



FUJITSU Storage ETERNUS SF AdvancedCopy Manager V16.0

Operation Guide for Copy Control Module

Windows/Solaris/Linux

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Preface

Purpose

This manual describes the how to use the ETERNUS SF AdvancedCopy Manager Copy Control Module (hereafter referred to as "AdvancedCopy Manager CCM") to deliver Advanced Copy functions in environments where AdvancedCopy Manager's agents for ETERNUS SF AdvancedCopy Manager (hereafter referred to as "AdvancedCopy Manager") have not been installed or ETERNUS SF Express (hereafter referred to as "Express") is used.

Intended Readers

This manual is intended for system administrators who perform storage management using AdvancedCopy Manager CCM or Express.

Organization

This manual is composed as follows:

[Chapter 1 Overview of AdvancedCopy Manager CCM](#)

This chapter provides an overview of AdvancedCopy Manager CCM.

[Chapter 2 Setup](#)

This chapter explains how to install and set up AdvancedCopy Manager CCM.

[Chapter 3 Operation](#)

This chapter explains how to operate AdvancedCopy Manager CCM.

[Chapter 4 Command References](#)

This chapter explains the various commands required for using AdvancedCopy Manager CCM.

[Chapter 5 Troubleshooting](#)

This chapter explains how to collect data when problems occur.

[Chapter 6 Notes on operations](#)

This chapter explains notes on operations of AdvancedCopy Manager CCM.

[Appendix A Preliminary checks of Advanced Copy status](#)

This appendix explains the preliminary checks of Advanced Copy status.

[Appendix B Backup and restoration of ZFS file systems](#)

This appendix explains backup and restoration of ZFS file systems.

[Appendix C XML Format Output Function](#)

This appendix explains the XML format output function.

[Appendix D Operation in Oracle VM Server for SPARC](#)

This appendix explains Oracle VM Server for SPARC in the operation using AdvancedCopy Manager CCM.

[Appendix E VMware Virtual Machine Automatic Backup/Restore \(Script\)](#)

This appendix explains auto backup/restore of virtual machines in a VMware environment.

Notation

The names, abbreviations, and symbols shown below are used in this manual.

Operating Systems

Formal Name	Abbreviation	
Microsoft(R) Windows Server(R) 2003, Standard Edition Microsoft(R) Windows Server(R) 2003, Standard x64 Edition Microsoft(R) Windows Server(R) 2003, Enterprise Edition Microsoft(R) Windows Server(R) 2003, Enterprise x64 Edition Microsoft(R) Windows Server(R) 2003 R2, Standard Edition Microsoft(R) Windows Server(R) 2003 R2, Standard x64 Edition Microsoft(R) Windows Server(R) 2003 R2, Enterprise Edition Microsoft(R) Windows Server(R) 2003 R2, Enterprise x64 Edition	Windows Server 2003	Windows
Microsoft(R) Windows Server(R) 2008 Standard (32-bit)(64-bit) Microsoft(R) Windows Server(R) 2008 Standard without Hyper-V(TM) (32-bit) (64-bit) Microsoft(R) Windows Server(R) 2008 Enterprise (32-bit)(64-bit) Microsoft(R) Windows Server(R) 2008 Enterprise without Hyper-V(TM) (32-bit) (64-bit) Microsoft(R) Windows Server(R) 2008 Datacenter (32-bit)(64-bit) Microsoft(R) Windows Server(R) 2008 Datacenter without Hyper-V(TM) (32-bit) (64-bit)	Windows Server 2008	
Microsoft(R) Windows Server(R) 2008 R2 Foundation Microsoft(R) Windows Server(R) 2008 R2 Standard Microsoft(R) Windows Server(R) 2008 R2 Enterprise Microsoft(R) Windows Server(R) 2008 R2 Datacenter	Windows Server 2008 R2	
Microsoft(R) Windows Server(R) 2012 Standard Microsoft(R) Windows Server(R) 2012 Datacenter	Windows Server 2012	
Microsoft(R) Windows Server(R) 2012 R2 Standard Microsoft(R) Windows Server(R) 2012 R2 Datacenter	Windows Server 2012 R2	
Windows Vista(R) Home Basic Windows Vista(R) Home Premium Windows Vista(R) Business Windows Vista(R) Enterprise Windows Vista(R) Ultimate	Windows Vista	
Windows(R) 7 Home Basic Windows(R) 7 Home Premium Windows(R) 7 Professional Windows(R) 7 Enterprise Windows(R) 7 Ultimate	Windows 7	
Windows(R) 8 Windows(R) 8 Pro	Windows 8	
Windows(R) 8.1 Windows(R) 8.1 Pro	Windows 8.1	
Solaris(TM) 9 Operating System	Solaris 9	Solaris or Solaris OS
Oracle Solaris 10	Solaris 10	
Oracle Solaris 11	Solaris 11	
Red Hat(R) Enterprise Linux(R) AS (v.4 for x86) Red Hat(R) Enterprise Linux(R) AS (v.4 for EM64T)	RHEL-AS4	Linux
Red Hat(R) Enterprise Linux(R) ES (v.4 for x86) Red Hat(R) Enterprise Linux(R) ES (v.4 for EM64T)	RHEL-ES4	
Red Hat(R) Enterprise Linux(R) 5 (for x86) Red Hat(R) Enterprise Linux(R) 5 (for Intel64)	RHEL5	
Red Hat(R) Enterprise Linux(R) 6 (for x86) Red Hat(R) Enterprise Linux(R) 6 (for Intel64)	RHEL6	

Formal Name	Abbreviation	
SUSE(R) Linux Enterprise Server 11 for x86 SUSE(R) Linux Enterprise Server 11 for EM64T	SUSE Linux Enterprise Server 11	
HP-UX 11i v1 HP-UX 11i v2 HP-UX 11i v3	HP-UX	
AIX(R) V6.1 AIX(R) V7.1	AIX	
VMware vSphere(R) 4 Essentials Kit VMware vSphere(R) 4 Essentials Plus Kit VMware vSphere(R) 4 Standard Edition(TM) VMware vSphere(R) 4 Standard Plus Data Recovery VMware vSphere(R) 4 Advanced Edition(TM) VMware vSphere(R) 4 Enterprise Edition(TM) VMware vSphere(R) 4 Enterprise Plus Edition(TM)	VMware vSphere 4	VMware
VMware vSphere(R) 5 Essentials Kit VMware vSphere(R) 5 Essentials Plus Kit VMware vSphere(R) 5 Standard Edition(TM) VMware vSphere(R) 5 Standard Plus Data Recovery VMware vSphere(R) 5 Enterprise Edition(TM) VMware vSphere(R) 5 Enterprise Plus Edition(TM)	VMware vSphere 5	

Oracle Solaris might be described as Solaris, Solaris Operating System, or Solaris OS.

FUJITSU Storage ETERNUS

Formal Name	Abbreviation		
FUJITSU Storage ETERNUS DX60/DX60 S2 FUJITSU Storage ETERNUS DX80/DX80 S2 FUJITSU Storage ETERNUS DX90/DX90 S2	-	ETERNUS Disk storage system	
FUJITSU Storage ETERNUS DX100 S3 FUJITSU Storage ETERNUS DX200 S3			
FUJITSU Storage ETERNUS DX410 FUJITSU Storage ETERNUS DX440	ETERNUS DX400 series		ETERNUS DX400/ DX400 S2 series
FUJITSU Storage ETERNUS DX410 S2 FUJITSU Storage ETERNUS DX440 S2	ETERNUS DX400 S2 series		
FUJITSU Storage ETERNUS DX500 S3 FUJITSU Storage ETERNUS DX600 S3	-		
FUJITSU Storage ETERNUS DX8100 FUJITSU Storage ETERNUS DX8400 FUJITSU Storage ETERNUS DX8700	ETERNUS DX8000 series		ETERNUS DX8000/ DX8000 S2 series
FUJITSU Storage ETERNUS DX8100 S2 FUJITSU Storage ETERNUS DX8700 S2	ETERNUS DX8000 S2 series		
FUJITSU Storage ETERNUS DX200F	-		

Each individual device name in this document is listed with "FUJITSU Storage" omitted from it.

Software Products

Formal Name	Abbreviation
Microsoft(R) Internet Explorer(R)	Internet Explorer
Mozilla(R) Firefox(R)	Firefox
Microsoft(R) Cluster Service	MSCS

Formal Name	Abbreviation
Microsoft(R) Windows Server(R) Failover Clustering	WSFC
Microsoft(R) Exchange Server	Exchange Server
Microsoft(R) SQL Server(R)	SQL Server
VMware(R) ESX(R)	VMware ESX
VMware(R) ESXi(TM)	VMware ESXi
VMware(R) vCenter(TM) Server	VMware vCenter Server or vCenter Server
FUJITSU Software PRIMECLUSTER Global Disk Services	GDS
FUJITSU Software PRIMECLUSTER Global File Services	GFS
FUJITSU Software Symfoware Server Enterprise Extended Edition FUJITSU Software Symfoware Server Enterprise Edition	Symfoware

Manuals

Formal Name	Abbreviation
FUJITSU Storage ETERNUS SF Express / ETERNUS SF Storage Cruiser / ETERNUS SF AdvancedCopy Manager Quick Reference	ETERNUS SF Quick Reference
FUJITSU Storage ETERNUS SF Express / ETERNUS SF Storage Cruiser / ETERNUS SF AdvancedCopy Manager Release Notes	ETERNUS SF Release Notes
FUJITSU Storage ETERNUS SF Express / ETERNUS SF Storage Cruiser / ETERNUS SF AdvancedCopy Manager Installation and Setup Guide	ETERNUS SF Installation and Setup Guide
FUJITSU Storage ETERNUS SF Express / ETERNUS SF Storage Cruiser / ETERNUS SF AdvancedCopy Manager Migration Guide	ETERNUS SF Migration Guide
FUJITSU Storage ETERNUS SF Express / ETERNUS SF Storage Cruiser / ETERNUS SF AdvancedCopy Manager Web Console Guide	ETERNUS SF Web Console Guide
FUJITSU Storage ETERNUS SF Storage Cruiser / ETERNUS SF AdvancedCopy Manager Cluster Environment Setup Guide	ETERNUS SF Cluster Environment Setup Guide
FUJITSU Storage ETERNUS SF Express / ETERNUS SF Storage Cruiser / ETERNUS SF AdvancedCopy Manager Messages	ETERNUS SF Messages
FUJITSU Storage ETERNUS SF Express / ETERNUS SF Storage Cruiser Event Guide	ETERNUS SF Event Guide
FUJITSU Storage ETERNUS SF Express / ETERNUS SF Storage Cruiser / ETERNUS SF AdvancedCopy Manager Glossary	ETERNUS SF Glossary

Besides the above-mentioned, each individual manual name in this document is listed with "FUJITSU Storage" omitted from it.

Others

- In this document, the following products are collectively described as "Windows Server 2008 or later".
 - Windows Server 2008
 - Windows Server 2008 R2
 - Windows Server 2012
 - Windows Server 2012 R2
- In this document, the following products are collectively described as "Windows Server 2012 or later".
 - Windows Server 2012
 - Windows Server 2012 R2

- In this document, unless there is a special explanatory note, ETERNUS DX200 S3 indicates ETERNUS DX200 S3 and ETERNUS DX200F. In addition, ETERNUS Disk storage system includes ETERNUS DX200F All Flash Arrays. However, the following functions are not supported in ETERNUS DX200F:
 - Energy saving operation for storage device
 - NAS operation for storage device
 - Automated Storage Tiering operation at multiple tiers (two or more)

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Notes

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- This manual is subject to change without advance notice.

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Update History

Content of Update	Updated Section	Revision
Referential description as to setup of shared folder within NAS backup volume was added.	3.10.1.2, 3.10.2.2, 3.10.3.1	1.1
The access method by CIFS protocol was changed.	3.10.4	
Added the point of using multiple ETERNUS Disk storage systems.	E.2	1.2
Modified the preparation for executing scripts.	E.5	
The information related to ETERNUS DX200F was described.	"Others" in Preface	1.3

Manual Organization and Reading Suggestions

Manual Organization

The following table describes the Manual organization of Express, Storage Cruiser and AdvancedCopy Manager.

When to Read	Related Manuals (Abbreviated)	Related Products (*1)			Explanation
		EXP	SC	ACM	
Before installation	Quick Reference	Yes	Yes	Yes	This manual is common for all products.
	Release Notes	Yes	Yes	Yes	This manual is common for all products.
	Overview	-	-	Yes	This manual is unique for the product.
During installation	Installation and Setup Guide	Yes	Yes	Yes	This manual is common for all products.
	Cluster Environment Setup Guide	-	Yes	Yes	This manual is common for Storage Cruiser and AdvancedCopy Manager.
	Migration Guide	Yes	Yes	Yes	This manual is common for all products.
During operation	Operation Guide	Yes	Yes	Yes	This manual is unique for each product. The following manuals are available: <ul style="list-style-type: none"> - Express Operation Guide - Storage Cruiser Operation Guide - Storage Cruiser Operation Guide for Optimization Function - AdvancedCopy Manager Operation Guide (for Windows) - AdvancedCopy Manager Operation Guide (for Solaris) - AdvancedCopy Manager Operation Guide (for Linux) - AdvancedCopy Manager Operation Guide (for HP-UX) - AdvancedCopy Manager Operation Guide (for AIX) - AdvancedCopy Manager Operation Guide for Copy Control Module
	Web Console Guide	Yes	Yes	Yes	This manual is common for all products.
Anytime	Event Guide	Yes	Yes	-	This manual is common for Express and Storage Cruiser.
	Messages	Yes	Yes	Yes	This manual is common for all products.

When to Read	Related Manuals (Abbreviated)	Related Products (*1)			Explanation
		EXP	SC	ACM	
	Glossary	Yes	Yes	Yes	This manual is common for all products.

*1: "EXP" indicates Express, "SC" indicates Storage Cruiser and "ACM" indicates AdvancedCopy Manager.

How to Read Manuals

Please use the following table to find the most useful information in the Express, Storage Cruiser and AdvancedCopy Manager manuals to answer your inquiry.

Purpose	Manual	Main Contents	How to Read
Acquiring a product overview and basic operation knowledge	Quick Reference	<ul style="list-style-type: none"> - Product overview - Installation decision - Overview of the necessary tasks from installation to first use 	Please read if you want to acquire a fundamental knowledge of the product and its operation in order to decide to install it or not.
	AdvancedCopy Manager Overview	<ul style="list-style-type: none"> - Main functions - Cooperation with application - Procedure overview for Advanced Copy of ETERNUS Disk storage system 	
Confirming the updated contents	Release Notes	<ul style="list-style-type: none"> - New function overview - Incompatibilities with previous version - Fixed bugs 	Please read if you want to know the updated contents from a previous version and if you perform the upgrade.
Deciding if a version upgrade is required	Migration Guide	<ul style="list-style-type: none"> - Notes and cautions about version upgrade - Version upgrade procedure 	Please read if you want to upgrade from a previous version.
Installing and correctly operating the product Setting up operating environment depending on purpose	Installation and Setup Guide	<ul style="list-style-type: none"> - Operating environment - Installation procedure - Setup procedure - Uninstallation procedure 	Please read if you want to install and setup the product.
	Cluster Environment Setup Guide	<ul style="list-style-type: none"> - Supported cluster software - Installation procedure for a clustered system - Setup procedure for a clustered system - Uninstallation procedure for a clustered system 	Please read if you want to install and setup the product on a clustered system.
Administration and operation of the installed system	Express Operation Guide	<ul style="list-style-type: none"> - Starting and stopping the software - Device monitoring 	Please read if you want to start or shutdown the system, monitor the operation status, do backup/restore operations, etc.

Purpose	Manual	Main Contents	How to Read
		<ul style="list-style-type: none"> - Data copy inside the storage system - Necessary tasks after an architectural modification of the system as well as product maintenance 	
	Storage Cruiser Operation Guide	<ul style="list-style-type: none"> - Starting and stopping the software - Device monitoring - Necessary tasks after an architectural modification of the system as well as product maintenance - Command reference 	
	Storage Cruiser Operation Guide for Optimization Function	<ul style="list-style-type: none"> - Operating environment construction - Operating status monitoring - Necessary tasks after an architectural modification of the system as well as product maintenance - Command reference 	
	AdvancedCopy Manager Operation Guide (for Windows)	<ul style="list-style-type: none"> - Starting and stopping the software - Data backup/restore inside the storage system - Necessary tasks after an architectural modification of the system as well as product maintenance - Command reference 	
	AdvancedCopy Manager Operation Guide (for Solaris)		
	AdvancedCopy Manager Operation Guide (for Linux)		
AdvancedCopy Manager Operation Guide (for HP-UX)			
AdvancedCopy Manager Operation Guide (for AIX) AdvancedCopy Manager Operation Guide for Copy Control Module			
Web Console Guide	<ul style="list-style-type: none"> - Operating environment - Screen layout description 	Please read if you want to understand the ETERNUS SF Web Console.	
Dealing with messages issued by the software	Messages	<ul style="list-style-type: none"> - Messages and their explanations - Parameter (variable information) description - System action - Countermeasures 	Please read if you want a practical way of investigating and dealing with messages issued by the software.
Dealing with events issued by the software	Event Guide	<ul style="list-style-type: none"> - Phenomenon of event - Countermeasures 	Please read if you need to find a practical way of investigating and dealing with events.

Purpose	Manual	Main Contents	How to Read
<p>Researching the meaning of specific terms related to the products and other important terms</p>	<p>Glossary</p>	<ul style="list-style-type: none"> - Product specific terminology explanation - Explanation of important terminology appearing in the manual - Synonyms and related terms - Proper form of abbreviated terms 	<p>Please read if you want to learn the meaning of important terms, product specific terms or abbreviations used in the manuals.</p>

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Chapter 1 Overview of AdvancedCopy Manager CCM

This chapter presents an overview of AdvancedCopy Manager CCM.

1.1 What is AdvancedCopy Manager?

AdvancedCopy Manager is a product that uses the following functions to deliver storage management for open systems:

- High-speed backup
- High-speed replication

AdvancedCopy Manager uses the Advanced Copy function of ETERNUS Disk storage systems to deliver these functions.

Refer to the *ETERNUS SF AdvancedCopy Manager Overview* for more information.

1.2 What is AdvancedCopy Manager CCM?

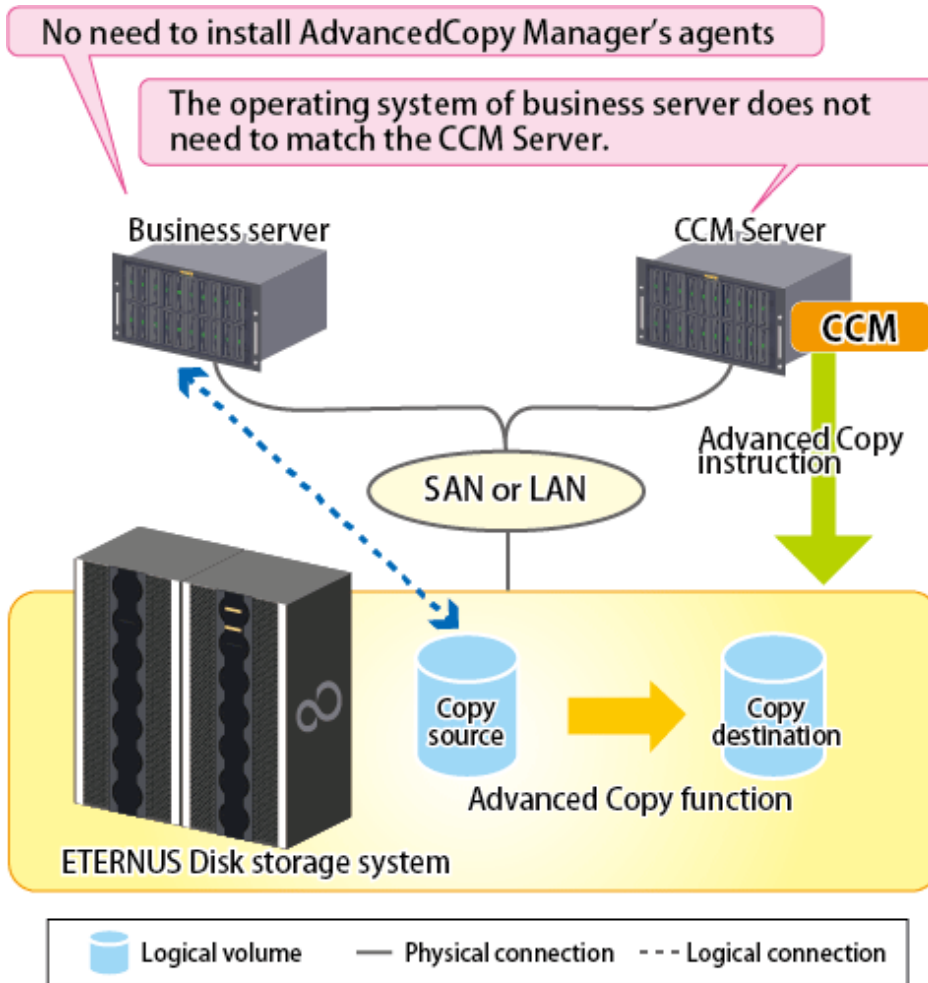
AdvancedCopy Manager CCM is a backup tool that uses the Advanced Copy function of ETERNUS Disk storage system without installing an AdvancedCopy Manager's agent on the business server.

Using AdvancedCopy Manager CCM has the following advantages:

- There is no need to install an AdvancedCopy Manager's agent on the business server.
 - Backups can be performed independently of the operating system of the business server.
 - Operational work becomes more efficient, because there is no need to spend time installing AdvancedCopy Manager's agents on each of the business servers.

In the following figure, indicates that backing up the data on the business server using the installation destination server for AdvancedCopy Manager CCM (hereafter called "CCM Server").

Figure 1.1 Overview of AdvancedCopy Manager CCM



1.3 System configuration

This section explains the system configuration for AdvancedCopy Manager CCM.

In AdvancedCopy Manager CCM, the CCM Server sends a command to ETERNUS Disk storage system to perform an Advanced Copy function. There are two available methods for sending the copy command:

- Sending a command to ETERNUS Disk storage system to perform an Advanced Copy function from the server over the SAN (hereafter referred to as "Copy command via SAN")
- Sending a command to ETERNUS Disk storage system to perform an Advanced Copy function from the server over the LAN (hereafter referred to as "Copy command via LAN")

With AdvancedCopy Manager CCM, the ETERNUS Disk storage systems listed below can use Copy command via SAN and via LAN.

Table 1.1 ETERNUS Disk storage system that can be operated by Copy command via SAN or via LAN

Device name	Copy command via SAN		Copy command via LAN	
	Operation	Firmware version	Operation	Firmware version
ETERNUS DX60/DX60 S2/DX80	A	All versions	N/A	-
ETERNUS DX90	A	All versions	A (*1)	V10L61 or later
ETERNUS DX80 S2/DX90 S2	A	All versions	A	All versions

Device name	Copy command via SAN		Copy command via LAN	
	Operation	Firmware version	Operation	Firmware version
ETERNUS DX100 S3/DX200 S3	A	All versions	A	All versions
ETERNUS DX400 series	A	All versions	A (*1)	V20L71 or later
ETERNUS DX400 S2 series	A	All versions	A	All versions
ETERNUS DX500 S3/DX600 S3	A	All versions	A	All versions
ETERNUS DX8000 series	A	All versions	A (*1)	V20L71 or later
ETERNUS DX8000 S2 series	A	All versions	A	All versions

(A=Available, N/A=Not Available)

*1: `acarray add` (ETERNUS Disk storage system registration command) cannot be executed with the lan option added.

Copying (REC) can only be performed between devices for which the following conditions are applicable:

- The ETERNUS Disk storage system that supports the Copy command via LAN that is connected with REC. Moreover,
- The ETERNUS Disk storage system specified in the -a option of `acgroup create` (Copy group creation command) must be the ETERNUS Disk storage system that supports the Copy command via LAN of the above condition.

