   # /opt/FJSVswsrp/bin/swsrpmake -m SBKVOL@SBK-SV SYSVOL@TRG-SV
   ```

   (∗) The command operand was specified in the format "volume name@storage server name", as shown in the examples below.
   - name of backup/restore target server: TRG-SV
   - name of system volume: SYSVOL
   - name of server that performs the backup/restore operation: SBK-SV
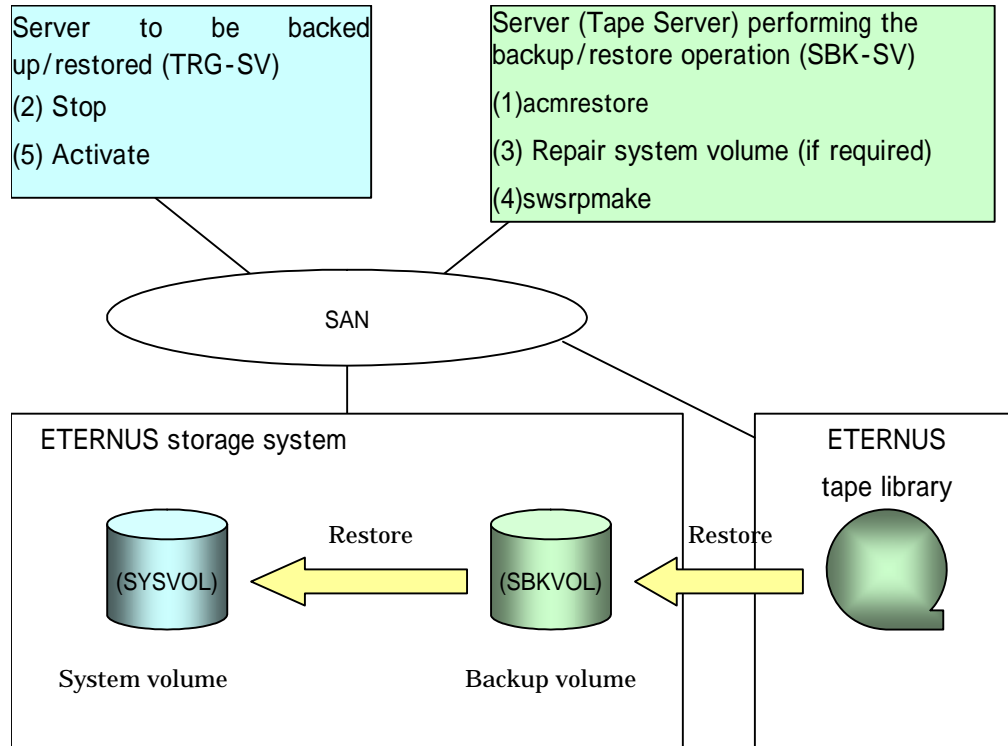   - name of backup volume: SBKVOL
4. Activate the restoration target server.

C.4.2 Restoring from tape using a backup volume

Restore the data from tape to a backup volume.
Then, the replication function can be used to restore the system volume from the backup volume.

Figure: Restoring from tape using a backup volume

The restoration procedure for data managed on tape is as follows:

1. Restore to the replica volume (backup volume) the data that is managed on tape.

   ```
   # /opt/FJSVswstc/bin/acmrestore -t "2005/02/01 12:00:55" -m TAPE SBKVOL
   ```

2. Stop the restoration target server.
   After the server stops, check that the server power is off.
3. If the system volume on the backup source server is unusable because of a hardware
   failure, recover the system volume so that the data can be restored.

4. On the server used for backup operations, execute the Replication creation command
   (swsrpmake) with replication in the reverse direction.

   ```
   # /opt/FJSVswsrp/bin/swsrpmake -m SBKVOL@SBK-SV SYSVOL@TRG-SV
   ```

   (*) The command operand was specified in the format "volume name@storage
   server name", as shown in the examples below.
   - name of backup/restore target server: TRG-SV
   - name of system volume: SYSVOL
   - name of server that performs the backup/restore operation: SBK-SV
   - name of backup volume: SBKVOL
5. Activate the restoration target server.

C.4.3 Restoring to a system volume directly from tape (1)

If the replication operation was used to copy data from a system volume (LU) to a slice, then the backup operation was used to backup the data from the slice to a tape, this data can be restored directly from tape to the system volume (LU) by specifying the parameters that restore the data to a different Storage Server volume.

Figure: Restoring from tape to system volume (LU)
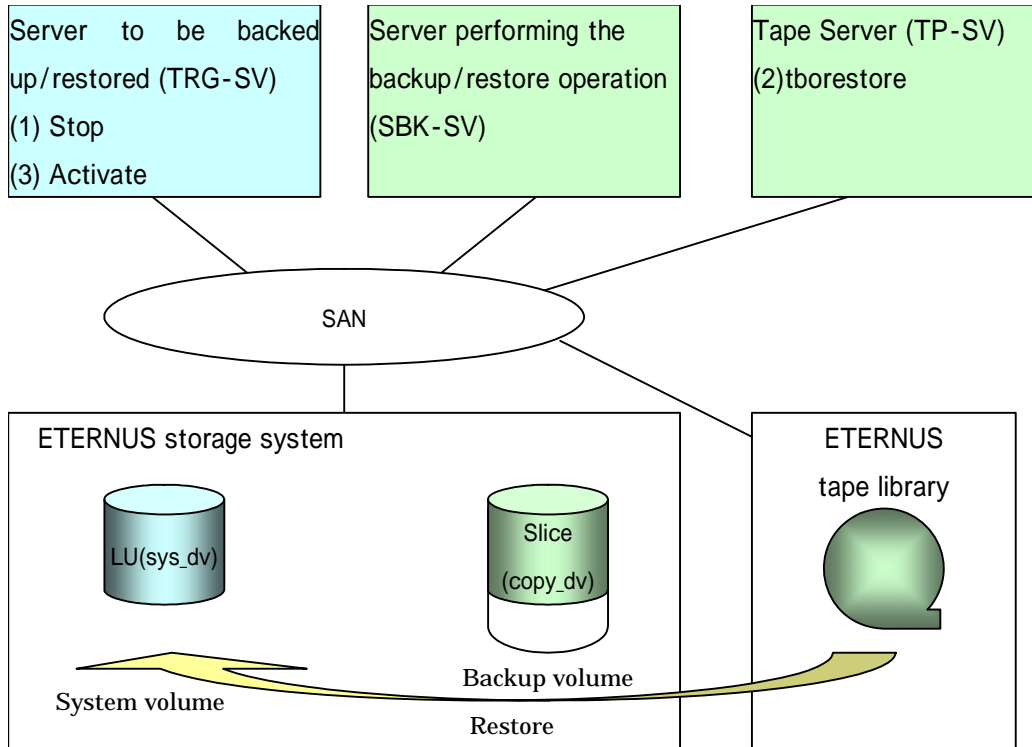
The restoration procedure for data managed on tape is as follows:

1. Stop the restoration target server.

2. From the Tape Server, execute the tborestore command to restore data from tape to the system volume (LU) of the restoration target server.

   — If generation management used

   ```
   # /opt/FJSVswstm/bin/tborestore -h SBK-SV [-g relative generation number | -v
   absolute generation number] -r sys_dv -d TRG-SV copy_dv
   ```

   — If day management used

   ```
   # /opt/FJSVswstm/bin/tborestore -h SBK-SV -t backup day and time -r sys_dv -d
   TRG-SV copy_dv
   ```

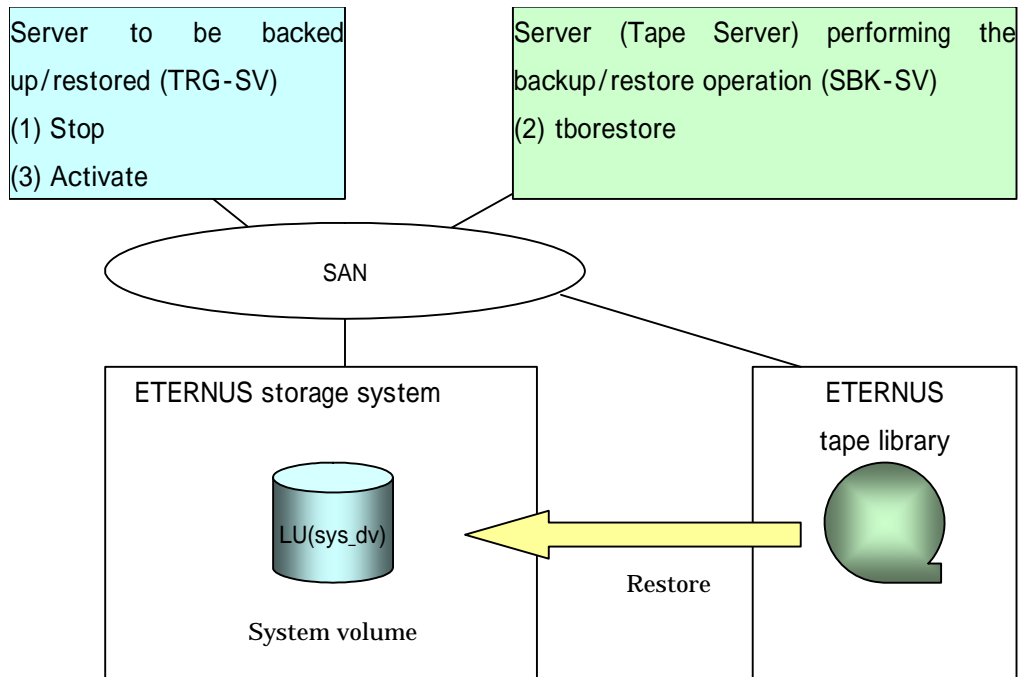3. Activate the restoration target server and resume transactions.