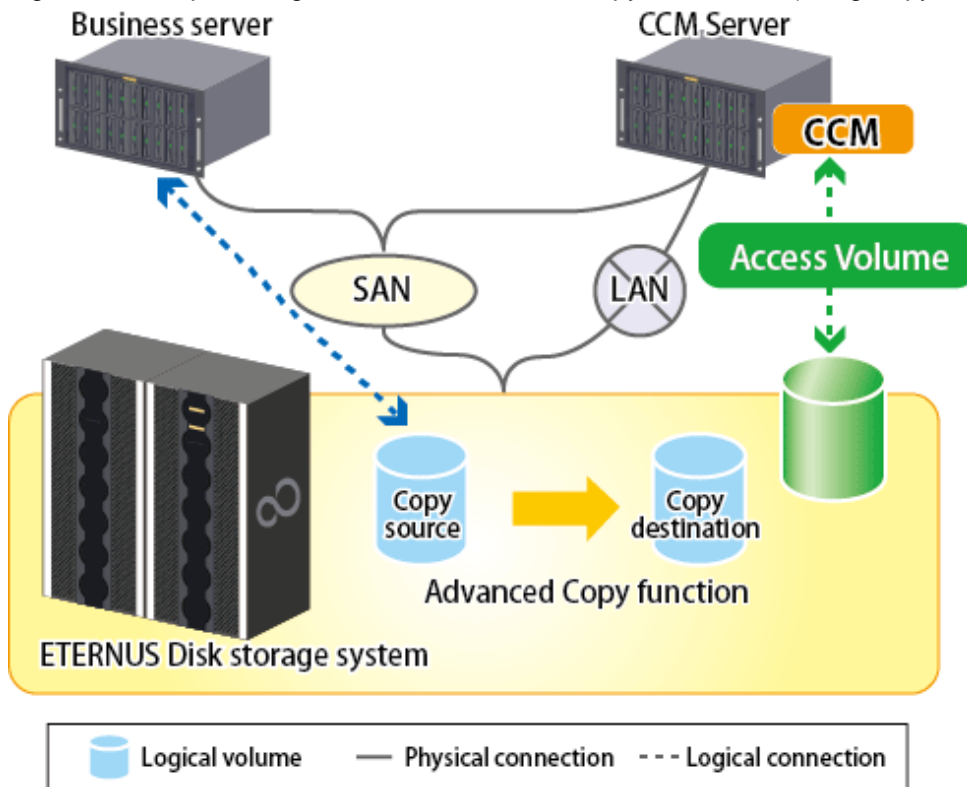
Moreover, in order to use the Copy command via LAN, it is necessary to apply the firmware version corresponding to the ETERNUS Disk storage system.

System configuration using Copy command via SAN

For using intra-box copy (OPC, QuickOPC, SnapOPC+ or EC)

When using the Copy command via SAN method, a logical volume that can be accessed from the CCM Server is needed in ETERNUS Disk storage system. In this manual, this logical volume is called "access volume". One logical volume of ETERNUS Disk storage system must be assigned to CCM Server as the access volume.

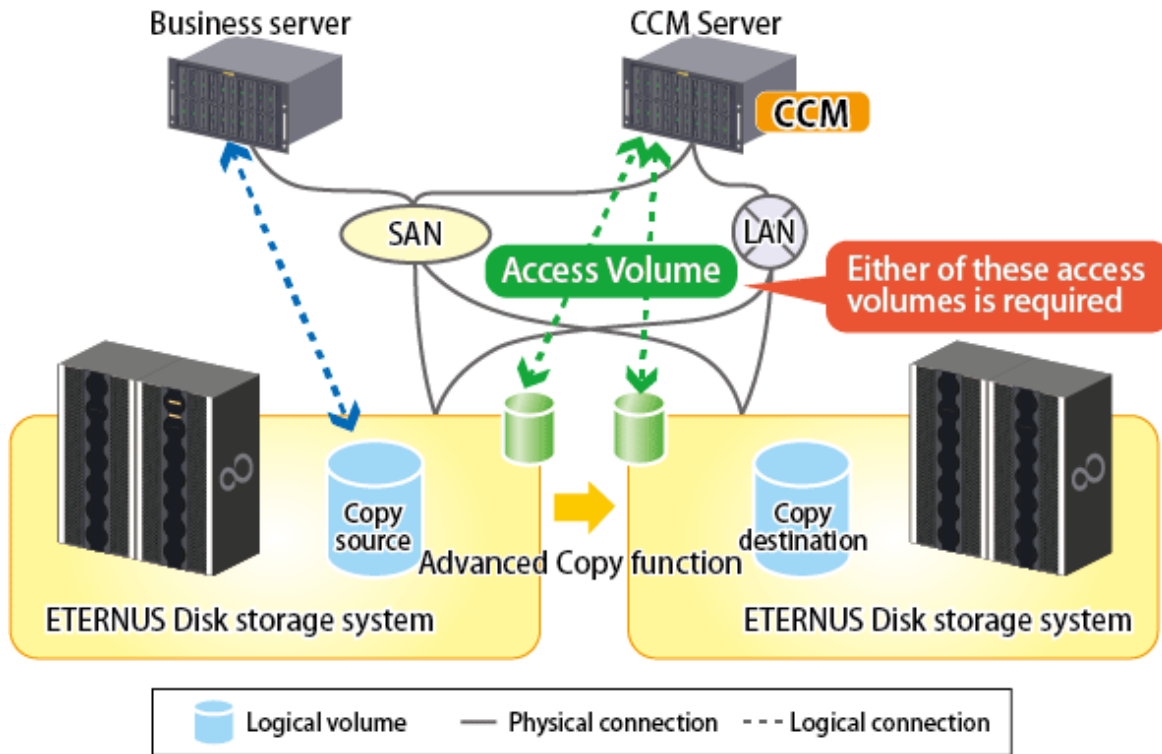
Figure 1.2 Sample configuration where intra-box copy is executed (using Copy command via SAN)



For using inter-box copy (REC)

To execute REC using AdvancedCopy Manager CCM, there must be an access volume on either the copy source or the copy destination.

Figure 1.3 Sample configuration where inter-box copy is executed (using Copy command via SAN)



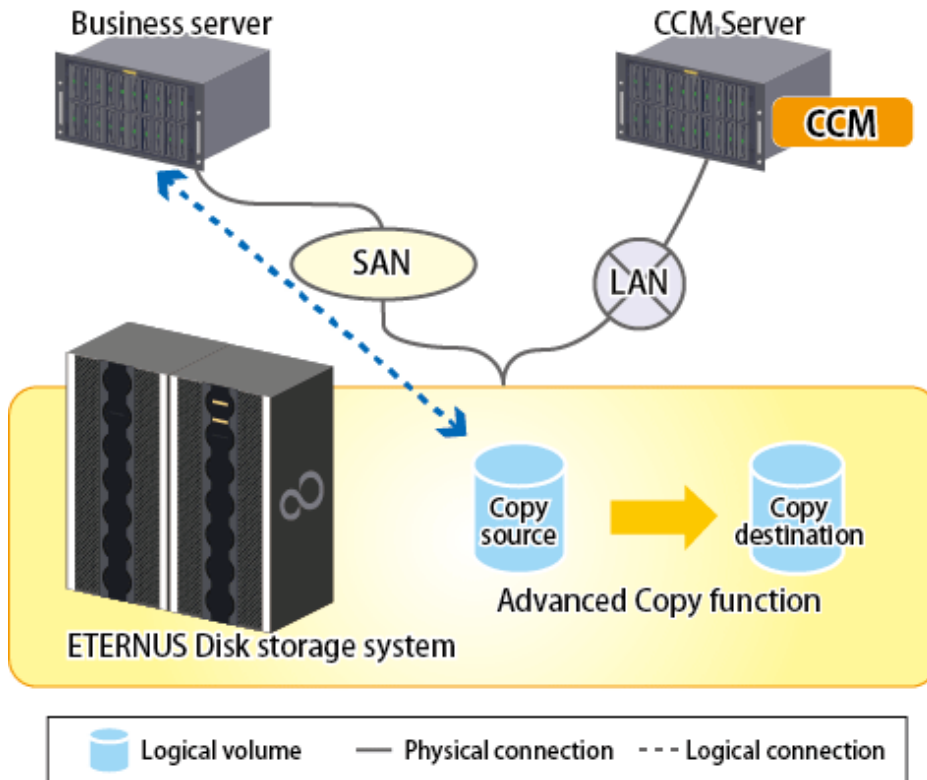
Point

The registration procedure for the ETERNUS Disk storage system which uses REC and is not connected with the SAN environment (hereafter called the "remote ETERNUS Disk storage system") depends on the OS. Refer to "2.4 Registering ETERNUS Disk storage system" for details of the registration procedure.

System configuration using Copy command via LAN

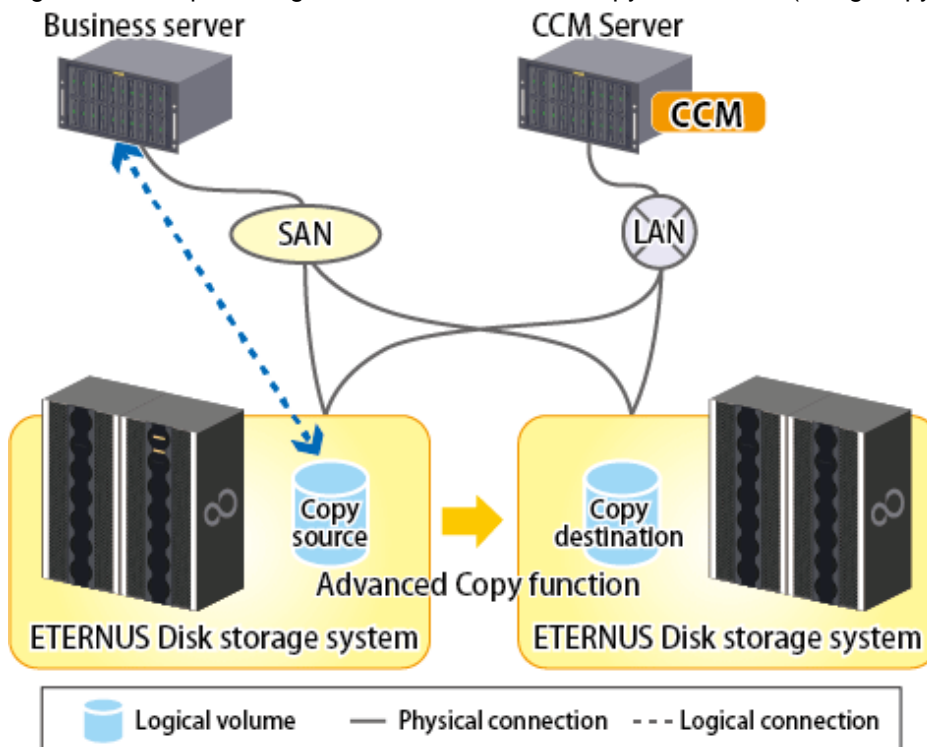
For using intra-box copy (OPC, QuickOPC, SnapOPC+ or EC)

Figure 1.4 Sample configuration where intra-box copy is executed (using Copy command via LAN)



For using inter-box copy (REC)

Figure 1.5 Sample configuration where inter-box copy is executed (using Copy command via LAN)



With inter-box copy (REC), a configuration which mixes SAN and LAN on the copy source and copy destination ETERNUS Disk storage system transmission paths is also possible.

System configuration using both Copy command via SAN and via LAN

Figure 1.6 Sample configuration where Copy command via SAN is used for copy source and Copy command via LAN is used for copy destination

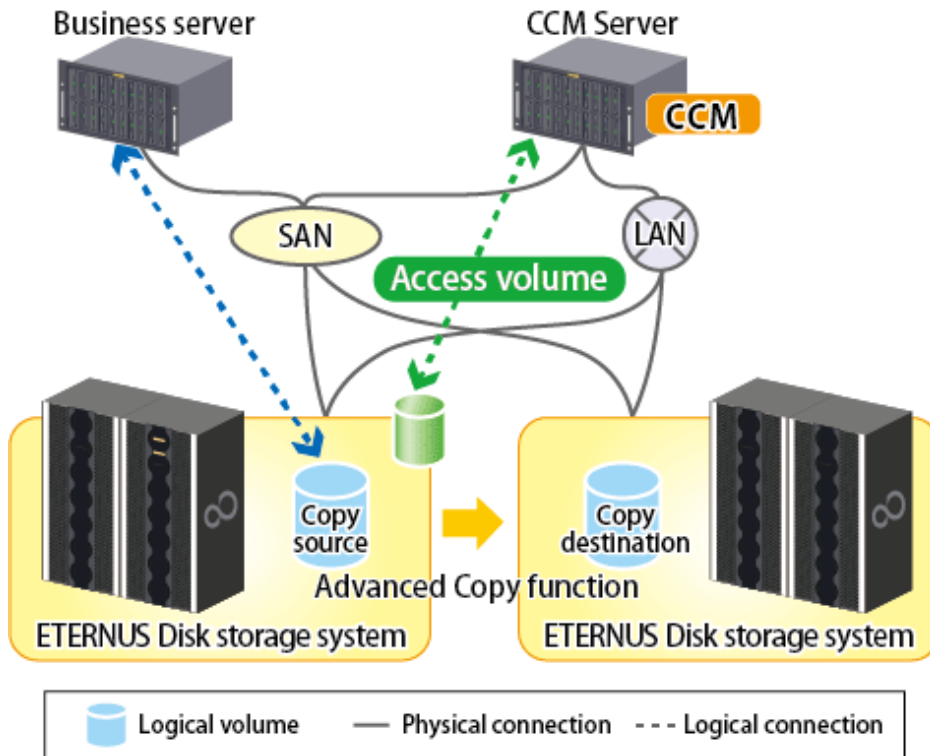


Figure 1.7 Sample configuration where Copy command via LAN is used for copy source and Copy command via SAN is used for copy destination

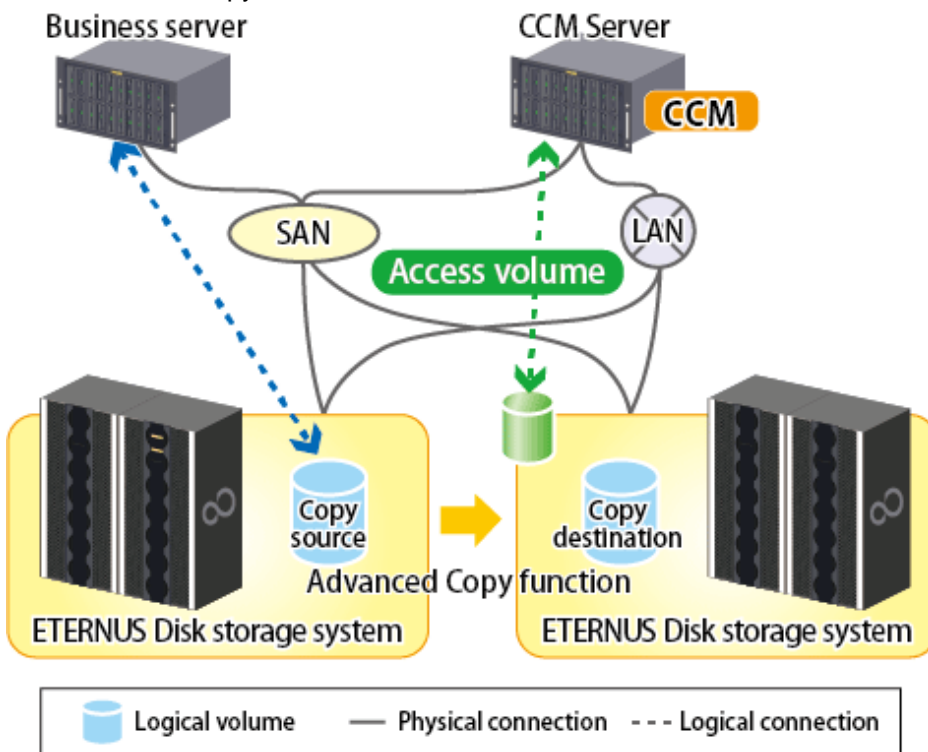
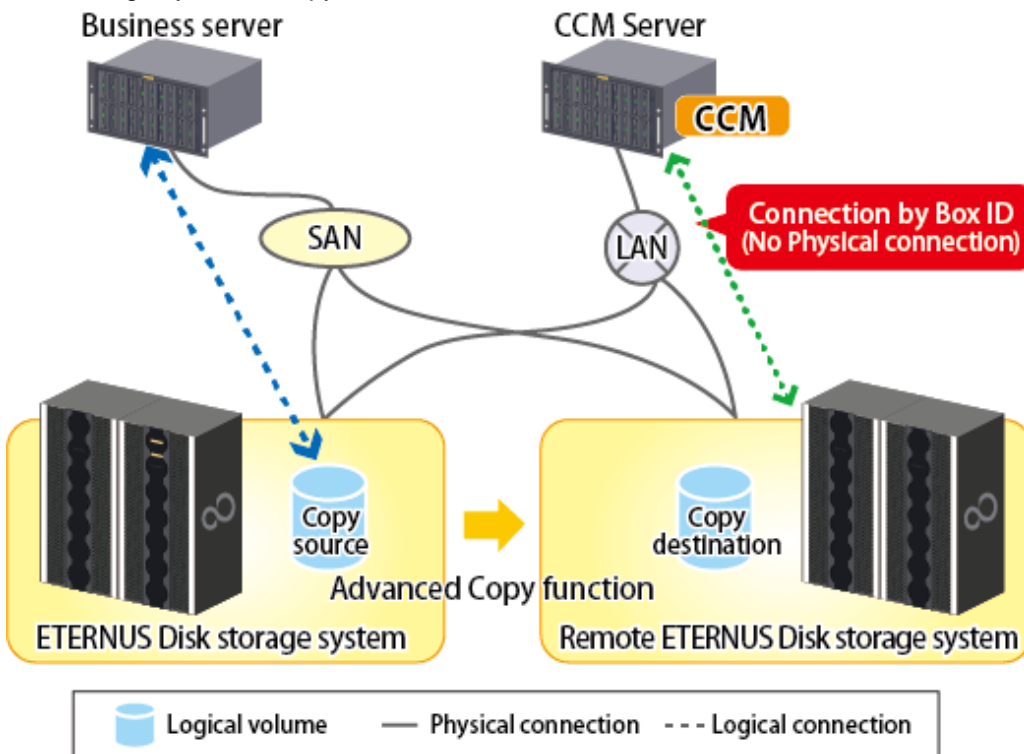


Figure 1.8 Sample configuration where Copy command via LAN is used for copy source and remote ETERNUS Disk storage system is copy destination



 **Point**

- It is recommended to not connect the copy destination logical volume to any server.
- If connecting the copy destination logical volume to a CCM Server in order to perform backup to a tape, it is necessary to have the same OS installed for the business server and CCM Server.
- If performing REC using the Copy command via LAN function, it is necessary that both ETERNUS Disk storage systems are able to be operated by Copy command via LAN.
Refer to "[Table 1.1 ETERNUS Disk storage system that can be operated by Copy command via SAN or via LAN](#)" for information regarding ETERNUS Disk storage systems which are able to be operated by Copy command via LAN.
- If the Copy command via LAN communicates with ETERNUS Disk storage system using SSH, the processing time increases in proportion to the number of Advanced Copy functions to execute, compared with the Copy command via SAN. Moreover, it may take a few minutes to execute Advanced Copy functions by using Copy command via LAN depending on the number of copy pairs to which AdvancedCopy Manager CCM executes at a time.
In a mixed environment of SAN/LAN, it is recommended to use the Copy command via SAN.

1.4 Supported functions

AdvancedCopy Manager CCM supports the following Advanced Copy functions.
Note that Advanced Copy is executed for each separate logical volume of ETERNUS Disk storage system.

Table 1.2 Advanced Copy functions supported by AdvancedCopy Manager CCM

Advanced Copy function		AdvancedCopy Manager	AdvancedCopy Manager CCM
Snapshot type high-speed copies	OPC	A	A
	QuickOPC	A	A
	SnapOPC	A	N/A
	SnapOPC+	A	A
Synchronous high-speed copies	EC	Reversing the copy direction	A
		Concurrent suspend function	A
	REC	Reversing the copy direction	A
		Initial copy skip function	A
		Concurrent suspend function	A
		Displaying or changing information about the REC transfer buffer	A

(A=Available, N/A=Not Available)

 **Note**

If using AdvancedCopy Manager and AdvancedCopy Manager CCM together, make sure that they control different logical volumes and that the logical volumes do not interact.

 **See**

AdvancedCopy Manager CCM can be operated on the cluster environment.
Refer to the *ETERNUS SF Cluster Environment Setup Guide* for more information.

1.5 Use of IPv6 address

The following is a description of using IPv6 address in AdvancedCopy Manager CCM.

1.5.1 Software requirement

The following are basic software requirements that support the use of IPv6 addresses in AdvancedCopy Manager CCM:

- Windows Server 2008 or later
- Solaris 10
- Solaris 11 (11/11 or later)
- Red Hat Enterprise Linux 5 (for Intel64)
- Red Hat Enterprise Linux 6 (for Intel64)



.....

Refer to "Operating environment of AdvancedCopy Manager CCM" in the *ETERNUS SF Installation and Setup Guide* for basic software requirements for AdvancedCopy Manager CCM.

.....

1.5.2 Supported device

The use of IPv6 address is supported for the following device:

- ETERNUS Disk storage system

1.5.3 IPv6 address notation

Notation of IP address to be input in AdvancedCopy Manager CCM

In AdvancedCopy Manager CCM, IPv6 address can be input in both full notation and abbreviated notation. However, no entry is allowed in the following format:

- IPv4-mapped address
- IPv4-compatible address
- Format in which an interface number or name is added as "%" to the end of the address
(e.g. fe80::1234%fx0)

Display of IP address in AdvancedCopy Manager CCM

In AdvancedCopy Manager CCM, IPv6 address is displayed with reference to RFC5952. Therefore, the notation of an input IP address may be different from that of an IP address displayed by command output or on the Web Console.

Chapter 2 Setup

This chapter explains the environment settings for using AdvancedCopy Manager CCM.
Make all of settings on the CCM Server.

2.1 Creating user account

It is necessary to create user accounts that are required for using AdvancedCopy Manager CCM.
Refer to "Creating user account for using AdvancedCopy Manager CCM" in the *ETERNUS SF Installation and Setup Guide* for details how to create.

2.2 Access volume settings

When using the Copy command via SAN method, a logical volume that can be accessed from the CCM Server is needed in ETERNUS Disk storage system. One logical volume with any size of ETERNUS Disk storage system must be assigned to CCM Server as the access volume.

The settings procedure for the access volume is explained below.

- For specifying the access volume manually when ETERNUS Disk storage system is registered.
 - For Windows
 1. Allocate a logical volume to be set up as the access volume to the CCM Server.
The allocated logical volume is recognized as a disk.
 2. Initialize the disk in MBR (DOS) or GPT disk format.
 3. Create a partition, and allocate a drive letter.
 - For Solaris
 1. Allocate a logical volume to be set up as the access volume to the CCM Server.
The allocated logical volume is recognized as a disk.
 2. Initialize the disk as a disk with EFI label or VTOC label.
 - For Linux
 1. Allocate a logical volume to be set up as the access volume to the CCM Server.
The allocated logical volume is recognized as a disk.
 2. Initialize the disk in MBR (DOS) or GPT disk format.

Note

The allocated logical volume as the access volume must not be included in the backup target for Advanced Copy.

- For specifying the access volume automatically when ETERNUS Disk storage system is registered.

Allocate a logical volume to be set up as the access volume to the CCM Server.
The allocated logical volume is recognized as a disk.

After specifying the access volume automatically, check that the specified access volume is not included in the backup target for Advanced Copy. If the access volume is included in the backup target for Advanced Copy, change the access volume by executing "[acarray change \(ETERNUS name and access volume for ETERNUS Disk storage system change command\)](#)".

2.3 Registering Advanced Copy license

To execute the Advanced Copy function of ETERNUS Disk storage system, it is necessary to register the Advanced Copy license to the license management function.

Refer to "Registration of license" in the *ETERNUS SF Installation and Setup Guide* to register the Advanced Copy license.

2.4 Registering ETERNUS Disk storage system

Register ETERNUS Disk storage system with AdvancedCopy Manager CCM as a device to be used for copies. Use [acarray add \(ETERNUS Disk storage system registration command\)](#) to register ETERNUS Disk storage system.

The following ETERNUS Disk storage system information is required for registration.

- ETERNUS Disk storage system name (hereafter called "ETERNUS name")

Future operations can be executed with the ETERNUS name.

In the case of REC, both copy source and copy destination ETERNUS names are required.

When using Web Console, specify a device name of ETERNUS Disk storage system as ETERNUS name.

- ETERNUS Disk storage system IP address
- ETERNUS Disk storage system user name and password

Specify the user name and password with the following privileges.

Storage device type	Privileges
ETERNUS Disk storage system which can operate by using Copy command via LAN	Software role of ETERNUS Disk storage system
ETERNUS Disk storage system which cannot operate by using Copy command via LAN	Administrator authorization of ETERNUS Disk storage system

Refer to "[Table 1.1 ETERNUS Disk storage system that can be operated by Copy command via SAN or via LAN](#)" for storage devices which can operate by using Copy command via LAN.

- Access volume set according to "[2.2 Access volume settings](#)" (This setup can be omitted)

When registering the ETERNUS Disk storage system which is operated by Copy command via SAN, an access volume specification can be omitted. However, it is necessary to specify an access volume in a clustered system. Refer to "[6.2 Notes about cluster operation](#)" for more information.