> **Note** **If the restoration destination volume is changed when restoring from tape**
>
> If the restoration destination volume is changed when restoring data, take measures

to ensure that restoration with a LU (disk) specified as the restoration destination volume, and restoration with a slice included in that LU (disk) specified as the restoration volume, cannot be performed simultaneously. If both are performed simultaneously, the restoration will not be correct because multiple restorations are performed to the same area.

C.4.4 Restoring to a system volume directly from tape (2)

Restore directly from tape to a system volume in LU (disk) units.

Figure: Restoring from tape

The restoration procedure for data managed on tape is as follows:

1. Stop the restoration target server in order to perform restoration.

2. From the Tape Server, execute the tborestore command to restore directly from tape to the system volume (LU) of the restoration target server.
   ```
   # /opt/FJSVswstm/bin/tborestore -h TRG-SV -t backup date and time sys_dv
   ```

3. Activate the restoration target server and resume transactions.

   ![Note icon]

   Note **If the restoration destination volume is changed when restoring from tape**
   If the restoration destination volume is changed when restoring data, take measures to ensure that restoration with a LU (disk) specified as the restoration destination volume, and restoration with a slice included in that LU (disk) specified as the restoration volume, cannot be performed simultaneously. If both are performed simultaneously, the restoration will not be correct because multiple restorations are performed to the same area.

Glossary

The special terms used in this manual are explained below.

Access path

Path required by a server to access disks in an ETERNUS storage system

Active site

The ACM backup environment that is normally active

Advanced copy function

Hardware-based copy function of ETERNUS storage systems. This is a generic name of EC and OPC.

AdvancedCopy Manager agent

Generic term referring to the daemons and applications used for backup or replication.

AdvancedCopy Manager client

Generic term referring to the GUI Client that operate in a storage management client.

AdvancedCopy Manager database

Generic term referring to management information such as registry, repository and management files for AdvancedCopy Manager.

AdvancedCopy Manager manager

Generic term referring to AdvancedCopy Manager-related services and applications existing in a Storage Management Server.

AdvancedCopy Manager tape agent

Generic term referring to the applications used for tape backup

AdvancedCopy Manager tape manager

Generic term referring to the Tape Server daemons and applications related to AdvancedCopy Manager in the Tape Server

Affinity Group

Management information on the ETERNUS storage system that shows the association between the Logical Unit Number (LUN) that can be recognized by the host, and the Logical Volume Number managed within the ETERNUS storage system.

Authentication management files

Generic term for the file where authentication management saves information on users and usage. There are two or more types and it is kept for every Storage Server with a repository.

Backup history

Backup data that is managed by backup management, and other backup related information

Backup management files

Generic term for files used during backup operations containing management information such as volume and server details. These files are stored in each Storage server and can be backed up by the resource backup command.

Backup management screen

GUI Client screen for backup management.

Backup server operation

The type of operation that uses a dedicated backup server that copies the copies destination volume to a tape device. The server is only connected to the copy destination volumes.

Backup synchronous processing

The process of synchronizing the contents of a transaction volume and a backup volume in preparation for synchronous backup operations.

CA (Channel adapter)

The adapter card used as an interface with server HBA/switch found in a Storage Server.

Cascade Copy

Group two or more concurrent copy processes by assuming the copy destination of one to be a copy origin of another.