When registering the ETERNUS Disk storage system which is operated by Copy command via LAN, it is unnecessary to specify an access volume.

Information

For registering ETERNUS Disk storage system operated by Copy command via SAN and omitting access volume setup, volumes in ETERNUS Disk storage system are searched in the following order. Finding a valid access volume may take a few minutes.

- For Windows

The order of "PhysicalDrive [disk number]" displayed in Disk Management.

The disk number is the same value as the "disk?" in the AdvancedCopy Manager block device name and the "Disk #" displayed in the [Disk Management] - [Computer Management] - [Management Tool] from the [Start] menu.

- For Solaris

1. ETERNUS multipath device (/dev/FJSVmplb/rdisk/*)

2. OS standard device (/dev/rdisk/*), Solaris standard multipath (MPxIO) device (/dev/rdisk/*)
 3. VxVM (/dev/vx/rdmp/*)
- For Linux
 1. Multipath device generated by device mapper facility (/dev/mapper/*)
 2. OS standard device (/dev/sd*)
 3. by-id format for udev (/dev/disk/by-id/*)
 4. by-path format for udev (/dev/disk/by-path/*)

.....

For the remote ETERNUS Disk storage system, AdvancedCopy Manager CCM registers it without authentication. The following ETERNUS Disk storage system information is required for registration.

- ETERNUS name
- Box ID

Point

.....

Note for REC:

Both the copy source and the copy destination ETERNUS Disk storage systems must be registered. Make sure that the REC path is set before registering ETERNUS Disk storage system on the CCM Server.

If the REC path is set after registering ETERNUS Disk storage system, refer to "[Changing information other than ETERNUS names and access volumes](#)" and register ETERNUS Disk storage system again.

Perform the following procedure on the CCM Server.

1. Register the one of ETERNUS Disk storage system.

This ETERNUS Disk storage system must be accessible by either SAN or LAN.

- When the ETERNUS Disk storage system has an access volume:

Register the ETERNUS Disk storage system that has the access volume set by "[2.2 Access volume settings](#)".

Execute [acarray add \(ETERNUS Disk storage system registration command\)](#) with -san option. When both ETERNUS Disk storage systems have an access volume, register either one.

Specify the existing drive letter or device name for the access volume.

- When the ETERNUS Disk storage system does not have an access volume:

Execute [acarray add \(ETERNUS Disk storage system registration command\)](#) with -lan option.

2. Register another ETERNUS Disk storage system.

Register the ETERNUS Disk storage system not registered in step 1. If there are more than two ETERNUS Disk storage systems in the REC configuration, repeat step 2 for the additional ETERNUS Disk storage systems.

- When the ETERNUS Disk storage system has an access volume:

Specify the existing drive letter or device name for the access volume.

- When the ETERNUS Disk storage system does not have an access volume:

Register using either of the following methods.

- Registering the LAN as connection route (This is recommended) :

Execute [acarray add \(ETERNUS Disk storage system registration command\)](#) with -lan option.

The information of Copy command and volume list can be referred.

- Registering the ETERNUS Disk storage system without authentication:

Execute [acarray add \(ETERNUS Disk storage system registration command\)](#) with -boxid option.

Registration cannot be done using a nonexistent drive letter as an access volume.

3. Refer to "2.5 Creating copy groups" to create copy groups.

Specify the ETERNUS name of step 1 in -a option.

Specify the ETERNUS name of step 2 in -remote option.

Execution examples are shown below.

Register ETERNUS Disk storage system.

- In the case of Copy command via SAN

[Execution example]

```
> acarray add -a ET001 -ip 10.124.6.251 -path c: -user root -password root -san
Successful completion.
```

- In the case of Copy command via LAN

[Execution example]

```
> acarray add -a ET001 -ip 10.124.6.251 -user root -password root -lan
Successful completion.
```

To check whether ETERNUS Disk storage system has been registered, use [acarray list \(ETERNUS Disk storage system information display command\)](#).

[Execution example]

```
> acarray list

Name   BOX-ID                                     IP Address
-----
ET001  00ETERNUSDXM##ET44S20A####HK000104##### 10.124.6.251
```

To check the connection route to the registered ETERNUS Disk storage system, use [acarray detail \(ETERNUS Disk storage system detail information display command\)](#) with -route option.

- In the case of Copy command via SAN

[Execution example]

```
> acarray detail -a ET001 -route

Disk Array Name      : ET001
BOX-ID               : 00ETERNUSDXM##ET44S20A####HK000104#####
IP Address           : 10.124.6.251
Admin User           : root
Access Volume        : c:
Access Route         : san
```

- In the case of Copy command via LAN

[Execution example]

```
> acarray detail -a ET001 -route

Disk Array Name      : ET001
BOX-ID               : 00ETERNUSDXM##ET44S20A####HK000104#####
IP Address           : 10.124.6.251
Admin User           : root
Access Volume        : -
Access Route         : lan
```

To register the remote ETERNUS Disk storage system which does not have network connection, use [acarray add \(ETERNUS Disk storage system registration command\)](#) with -boxid option.

[Execution example]

```
> acarray add -a ET001 -boxid 00ETERNUSDXM##ET44S20A####HK000104##### -remote
Successful completion.
```

To check whether ETERNUS Disk storage system has been registered, use [acarray list \(ETERNUS Disk storage system information display command\)](#).

[Execution example]

```
> acarray list -remote

Name  BOX-ID
-----
ET001 00ETERNUSDXM##ET44S20A####HK000104#####
ET002 00ETERNUSDXH##ET87S20A####NC4110699004##
```

2.5 Creating copy groups

Create copy groups. A copy group is a group of copy pairs, consisting of a copy source logical volume and a copy destination logical volume.

When creating copy groups, specify which type of Advanced Copy and which ETERNUS Disk storage system to use.

Refer to "[4.6.1 acgroup create \(Copy group creation command\)](#)" for more information.

[Execution example]

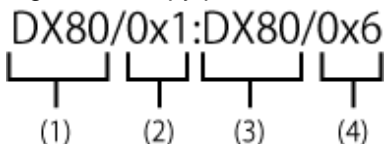
```
> acgroup create -g GRP1 -type OPC -a ET001
Successful completion.
```

2.6 Adding copy pairs

Add copy pairs to the copy groups that have been created.

Copy pairs are strings that define copy source and destination logical volumes.

Figure 2.1 Copy pair format



- (1) ETERNUS name for the copy source
- (2) Logical volume number for the copy source (*1)
- (3) ETERNUS name for the copy destination
- (4) Logical volume number for the copy destination (*1)

*1: Specify the hexadecimal starting with "0x" (ex, "0x1" or "0x0001")

Use the following procedure to add copy pairs.

1. Check the logical volume numbers for the copy source and destination that will be added as a copy pair.

- Checking the logical volume number of the copy source

If using the AdvancedCopy Manager CCM function to check the correspondence between the OS device name and the logical volume number, execute the following, depending on the server.

1. Check the operating OS.

Refer to "[4.11.2 acgetvolinfo \(Logical volume information display command\)](#)" for the operating OS.

2. Execute [acgetvolinfo \(Logical volume information display command\)](#) to check the correspondence between the OS device name and the logical volume number.

- Checking the logical volume number of the copy destination

It is recommended to not connect the copy destination logical volume to any server.

Execute [acinq lv \(Logical volume information display command\)](#) with -free option on the CCM Server to check a logical volume number that is not connected to the server.



Note

When including a logical volume of a remote ETERNUS Disk storage system in a copy pair, confirm the logical volume number of the object using the ETERNUS Web GUI.

2. Add the copy pair to a copy group using [acpair add \(Copy pair addition command\)](#).

Execution example for making the copy group "GRP1" shown in "[Figure 2.2 Adding copy pairs](#)" is as follows.

[Execution example]

```
> acpair add -g GRP1 -p ET001/0x25:ET001/0x29
Successful completion.

> acpair add -g GRP1 -p ET001/0x26:ET001/0x30
Successful completion.

> acpair add -g GRP1 -p ET001/0x27:ET001/0x31
Successful completion.

> acpair add -g GRP1 -p ET001/0x28:ET001/0x32
Successful completion.
```

In the case when the copy type is SnapOPCP (SnapOPC+), the execution example for making the copy group "GRP2" shown in "[Figure 2.2 Adding copy pairs](#)" is as follows.

[Execution example]

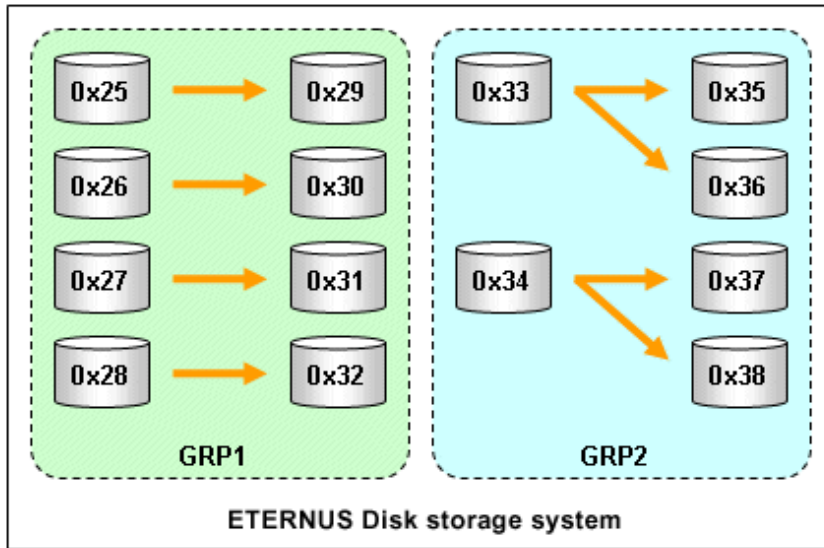
```
> acpair add -g GRP2 -p ET001/0x33:ET001/0x35
Successful completion.

> acpair add -g GRP2 -p ET001/0x33:ET001/0x36
Successful completion.

> acpair add -g GRP2 -p ET001/0x34:ET001/0x37
Successful completion.

> acpair add -g GRP2 -p ET001/0x34:ET001/0x38
Successful completion.
```

Figure 2.2 Adding copy pairs



3. Check the logical volume numbers of the copy pairs that have been added.

Display information about ETERNUS Disk storage system using [acgroup detail \(Copy group detail information display command\)](#), and check that the copy pairs have been added using the specified logical volume numbers.

[Execution example]

```
> acgroup detail -g GRP1

Copy Group Name : GRP1
Copy Group Type : OPC
Disk Array Name : ET001 (00ETERNUSDXM##ET44S20A####HK000104#####)

Pair
-----
ET001/0x25:ET001/0x29
ET001/0x26:ET001/0x30
ET001/0x27:ET001/0x31
ET001/0x28:ET001/0x32
```

2.7 Setting copy volume protection

Volume protection can be set for transaction volumes in order to prevent volumes being discarded accidentally via operator error.

The copy volume protection function performs tasks at ETERNUS Disk storage system to protect logical volumes from all Advanced Copy functions.

Use the following commands to set and release volume protection settings:

- "[4.4.1 acinhibit set \(Volume protection settings command\)](#)"
- "[4.4.2 acinhibit unset \(Volume protection settings release command\)](#)"

In addition, the following command can be used to check the copy volume protection status:

- "[4.3.1 acinq lv \(Logical volume information display command\)](#)"

Note

ETERNUS Disk storage system must support the copy volume protection function in order to use it.

The following logical volumes do not support this function.

- Logical volume in the remote ETERNUS Disk storage system
- An REC session destination logical volume

The purpose of this function is to prevent copy operation errors. It does not prevent file write or other disk access.

2.7.1 Copy volume protection unit

Copy volumes can be protected in logical volume units. The following types of logical volumes can be protected.

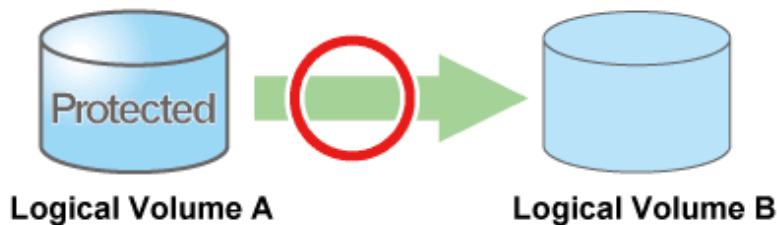
- Open Volume (Open)
- Flexible Tier Volume (FTV)
- Thin Provisioning volume
- Wide Striping Volume (WSV)

Individual partitions or slices cannot be selected for protection.

2.7.2 Advanced Copy of protected volumes

This section describes Advanced Copy operations for protected logical volumes.

- The volume-protected logical volume A can be set as the copy source (backup source).



- The volume-protected logical volume B cannot be set as the copy destination (backup destination).



If the copy destination logical volume is protected, an error is output when Advanced Copy is executed.

[Execution example]

```
> acopc start -g group01
ET001/0x1:ET001/0x6
```

```
ccm5007 The target logical volume is write protected. target logical volume=ET001/0x6  
  
Succeeded : 0  
Failed    : 1
```

Depending on the volume protection status, the following commands output errors:

- "4.7.1 acopc start (OPC/QuickOPC copy start command)"
- "4.7.4 acsnap start (SnapOPC+ copy start command)"
- "4.8.1 acec start (Synchronous high-speed copy start command)"
- "4.8.4 acec resume (Synchronous high-speed copy restart command)"

2.7.3 Volume protection function for logical volumes not performed

Volume protection can be set for logical volumes to prevent incorrect operation even if AdvancedCopy Manager CCM does not perform copy operations for them.

Logical volumes for which volume protection has been set can be added to a copy group as a copy destination.

Note that an error does not occur if a copy pair is added to a copy group.

Chapter 3 Operation

This chapter explains the procedures required to operate AdvancedCopy Manager CCM.

Point

- AdvancedCopy Manager CCM performs backups and restorations regardless of the status of the business server. Make sure that the business server has stopped before executing backups and restorations.
If file server or other operations prevent unmounting of the copy source logical volume, it is possible to also perform backups and restorations using [acutil fsflush \(File system flush command\) \[Windows only\]](#).
- If a copy destination logical volume is connected to Linux server or Windows server, please execute the following commands to recognize the data of the copy destination volume to OS after the copy is executed.

- For Windows

```
acutil refresh -d devi ceName
```

deviceName: Physical device name of the copy destination volume (PhysicalDrive[disk number])

- For Linux

```
sfdisk -R devi ceName
```

deviceName: Device name of the copy destination volume (/dev/sd*)

- PATH environment variables need to be set to use AdvancedCopy Manager CCM commands. Refer to "Setting PATH environment variable" in "Setup of AdvancedCopy Manager CCM" in the *ETERNUS SF Installation and Setup Guide* for how to set it.

3.1 Operating Advanced Copy

AdvancedCopy Manager CCM provides both Copy command via SAN and Copy command via LAN as the data copy methods within ETERNUS Disk storage system.

3.1.1 System configuration

Refer to "[Table 1.1 ETERNUS Disk storage system that can be operated by Copy command via SAN or via LAN](#)" for information regarding ETERNUS Disk storage systems which are able to be operated by Copy command via LAN

Connection Mode

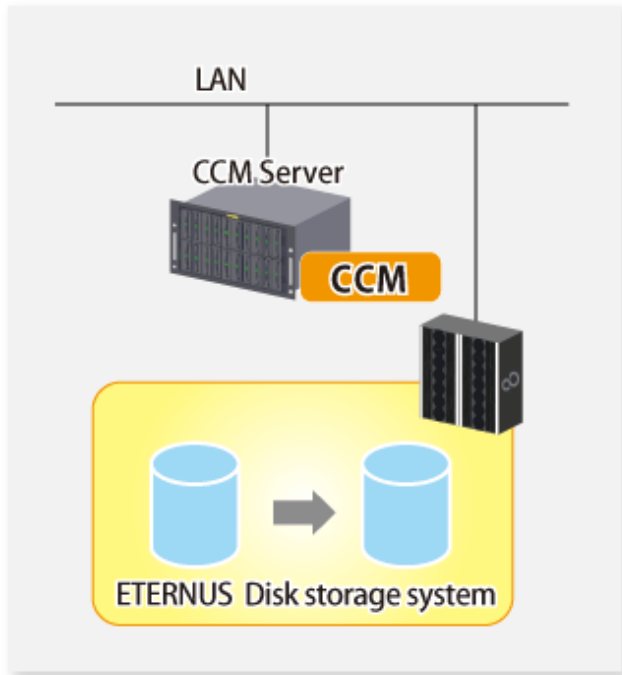
The AdvancedCopy Manager CCM supports the following modes as the connection mode between the CCM Server and ETERNUS Disk storage system.

Select the connection mode during registration of ETERNUS Disk storage system using [acarray add \(ETERNUS Disk storage system registration command\)](#).

LAN connection environment

This mode connects the CCM Server and ETERNUS Disk storage system by LAN only.

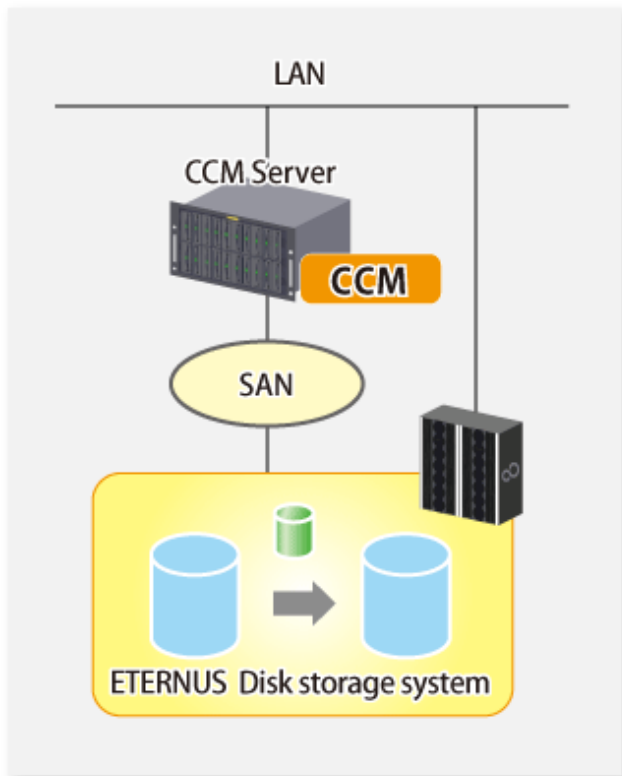
All requests from the CCM Server to ETERNUS Disk storage system are issued via LAN.



SAN/LAN mixed environment

This mode connects the CCM Server and ETERNUS Disk storage system by SAN and LAN. Requests from the CCM Server are issued via the transmission paths set up with [acarray add \(ETERNUS Disk storage system registration command\)](#).

For a SAN/LAN mixed environment, it is recommended that connection via SAN be setup.



Authentication Method

The Copy command via LAN provides security through login authentication and encryption through ssh. Login authentication is performed with the username and password set to ETERNUS Disk storage system.

Transmission Method

This indicates the method of transmission for the Copy command via SAN and the Copy command via LAN.

Figure 3.1 Copy command via SAN

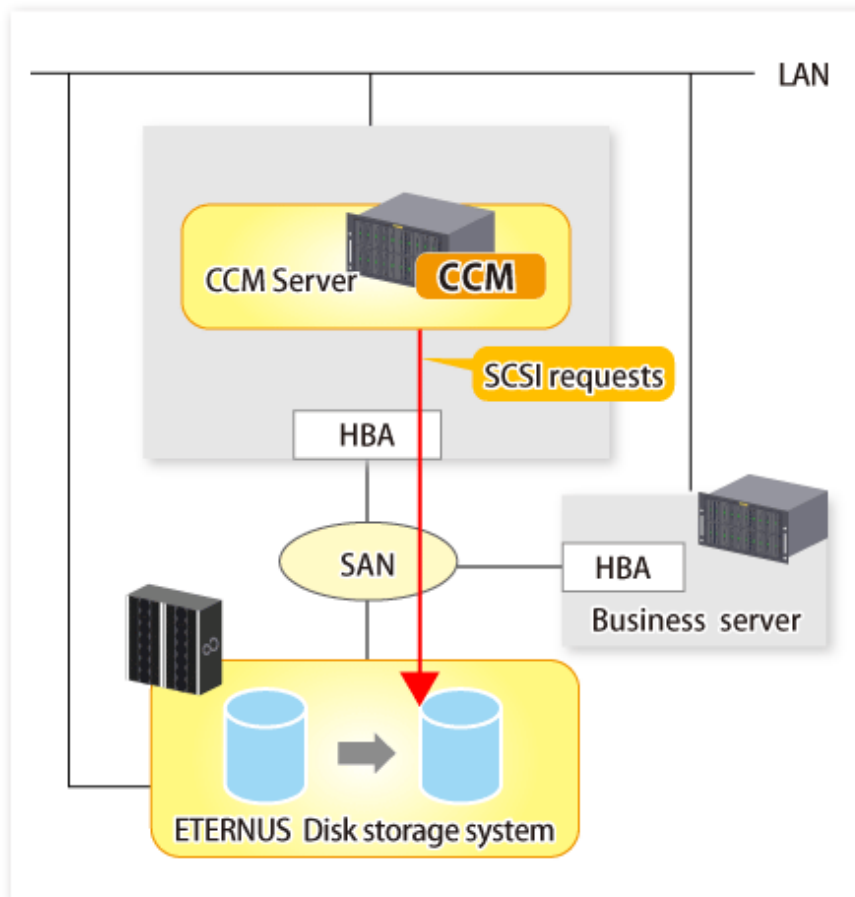
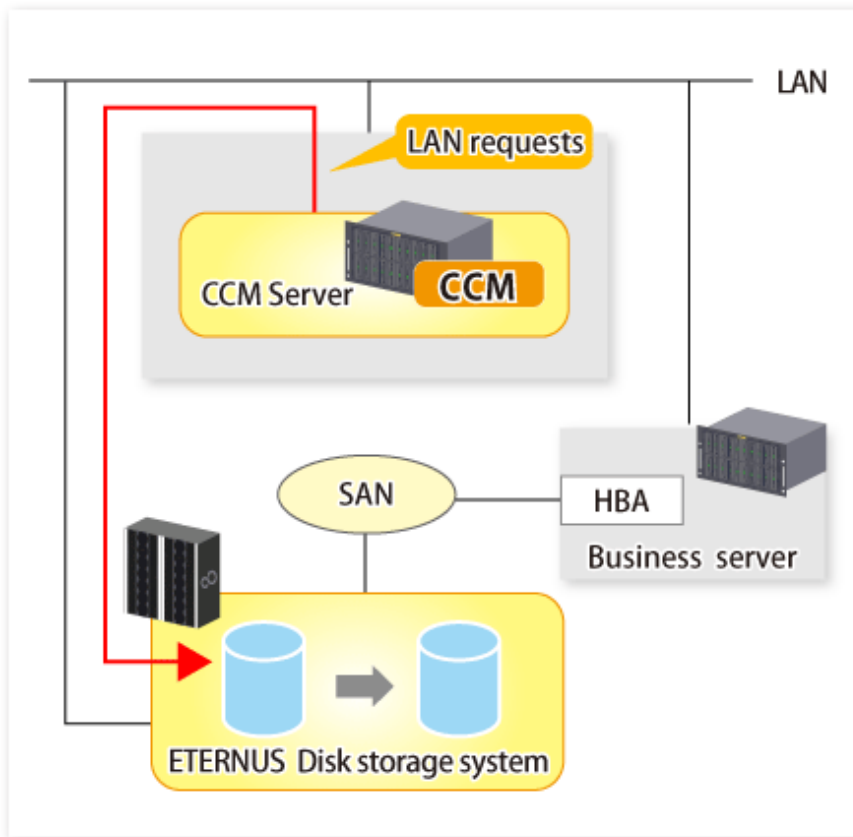


Figure 3.2 Copy command via LAN



3.1.2 Notes about number of sessions with ETERNUS Disk storage system

The Copy command via LAN communicates with ETERNUS Disk storage system using SSH.

One session is used for each ETERNUS Disk storage system which is operable with the Copy command via LAN.

The sessions used for LAN communication are included in the total number of active sessions in the ETERNUS Disk storage system.

The maximum number of sessions is 16.

3.2 Executing Advanced Copy

This section explains the procedures for executing Advanced Copy function using AdvancedCopy Manager CCM.

Refer to "Advanced Copy functions" in the *ETERNUS SF AdvancedCopy Manager Overview* for more information about each type of copy.

3.2.1 Executing snapshot type high-speed copy

This section explains, using Windows examples, how to execute snapshot-type high-speed copies. The procedures for Solaris and Linux are the same.

3.2.1.1 Backup via OPC

This section explains the operation methods of following processes.

- Pre-checking volume protection status (only if volume protection is to be set)
- Setting volume protection (only if volume protection is to be set)
- Checking volume protection status (only if volume protection is to be set)
- Execution of backup
- Check the backup execution status
- Check the OPC copy progress status

Pre-checking volume protection status (only if volume protection is to be set)

Execute `acinq lv` (Logical volume information display command) with `-l` option added to check the volume protection status.

[Execution example]

```
> acinq lv -a ET001 -l
LV No  LV Name LV Size LV Type RG No Encrypt Virtual Size Copy Inhibit
-----
0x0001      1024M Open      4 -      - -
0x0002      1024M Open      4 -      - -
0x0003      1024M Open      2 -      - -
:
```

Setting volume protection (only if volume protection is to be set)

Execute `acinhibit set` (Volume protection settings command) to set volume protection for the copy source logical volume.

[Execution example]

```
> acinhibit set -v ET001/0x1
Successful completion
```

Checking volume protection status (only if volume protection is to be set)

Execute `acinq lv` (Logical volume information display command) with `-l` option added to check the volume protection status.

[Execution example]

```
> acinq lv -a ET001 -l
LV No  LV Name LV Size LV Type RG No Encrypt Virtual Size Copy Inhibit
-----
0x0001      1024M Open      4 -      - Yes
0x0002      1024M Open      4 -      - Yes
0x0003      1024M Open      2 -      - -
:
```

Execution of backup

Execute `acopc start` (OPC/QuickOPC copy start command) to execute backups via OPC.

[Execution example]

```
> acopc start -g OpcGroup

ET001/0x1:ET001/0x3
# DATE : 2008/06/25 00:00:00 - << OPC Started >>
# From:BoxID=303045343030304d3323232323234534353053323041232323234b44343033303633393030342323/
```

```
Olu=1/Adr_high=0/Adr_low=0/size_high=0/size_low=0
# To :BoxID=3030453430304d33232323234534353053323041232323234b44343033303633393030342323/
Olu=3/Adr_high=0/Adr_low=0

ET001/0x2:ET001/0x4
# DATE : 2008/06/25 00:00:02 - << OPC Started >>
# From:BoxID=3030453430304d33232323234534353053323041232323234b44343033303633393030342323/
Olu=2/Adr_high=0/Adr_low=0/size_high=0/size_low=0
# To :BoxID=3030453430304d33232323234534353053323041232323234b44343033303633393030342323/
Olu=4/Adr_high=0/Adr_low=0

Succeeded : 2
Failed : 0
```

Check the backup execution status

The execution status of the backup can be checked by using [acopc query \(OPC/QuickOPC copy status display command\)](#).

[Execution example]

```
> acopc query -g OpcGroup

Copy Group Name : OpcGroup
Copy Group Type : OPC
Disk Array Name : ET001 (00ETERNUSDXM##ET44S20A####HK000104#####)

Source    <=> Target    SID  OPC Status    Copy Phase Copied Block
-----
ET001/0x1 ==> ET001/0x3 0x21 "OPC Executing" "Copying"          0
ET001/0x2 ==> ET001/0x4 0x22 "OPC Executing" "Copying"        471859
```

Check the OPC copy progress status

The OPC copy progress status of the backup can be checked by using [acopc query \(OPC/QuickOPC copy status display command\)](#) with `-progress` option.

[Execution example]

```
> acopc query -g OpcGroup -progress

Copy Group Name : OpcGroup
Copy Group Type : OPC
Disk Array Name : ET001 (00ETERNUSDXM##ET44S20A####HK000104#####)

Source    <=> Target    Progress Copied Block Total Block
-----
ET001/0x1 ==> ET001/0x3    0%          0    1048576
ET001/0x2 ==> ET001/0x4   45%        471859  1048576
```

3.2.1.2 Restore on OPC backup environment

This section explains the operation methods of following processes.

- [Pre-checking volume protection status \(only if volume protection is to be set\)](#)
- [Releasing volume protection settings \(only if volume protection is already set\)](#)
- [Checking volume protection status \(only if volume protection status was changed\)](#)
- [Execution of restore](#)
- [Check the restore execution status](#)

- Check the OPC copy progress status

Pre-checking volume protection status (only if volume protection is to be set)

Execute `acinq lv` (Logical volume information display command) with `-l` option added to check the volume protection status.

[Execution example]

```
> acinq lv -a ET001 -l
LV No  LV Name LV Size LV Type RG No  Encrypt Virtual Size Copy Inhibit
-----
0x0001      1024M Open      4 -      - Yes
0x0002      1024M Open      4 -      - Yes
0x0003      1024M Open      2 -      - -
:
```

Releasing volume protection settings (only if volume protection is already set)

To restore data (copying to copy source), if the copy source logical volume has volume protection set, execute `acinhbit unset` (Volume protection settings release command) to release the volume protection settings.

[Execution example]

```
> acinhbit unset -v ET001/0x1
Successful completion
```

Checking volume protection status (only if volume protection status was changed)

Execute `acinq lv` (Logical volume information display command) with `-l` option added to check the volume protection status.

[Execution example]

```
> acinq lv -a ET001 -l
LV No  LV Name LV Size LV Type RG No  Encrypt Virtual Size Copy Inhibit
-----
0x0001      1024M Open      4 -      - -
0x0002      1024M Open      4 -      - -
0x0003      1024M Open      2 -      - -
:
```

Execution of restore

Execute an OPC in the reverse direction (from the copy destination volume to the copy source volume) by using `acopc start` (OPC/QuickOPC copy start command) with `-r` option.

[Execution example]

```
> acopc start -g OpcGroup -r

ET001/0x1:ET001/0x3
# DATE : 2008/06/25 12:00:00 - << OPC Started >>
# From:BoxID=303045343030304d3323232323234534353053323041232323234b443430333036333393030342323/
Olu=3/Adr_high=0/Adr_low=0/size_high=0/size_low=0
# To :BoxID=303045343030304d3323232323234534353053323041232323234b443430333036333393030342323/
Olu=1/Adr_high=0/Adr_low=0

ET001/0x2:ET001/0x4
```

```
# DATE : 2008/06/25 12:00:02 - << OPC Started >>
# From:BoxID=303045343030304d3323232323234534353053323041232323234b44343033303633393030342323/
Olu=4/Adr_high=0/Adr_low=0/size_high=0/size_low=0
# To :BoxID=303045343030304d3323232323234534353053323041232323234b44343033303633393030342323/
Olu=2/Adr_high=0/Adr_low=0

Succeeded : 2
Failed : 0
```

Check the restore execution status

The execution status of the restoration can be checked by using [acopc query \(OPC/QuickOPC copy status display command\)](#) with -r option.

[Execution example]

```
> acopc query -g OpcGroup -r

Copy Group Name : OpcGroup
Copy Group Type : OPC
Disk Array Name : ET001 (00ETERNUSDXM##ET44S20A####HK000104#####)

Source    <=> Target    SID  OPC Status    Copy Phase Copied Block
-----
ET001/0x1 <== ET001/0x3 0x42 "OPC Executing" "Copying"      9408
ET001/0x2 <== ET001/0x4 0x43 "OPC Executing" "Copying"      3728
```

Check the OPC copy progress status

The OPC copy progress status of the restoration can be checked by using [acopc query \(OPC/QuickOPC copy status display command\)](#) with -r and -progress options.

[Execution example]

```
> acopc query -g OpcGroup -r -progress

Copy Group Name : OpcGroup
Copy Group Type : OPC
Disk Array Name : ET001 (00ETERNUSDXM##ET44S20A####HK000104#####)

Source    <=> Target    Progress Copied Block Total Block
-----
ET001/0x1 <== ET001/0x3    1%          9408    1048576
ET001/0x2 <== ET001/0x4    1%          3728    1048576
```



Point

Protection settings can be set for a logical volume even while copy is in progress. Therefore, volume protection can be set again without waiting for completion of the restore process (physical copy completion).

3.2.1.3 Backup via QuickOPC

This section explains the operation methods of following processes.

- [Pre-checking volume protection status \(only if volume protection is to be set\)](#)
- [Set volume protection \(only if volume protection is to be set\)](#)
- [Check volume protection status \(only if volume protection is to be set\)](#)

- Execution of first backup
- Check the backup execution status
- Check the tracking status
- Execution of backup for the second or subsequent time

Pre-checking volume protection status (only if volume protection is to be set)

Execute [acinq lv \(Logical volume information display command\)](#) with -l option added to check the volume protection status.

[Execution example]

```
> acinq lv -a ET001 -l
LV No  LV Name LV Size LV Type RG No Encrypt Virtual Size Copy Inhibit
-----
0x0001      1024M Open      4 -      - -
0x0002      1024M Open      4 -      - -
0x0003      1024M Open      2 -      - -
:
```

Set volume protection (only if volume protection is to be set)

Execute [acinhibit set \(Volume protection settings command\)](#) to set volume protection for the copy source logical volume.

[Execution example]

```
> acinhibit set -v ET001/0x1
Successful completion
```

Check volume protection status (only if volume protection is to be set)

Execute [acinq lv \(Logical volume information display command\)](#) with -l option added to check the volume protection status.

[Execution example]

```
> acinq lv -a ET001 -l
LV No  LV Name LV Size LV Type RG No Encrypt Virtual Size Copy Inhibit
-----
0x0001      1024M Open      4 -      - Yes
0x0002      1024M Open      4 -      - Yes
0x0003      1024M Open      2 -      - -
:
```

Execution of first backup

Execute [acopc start \(OPC/QuickOPC copy start command\)](#) to execute backups via QuickOPC.

For the first QuickOPC, execute [acopc start \(OPC/QuickOPC copy start command\)](#) without -diff option.

[Execution example]

```
> acopc start -g QuickOpcGroup

ET001/0x1:ET001/0x3
# DATE : 2008/06/25 00:00:00 - << Differential OPC Started >>
# From:BoxID=303045343030304d3323232323234534353053323041232323234b44343033303633393030342323/
Olu=1/Adr_high=0/Adr_low=0/size_high=0/size_low=0
# To :BoxID=303045343030304d3323232323234534353053323041232323234b44343033303633393030342323/
```

```

Olu=3//Adr_high=0/Adr_low=0

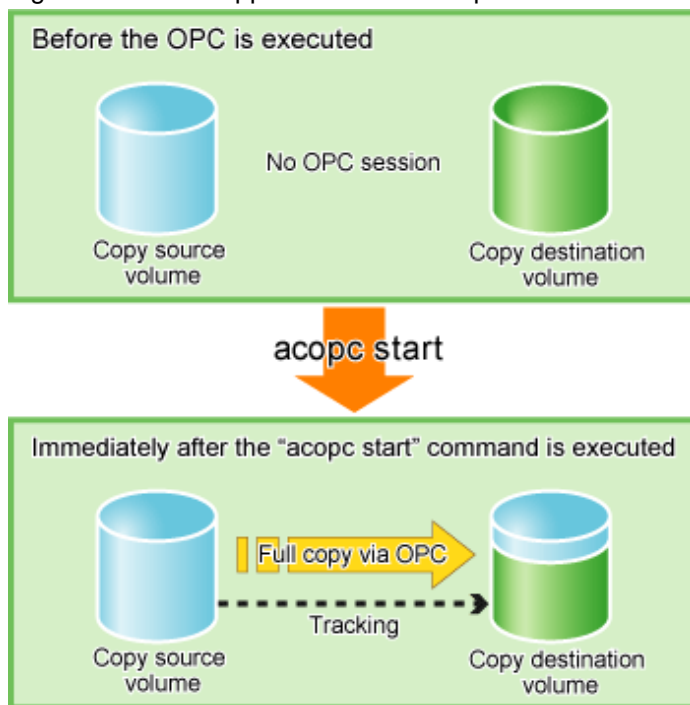
ET001/0x2:ET001/0x4
# DATE : 2008/06/25 00:00:02 - << Differential OPC Started >>
# From:BoxID=303045343030304d33232323234534353053323041232323234b44343033303633393030342323/
Olu=2/Adr_high=0/Adr_low=0/size_high=0/size_low=0
# To :BoxID=303045343030304d33232323234534353053323041232323234b44343033303633393030342323/
Olu=4/Adr_high=0/Adr_low=0

Succeeded : 2
Failed : 0

```

Executing the first QuickOPC starts a tracking process as well as an OPC from the copy source volume to the copy destination volume.

Figure 3.3 What happens when the `acopc start` command is executed (for the first time)



Check the backup execution status

The execution status of the backup can be checked by using `acopc query` (OPC/QuickOPC copy status display command) in the same way as for backups via OPC.

[Execution example]

```

> acec query -g QuickOpcGroup

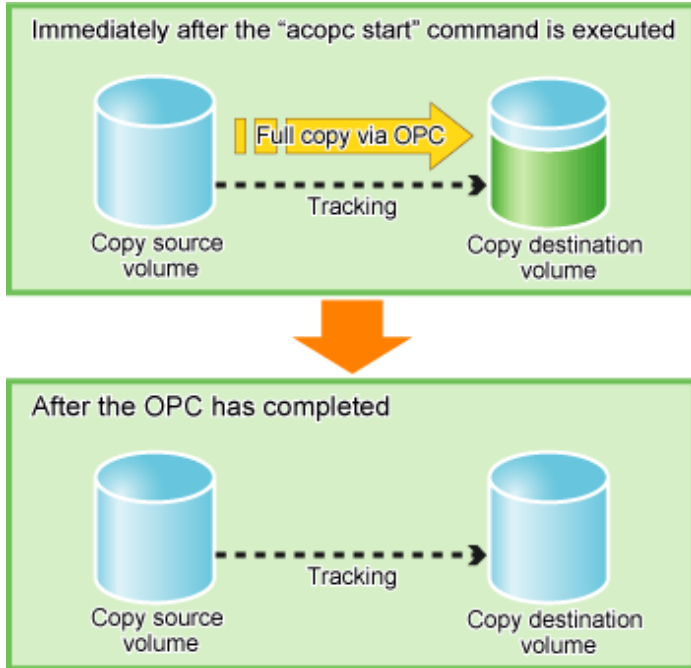
Copy Group Name : QuickOpcGroup
Copy Group Type : QuickOPC
Disk Array Name : ET001 (00ETERNUSDXM##ET44S20A####HK000104#####)

Source  <=> Target  SID  OPC Status      Copy Phase      Copied Block
-----
ET001/0x1 ==> ET001/0x3 0x21 "OPC Executing" "Copying/Tracking" 6912
ET001/0x2 ==> ET001/0x4 0x22 "OPC Executing" "Copying/Tracking" 5760

```

When the physical copy of QuickOPC finishes, only the tracking process will still be running.

Figure 3.4 What happens when the snapshot processing finishes



Check the tracking status

The tracking status can be checked by using `acopc query (OPC/QuickOPC copy status display command)`. Confirm that the physical copying process has finished by checking that the Copy Phase is in "Tracking" mode.

[Execution example]

```
> acopc query -g QuickOpcGroup

Copy Group Name : QuickOpcGroup
Copy Group Type : QuickOPC
Disk Array Name : ET001 (00ETERNUSDXM##ET44S20A####HK000104#####)

Source   <=> Target   SID  OPC Status      Copy Phase Copied Block
-----
ET001/0x1 ==> ET001/0x3 0x21 "OPC Executing" "Tracking"      1048576
ET001/0x2 ==> ET001/0x4 0x22 "OPC Executing" "Tracking"      1048576
```

Execution of backup for the second or subsequent time

If `acopc start (OPC/QuickOPC copy start command)` is executed with `-diff` option while the tracking processing is running, only the differential data updated since the last OPC will be copied, which means that copies take less time to complete.

[Execution example]

```
> acopc start -g QuickOpcGroup -diff

ET001/0x1:ET001/0x3
# DATE : 2008/06/26 00:00:00 - << Differential OPC Started >>
# From:BoxID=303045343030304d3323232323234534353053323041232323234b44343033303633393030342323/
Olu=1/Adr_high=0/Adr_low=0/size_high=0/size_low=0
# To :BoxID=303045343030304d3323232323234534353053323041232323234b44343033303633393030342323/
Olu=3/Adr_high=0/Adr_low=0

ET001/0x2:ET001/0x4
# DATE : 2008/06/26 00:00:02 - << Differential OPC Started >>
# From:BoxID=303045343030304d3323232323234534353053323041232323234b44343033303633393030342323/
```

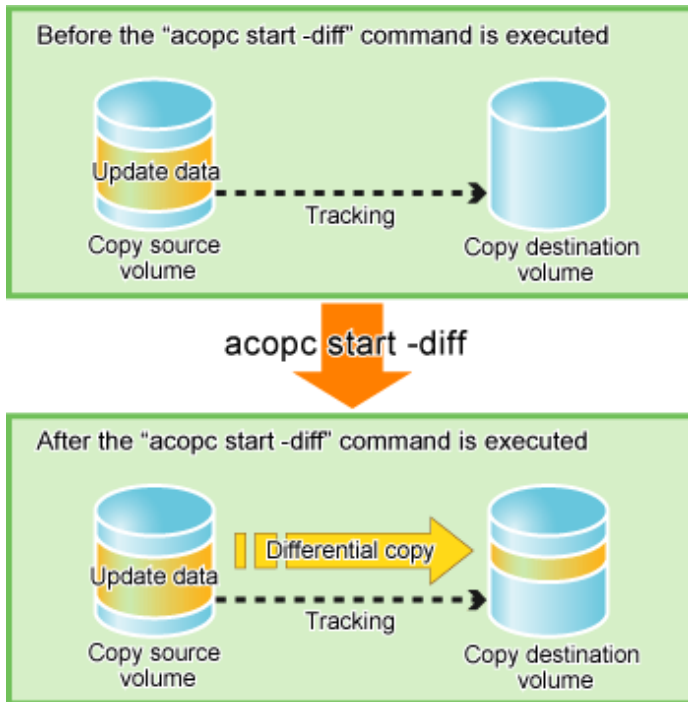
```

Olu=2/Adr_high=0/Adr_low=0/size_high=0/size_low=0
# To :BoxID=3030453430304d3323232323234534353053323041232323234b44343033303633393030342323/
Olu=4/Adr_high=0/Adr_low=0

Succeeded : 2
Failed : 0

```

Figure 3.5 What happens when the acopc start command is executed (for the second or subsequent time)



3.2.1.4 Restore on QuickOPC backup environment

This section explains the operation methods of following processes.

- Pre-checking volume protection status (only if volume protection is to be set)
- Release volume protection settings (only if volume protection is already set)
- Check volume protection status (only if volume protection status was changed)
- Execution of restore
- Check the restore execution status
- Check the QuickOPC copy progress status

Pre-checking volume protection status (only if volume protection is to be set)

Execute `acinq lv` (Logical volume information display command) with `-l` option added to check the volume protection status.

[Execution example]

```

> acinq lv -a ET001 -l
LV No  LV Name LV Size LV Type RG No  Encrypt Virtual Size Copy Inhibit
-----
0x0001      1024M Open      4 -      - Yes
0x0002      1024M Open      4 -      - Yes

```

```
0x0003          1024M Open          2 -          - -
:
```

Release volume protection settings (only if volume protection is already set)

To restore data (copying to copy source), if the copy source logical volume has volume protection set, execute [acinhibit unset \(Volume protection settings release command\)](#) to release the volume protection settings.

[Execution example]

```
> acinhibit unset -v ET001/0x1
Successful completion
```

Check volume protection status (only if volume protection status was changed)

Execute [acinq lv \(Logical volume information display command\)](#) with -l option added to check the volume protection status.

[Execution example]

```
> acinq lv -a ET001 -l

LV No  LV Name  LV Size  LV Type  RG No  Encrypt  Virtual  Size  Copy  Inhibit
-----  -
0x0001          1024M  Open          4 -          - -
0x0002          1024M  Open          4 -          - -
0x0003          1024M  Open          2 -          - -
:
```

Execution of restore

Execute a QuickOPC in the reverse direction (from the copy destination volume to the copy source volume) by using [acopc start \(OPC/QuickOPC copy start command\)](#) with -r option.

[Execution example]

```
> acopc start -g QuickOpcGroup -r

ET001/0x1:ET001/0x3
# DATE : 2008/06/26 12:00:00 - << OPC Started >>
# From:BoxID=303045343030304d3323232323234534353053323041232323234b44343033303633393030342323/
Olu=3/Adr_high=0/Adr_low=0/size_high=0/size_low=0
# To :BoxID=303045343030304d3323232323234534353053323041232323234b44343033303633393030342323/
Olu=1/Adr_high=0/Adr_low=0

ET001/0x2:ET001/0x4
# DATE : 2008/06/26 12:00:02 - << OPC Started >>
# From:BoxID=303045343030304d3323232323234534353053323041232323234b44343033303633393030342323/
Olu=4/Adr_high=0/Adr_low=0/size_high=0/size_low=0
# To :BoxID=303045343030304d3323232323234534353053323041232323234b44343033303633393030342323/
Olu=2/Adr_high=0/Adr_low=0

Succeeded : 2
Failed : 0
```

Check the restore execution status

The execution status of the restoration can be checked by using [acopc query \(OPC/QuickOPC copy status display command\)](#) with -r option.

[Execution example]

```

> acopc query -g QuickOpcGroup -r

Copy Group Name : QuickOpcGroup
Copy Group Type : QuickOPC
Disk Array Name : ET001 (00ETERNUSDXM##ET44S20A####HK000104#####)

Source    <=> Target    SID  OPC Status    Copy Phase Copied Block
-----
ET001/0x1 <== ET001/0x3 0x42 "OPC Executing" "Copying"      974848
ET001/0x2 <== ET001/0x4 0x43 "OPC Executing" "Copying"      786432

```

 **Point**

With backup and restoration operations that use QuickOPC, not all data on the logical volume, but only differential data that has been updated since the last OPC completed is copied. This means that both backups and restorations take less time to complete.

Protection settings can be set for a logical volume even while copy is in progress. Therefore, volume protection can be set again without waiting for completion of the restore process (physical copy completion).

Check the QuickOPC copy progress status

The QuickOPC copy progress status of the restoration can be checked by using `acopc query (OPC/QuickOPC copy status display command)` with -r and -progress options.

[Execution example]

```

> acopc query -g QuickOpcGroup -r -progress

Copy Group Name : QuickOpcGroup
Copy Group Type : QuickOPC
Disk Array Name : ET001 (00ETERNUSDXM##ET44S20A####HK000104#####)

Source    <=> Target    Progress Copied Block Total Block
-----
ET001/0x1 <== ET001/0x3    93%      974848    1048576
ET001/0x2 <== ET001/0x4    75%      786432    1048576

```

3.2.1.5 Backup via SnapOPC+

This section explains the operation methods of following processes.

- [Pre-checking volume protection status \(only if volume protection is to be set\)](#)
- [Set volume protection \(only if volume protection is to be set\)](#)
- [Check volume protection status \(only if volume protection is to be set\)](#)
- [Execution of backup](#)
- [Check the backup execution status](#)

Pre-checking volume protection status (only if volume protection is to be set)

Execute `acinq lv (Logical volume information display command)` with -l option added to check the volume protection status.

[Execution example]

```

> acinq lv -a ET001 -l
LV No  LV Name LV Size LV Type RG No Encrypt Virtual Size Copy Inhibit

```

```

-----
0x0001      1024M Open      4 -      - -
0x0002      1024M Open      4 -      - -
0x0003      1024M Open      2 -      - -
:

```

Setting volume protection (only if volume protection is to be set)

Execute [acinhbit set \(Volume protection settings command\)](#) to set volume protection for the copy source logical volume.

[Execution example]

```

> acinhbit set -v ET001/0x1
Successful completion

```

Checking volume protection status (only if volume protection is to be set)

Execute [acinq lv \(Logical volume information display command\)](#) with -l option added to check the volume protection status.

[Execution example]

```

> acinq lv -a ET001 -l

LV No  LV Name  LV Size  LV Type  RG No  Encrypt  Virtual Size  Copy Inhibit
-----
0x0001      1024M Open      4 -      - Yes
0x0002      1024M Open      4 -      - Yes
0x0003      1024M Open      2 -      - -
:

```

Execution of backup

Execute [acsnap start \(SnapOPC+ copy start command\)](#) to execute backups via SnapOPC+.

[Execution example]

```

> acsnap start -g SnapOPCGroup

ET001/0x1:ET001/0x4
# DATE : 2008/06/24 16:28:00 - << SnapOPCP Started >>

ET001/0x2:ET001/0x5
# DATE : 2008/06/24 16:28:00 - << SnapOPCP Started >>

Succeeded : 2
Failed    : 0

```

Check the backup execution status

The execution status of the backup can be checked by using [acsnap query \(SnapOPC+ copy status display command\)](#).