Refer to the SA/SE handbook of the ETERNUS Series for the requirement of the cascade copy.

CCM Server

The server where the Copy Control Module is installed.

CM (Controller module)

The controller that manages devices within ETERNUS. The CM to be used as the access route (the CM in charge) is set separately for each RAID group in order to achieve load balancing.

Copy Control Module (CCM)

A tool that enables backup using the Advanced Copy function of the ETERNUS storage system. One advantage is that it can be used without installing the AdvancedCopy Manager Agent on the backup source server (the transaction server).

COS

The service class of the fibre channel. Classes 2 and 3 are general now, and the difference between classes 2 and 3 is that only class 2 requires the acceptance confirmation for frame notice assignment.

Day management backup

Backup operation that manages backups according to a specified number of preservation days. This backup operation is available only for backing up data to tape.

Device map file

File that describes both the relationship between transaction volumes and backup volumes for backup management, and the relationship between copy source volumes and copy destination volumes for replication management

Differential OPC

This is a previously used term for QuickOPC. Refer to the paragraph on QuickOPC for an explanation.

Disaster Recovery site

An environment prepared at a different location to be used for data recovery after a disaster.

EC

This is an abbreviation for Equivalent Copy. It is one of the copy functions of the hardware devices in the ETERNUS storage systems. This function maintains the mirror state between the disks in a hardware device. When detach control is executed from software, a copy of such a disk is created.

Equivalency maintenance state

A state in which the EC function maintains the contents of a transaction volume and backup volume in precise equivalence.

ETERNUS

Brand name for Fujitsu's storage systems
AdvancedCopy Manager provides high-speed backup and replication functions by linking with the following devices:
● ETERNUS disk array
   (ETERNUS2000/ETERNUS3000/ETERNUS4000/ETERNUS6000/ETERNUS8000/ETERNUS GR series)
● ETERNUS NR1000F series network disk array
● ETERNUS tape library (ETERNUS LT series)

ETERNUS GR series

Generic name for Fujitsu's disk array devices (GR720/730/740/820/840).

ETERNUS VSS Hardware Provider

The ETERNUS VSS Hardware Provider (hereafter called "VSSHP") is software that provides the ETERNUS storage system service, based on the interface provided with the Microsoft Volume Shadow Copy Service (hereafter called "VSS").

In AdvancedCopy Manager, during backup of the Exchange database, the VSSHP function may be used to perform backup.

For details on VSSHP, refer to the "ETERNUS VSS Hardware Provider software manual".

ETERNUSmgr (ETERNUS Manager)

Software product for monitoring and displaying the status of the ETERNUS2000/ETERNUS3000/ETERNUS4000/ETERNUS6000/ETERNUS8000 machine and for setup and maintenance

Fabric

Topology using the fibre channel interface. A fibre channel switch is used and two or more communications between nodes can be performed simultaneously.

FC-AL (Fibre Channel Arbitrated Loop)

Topology using the fibre channel interface. A fibre channel that now allows the connection between two or more nodes using a hub. This topology is mostly used for 1 to 1 connectivity between devices. A port that is connected to the fibre channel is either an NL port or an L port.

Fibre channel

One of the interfaces used to perform serial transfer of data. High-speed forwarding of data and the long distance transmission with the server are features of this transfer type.

Fibre channel hub

This is a hub that is only used for fibre channel networks. It is a device that connects two or more fibre channel node devices in a loop. It operates with the FC-AL topology.

Fibre channel switch

This is a switch used only on fibre channel networks. Its primary function is to facilitate communication between two or more fibre channel nodes at the same time. It exceeds a fibre channel hub in performance and reliability and operates with the fabric topology.

File unit backup

Direct specification that performs backup to tape of only the specified data in a directory or file on a disk that is mounted on the backup target server

File unit backup agent

Software that performs backups on a file basis.
Starts the TSM client and specifies file unit backup or restore to a tape

FL port

The port of the fabric topology (fibre channel switch) connected to the NL port.

F port

The port of the fabric topology (fibre channel switch) connected to the N port.

Framework

Generic name referring to applications such as communication services and configuration management that form the foundation of the AdvancedCopy Manager product suite.