[Execution example]

```

> acsnap query -g SnapOPCGroup

Copy Group Name : SnapOPCGroup
Copy Group Type : SnapOPCP
Disk Array Name : ET001 (00ETERNUSDXM##ET44S20A####HK000104#####)

Source    <=> Target    SID  Snap Status                Gen  Date        Copied Block
-----
ET001/0x1 ==> ET001/0x4 0x22 "Copy On Write(Active)"    2   10minute    1048576

```

ET001/0x1 ==> ET001/0x3 0x21 "Copy On Write(Inactive)"	1	1day	1048576
ET001/0x2 ==> ET001/0x5 0x23 "Copy On Write(Active)"	1	10minute	1048576
ET001/0x2 N/A ET001/0x6 N/A "Snap action not startup"	N/A	N/A	0

3.2.1.6 Restore on SnapOPC+ backup environment

This section explains the operation methods of following processes.

- [Pre-checking volume protection status \(only if volume protection is to be set\)](#)
- [Releasing volume protection settings \(only if volume protection is already set\)](#)
- [Checking volume protection status \(only if volume protection status was changed\)](#)
- [Execution of restore](#)
- [Check the restore execution status](#)

Point

The restoration by using SnapOPC+ can be execution for the following ETERNUS Disk storage systems.

- ETERNUS DX80 S2/DX90 S2
- ETERNUS DX100 S3/DX200 S3
- ETERNUS DX400/DX400 S2 series
- ETERNUS DX500 S3/DX600 S3
- ETERNUS DX8000/DX8000 S2 series

Pre-checking volume protection status (only if volume protection is to be set)

Execute [acinq lv \(Logical volume information display command\)](#) with -l option added to check the volume protection status.

[Execution example]

```
> acinq lv -a ET001 -l
LV No  LV Name LV Size LV Type RG No Encrypt Virtual Size Copy Inhibit
-----
0x0001      1024M Open      4 -      - Yes
0x0002      1024M Open      4 -      - Yes
0x0003      1024M Open      2 -      - -
:
```

Releasing volume protection settings (only if volume protection is already set)

To restore data (copying to copy source), if the copy source logical volume has volume protection set, execute [acinhibit unset \(Volume protection settings release command\)](#) to release the volume protection settings.

[Execution example]

```
> acinhibit unset -v ET001/0x1
Successful completion
```

Checking volume protection status (only if volume protection status was changed)

Execute [acinq lv \(Logical volume information display command\)](#) with -l option added to check the volume protection status.

[Execution example]


```

> acinq lv -a ET001 -l

LV No  LV Name  LV Size  LV Type  RG No  Encrypt  Virtual Size  Copy Inhibit
-----
0x0001      1024M  Open      4 -      - -
0x0002      1024M  Open      4 -      - -
0x0003      1024M  Open      2 -      - -
:

```

Execution of restore

Execute a SnapOPC+ in the reverse direction (from the copy destination volume to the copy source volume) by using `acsnap start (SnapOPC + copy start command)` with `-r` option.

[Execution example]

```

> acsnap start -g SnapOPCGroup -r

ET001/0x1:ET001/0x4
# DATE : 2008/06/24 16:28:00 - << SnapOPCP Started >>

ET001/0x2:ET001/0x5
# DATE : 2008/06/24 16:28:00 - << SnapOPCP Started >>

Succeeded : 2
Failed    : 0

```

Check the restore execution status

The execution status of the restoration can be checked by using `acsnap query (SnapOPC+ copy status display command)` with `-r` option.

[Execution example]

```

> acsnap query -g SnapOPCGroup -r

Copy Group Name : SnapOPCGroup
Copy Group Type : SnapOPCP
Disk Array Name : ET001 (00ETERNUSDXM##ET44S20A####HK000104#####)

Source    <=> Target    SID  OPC Status          Copy Phase Copied Block
-----
ET001/0x1 <== ET001/0x4 0x22 "Copy On Write(Active)" "Copying"      1048576
ET001/0x1 N/A ET001/0x3 N/A  "OPC action not startup" "Not set"       0
ET001/0x2 N/A ET001/0x5 N/A  "OPC action not startup" "Not set"       0
ET001/0x2 N/A ET001/0x6 N/A  "OPC action not startup" "Not set"       0

```

Point

Protection settings can be set for a logical volume even while copy is in progress. Therefore, volume protection can be set again without waiting for completion of the restore process (physical copy completion).

3.2.1.7 Using Concurrent OPC function on OPC/QuickOPC/SnapOPC+

The Concurrent OPC function simultaneously creates the snapshots of multiple logical volumes for ETERNUS Disk storage system. By using this function, a copy with consistency can be easily taken. In OPC/QuickOPC/SnapOPC+ can be used this function.

To use this function, execute `acopc start (OPC/QuickOPC copy start command)` or `acsnap start (SnapOPC+ copy start command)` with `-concur` option.

Refer to the followings depends on your backup process for the operating methods.

- "3.2.1.1 Backup via OPC"
- "3.2.1.3 Backup via QuickOPC"
- "3.2.1.5 Backup via SnapOPC+"

Note

- The session may remain defined OPC when this command is forced to terminate by the task manager, by executing Ctrl-C, etc. In such a case, stop the session by re-execute this command, or by executing `acopc cancel` (OPC/QuickOPC copy stop command) or `acsnap cancel` (SnapOPC+ copy stop command).
- The maximum number of copy pairs which execute the Concurrent OPC function simultaneously is 1024.

3.2.2 Executing synchronous high-speed copy

This section explains, using Windows examples, how to execute synchronous high-speed copies. Solaris and Linux are the same.

3.2.2.1 Backup via EC

This section explains the operation methods of following processes.

- Pre-checking volume protection status (only if volume protection is to be set)
- Setting volume protection (only if volume protection is to be set)
- Checking volume protection status (only if volume protection is to be set)
- Start of EC
- Check the EC execution status
- Check the EC copy progress status
- Suspend of EC
- Resume of EC

Pre-checking volume protection status (only if volume protection is to be set)

Execute `acinq lv` (Logical volume information display command) with `-l` option added to check the volume protection status.

[Execution example]

```
> acinq lv -a ET001 -l
LV No  LV Name  LV Size  LV Type  RG No  Encrypt  Virtual Size  Copy Inhibit
-----
0x0001      1024M  Open      4  -      -  -
0x0002      1024M  Open      4  -      -  -
0x0003      1024M  Open      2  -      -  -
:
```

Setting volume protection (only if volume protection is to be set)

Execute `acinhibit set` (Volume protection settings command) to set volume protection for the copy source logical volume.

[Execution example]

```
> acinhibit set -v ET001/0x1
Successful completion
```

Checking volume protection status (only if volume protection status was changed)

Execute [acinq lv \(Logical volume information display command\)](#) with -l option added to check the volume protection status.

[Execution example]

```
> acinq lv -a ET001 -l

LV No  LV Name  LV Size  LV Type  RG No  Encrypt  Virtual  Size  Copy  Inhibit
-----
0x0001      1024M  Open      4  -      -  Yes
0x0002      1024M  Open      4  -      -  Yes
0x0003      1024M  Open      2  -      -  -
:
```

Start of EC

Execute [acec start \(Synchronous high-speed copy start command\)](#) to start an EC.

[Execution example]

```
> acec start -g EcGroup

ET001/0x1:ET001/0x3
# DATE : 2008/06/24 07:00:00 - << EC Started >>
# From:BoxID=303045343030304d3323232323234534353053323041232323234b44343033303633393030342323/Olu=1/
Adr_high=0/Adr_low=0/size_high=0/size_low=0
# To :BoxID=303045343030304d3323232323234534353053323041232323234b44343033303633393030342323/Olu=3/
Adr_high=0/Adr_low=0

ET001/0x2:ET001/0x4
# DATE : 2008/06/24 07:00:02 - << EC Started >>
# From:BoxID=303045343030304d3323232323234534353053323041232323234b44343033303633393030342323/Olu=2/
Adr_high=0/Adr_low=0/size_high=0/size_low=0
# To :BoxID=303045343030304d3323232323234534353053323041232323234b44343033303633393030342323/Olu=4/
Adr_high=0/Adr_low=0

Succeeded : 2
Failed    : 0
```

Check the EC execution status

Check the execution status of the EC by using [acec query \(Synchronous high-speed copy status display command\)](#).

Check that all of the ECs in the copy group are in an equivalency maintenance state.

[Execution example]

```
> acec query -g EcGroup

Copy Group Name : EcGroup
Copy Group Type : EC
Disk Array Name : ET001 (00ETERNUSDXM##ET44S20A####HK000104#####)

Source    <=> Target    SID  EC Status    Copy Phase Copied Block
-----
ET001/0x1 ==> ET001/0x3 0x1  "EC Executing" "Paired"      1048576
ET001/0x2 ==> ET001/0x4 0x2  "EC Executing" "Paired"      1048576
```

Check the EC copy progress status

The EC copy progress status of the backup can be checked by using [acec query \(Synchronous high-speed copy status display command\)](#) with `-progress` option.

[Execution example]

```
> acec query -g EcGroup -progress

Copy Group Name : EcGroup
Copy Group Type : EC
Disk Array Name : ET001 (00ETERNUSDXM##ET44S20A####HK000104#####)

Source    <=> Target    Progress Copied Block Total Block
-----
ET001/0x1 ==> ET001/0x3    100%      1048576    1048576
ET001/0x2 ==> ET001/0x4    100%      1048576    1048576
```

Suspend of EC

Execute [acec suspend \(Synchronous high-speed copy temporary suspension command\)](#) to temporarily suspend ECs. The backup process is now complete.

[Execution example]

```
> acec suspend -g EcGroup

ET001/0x1:ET001/0x3
# DATE : 2008/06/25 00:00:00 - << EC Suspended >>

ET001/0x2:ET001/0x4
# DATE : 2008/06/25 00:00:02 - << EC Suspended >>

Succeeded : 2
Failed    : 0
```

For suspend many ECs at the same time by using the concurrent suspend function, execute [acec suspend \(Synchronous high-speed copy temporary suspension command\)](#) with `-concur` option.

[Execution example]

```
> acec suspend -g EcGroup -concur
Successful completion.
```

Resume of EC

If backup data is no longer required, execute [acec resume \(Synchronous high-speed copy restart command\)](#) to restart ECs in preparation for the next backup.

[Execution example]

```
> acec resume -g EcGroup

ET001/0x1:ET001/0x3
# DATE : 2008/06/25 07:00:00 - << EC Resumed >>

ET001/0x2:ET001/0x4
# DATE : 2008/06/25 07:00:02 - << EC Resumed >>

Succeeded : 2
Failed    : 0
```

3.2.2.2 Restore on EC backup environment

This section explains the operation methods of following processes.

- Pre-checking volume protection status (only if volume protection is to be set)
- Releasing volume protection settings (only if volume protection is already set)
- Checking volume protection status (only if volume protection status was changed)
- Start of EC
- Check the EC execution status
- Check the EC copy progress status
- Suspend of EC
- Resume of EC

Pre-checking volume protection status (only if volume protection is to be set)

Execute `acinq lv` (Logical volume information display command) with `-l` option added to check the volume protection status.

[Execution example]

```
> acinq lv -a ET001 -l
LV No  LV Name LV Size LV Type RG No Encrypt Virtual Size Copy Inhibit
-----
0x0001      1024M Open      4 -          - Yes
0x0002      1024M Open      4 -          - Yes
0x0003      1024M Open      2 -          - -
:
```

Releasing volume protection settings (only if volume protection is already set)

To restore data (copying to copy source), if the copy source logical volume has volume protection set, execute `acinhbit unset` (Volume protection settings release command) to release the volume protection settings.

[Execution example]

```
> acinhbit unset -v ET001/0x1
Successful completion
```

Checking volume protection status (only if volume protection status was changed)

Execute `acinq lv` (Logical volume information display command) with `-l` option added to check the volume protection status.

[Execution example]

```
> acinq lv -a ET001 -l
LV No  LV Name LV Size LV Type RG No Encrypt Virtual Size Copy Inhibit
-----
0x0001      1024M Open      4 -          - -
0x0002      1024M Open      4 -          - -
0x0003      1024M Open      2 -          - -
:
```

Start of EC

Starting an EC in the reverse direction (i.e., from the copy destination volume to the copy source volume).
The EC start method differs depending on whether there is an EC session already.

- If there is an EC session between the copy source volume and the copy destination volume:

1. Reverse the EC direction by using [acec reverse \(Synchronous high-speed copy reverse command\)](#).

[Execution example]

```
> acec reverse -g EcGroup

ET001/0x1:ET001/0x3
# DATE : 2008/06/25 12:00:00 - << EC Change >>

ET001/0x2:ET001/0x4
# DATE : 2008/06/25 12:00:02 - << EC Change >>

Succeeded : 2
Failed    : 0
```

Note

If the copy destination logical volume is protected, a warning message is output when [acec reverse \(Synchronous high-speed copy reverse command\)](#) is executed (the command completes successfully).

[Execution example]

```
> acec reverse -g RecEcGroup

ET001/0x1:ET001/0x3
# DATE : 2008/06/24 16:28:00 - << EC Change >>
Warning:ccm7001 The target logical volume is write protected. target logical
volume=ET001/0x1

Succeeded : 1
Failed    : 0
```

Execute [acinhibit unset \(Volume protection settings release command\)](#) to release the volume protection settings.

2. Restart the EC by using [acec resume \(Synchronous high-speed copy restart command\)](#) with -r option.

[Execution example]

```
> acec resume -g EcGroup -r

ET001/0x1:ET001/0x3
# DATE : 2008/06/25 12:01:00 - << EC Resumed >>

ET001/0x2:ET001/0x4
# DATE : 2008/06/25 12:01:02 - << EC Resumed >>

Succeeded : 2
Failed    : 0
```

- If there is no EC session between the copy source volume and the copy destination volume:

Start an EC from the copy destination volume to the copy source volume by using [acec start \(Synchronous high-speed copy start command\)](#) with -r option.

[Execution example]

```

> acec start -g EcGroup -r

ET001/0x1:ET001/0x3
# DATE : 2008/06/25 12:00:00 - << EC Started >>
# From:BoxID=303045343030304d3323232323234534353053323041232323234b44343033303633393030342323/
Olu=3/Adr_high=0/Adr_low=0/size_high=0/size_low=0
# To :BoxID=303045343030304d3323232323234534353053323041232323234b44343033303633393030342323/
Olu=1/Adr_high=0/Adr_low=0

ET001/0x2:ET001/0x4
# DATE : 2008/06/25 12:00:02 - << EC Started >>
# From:BoxID=303045343030304d3323232323234534353053323041232323234b44343033303633393030342323/
Olu=4/Adr_high=0/Adr_low=0/size_high=0/size_low=0
# To :BoxID=303045343030304d3323232323234534353053323041232323234b44343033303633393030342323/
Olu=2/Adr_high=0/Adr_low=0

Succeeded : 2
Failed : 0

```

Check the EC execution status

Check the execution status of the EC by using [acec query \(Synchronous high-speed copy status display command\)](#) with -r option. Check that all of the ECs in the copy group are in an equivalency maintenance state.

[Execution example]

```

> acec query -g EcGroup -r

Copy Group Name : EcGroup
Copy Group Type : EC
Disk Array Name : ET001 (00ETERNUSDXM##ET44S20A####HK000104#####)

Source    <=> Target    SID  EC Status      Copy Phase Copied Block
-----
ET001/0x1 <== ET001/0x3 0x1  "EC Executing" "Paired"      1048576
ET001/0x2 <== ET001/0x4 0x2  "EC Executing" "Paired"      1048576

```

Check the EC copy progress status

The EC copy progress status of the restoration can be checked by using [acec query \(Synchronous high-speed copy status display command\)](#) with -r and -progress options.

[Execution example]

```

> acec query -g EcGroup -r -progress

Copy Group Name : EcGroup
Copy Group Type : EC
Disk Array Name : ET001 (00ETERNUSDXM##ET44S20A####HK000104#####)

Source    <=> Target    Progress Copied Block Total Block
-----
ET001/0x1 <== ET001/0x3    100%      1048576    1048576
ET001/0x2 <== ET001/0x4    100%      1048576    1048576

```



Protection settings can be set for a logical volume even while copy is in progress. Therefore, volume protection can be set again without waiting for completion of the restore process (physical copy completion).

Suspend of EC

Temporarily suspend the EC by using [acec suspend \(Synchronous high-speed copy temporary suspension command\)](#) with -r option. The restoration process is now complete.

[Execution example]

```
> acec suspend -g EcGroup -r

ET001/0x1:ET001/0x3
# DATE : 2008/06/25 15:00:00 - << EC Suspended >>

ET001/0x2:ET001/0x4
# DATE : 2008/06/25 15:00:02 - << EC Suspended >>

Succeeded : 2
Failed : 0
```

Resume of EC

Reverse the EC by using [acec reverse \(Synchronous high-speed copy reverse command\)](#) with -r option in preparation for the next backup.

[Execution example]

```
> acec reverse -g EcGroup -r

ET001/0x1:ET001/0x3
# DATE : 2008/06/25 15:10:00 - << EC Change >>

ET001/0x2:ET001/0x4
# DATE : 2008/06/25 15:10:02 - << EC Change >>

Succeeded : 2
Failed : 0
```

3.2.2.3 Backup via REC

The procedure for executing backup via REC depends on which transfer mode is being used.

If the transfer mode is synchronous mode, refer to "[Backup in synchronous mode](#)".

If the transfer mode is Stack mode or Consistency mode, refer to "[Backup in Stack mode or Consistency mode](#)".

Information

Refer to "[Transfer mode](#)" for more information about these transfer modes.

Backup in synchronous mode

Use the following procedure to take a backup via REC in synchronous mode.

1. Pre-checking volume protection status (only if volume protection is to be set)

Execute [acinq lv \(Logical volume information display command\)](#) with -l option added to check the volume protection status.

[Execution example]

```
> acinq lv -a ET001 -l
LV No  LV Name LV Size LV Type RG No Encrypt Virtual Size Copy Inhibit
-----
0x0001      1024M Open      4 -      - -
0x0002      1024M Open      4 -      - -
```



```
0x0003      1024M Open      2 -          - -
:
```

2. Setting volume protection (only if volume protection is to be set)

Execute [acinhibit set \(Volume protection settings command\)](#) to set volume protection for the copy source logical volume.

[Execution example]

```
> acinhibit set -v ET001/0x1
Successful completion
```

3. Checking volume protection status (only if volume protection status was changed)

Execute [acing lv \(Logical volume information display command\)](#) with -l option added to check the volume protection status.

[Execution example]

```
> acing lv -a ET001 -l

LV No  LV Name LV Size LV Type RG No Encrypt Virtual Size Copy Inhibit
-----
0x0001      1024M Open      4 -          - Yes
0x0002      1024M Open      4 -          - Yes
0x0003      1024M Open      2 -          - -
:
```

4. Execute [acec start \(Synchronous high-speed copy start command\)](#) to start a REC from the copy source volume to the copy destination volume.

Specify the "-transfer sync" option to transfer data in synchronous mode.

[Execution example]

```
> acec start -g RecGroup -transfer sync

ET001/0x1:ET002/0x1
# DATE : 2008/06/24 07:00:00 - << EC Started >>
# From:BoxID=303045343030304d3323232323234534353053323041232323234b44343033303633393030342323/
Olu=1//Adr_high=0/Adr_low=0/size_high=0/size_low=0
# To :BoxID=303045383030304d3923232323234538393053323041232323234b4f343037303633393030332323/Olu=1/
Adr_high=0/Adr_low=0

ET001/0x2:ET002/0x2
# DATE : 2008/06/24 07:00:02 - << EC Started >>
# From:BoxID=303045343030304d3323232323234534353053323041232323234b44343033303633393030342323/Olu=2/
Adr_high=0/Adr_low=0/size_high=0/size_low=0
# To :BoxID=303045383030304d3923232323234538393053323041232323234b4f343037303633393030332323/Olu=2/
Adr_high=0/Adr_low=0

Succeeded : 2
Failed : 0
```

5. Execute [acec query \(Synchronous high-speed copy status display command\)](#) to check that all of the RECs in the copy group are in an equivalency maintenance state.

[Execution example]

```
> acec query -g RecGroup

Copy Group Name      : RecGroup
Copy Group Type      : REC
Disk Array Name      : ET001 (00ETERNUSDXM##ET44S20A####HK000104#####)
Remote Disk Array Name : ET002 (00ETERNUSDXM##ET87S20A####NC4110699004##)
```

Source	<=>	Target	SID(RSID)	EC Status	Copy Phase	Copied	Block	Rcv	Split	Xfer
ET001/0x1	==>	ET002/0x1	0x49(0x10)	"EC Executing"	"Paired"	1048576	auto	auto	sync	
ET001/0x2	==>	ET002/0x2	0x4A(0x11)	"EC Executing"	"Paired"	1048576	auto	auto	sync	

The REC copy progress status of the backup can be checked by using [acec query \(Synchronous high-speed copy status display command\)](#) with -progress option.

[Execution example]

```
> acec query -g RecEcGroup -progress

Copy Group Name      : RecEcGroup
Copy Group Type      : REC
Disk Array Name      : ET001 (00ETERNUSDXM##ET44S20A####HK000104#####)
Remote Disk Array Name : ET002 (00ETERNUSDXH##ET87S20A####NC4110699004##)

Source    <=> Target    Progress Copied Block Total Block
-----
ET001/0x1 ==> ET002/0x1      0%          0      1048576
ET001/0x2 ==> ET002/0x2    100%     1048576     1048576
```

- Temporarily suspend the REC by using [acec suspend \(Synchronous high-speed copy temporary suspension command\)](#).

The backup process is now complete.

[Execution example]

```
> acec suspend -g RecGroup

ET001/0x1:ET002/0x1
# DATE : 2008/06/25 00:00:00 - << EC Suspended >>

ET001/0x2:ET002/0x2
# DATE : 2008/06/25 00:00:02 - << EC Suspended >>

Succeeded : 2
Failed    : 0
```

For suspend many RECs at the same time by using the concurrent suspend function, execute [acec suspend \(Synchronous high-speed copy temporary suspension command\)](#) with -concur option.

[Execution example]

```
> acec suspend -g RecEcGroup -concur
Successful completion.
```

- If backup data is no longer required, restart the REC by using [acec resume \(Synchronous high-speed copy restart command\)](#) in preparation for the next backup.

[Execution example]

```
> acec resume -g RecGroup

ET001/0x1:ET002/0x1
# DATE : 2008/06/25 07:00:00 - << EC Resumed >>

ET001/0x2:ET002/0x2
# DATE : 2008/06/25 07:00:02 - << EC Resumed >>

Succeeded : 2
Failed    : 0
```

Backup in Stack mode or Consistency mode

Use the following procedure to take a backup via REC in Stack mode or Consistency mode.

1. Pre-checking volume protection status (only if volume protection is to be set)

Execute [acinq lv \(Logical volume information display command\)](#) with -l option added to check the volume protection status.

[Execution example]

```
> acinq lv -a ET001 -l
LV No  LV Name LV Size LV Type RG No Encrypt Virtual Size Copy Inhibit
-----
0x0001      1024M Open      4 -      - -
0x0002      1024M Open      4 -      - -
0x0003      1024M Open      2 -      - -
:
```

2. Setting volume protection (only if volume protection is to be set)

Execute [acinhbit set \(Volume protection settings command\)](#) to set volume protection for the copy source logical volume.

[Execution example]

```
> acinhbit set -v ET001/0x1
Successful completion
```

3. Checking volume protection status (only if volume protection is to be set)

Execute [acinq lv \(Logical volume information display command\)](#) with -l option added to check the volume protection status.

[Execution example]

```
> acinq lv -a ET001 -l
LV No  LV Name LV Size LV Type RG No Encrypt Virtual Size Copy Inhibit
-----
0x0001      1024M Open      4 -      - Yes
0x0002      1024M Open      4 -      - Yes
0x0003      1024M Open      2 -      - -
:
```

4. Execute [acec start \(Synchronous high-speed copy start command\)](#) to start a REC from the copy source volume to the copy destination volume.

- To copy in Stack mode

Specify -transfer stack option.

[Execution example]

```
> acec start -g RecGroup -transfer stack

ET001/0x1:ET002/0x1
# DATE : 2008/06/24 07:00:00 - << EC Started >>
#
From:BoxID=303045343030304d33232323234534353053323041232323234b44343033303633393030342323
/Olu=1/Adr_high=0/Adr_low=0/size_high=0/size_low=0
#
To :BoxID=303045383030304d3923232323234538393053323041232323234b4f343037303633393030332323/
/Olu=1/Adr_high=0/Adr_low=0

ET001/0x2:ET002/0x2
```

```
# DATE : 2008/06/24 07:00:02 - << EC Started >>
#
From:BoxID=303045343030304d3323232323234534353053323041232323234b44343033303633393030342323
/Olu=2/Adr_high=0/Adr_low=0/size_high=0/size_low=0
#
To :BoxID=303045383030304d3923232323234538393053323041232323234b4f343037303633393030332323/
Olu=2/Adr_high=0/Adr_low=0

Succeeded : 2
Failed : 0
```

- To copy in Consistency mode
Specify -transfer consist option.