GDS Snapshot

Abbreviation of PRIMECLUSTER GDS Snapshot, which is an optional product of PRIMECLUSTER GDS (hereinafter referred to as GDS). With this product, you can create a snapshot of a GDS logical volume (ie, a replica at a certain time). AdvancedCopy Manager supports the backup and replication operations of logical volumes in linkage with GDS Snapshot.

Generation management backup

Backup operation that performs management with the specified number of preservation generations

Generation overflow

This is the situation that arises when the number of backups specified as backup generations have already been used. If the next backup is performed, the backup volume having the oldest backup history is deleted from the generation management. This is called generation overflow. The actual number of backup generations is specified by the backup policy configuration command.

GR Manager, GRmgr

Storage management software of GR720/730/740.

Hard disk driver

Hard disk driver software of a host server. Controls a disk array unit instead of the sd driver. This driver must be installed to perform multipath control.

HBA (Host bus adapter)

The adapter card used as an interface with the storage port/switch CA carried in a server.

HDDV

See "Hard disk driver."

Inter-server replication

Replication in which the source and destination are volumes connected to different servers

Host Affinity Group

Management information on the ETERNUS storage system that shows the association between the World Wide Name of the host and the Affinity Group.

Load share

One of the operation modes of a cluster system. It enables systems that are structured from multiple active nodes to be handled logically as one database.

Logical node

Name of a logical server in a cluster system

LUN

Abbreviation for Logical Unit Number. The logical unit is defined under a channel adapter on a storage unit.

LUN Mapping

Assigns and sets up a LUN which shows a Logical unit LUN (Logical Unit Number) defined as the channel adapter subordinate in GR720/GR730/GR740 storage equipment from the HOST side, and real LUN (mapping). Therefore, HOST to LUN0 and visible Logical unit can be set up with real Logical unit LUNxx.

MPHD

See "Multipath disk control."

MPLB

See "Multipath disk control, load balance option."

Multipath disk control

Driver software that performs multipath disk control of the host server.
Failover driver software that merges two physical access paths into one logical path to avoid stopping access to a disk array unit because of the failure of one physical access path.

Multi path disk control, load balance option

Driver software that performs multipath disk control of the host server. This driver has both load balance (path load distribution) and multipath (two to eight paths) functionality in addition to the multipath disk control failover function. It is superior in terms of reliability, operability, and performance and is the most suitable driver software for a SAN operation server.

NAS backup

The TSM backup function that uses the NDMP functions of the NAS device to back up the data on a NAS device without sending the data via a network

NAS device

The network disk array device of the ETERNUS NR1000F series

NAS directory

A directory created under a NAS volume

NAS volume

A disk volume on a NAS device.

Disk volumes are defined under /vol, and take the form /vol/vol0, /vol/vol1, and so on.

NDMP

NDMP (Network Data Management Protocol) is a communications protocol that manages data on an NAS device.

NL-Private port

The port of the FC-AL topology which has not made a fibre channel switch connection.

NL-Public port

The port of the FC-AL topology which is making a fibre channel switch connection.

N port

The port used by Fabric topology (switch environment) or Point-to-Point in a fibre channel.

OPC

This is an abbreviation of the term "one point copy" which is a hardware function of ETERNUS storage systems. This function executes disk copy at high speeds at the hardware level. When software issues a copy request, a physical copy operation is performed by the hardware. However, the emulation function makes it look like the copy is completed at the software level.

Ordinary transaction volume

Volume to be backed up and not provided with a database space.

Point-to-point

Topology using the fibre channel interface. Although it is the topology of 1 to 1 connection of an N port, the main part of the present 1 to 1 connection is the 1 to 1 connection of FC-AL.

Pre-processing or post-processing

Scripted processing that is executed immediately before or after advanced copying at the time of backup or replication. The pre-processing and post-processing scripts are called as part of the command processing of backup or replication management.

PRIMECLUSTER

Software product for cluster configuration

PRIMECLUSTER GDS

Software product that improves data integrity by mirroring disk units

PRIMECLUSTER GFS

Software product that creates a multivolume file system that offers robustness and improves data availability. This file system is completely compatible with UFS, which is the standard API of UNIX.

QuickOPC

This is a copy method generally used to copy only the data that is updated after a physical copy of all data by OPC is completed.

It is a suitable copy method for Disk to Disk backup.

Differential OPC is an old name for QuickOPC.