[Execution example]

```
> acec start -g RecGroup -transfer consist

ET001/0x1:ET002/0x1
# DATE : 2008/06/24 07:00:00 - << EC Started >>
#
From:BoxID=303045343030304d3323232323234534353053323041232323234b44343033303633393030342323
/Olu=1/Adr_high=0/Adr_low=0/size_high=0/size_low=0
#
To :BoxID=303045383030304d3923232323234538393053323041232323234b4f343037303633393030332323/
Olu=1/Adr_high=0/Adr_low=0

ET001/0x2:ET002/0x2
# DATE : 2008/06/24 07:00:02 - << EC Started >>
#
From:BoxID=303045343030304d3323232323234534353053323041232323234b44343033303633393030342323
/Olu=2/Adr_high=0/Adr_low=0/size_high=0/size_low=0
#
To :BoxID=303045383030304d3923232323234538393053323041232323234b4f343037303633393030332323/
Olu=2/Adr_high=0/Adr_low=0

Succeeded : 2
Failed : 0
```

5. Execute **acec query (Synchronous high-speed copy status display command)** to check the status of all of the RECs in the copy group.

- In the case of Stack mode

Check that the copied block count and the entire block count are the same by executing the command with -progress option.

[Execution example]

```
> acec query -g RECGroup -progress

Copy Group Name      : RECGroup
Copy Group Type      : REC
Disk Array Name      : ET001 (00ETERNUSDXM##ET44S20A####HK000104#####)
Remote Disk Array Name : ET002 (00ETERNUSDXH##ET87S20A####NC4110699004##)

Source  <=> Target    Progress Copied Block Total Block
-----
ET001/0x1 ==> ET002/0x1    100%      1048576    1048576
ET001/0x2 ==> ET002/0x2    100%      1048576    1048576
```

- In the case of Consistency mode

Check that the copy phases are in an equivalency maintenance state.

[Execution example]

```

> acec query -g RecGroup

Copy Group Name      : RecGroup
Copy Group Type      : REC
Disk Array Name      : ET001 (00ETERNUSDXM##ET44S20A####HK000104#####)
Remote Disk Array Name : ET002 (00ETERNUSDXH##ET87S20A####NC4110699004##)

Source  <=> Target  SID(RSID)  EC Status      Copy Phase Copied Block Rcv  Split
Xfer
-----
-----
ET001/0x1 ==> ET002/0x1 0x49(0x10) "EC Executing" "Paired"      1048576 auto ----
consist
ET001/0x2 ==> ET002/0x2 0x4A(0x11) "EC Executing" "Paired"      1048576 auto ----
consist

```

The REC copy progress status of the backup can be checked by using [acec query \(Synchronous high-speed copy status display command\)](#) with -progress option.

[Execution example]

```

> acec query -g RECGroup -progress

Copy Group Name      : RECGroup
Copy Group Type      : REC
Disk Array Name      : ET001 (00ETERNUSDXM##ET44S20A####HK000104#####)
Remote Disk Array Name : ET002 (00ETERNUSDXH##ET87S20A####NC4110699004##)

Source  <=> Target  Progress Copied Block Total Block
-----
-----
ET001/0x1 ==> ET002/0x1      45%      471859      1048576
ET001/0x2 ==> ET002/0x2     100%     1048576     1048576

```

6. Forcibly and temporarily suspend the REC by using [acec suspend \(Synchronous high-speed copy temporary suspension command\)](#) with -force option.

[Execution example]

```

> acec suspend -g RecGroup -force

ET001/0x1:ET002/0x1
# DATE : 2008/06/25 00:00:00 - << EC Suspended >>

ET001/0x2:ET002/0x2
# DATE : 2008/06/25 00:00:02 - << EC Suspended >>

Succeeded : 2
Failed    : 0

```

7. Execute [acec change \(Synchronous high-speed copy mode change command\)](#) to change the REC transfer mode to "through".

[Execution example]

```

> acec change -g RecGroup -transfer through

ET001/0x1:ET002/0x1
# DATE : 2008/06/25 00:01:00 - << EC Change >>

ET001/0x2:ET002/0x2
# DATE : 2008/06/25 00:01:02 - << EC Change >>

```

```
Succeeded : 2
Failed    : 0
```

8. Execute [acec resume \(Synchronous high-speed copy restart command\)](#) to restart RECs.

[Execution example]

```
> acec resume -g RecGroup

ET001/0x1:ET002/0x1
# DATE : 2008/06/25 00:02:00 - << EC Resumed >>

ET001/0x2:ET002/0x2
# DATE : 2008/06/25 00:02:02 - << EC Resumed >>

Succeeded : 2
Failed    : 0
```

9. Execute [acec query \(Synchronous high-speed copy status display command\)](#) to check that all of the RECs in the copy group are in an equivalency maintenance state.

[Execution example]

```
> acec query -g RecGroup

Copy Group Name      : RecGroup
Copy Group Type      : REC
Disk Array Name      : ET001 (00ETERNUSDXM##ET44S20A####HK000104#####)
Remote Disk Array Name : ET002 (00ETERNUSDXH##ET87S20A####NC4110699004##)

Source  <=> Target  SID(RSID)  EC Status      Copy Phase Copied Block Rcv  Split Xfer
-----
-----
ET001/0x1 ==> ET002/0x1 0x49(0x10) "EC Executing" "Paired"      1048576 auto ---- through
ET001/0x2 ==> ET002/0x2 0x4A(0x11) "EC Executing" "Paired"      1048576 auto ---- through
```

10. Temporarily suspend the REC by using [acec suspend \(Synchronous high-speed copy temporary suspension command\)](#).

The backup process is now complete.

[Execution example]

```
> acec suspend -g RecGroup

ET001/0x1:ET002/0x1
# DATE : 2008/06/25 00:10:00 - << EC Suspended >>

ET001/0x2:ET002/0x2
# DATE : 2008/06/25 00:10:02 - << EC Suspended >>

Succeeded : 2
Failed    : 0
```

11. If backup data is no longer required, execute [acec change \(Synchronous high-speed copy mode change command\)](#) to change the transfer mode back to the original mode (either Stack mode or Consistency mode) in preparation for the next backup.

- To change to Stack mode

[Execution example]

```
> acec change -g RecGroup -transfer stack

ET001/0x1:ET002/0x1
```

```
# DATE : 2008/06/25 07:00:00 - << EC Change >>
ET001/0x2:ET002/0x2
# DATE : 2008/06/25 07:00:02 - << EC Change >>

Succeeded : 2
Failed    : 0
```

- To change to Consistency mode

[Execution example]

```
> acec change -g RecGroup -transfer consist

ET001/0x1:ET002/0x1
# DATE : 2008/06/25 07:00:00 - << EC Change >>

ET001/0x2:ET002/0x2
# DATE : 2008/06/25 07:00:02 - << EC Change >>

Succeeded : 2
Failed    : 0
```

- Restart the REC using [acec resume \(Synchronous high-speed copy restart command\)](#).

[Execution example]

```
> acec resume -g RecGroup

ET001/0x1:ET002/0x1
# DATE : 2008/06/25 07:01:00 - << EC Resumed >>

ET001/0x2:ET002/0x2
# DATE : 2008/06/25 07:01:02 - << EC Resumed >>

Succeeded : 2
Failed    : 0
```

3.2.2.4 Restore on REC backup environment

The procedure for executing restorations on REC backup environment depends on which transfer mode is being used.

If the transfer mode is synchronous mode, refer to "[Restore in synchronous mode](#)".

If the transfer mode is Stack mode or Consistency mode, refer to "[Restore in Stack mode or Consistency mode](#)".



Information

Refer to "[Transfer mode](#)" for more information about these transfer modes.

Restore in synchronous mode

Execute restoration via REC using the following procedures.

1. Pre-checking volume protection status (only if volume protection is to be set)

Execute [acinq lv \(Logical volume information display command\)](#) with -l option added to check the volume protection status.

[Execution example]

```

> acinq lv -a ET001 -l
LV No LV Name LV Size LV Type RG No Encrypt Virtual Size Copy Inhibit
-----
0x0001          1024M Open      4 -          - Yes
0x0002          1024M Open      4 -          - Yes
0x0003          1024M Open      2 -          - -
:

```

2. Releasing volume protection settings (only if volume protection is already set)

To restore data (copying to copy source), if the copy source logical volume has volume protection set, execute [acinhbit unset \(Volume protection settings release command\)](#) to release the volume protection settings.

[Execution example]

```

> acinhbit unset -v ET001/0x1
Successful completion

```

3. Checking volume protection status (only if volume protection is already set)

Execute [acinq lv \(Logical volume information display command\)](#) with -l option added to check the volume protection status.

[Execution example]

```

> acinq lv -a ET001 -l
LV No LV Name LV Size LV Type RG No Encrypt Virtual Size Copy Inhibit
-----
0x0001          1024M Open      4 -          - -
0x0002          1024M Open      4 -          - -
0x0003          1024M Open      2 -          - -
:

```

4. Starting an REC in the reverse direction (i.e., from the copy destination volume to the copy source volume).

The EC start method differs depending on whether there is a REC session already.

- If there is a REC session between the copy source volume and the copy destination volume:

- a. Reverse the REC copy direction using [acec reverse \(Synchronous high-speed copy reverse command\)](#).

[Execution example]

```

> acec reverse -g RecGroup

ET001/0x1:ET002/0x1
# DATE : 2008/06/25 12:00:00 - << EC Change >>

ET001/0x2:ET002/0x2
# DATE : 2008/06/25 12:00:02 - << EC Change >>

Succeeded : 2
Failed    : 0

```

 Note

If the copy destination logical volume is protected, a warning message is output when [acec reverse \(Synchronous high-speed copy reverse command\)](#) is executed (the command completes successfully).

[Execution example]

```

> acec reverse -g RecEcGroup

```



```

ET001/0x1:ET002/0x3
# DATE : 2008/06/24 16:28:00 - << EC Change >>
Warning:ccm7001 The target logical volume is write protected. target logical
volume=ET001/0x1

Succeeded : 1
Failed    : 0

```

Execute [acinhbit unset \(Volume protection settings release command\)](#) to release the volume protection settings.

- b. Restart the REC by using [acec resume \(Synchronous high-speed copy restart command\)](#) with -r option.

[Execution example]

```

> acec resume -g RecGroup -r

ET001/0x1:ET002/0x1
# DATE : 2008/06/25 12:01:00 - << EC Resumed >>

ET001/0x2:ET002/0x2
# DATE : 2008/06/25 12:00:02 - << EC Resumed >>

Succeeded : 2
Failed    : 0

```

- If there is no REC session between the copy source volume and the copy destination volume:

Start an REC from the copy destination volume to the copy source volume by using [acec start \(Synchronous high-speed copy start command\)](#) with -r option.

[Execution example]

```

> acec start -g RecGroup -r -transfer sync

ET001/0x1:ET002/0x1
# DATE : 2008/06/25 12:00:00 - << EC Started >>
#
From:BoxID=303045383030304d3923232323234538393053323041232323234b4f343037303633393030332323/
Olu=1/Adr_high=0/Adr_low=0/size_high=0/size_low=0
# To  :BoxID=303045343030304d3323232323234534353053323041232323234b44343033303633393030342323/
Olu=1/Adr_high=0/Adr_low=0

ET001/0x2:ET002/0x2
# DATE : 2008/06/25 12:00:02 - << EC Started >>
#
From:BoxID=303045383030304d3923232323234538393053323041232323234b4f343037303633393030332323/
Olu=2/Adr_high=0/Adr_low=0/size_high=0/size_low=0
# To  :BoxID=303045343030304d3323232323234534353053323041232323234b44343033303633393030342323/
Olu=2/Adr_high=0/Adr_low=0

Succeeded : 2
Failed    : 0

```

5. Check the status of all of the RECs in the copy group using [acec query \(Synchronous high-speed copy status display command\)](#).

[Execution example]

```

> acec query -g RecGroup -r

Copy Group Name      : RecGroup
Copy Group Type      : REC
Disk Array Name      : ET001 (00ETERNUSDXM##ET44S20A####HK000104#####)
Remote Disk Array Name : ET002 (00ETERNUSDXH##ET87S20A####NC4110699004##)

```

Source	<=>	Target	SID(RSID)	EC Status	Copy Phase	Copied	Block Rcv	Split	Xfer
ET001/0x1	<==	ET002/0x1	0x49(0x10)	"EC Executing"	"Copying"	1048576	auto	----	sync
ET001/0x2	<==	ET002/0x2	0x4A(0x11)	"EC Executing"	"Copying"	1048576	auto	----	sync

- Temporarily suspend the REC by using [acec suspend \(Synchronous high-speed copy temporary suspension command\)](#) with -r option.

The restoration process is now complete.

[Execution example]

```
> acec suspend -g RecGroup -r

ET001/0x1:ET002/0x1
# DATE : 2008/06/25 15:00:00 - << EC Suspended >>

ET001/0x2:ET002/0x2
# DATE : 2008/06/25 15:00:02 - << EC Suspended >>

Succeeded : 2
Failed : 0
```

- Reverse the REC copy direction by using [acec reverse \(Synchronous high-speed copy reverse command\)](#) with -r option in preparation for the next backup.

[Execution example]

```
> acec reverse -g RecGroup -r

ET001/0x1:ET002/0x1
# DATE : 2008/06/25 15:10:00 - << EC Change >>

ET001/0x2:ET002/0x2
# DATE : 2008/06/25 15:10:02 - << EC Change >>

Succeeded : 2
Failed : 0
```

Point

The copy destination logical volumes for a REC session cannot have volume protection set.

If the REC session is cancelled after restoration, volume protection can be set.

Restore in Stack mode or Consistency mode

Execute restoration via REC using the following procedures.

- Pre-checking volume protection status (only if volume protection is to be set)

Execute [acinq lv \(Logical volume information display command\)](#) with -l option added to check the volume protection status.

[Execution example]

```
> acinq lv -a ET001 -l
LV No  LV Name LV Size LV Type RG No Encrypt Virtual Size Copy Inhibit
-----
0x0001      1024M Open      4 -          - Yes
0x0002      1024M Open      4 -          - Yes
```

```

0x0003      1024M Open      2 -          - -
:

```

2. Releasing volume protection settings (only if volume protection is already set)

To restore data (copying to copy source), if the copy source logical volume has volume protection set, execute [acinhibit unset \(Volume protection settings release command\)](#) to release the volume protection settings.

[Execution example]

```

> acinhibit unset -v ET001/0x1
Successful completion

```

3. Checking volume protection status (only if volume protection status was changed)

Execute [acing lv \(Logical volume information display command\)](#) with -l option added to check the volume protection status.

[Execution example]

```

> acinq lv -a ET001 -l

LV No  LV Name LV Size LV Type RG No Encrypt Virtual Size Copy Inhibit
-----
0x0001      1024M Open      4 -          - -
0x0002      1024M Open      4 -          - -
0x0003      1024M Open      2 -          - -
:

```

4. Starting an REC in the reverse direction (i.e., from the copy destination volume to the copy source volume).

The EC start method differs depending on whether there is a REC session already.

- If there is a REC session between the copy source volume and the copy destination volume:

- a. Check the transfer mode of the REC by using [acec query \(Synchronous high-speed copy status display command\)](#).

If necessary, execute [acec change \(Synchronous high-speed copy mode change command\)](#) as required to change to another transfer mode (Stack mode or Consistency mode).

In the case of Stack mode

[Execution example]

```

> acec change -g RecGroup -transfer stack

ET001/0x1:ET002/0x1
# DATE : 2008/06/25 12:01:00 - << EC Change >>

ET001/0x2:ET002/0x2
# DATE : 2008/06/25 12:01:02 - << EC Change >>

Succeeded : 2
Failed    : 0

```

In the case of Consistency mode

[Execution example]

```

> acec change -g RecGroup -transfer consist

ET001/0x1:ET002/0x1
# DATE : 2008/06/25 12:01:00 - << EC Change >>

ET001/0x2:ET002/0x2
# DATE : 2008/06/25 12:01:02 - << EC Change >>

```

```
Succeeded : 2
Failed    : 0
```

- b. Reverse the REC direction by using [acec reverse \(Synchronous high-speed copy reverse command\)](#).

[Execution example]

```
> acec reverse -g RecGroup

ET001/0x1:ET002/0x1
# DATE : 2008/06/25 12:00:00 - << EC Change >>

ET001/0x2:ET002/0x2
# DATE : 2008/06/25 12:00:02 - << EC Change >>

Succeeded : 2
Failed    : 0
```

Note

If the copy destination logical volume is protected, a warning message is output when [acec reverse \(Synchronous high-speed copy reverse command\)](#) is executed (the command completes successfully).

[Execution example]

```
> acec reverse -g RecEcGroup

ET001/0x1:ET002/0x3
# DATE : 2008/06/24 16:28:00 - << EC Change >>
Warning:ccm7001 The target logical volume is write protected. target logical
volume=ET001/0x1

Succeeded : 1
Failed    : 0
```

Execute [acinhibit unset \(Volume protection settings release command\)](#) to release the volume protection settings.

- c. Restart the REC by using [acec resume \(Synchronous high-speed copy restart command\)](#) with -r option.

[Execution example]

```
> acec resume -g RecGroup -r

ET001/0x1:ET002/0x1
# DATE : 2008/06/25 12:02:00 - << EC Resumed >>

ET001/0x2:ET002/0x2
# DATE : 2008/06/25 12:02:02 - << EC Resumed >>

Succeeded : 2
Failed    : 0
```

- If there is no REC session between the copy source volume and the copy destination volume:

Start a REC from the copy destination volume to the copy source volume by using [acec start \(Synchronous high-speed copy start command\)](#) with -r option.

- In the case of Stack mode

[Execution example]

```

> acec start -g RecGroup -r -transfer stack

ET001/0x1:ET002/0x1
# DATE : 2008/06/25 12:00:00 - << EC Started >>
#
From:BoxID=303045383030304d3923232323234538393053323041232323234b4f34303730363339303033232
3/Olu=1/Adr_high=0/Adr_low=0/size_high=0/size_low=0
#
To :BoxID=303045343030304d3323232323234534353053323041232323234b4434303330363339303034232
3/Olu=1/Adr_high=0/Adr_low=0

ET001/0x2:ET002/0x2
# DATE : 2008/06/25 12:00:02 - << EC Started >>
#
From:BoxID=303045383030304d3923232323234538393053323041232323234b4f34303730363339303033232
3/Olu=2/Adr_high=0/Adr_low=0/size_high=0/size_low=0
#
To :BoxID=303045343030304d3323232323234534353053323041232323234b4434303330363339303034232
3/Olu=2/Adr_high=0/Adr_low=0

Succeeded : 2
Failed : 0

```

- In the case of Consistency mode

[Execution example]

```

> acec start -g RecGroup -r -transfer consist

ET001/0x1:ET002/0x1
# DATE : 2008/06/25 12:00:00 - << EC Started >>
#
From:BoxID=303045383030304d3923232323234538393053323041232323234b4f34303730363339303033232
3/Olu=1/Adr_high=0/Adr_low=0/size_high=0/size_low=0
#
To :BoxID=303045343030304d3323232323234534353053323041232323234b4434303330363339303034232
3/Olu=1/Adr_high=0/Adr_low=0

ET001/0x2:ET002/0x2
# DATE : 2008/06/25 12:00:02 - << EC Started >>
#
From:BoxID=303045383030304d3923232323234538393053323041232323234b4f34303730363339303033232
3/Olu=2/Adr_high=0/Adr_low=0/size_high=0/size_low=0
#
To :BoxID=303045343030304d3323232323234534353053323041232323234b4434303330363339303034232
3/Olu=2/Adr_high=0/Adr_low=0

Succeeded : 2
Failed : 0

```

5. Check the status of all of the RECs in the copy group by using [acec query \(Synchronous high-speed copy status display command\)](#) with -r option.

- In the case of Stack mode

Check that the copied block count and the entire block count are the same by executing the command with -progress option.

[Execution example]

```

> acec query -g RECGroup -r -progress

Copy Group Name      : RECGroup
Copy Group Type     : REC

```

```

Disk Array Name      : ET001 (00ETERNUSDXM##ET44S20A####HK000104#####)
Remote Disk Array Name : ET002 (00ETERNUSDXH##ET87S20A####NC4110699004##)

Source    <=> Target    Progress Copied Block Total Block
-----
ET001/0x1 <== ET002/0x1    100%      1048576    1048576
ET001/0x2 <== ET002/0x2    100%      1048576    1048576

```

- In the case of Consistency mode

Check that the copy phases are in an equivalency maintenance state.

[Execution example]

```

> acec query -g RecGroup -r

Copy Group Name      : RecGroup
Copy Group Type      : REC
Disk Array Name      : ET001 (00ETERNUSDXM##ET44S20A####HK000104#####)
Remote Disk Array Name : ET002 (00ETERNUSDXH##ET87S20A####NC4110699004##)

Source    <=> Target    SID(RSID)  EC Status    Copy Phase Copied Block Rcv  Split Xfer
-----
ET001/0x1 <== ET002/0x1 0x49(0x10) "EC Executing" "Paired"      1048576 auto ----
consist
ET001/0x2 <== ET002/0x2 0x4A(0x11) "EC Executing" "Paired"      1048576 auto ----
consist

```

6. Forcibly and temporarily suspend the REC by using [acec suspend \(Synchronous high-speed copy temporary suspension command\)](#) with -force option.

[Execution example]

```

> acec suspend -g RecGroup -r -force

ET001/0x1:ET002/0x1
# DATE : 2008/06/25 15:00:00 - << EC Suspended >>

ET001/0x2:ET002/0x2
# DATE : 2008/06/25 15:00:02 - << EC Suspended >>

Succeeded : 2
Failed    : 0

```

7. Execute [acec change \(Synchronous high-speed copy mode change command\)](#) to change the REC transfer mode to "through".

[Execution example]

```

> acec change -g RecGroup -r -transfer through

ET001/0x1:ET002/0x1
# DATE : 2008/06/25 15:01:00 - << EC Change >>

ET001/0x2:ET002/0x2
# DATE : 2008/06/25 15:01:02 - << EC Change >>

Succeeded : 2
Failed    : 0

```

8. Restart the REC by using [acec resume \(Synchronous high-speed copy restart command\)](#) with -r option.

[Execution example]

```

> acec resume -g RecGroup -r

ET001/0x1:ET002/0x1
# DATE : 2008/06/25 15:02:00 - << EC Resumed >>

ET001/0x2:ET002/0x2
# DATE : 2008/06/25 15:02:02 - << EC Resumed >>

Succeeded : 2
Failed    : 0

```

9. Execute [acec query \(Synchronous high-speed copy status display command\)](#) with -r option to check that all of the REC pairs in the copy group are in an equivalency maintenance state.

[Execution example]

```

> acec query -g RecGroup -r

Copy Group Name      : RecGroup
Copy Group Type      : REC
Disk Array Name      : ET001 (00ETERNUSDXM##ET44S20A####HK000104#####)
Remote Disk Array Name : ET002 (00ETERNUSDXH##ET87S20A####NC4110699004##)

Source  <=> Target  SID(RSID)  EC Status      Copy Phase Copied Block Rcv  Split Xfer
-----
-----
ET001/0x1 <== ET002/0x1 0x49(0x10) "EC Executing" "Paired"          1048576 auto ---- through
ET001/0x2 <== ET002/0x2 0x4A(0x11) "EC Executing" "Paired"          1048576 auto ---- through

```

10. Temporarily suspend the REC by using [acec suspend \(Synchronous high-speed copy temporary suspension command\)](#) with -r option.

The restoration process is now complete.

[Execution example]

```

> acec suspend -g RecGroup -r

ET001/0x1:ET002/0x1
# DATE : 2008/06/25 15:10:00 - << EC Suspended >>

ET001/0x2:ET002/0x2
# DATE : 2008/06/25 15:10:02 - << EC Suspended >>

Succeeded : 2
Failed    : 0

```

11. Execute [acec change \(Synchronous high-speed copy mode change command\)](#) with -r option to change the transfer mode back to the original mode (either Stack mode or Consistency mode) in preparation for the next backup.

- In the case of Stack mode

[Execution example]

```

> acec change -g RecGroup -r -transfer stack

ET001/0x1:ET002/0x1
# DATE : 2008/06/25 15:20:00 - << EC Change >>

ET001/0x2:ET002/0x2
# DATE : 2008/06/25 15:20:02 - << EC Change >>

```

```
Succeeded : 2
Failed    : 0
```

- In the case of Consistency mode

[Execution example]

```
> acec change -g RecGroup -r -transfer consist

ET001/0x1:ET002/0x1
# DATE : 2008/06/25 15:20:00 - << EC Change >>

ET001/0x2:ET002/0x2
# DATE : 2008/06/25 15:20:02 - << EC Change >>

Succeeded : 2
Failed    : 0
```

12. Reverse the REC copy direction by using [acec reverse \(Synchronous high-speed copy reverse command\)](#) with -r option.

[Execution example]

```
> acec reverse -g RecGroup -r

ET001/0x1:ET002/0x1
# DATE : 2008/06/25 15:21:00 - << EC Change >>

ET001/0x2:ET002/0x2
# DATE : 2008/06/25 15:21:02 - << EC Change >>

Succeeded : 2
Failed    : 0
```



Point

.....

The copy destination logical volumes for a REC session cannot have volume protection set.

If the REC session is cancelled after restoration, volume protection can be set.

.....

3.2.2.5 REC operating modes

This section explains the REC operating modes.

There are three types of operating modes for copies that use the REC function, as listed below. One of the following operating modes can be specified to match the operation.

- Transfer mode
- Recovery mode
- Split mode

Transfer mode

This mode relates to the method that the REC uses to transfer data.

Table 3.1 Types of transfer modes

Transfer method	Transfer mode	Explanation
Synchronous transfer method	Synchronous	<p>In this mode, responses to write requests from the server do not return as "complete" until data has been written to the copy source volume and copied to the destination volume.</p> <p>Synchronizing data copies with writes to the copy source guarantees the integrity of the data on both the copy source volume and the copy destination volume when the copy completes.</p> <p>This mode is suitable to RECs within sites with short delay times, because it has a large impact on the performance of write accesses from the server.</p>
Asynchronous transfer methods	Stack	<p>This mode has only a small impact on the time taken to respond to the server because it only records the position of the block that has been updated before returning "complete" to the server. The data for this block is transferred using an independent transfer engine.</p> <p>Copies can be executed even when there is only limited bandwidth, but in this case the amount of data that has not been transferred may build up.</p>
	Consistency	<p>This mode guarantees the sequence of transfers between copy sessions for the copy destination ETERNUS Disk storage system, and is suitable for operations, such as on databases, that perform mirroring using copies that consist of multiple areas.</p> <p>This mode uses part of cache memory for transfer buffers. Data is transferred to the copy destination by first "storing" a block of data to be copied in a transmission transfer buffer and then using a reception transfer buffer to "expand" the data that has been transferred.</p>
	Through	<p>This mode is for transferring data that has not been transferred when copies in Stack mode or Consistency mode are stopped or suspended.</p>

Recovery mode

Recovery mode is an operating mode for performing recovery following REC communication errors. The following operating modes can be selected.

Table 3.2 Types of recovery mode

Recovery mode	Explanation
Automatic Recovery	In this mode, REC sessions recover automatically when the line that was disconnected due to a communications error is connected again.
Manual Recovery	In this mode, REC sessions must be recovered manually even if the line that was disconnected due to a communications error is connected again.

Split mode

Split mode is an operating mode used when the line path is disconnected due to a line error or disaster, in situations where an REC in synchronous mode is in an equivalency maintenance state. The following operating modes can be selected.

Table 3.3 Types of split mode

Split mode	Explanation
Automatic Split	In this mode, if a communication error occurs for some reason while the REC is executing, the REC session will be automatically disconnected and update processing to the copy source will continue.
Manual Split	<p>In this mode, if a communication error occurs for some reason while the REC is executing, the operator will be asked to choose whether to disconnect the REC session.</p> <p>This results in reduced availability, but it also minimizes data losses when disasters occur, because there is no discrepancy between the data on the copy source and the data on the copy destination.</p>

3.2.2.6 Backup via REC using initial copy skip

The initial copy skip function is used when an initial copy cannot be executed by reason of network bandwidth shortage.

Change the REC synchronous processing to the suspend status by executing [acec start \(Synchronous high-speed copy start command\)](#) with `-skip` option. In this case, the data of copy source volume is not copied to copy destination volume.

[Execution example]

```
> acec start -g RecEcGroup -skip

ET001/0x1:ET002/0x1
# DATE : 2008/06/24 16:28:00 - << EC Started >>
#
From:BoxID=303045343030304d3323232323234534353053323041232323234b44343033303633393030342323/Olu=1/
Adr_high=0/Adr_low=0/size_high=0/size_low=0
#
To :BoxID=303045383030304d3923232323234538393053323041232323234b4f343037303633393030332323/Olu=1/
Adr_high=0/Adr_low=0

ET001/0x2:ET002/0x2
# DATE : 2008/06/24 16:28:00 - << EC Started >>
#
From:BoxID=303045343030304d3323232323234534353053323041232323234b44343033303633393030342323/Olu=2/
Adr_high=0/Adr_low=0/size_high=0/size_low=0
#
To :BoxID=303045383030304d3923232323234538393053323041232323234b4f343037303633393030332323/Olu=2/
Adr_high=0/Adr_low=0

Succeeded : 2
Failed : 0
```

Execute [acec query \(Synchronous high-speed copy status display command\)](#) to check the status of all of the RECs in the copy group.

[Execution example]

```
> acec query -g RecEcGroup

Copy Group Name      : RecEcGroup
Copy Group Type      : REC
Disk Array Name      : ET001 (00ETERNUSDXM##ET44S20A####HK000104#####)
Remote Disk Array Name : ET002 (00ETERNUSDXH##ET87S20A####NC4110699004##)

Source    <=> Target    SID(RSID)  EC Status   Copy Phase Copied Block Rcv  Split Xfer
-----
ET001/0x1 ==> ET002/0x1 0x4B(0x12) "EC Suspend" "Paired"      1048576 auto auto  through
ET001/0x2 ==> ET002/0x2 0x4A(0x11) "EC Suspend" "Paired"      1048576 auto auto  through
```

After changing the REC synchronous processing to the suspend status, back up the data from copy source volume to tape and restore its data from tape to copy destination volume.

Restart the RECs suspended by using initial copy skip function, by executing [acec resume \(Synchronous high-speed copy restart command\)](#) with `-remain` option.

[Execution example]

```
> acec resume -g RecEcGroup -remain

ET001/0x1:ET002/0x1
# DATE : 2008/06/24 16:28:00 - << EC Resumed >>

ET001/0x2:ET002/0x2
# DATE : 2008/06/24 16:28:00 - << EC Resumed >>
```

```
Succeeded : 2
Failed    : 0
```

3.2.2.7 Restore on REC backup environment using initial copy skip

Refer to "[3.2.2.4 Restore on REC backup environment](#)", for the restoration procedure on REC backup environment using initial copy skip function.

3.2.2.8 Using Concurrent suspend function on EC/REC

The concurrent suspend function simultaneously suspends multiple EC/REC sessions for ETERNUS Disk storage system. By using this function, a copy with consistency can be easily taken.

To use the concurrent suspend function, execute [acec suspend \(Synchronous high-speed copy temporary suspension command\)](#) with -concur option. Refer to "[3.2.2.1 Backup via EC](#)" or "[3.2.2.3 Backup via REC](#)" for the operating methods.



Note

- The concurrent suspend function of REC can be used only when the transfer mode is not Stack mode.
- The concurrent suspend function of REC is feasible under the following conditions:
If an ETERNUS Disk storage system is any of the following systems, both storage systems that execute REC are registered in "Registering devices operated by Copy command via SAN" or "Registering devices operated by Copy command via LAN" and the ETERNUS name specified by the -a option of [acgroup create \(Copy group creation command\)](#) points to the copy source of the copy pair.
 - ETERNUS DX80/DX80 S2/DX90/DX90 S2 (for firmware version numbers before V10L30)
 - ETERNUS DX400/DX400 S2 series (for firmware version numbers before V10L30)
 - ETERNUS DX8000/DX8000 S2 series (for firmware version numbers before V10L30)
- The concurrent suspend function of REC is feasible under the following conditions:
If an ETERNUS Disk storage system is any of the following systems, even when one of the ETERNUS Disk storage system using REC that has been registered as the remote ETERNUS Disk storage system.
 - ETERNUS DX80 S2/DX90 S2 (for firmware version numbers V10L30 or later)
 - ETERNUS DX100 S3/DX200 S3
 - ETERNUS DX400 S2 series (for firmware version numbers V10L30 or later)
 - ETERNUS DX500 S3/DX600 S3
 - ETERNUS DX8000 S2 series (for firmware version numbers V10L30 or later)
- If the REC transfer mode is Consistency mode and the REC Disk buffer is used, check that no transferred data exists in the REC Disk buffer before executing the concurrent suspend.
You can check the data size by executing [acrecbuff stat \(REC transfer buffer status display command\)](#) with -disk option in "DiskRate" field.
- The maximum number of copy pairs which execute the concurrent suspend function simultaneously is 845.

Changing timeout value for concurrent suspend function

When there is more data to be transferred than can be transferred during the timeout interval, a timeout error will occur. When a timeout occurs, the following message is output.

[Execution example]

```
> acec suspend -g EcGroup -concur
ccm5004 Operation failed. function=stxcec.SUSPEND.concur, message=STXC1300 ERROR Time out detected.
```

If this message is displayed, change the timeout value for concurrent suspend function.



See

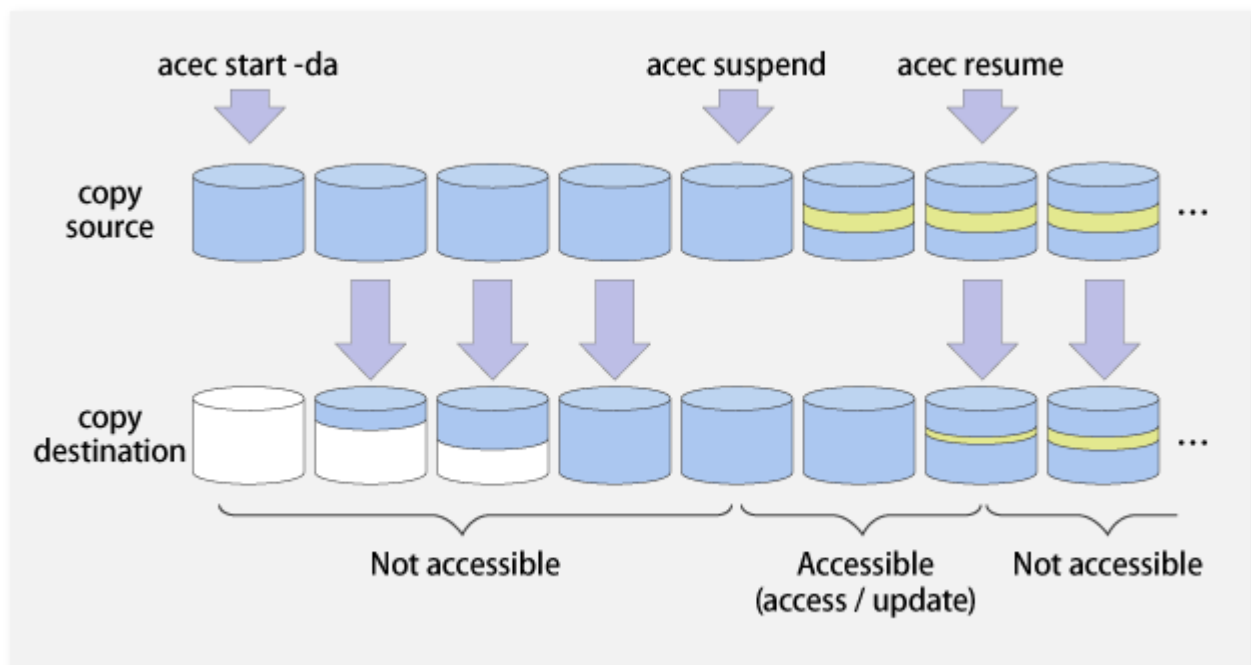
Refer to "3.6.7 Changing timeout value for concurrent suspend function" for the method of changing the timeout value.

3.2.2.9 Using Destination Access Permission function on EC/REC

The Destination Access Permission function suppresses access (reference and updates) to the copy destination logical volume during the time from the start to the suspension of the synchronous high-speed copy.

When using this function, it is possible to suppress the erroneous reference to copy destination logical volumes which are in an invalid status when part way through copying.

Figure 3.6 Example for if acec suspend command was used



To set the Destination Access Permission function, execute [acec start \(Synchronous high-speed copy start command\)](#) with -da option. The access suppression is continued until the suspension of the synchronous process with [acec suspend \(Synchronous high-speed copy temporary suspension command\)](#) or until the synchronous process is stopped with [acec cancel \(Synchronous high-speed copy stop command\)](#).

If changing the settings, stop the synchronous process which is running by using [acec cancel \(Synchronous high-speed copy stop command\)](#) and then execute [acec start \(Synchronous high-speed copy start command\)](#) again.

Also, it is possible to check the access suppression status by using [acec query \(Synchronous high-speed copy status display command\)](#) with -da option.

3.3 Managing copy sessions

This section explains the method for performing the following tasks to all of the copy sessions set up to the target ETERNUS Disk storage system.

- [3.3.1 Displaying copy session information](#)
- [3.3.2 Forcibly stopping copy sessions](#)
- [3.3.3 Forcibly suspending REC sessions](#)

3.3.1 Displaying copy session information

The displaying of copy session information is performed using [accopy query](#) ([Copy session information display command](#)).

Display information for all existing copy sessions in an ETERNUS Disk storage system (Including REC sessions)

Specify "all" in the -type option.

[Execution example]

```
> accopy query -a ET001 -type all
```

Display information for all existing copy sessions in an ETERNUS Disk storage system (Excluding REC sessions)

Specify "local" in the -type option.

[Execution example]

```
> accopy query -a ET001 -type local
```

Display information for all existing copy sessions in an ETERNUS Disk storage system

Specify "remote" in the -type option.

[Execution example]

```
> accopy query -a ET001 -type remote
```

Display information for all existing copy sessions between ETERNUS Disk Storage Systems

Specify the names of the ETERNUS's set up to the REC session copy source and copy destination using the -sa option and -ta option respectively.

[Execution example]

```
> accopy query -a ET001 -sa ET001 -ta ET002
```

3.3.2 Forcibly stopping copy sessions

The forcible stop of copy sessions is performed using [accopy fcancel](#) ([Copy session forcible stop command](#)).

Forcibly stop all existing copy sessions in an ETERNUS Disk storage system (Including REC sessions)

Specify "all" in the -type option.

[Execution example]

```
> accopy fcancel -a ET001 -type all
```

Forcibly stop all existing copy sessions in an ETERNUS Disk storage system (Excluding REC sessions)

Specify "local" in the -type option.

[Execution example]

```
> accopy fcancel -a ET001 -type local
```

Forcibly stop all existing copy sessions in an ETERNUS Disk storage system

Specify "remote" in the -type option.

[Execution example]

```
> accopy fcancel -a ET001 -type remote
```

Forcibly stop all existing copy sessions between ETERNUS Disk storage systems

Specify the names of the ETERNUS's set up to the copy source and the copy destination using the -sa option and -ta option respectively.

[Execution example]

```
> accopy fcancel -a ET001 -sa ET001 -ta ET002
```

Forcibly stop a single copy session

Specify the copy source volume and the copy destination volume using the -s option and -t option respectively.

[Execution example]

```
> accopy fcancel -a ET001 -s ET001/0x1 -t ET001/0x2
```

Forcibly stop a single monitor session

Specify the copy source volume with the -v option. At the same time, specify the -estimate option as well.

[Execution example]

```
> accopy fcancel -a ET001 -v ET001/0x1 -estimate
```

Forcibly stop multiple copy sessions

Using the -stdin option, specify the Tab Separated Value (TSV) type file upon which the information for the copy sessions to be forcibly stopped is written.

[Execution example]

```
> accopy fcancel -a ET001 -stdin < SESSIONS.txt
```



Note

Use ETERNUS Web GUI or ETERNUS CLI to stop the monitor session started by the following methods.

- Operation by Copy command via SAN
 - Started by Copy command via LAN
 - Started by ETERNUS Web GUI
 - Started by ETERNUS CLI
- Operation by Copy command via LAN
 - Started by Copy command via SAN

3.3.3 Forcibly suspending REC sessions

The forcible suspension of REC sessions is performed with `accopy fsuspend` (Copy session forcible suspend command).

Forcibly suspend all existing REC sessions in an ETERNUS Disk storage system

[Execution example]

```
> accopy fsuspend -a ET001
```

Forcibly suspend all existing REC sessions between ETERNUS Disk storage systems

Specify the names of the ETERNUS's set up to the REC sessions' copy source and copy destination using the `-sa` option and `-ta` option respectively.

[Execution example]

```
> accopy fsuspend -a ET001 -sa ET001 -ta ET002
```

Forcibly suspend a single REC session

Specify the copy source volume and copy destination volume using the `-s` option and `-t` option respectively.

[Execution example]

```
> accopy fsuspend -a ET001 -s ET001/0x1 -t ET002/0x1
```

Forcibly suspend multiple REC sessions

Using the `-stdin` option, specify the Tab Separated Value (TSV) type file upon which the information for the copy sessions to be forcibly stopped is written.

[Execution example]

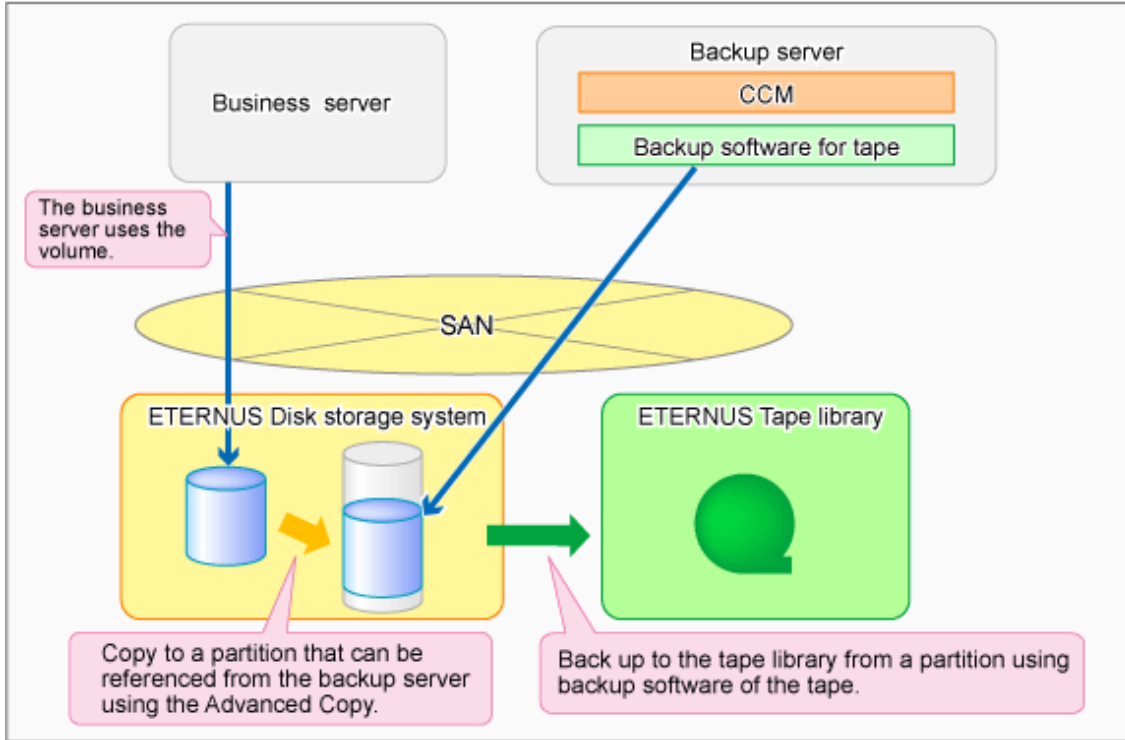
```
> accopy fsuspend -a ET001 -stdin < SESSIONS.txt
```

3.4 Backing up to tape

Back up the volume data to the tape device connected to the backup server.

AdvancedCopy Manager CCM copies backup data to a volume partition referenced from the backup server. Then, copied data to the partition will be backed up to the tape library by using tape backup software.

Figure 3.7 Overview of backup to tape library



3.4.1 LU to Partition

If you want to copy the contents of a disk volume, specify the extent start position in the copy source volume, the extent size, and the extent start position in the copy destination volume. AdvancedCopy Manager CCM can backup the contents of a volume to a partition by using these specifications. Under AdvancedCopy Manager CCM, this function is called "LU to Partition".

Figure 3.8 Copying a volume to a partition



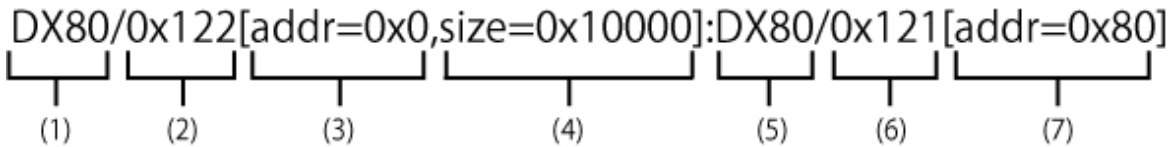
Note

You can use this function only if you backup the data of copy destination volumes to a secondary medium, such as tape. Do not use this function for copying from one disk to another disk.

Adding copy pair

To use the LU to Partition function, it is necessary to specify the extent start position and add a copy pair. Copy pairs are strings that define the copy source and copy destination logical volumes.

Figure 3.9 Copy pair format



- (1) Copy source ETERNUS name
- (2) Copy source logical volume number (*1)
- (3) Extent start position at the copy source volume (block units) (*1)
- (4) Extent size at the copy source volume (number of blocks) (*1)
- (5) Copy destination ETERNUS name
- (6) Copy destination logical volume number (*1)
- (7) Extent start position at the copy destination volume (block units) (*1)

*1: Specify the hexadecimal starting with "0x". (ex, "0x1" or "0x0001")

Follow the procedure below to add a copy pair.

1. Calculating the extent size at the copy source

Calculate the extent size at the copy source that is to be added to the copy pair.

1. Execute [acinq lv \(Logical volume information display command\)](#) on the backup server to check the copy source logical volume number (LV No) and the logical volume size (LV Size).

[Execution example]

```
> acinq lv -a ET001

LV No  LV Name LV Size LV Type RG No Encrypt
-----
0x0000          128M Open      0 -
0x0001          128M Open      0 -
0x0002          128M Open      0 -
0x0003          128M Open      0 -
0x0004          128M Open      0 -
0x0005          128M Open      0 -
0x0006          128M Open      0 -
0x0007          128M Open      0 -
0x0008          1024M Open     0 -
0x0009          1024M Open     0 -
0x000A          1024M Open     0 -
0x000B          1024M Open     0 -
0x000C          1024M Open     0 -
0x000D          1024M Open     0 -
0x000E          1024M Open     0 -
0x000F          1024M Open     0 -
```

2. Calculate the extent size (number of blocks) from the logical volume size in MB by using the following formula.

$$\text{extent size (number of blocks)} = \text{logical volume size (MB)} * 1024 * 1024 / 512$$



If the copy source logical volume number is not known

- For Solaris, Linux, HP-UX, and AIX

1. Execute [acgetvolinfo \(Logical volume information display command\)](#) on the business server to check the copy source logical volume number (LV No) and the extent size (Size).

[Execution example]

[For Solaris]

```
# acgetvolinfo /dev/rdisk/c4t0d10s2
BOX-ID,LV No,Address,Size
00ETERNUSDXM##ET44S20A####HK000104#####,0x001,0x0,0x40000
```

[For Linux]

```
# acgetvolinfo /dev/sdo
BOX-ID,LV No,Address,Size
00ETERNUSDXM##ET44S20A####HK000104#####,0x001,0x0,0x40000
```

[For HP-UX]

```
# acgetvolinfo /dev/rdisk/clt0d20
BOX-ID,LV No,Address,Size
00ETERNUSDXM##ET44S20A####HK000104#####,0x001,0x0,0x40000
```

[For AIX]

```
# acgetvolinfo /dev/hdisk10
BOX-ID,LV No,Address,Size
00ETERNUSDXM##ET44S20A####HK000104#####,0x001,0x0,0x40000
```

2. Calculate the logical volume size (in bytes or MB) from the extent size (number of blocks) of the logical volume size by using the following formula.

```
logical volume size (in bytes) = extent size (in blocks) * 512
logical volume size (in MB) = extent size (in blocks) * 512/(1024 * 1024)
```

- For Windows

1. Check the copy-source logical volume number (LV No) by executing [acgetvolinfo \(Logical volume information display command\)](#) in the transaction server.

[Execution example]

```
C:\> acgetvolinfo F:
BOX-ID,LV No,Address,Size
00ETERNUSDXM##ET44S20A####HK000104#####,0x001,0x80,0x20000
```

2. Check the logical volume size by executing [acinqlv \(Logical volume information display command\)](#) in the backup server.

2. Creating partitions

Create partitions at the copy destination volume.

The partition size must be larger than the copy source logical volume size. As a guideline, create a partition with a size that is 128MB larger than the copy source logical volume.