REC

Abbreviation for "Remote Equivalent Copy". REC uses a hardware function of ETERNUS storage systems to achieve EC (Equivalent Copy) between different cabinets.

Registry

AdvancedCopy Manager environment definition file.

Replication management files

Generic term referring to the files where replication management saves the usage information. There are two or more kinds. It is kept for every Storage Server with a data repository.

Repository

The repository contains all management and operational information required by AdvancedCopy Manager and its domain.

It is comprised of data contained in a management database hosted in a Storage Management Server.
The information on the device to be managed, and information on backup and replication management, etc. are all stored in a repository.
This repository is created at the time of installation of AdvancedCopy Manager.

RMI daemon

The RMI server to an AdvancedCopy Manager client.

ROPC

Abbreviation of "Remote One Point Copy". ROPC uses a hardware function of ETERNUS storage systems to achieve OPC between different cabinets.

SafeFILE

Software product that creates a multivolume file system that offers robustness and improves data availability. SafeFILE extends the UNIX file system (UFS) and improves availability and performance.

SAN (storage area network)

Abbreviation for "Storage Area Network". It is a server storage network. Broadly speaking, this also refers to the implementation of centralized storage, data sharing among different servers, and integrated storage management.

SDX object

Virtual resource managed by PRIMECLUSTER GDS or SynfinityDISK. It is a general term for classes, groups, disks, volumes, and slices. An SDX object is sometimes called an "object."

Session

Unit of copying execution that is performed by the advanced copy function

Snap Data Disk

This is a disk for storing the copy used as the SnapOPC destination. It is necessary to define a Snap Data Disk in advance of SnapOPC being invoked.

SnapOPC

A copy method used when updating data. This method copies the pre-update status of the data parts that are to be updated, and matches the original non-updated parts to preserve the pre-update status (a copy-on-write copy method).
This method can be used for efficient data copying since it reduces the data size at the copy destination.
This copy method is suited to backing up file servers.

SnapOPC+

This method copies only the pre-update status of the data parts that are to be updated, and saves the data in snap generation units (a copy-on-write copy method).
This method can be used for efficient data copying since it reduces the data size at the copy destination and data can be saved in snap generation units. This copy method is suited to backing up file servers.

Snap shot type high-speed backup

Backup using the one point copy (OPC) function of ETERNUS storage systems.

Storage

A generic name of external storage devices such as disk array devices and tape units. These devices include ETERNUS storage systems, F649x series and Spectris/Platinum.

Storage management client

This term refers to a client machine that the AdvancedCopy Manager GUI Client is operated.

Storage Management Server

Server in which AdvancedCopy Manager's Manager exists.

Storage Server

Server in which AdvancedCopy Manager's Agent exists.

Suspend/Resume function

This function sets Suspend or Resume for the EC equivalency maintenance status. The synchronous backup operation can be made faster because the function can create a differential copy from the Suspend state.

Suspend specification

The act of specifying the -suspend option in the backup execution command (swstbackup) to back up using the Suspend/Resume function

Synchronous backup

This involves using the Equivalent Copy (EC) function of the disk array GR series to perform backup.

Tape library unit

A device that holds a large number of magnetic tapes and uses the controller in the device to automatically replace magnetic tapes in order to gain access to the tapes. It includes ETERNUS LT270 and ETERNUS LT230.

Tape Server

Backup Tape Server for processing requests regarding tape backup operations

TOC

The backup data table of contents provided from a NAS device in parallel with NAS backup operations. TSM uses the obtained TOC to restore data when executing NAS disk unit restore or NAS file unit restore.

TSM

The abbreviation of file backup management product "Tivoli Storage Manager". Tape servers deliver a backup management function by calling TSM internally.

TSM client GUI

Starts the TSM client and issues file unit backup and restore instructions to a tape. Commands and a GUI are provided for the TSM client, and processing instructions can be issued from the GUI interface.

TSM Web backup/archive client

A TSM processing interface that enables use of a Web browser to connect from an operations terminal to a TSM client.
This enables backup and restore instructions to be issued from an operations terminal to a tape.

Volume Shadow Copy Service

The Volume Shadow Copy Service is a function that provides a communications foundation for backup software, server applications and storage hardware. It is installed as standard with Windows Server 2003.

VSS

Refer to "Volume Shadow Copy Service".

VSSHP

Refer to "ETERNUS VSS Hardware Provider".