Megabyte unit

In this document, the megabyte unit is defined as being 1024x1024 bytes.
However, when creating partitions, note that Linux calculates the megabyte unit as being 1000x1000 bytes.

Point

Creating partitions

- For Windows
Create partitions with a drive letter.
- For Solaris
Create partitions without a VTOC label.

3. Checking the information on the copy destination logical volume

Execute [acgetvolinfo \(Logical volume information display command\)](#) on the backup server to check the copy destination logical volume (LV No), the extent start position (Address), and the extent size (Size) to be added.

Point

Check that the extent size of a partition at the copy destination is larger than the extent size of the copy source volume.

[Execution example]

- For Solaris

```
# acgetvolinfo /dev/dsk/c0t0d0s3
BOX-ID,LV No,Address,Size
00ETERNUSDXM##ET44S20A####HK000104#####,0x008,0x0100000,0x140cc3
```

- For Linux

```
# acgetvolinfo /dev/sda1
BOX-ID,LV No,Address,Size
00ETERNUSDXM##ET44S20A####HK000104#####,0x008,0x0100000,0x140cc3
```

- For Windows

```
C:\> acgetvolinfo X:
BOX-ID,LV No,Address,Size
00ETERNUSDXM##ET44S20A####HK000104#####,0x008,0x0100000,0x140cc3
```

Under Windows, execute the mountvol command to unmount a partition.

[Execution example]

```
C:\> mountvol X: /p
```

Note

Do not mount the copy destination volume partition during AdvancedCopy Manager CCM operation.

4. Adding copy pairs

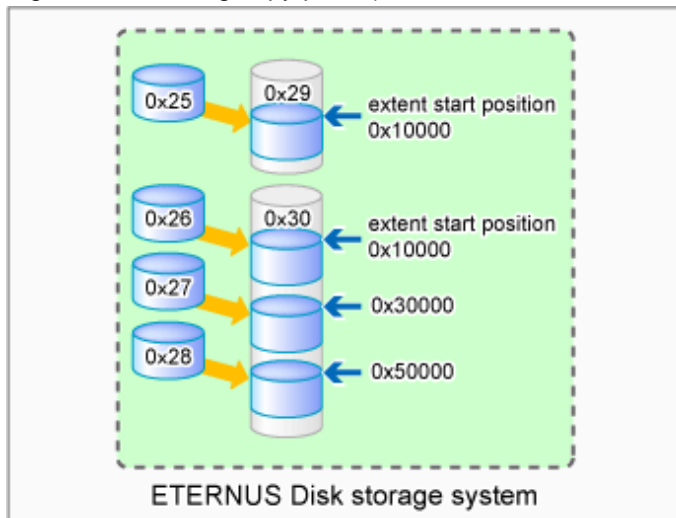
Execute [acpair add \(Copy pair addition command\)](#) to add a copy pair to a copy group.
Create copy pairs at the copy source volume by specify the following values:

- Values specified to the copy source volume
 - Extent start position: 0x0
 - Extent size: Logical volume extent size calculated in step 1
- Values specified to the copy destination volume
 - Extent start position: Copy destination volume extent start position checked in step 3

The execution example below shows how to add copy groups.

- For OPC, QuickOPC, EC, or REC

Figure 3.10 Adding copy pairs (OPC, QuickOPC, EC, or REC)



[Execution example]

```

> acpair add -g GRP1 -p ET001/0x25[addr=0x0,size=0x5000]:ET001/0x29[addr=0x10000]
Successful completion.

> acpair add -g GRP1 -p ET001/0x26[addr=0x0,size=0x5000]:ET001/0x30[addr=0x10000]
Successful completion.

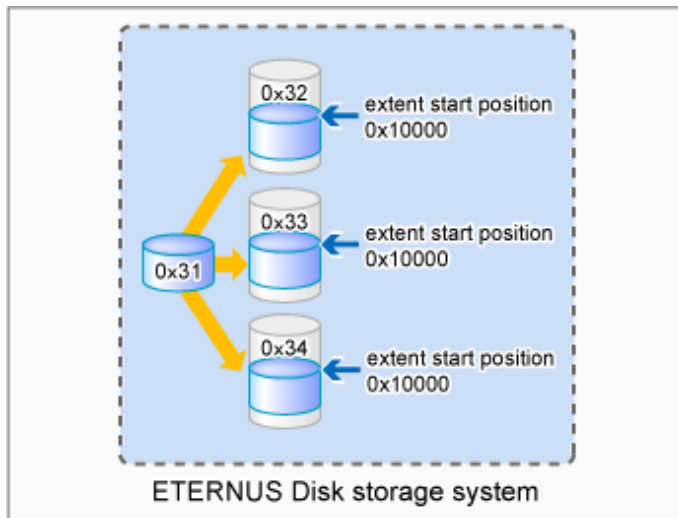
> acpair add -g GRP1 -p ET001/0x27[addr=0x0,size=0x5000]:ET001/0x30[addr=0x30000]
Successful completion.

> acpair add -g GRP1 -p ET001/0x28[addr=0x0,size=0x5000]:ET001/0x30[addr=0x50000]
Successful completion.

```

- For SnapOPCP

Figure 3.11 Adding copy pairs (For SnapOPCP)



[Execution example]

```
> acpair add -g GRP2 -p ET001/0x31[addr=0x0,size=0x5000]:ET001/0x32[addr=0x10000]
Successful completion.

> acpair add -g GRP2 -p ET001/0x31[addr=0x0,size=0x5000]:ET001/0x33[addr=0x10000]
Successful completion.

> acpair add -g GRP2 -p ET001/0x31[addr=0x0,size=0x5000]:ET001/0x34[addr=0x10000]
Successful completion.
```

Note

Multiple sessions cannot be created for the same volume (SDV) under SnapOPC+. Register copy pairs by creating one partition for one volume.

5. Checking added copy pairs

Checking the logical volume number of an added copy pair

Execute [acgroup detail \(Copy group detail information display command\)](#) to display ETERNUS Disk storage system information, and check that the copy pair was added to the specified logical volume number.

[Execution example]

```
> acgroup detail -g GRP1

Copy Group Name : GRP1
Copy Group Type : OPC
Disk Array Name : ET001 (00ETERNUSDXM##ET44S20A####HK000104#####)

Pair
-----
ET001/0x25[addr=0x0,size=0x5000]:ET001/0x29[addr=0x10000]
ET001/0x26[addr=0x0,size=0x5000]:ET001/0x30[addr=0x10000]
ET001/0x27[addr=0x0,size=0x5000]:ET001/0x30[addr=0x30000]
ET001/0x28[addr=0x0,size=0x5000]:ET001/0x30[addr=0x50000]
```

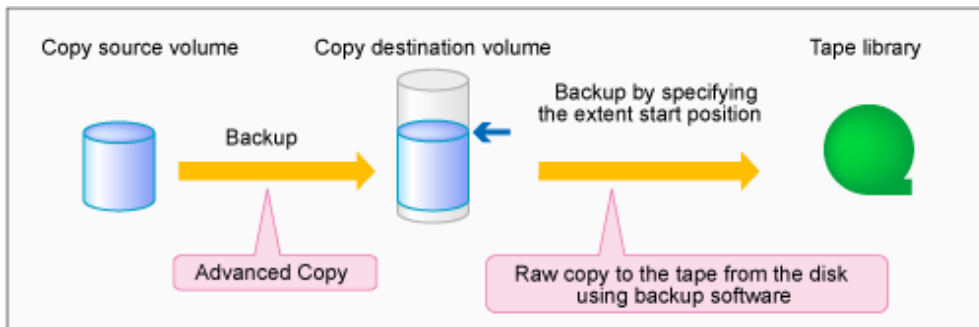
3.4.2 Backup to tape

3.4.2.1 Overview of backup

To back up a volume to the tape library using AdvancedCopy Manager CCM, use the LU to Partition function.

Copy the contents of the copy source volume to a partition that can be referenced from the backup server. Then use the backup software to back up to the tape library.

Figure 3.12 Overview of tape backup



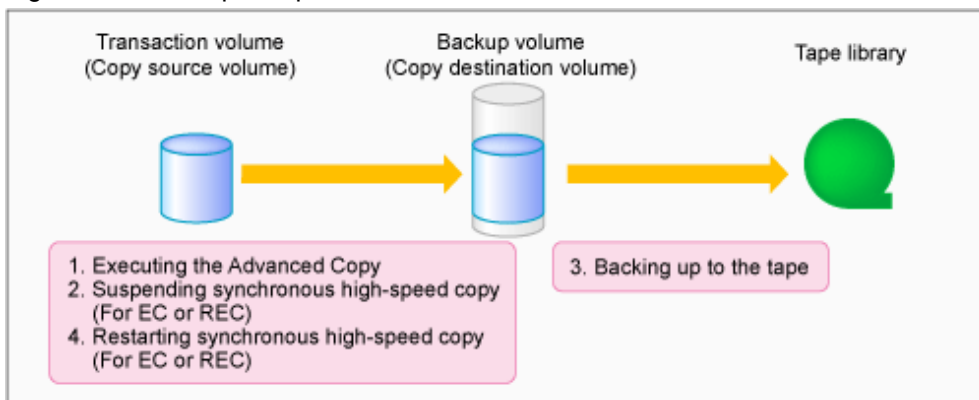
To manage the backup data on the tape library, the backup software with a function capable of performing RAW copy is required. Prepare the software that operates the ETERNUS Tape library or similar.

Refer to the manuals of the backup software and tape device that you are using for details on how to back up to tape.

3.4.2.2 Backup procedure

The flow to back up the transaction volume is shown below.

Figure 3.13 Backup to tape



Follow the procedure below to back up transaction volume data to tape.

1. Executing Advanced Copy

Back up the contents of the transaction volume to the backup volume partition by executing the Advanced Copy. Refer to the copy types in "3.2 Executing Advanced Copy" for the execution procedure.

2. Temporarily suspending synchronous high-speed copy (EC and REC only)

Temporarily suspend synchronous high-speed copy.

- If the transfer mode for backup using EC or REC is synchronous mode:

Execute `acec suspend (Synchronous high-speed copy temporary suspension command)` to temporarily suspend synchronous high-speed copy.

[Execution example]

```
> acec suspend -g group01

ET001/0x1[addr=0x0,size=0x5000]:ET002/0x3[addr=0x10000]
# DATE : 2008/06/24 16:28:00 - << EC Suspended >>

Succeeded : 1
Failed    : 0
```

- If the transfer mode for backup using REC is Stack mode or Consistency mode:

1. Execute [acec suspend \(Synchronous high-speed copy temporary suspension command\)](#) with -force option to forcibly temporarily suspend REC.

[Execution example]

```
> acec suspend -g group01 -force

ET001/0x1[addr=0x0,size=0x5000]:ET002/0x3[addr=0x10000]
# DATE : 2008/06/25 00:00:00 - << EC Suspended >>

Succeeded : 1
Failed    : 0
```

2. Execute [acec change \(Synchronous high-speed copy mode change command\)](#) to change the REC transfer mode to "through".

[Execution example]

```
> acec change -g group01 -transfer through

ET001/0x1[addr=0x0,size=0x5000]:ET002/0x3[addr=0x10000]
# DATE : 2008/06/25 00:01:00 - << EC Change >>

Succeeded : 1
Failed    : 0
```

3. Execute [acec resume \(Synchronous high-speed copy restart command\)](#) to restart REC.

[Execution example]

```
> acec resume -g group01

ET001/0x1[addr=0x0,size=0x5000]:ET002/0x3[addr=0x10000]
# DATE : 2008/06/25 00:02:00 - << EC Resumed >>

Succeeded : 1
Failed    : 0
```

4. Execute [acec query \(Synchronous high-speed copy status display command\)](#) to check that the REC is in an equivalency maintenance state.

[Execution example]

```
> acec query -g group01

Copy Group Name      : group01
Copy Group Type      : REC
Disk Array Name      : ET001 (00ETERNUSDXM##ET44S20A####HK000104#####)
Remote Disk Array Name : ET002 (00ETERNUSDXH##ET87S20A####NC411069004##)

Source                <=> Target                SID(RSID)  EC
```

```

Status      Copy Phase Copied Block Rcv Split Xfer
-----
-----
ET001/0x1[addr=0x0,size=0x5000] ==> ET002/0x3[addr=0x10000] 0x49(0x10) "EC
Executing" "Paired"          1048576 auto ---- through

```

- Execute [acec suspend \(Synchronous high-speed copy temporary suspension command\)](#) to temporarily suspend REC.

[Execution example]

```

> acec suspend -g group01

ET001/0x1[addr=0x0,size=0x5000]:ET002/0x3[addr=0x10000]
# DATE : 2008/06/25 00:10:00 - << EC Suspended >>

Succeeded : 1
Failed    : 0

```

3. Backing up to tape

Use the backup software to back up the data created in the copy destination volume partition to tape.

Refer to the manuals of the backup software and tape device that you are using for details on how to back up to tape.

4. Restarting synchronous high-speed copy (EC or REC only)

Restart synchronous high-speed copy.

- If the transfer mode for backup using EC or REC is synchronous mode:

Execute [acec resume \(Synchronous high-speed copy restart command\)](#) to restart synchronous high-speed copy.

[Execution example]

```

> acec resume -g group01

ET001/0x1[addr=0x0,size=0x5000]:ET001/0x3[addr=0x10000]
# DATE : 2008/06/24 16:28:00 - << EC Resumed >>

Succeeded : 1
Failed    : 0

```

- If the transfer mode for back up using REC is Stack mode or Consistency mode:

- Execute [acec change \(Synchronous high-speed copy mode change command\)](#) to change the transfer mode to the original mode (Stack mode or Consistency mode).

If changing to Stack mode

[Execution example]

```

> acec change -g group01 -transfer stack

ET001/0x1[addr=0x0,size=0x5000]:ET002/0x3[addr=0x10000]
# DATE : 2008/06/25 07:00:00 - << EC Change >>

Succeeded : 1
Failed    : 0

```

If changing to Consistency mode

[Execution example]

```

> acec change -g group01 -transfer consist

ET001/0x1[addr=0x0,size=0x5000]:ET002/0x3[addr=0x10000]

```



```
# DATE : 2008/06/25 07:00:00 - << EC Change >>

Succeeded : 1
Failed    : 0
```

- Execute `acec resume` (Synchronous high-speed copy restart command) to restart synchronous high-speed copy.
[Execution example]

```
> acec resume -g group01

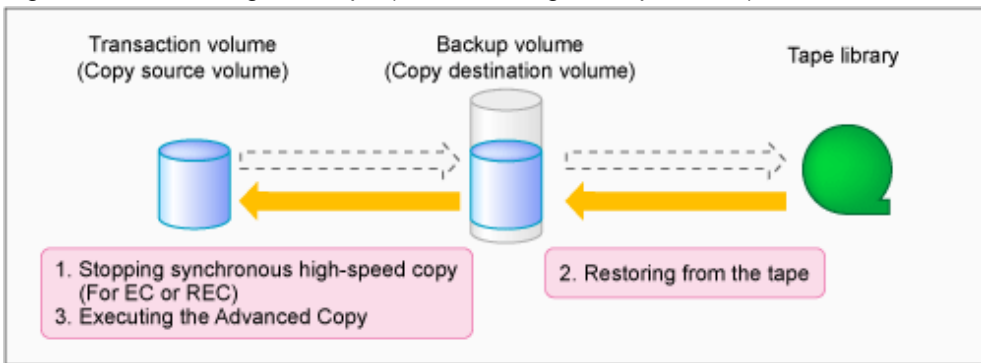
ET001/0x1[addr=0x0,size=0x5000]:ET002/0x3[addr=0x10000]
# DATE : 2008/06/24 16:28:00 - << EC Resumed >>

Succeeded : 1
Failed    : 0
```

3.4.3 Restoring from tape

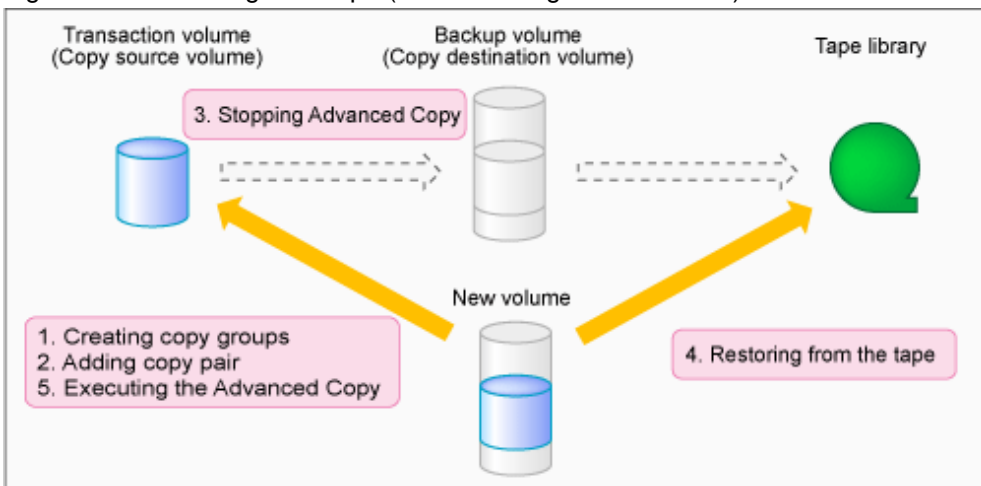
For OPC, QuickOPC, EC or REC, follow the procedure below to restore transaction volume data from tape. This method is called "Restoring using backup volume". Refer to "3.4.3.1 Restoring using backup volume" for details.

Figure 3.14 Restoring from tape (Restore using backup volume)



For SnapOPC+, follow the procedure below to restore transaction volume data from tape. This method is called "Restoring using a new volume". In addition, if you do not use a backup volume that was used for backup regardless of copy type, follow the procedure below. Refer to "3.4.3.2 Restoring using a new volume" for details.

Figure 3.15 Restoring from tape (Restore using a new volume)



3.4.3.1 Restoring using backup volume

Follow the procedure below to restore using a backup volume.



The backup volume contents are overwritten by the tape contents.

If you want to keep the backup volume data, perform restore the data using "[3.4.3.2 Restoring using a new volume](#)".

1. Stopping synchronous high-speed copy (EC or REC only)

Execute [acec cancel](#) ([Synchronous high-speed copy stop command](#)) with -p and -force options to stop synchronous high-speed copy.

[Execution example]

```
> acec cancel -g group01 -p ET001/0x1[addr=0x0,size=0x5000]:ET001/0x3[addr=0x10000] -force

ET001/0x1[addr=0x0,size=0x5000]:ET001/0x3[addr=0x10000]
# DATE : 2008/06/24 16:28:00 - << EC Disconnected >>

Succeeded : 1
Failed    : 0
```

2. Restoring from tape

Restore to the backup volume partition the data that was backed up to tape.

Refer to the manuals of the backup software and tape device that you are using for details on how to back up to tape.

3. Executing Advanced Copy

Restore the contents of the backup volume partition to the transaction volume.

Refer to the copy types in "[3.2 Executing Advanced Copy](#)" for the execution procedure.

3.4.3.2 Restoring using a new volume

Follow the procedure below to restore data using a new volume.

1. Creating a copy group

To perform Advanced Copy for a transaction volume and a new volume partition, create a new copy group. Specify OPC as the copy type by using [acgroup create](#) ([Copy group creation command](#)).

[Execution example]

```
> acgroup create -g group02 -type OPC -a ET001
Successful completion.
```

2. Adding copy pairs

Specify the transaction volume as the copy source and the new volume partition as the copy destination and add the pair.

Refer to "[Adding copy pair](#)" for the execution procedure.

[Execution example]

```
> acpair add -g group02 -p ET001/0x25[addr=0x0,size=0x5000]:ET001/0x34[addr=0x10000]
Successful completion.
```

3. Stopping Advanced Copy

To reinstate data to the transaction volume, stop Advanced Copy from the transaction volume to the backup volume.

- For OPC or QuickOPC

Execute [acopc query \(OPC/QuickOPC copy status display command\)](#) to check the copy status.

If the session and the Tracking (only for QuickOPC) have not been stopped, execute [acopc cancel \(OPC/QuickOPC copy stop command\)](#) with -p option to stop physical copying and to stop Tracking (only for QuickOPC).

[Execution example]

```
> acopc query -g group01

Copy Group Name : group01
Copy Group Type : OPC
Disk Array Name : ET001 (00ETERNUSDXM##ET44S20A####HK000104#####)

Source                <=> Target                SID  OPC Status      Copy
Phase Copied Block
-----
-----
ET001/0x1[addr=0x0,size=0x5000] ==> ET001/0x3[addr=0x10000] 0x21 "OPC Executing"
"Copying"                0

> acopc cancel -g group01 -p ET001/0x1[addr=0x0,size=0x5000]:ET001/0x3[addr=0x10000]

ET001/0x1:ET001/0x6
# DATE : 2008/06/24 16:28:00 - << OPC Disconnected >>

Succeeded : 1
Failed    : 0
```

 **Note**

If an operation is performing reverse copy, also check the reverse Advanced Copy status.

- For SnapOPC+

Execute [acsnap query \(SnapOPC+ copy status display command\)](#) to check the copy status.

If the session has not been stopped, execute [acsnap cancel \(SnapOPC+ copy stop command\)](#) with -force option to stop synchronous high-speed copying.

[Execution example]

```
> acsnap query -g group01

Copy Group Name : group01
Copy Group Type : SnapOPCP
Disk Array Name : ET001 (00ETERNUSDXM##ET44S20A####HK000104#####)

Source                <=> Target                SID  Snap
Status                Gen Date      Copied Block
-----
-----
ET001/0x31[addr=0x0,size=0x0] ==> ET001/0x34[addr=0x0,size=0x01000] 0x23 "Copy On
Write(Active)"      3 10minute    1048576
ET001/0x31[addr=0x0,size=0x0] ==> ET001/0x33[addr=0x0,size=0x01000] 0x22 "Copy On
Write(Inactive)"    2 3hour       1048576
ET001/0x31[addr=0x0,size=0x0] ==> ET001/0x32[addr=0x0,size=0x01000] 0x21 "Copy On
Write(Inactive)"    1 1day        1048576

> acsnap cancel -g group01 -force

ET001/0x31[addr=0x0,size=0x0]:ET001/0x32[addr=0x0,size=0x01000]
# DATE : 2008/06/24 16:28:00 - << SnapOPCP Disconnected >>
```

```

ET001/0x31[addr=0x0,size=0x0]:ET001/0x33[addr=0x0,size=0x01000]
# DATE : 2008/06/24 16:28:00 - << SnapOPCP Disconnected >>

ET001/0x31[addr=0x0,size=0x0]:ET001/0x34[addr=0x0,size=0x01000]
# DATE : 2008/06/24 16:28:00 - << SnapOPCP Disconnected >>

Succeeded : 3
Failed    : 0

```

Note

If an operation is performing reverse copy, also check the reverse Advanced Copy status.

- For EC or REC

Execute [acec cancel \(Synchronous high-speed copy stop command\)](#) with `-p` and `-force` options to stop synchronous high-speed copy.

[Execution example]

```

> acec cancel -g group01 -p ET001/0x1[addr=0x0,size=0x5000]:ET001/0x3[addr=0x10000]
-force

ET001/0x1[addr=0x0,size=0x5000]:ET001/0x3[addr=0x10000]
# DATE : 2008/06/24 16:28:00 - << EC Disconnected >>

Succeeded : 1
Failed    : 0

```

4. Restoring from tape

Restore to the new volume partition the data that was backed up to tape.

Refer to the manuals of the backup software and tape device that you are using for details on how to back up to tape.

5. Executing Advanced Copy

Restore the contents of the new volume partition to the transaction volume.

Refer to "[3.2.1.2 Restore on OPC backup environment](#)" for the execution procedure.

[Execution example]

```

> acopc start -g group02 -p ET001/0x1[addr=0x0,size=0x5000]:ET001/0x3[addr=0x10000] -r

ET001/0x1[addr=0x0,size=0x5000]:ET001/0x3[addr=0x10000]
# DATE : 2008/06/25 12:00:00 - << OPC Started >>
#
From:BoxID=303045343030304d3323232323234534353053323041232323234b4434303330363339303034232
3/Olu=3/Adr_high=0/Adr_low=0/size_high=0/size_low=0
#
To  :BoxID=303045343030304d3323232323234534353053323041232323234b4434303330363339303034232
3/Olu=1/Adr_high=0/Adr_low=0

Succeeded : 1
Failed    : 0

```



Copy from the transaction volume to the backup volume is not guaranteed until physical copying of the transaction volume from the new volume is completed (until the OPC session disconnects). Do not begin copying from the transaction volume to the backup volume until physical copy is completed.

3.5 How to back up environment settings files

With AdvancedCopy Manager CCM, definition files must be backed up and restored manually. Stop AdvancedCopy Manager CCM processing before backing up or restoring these files.

When using AdvancedCopy Manager CCM installed as a standalone program, refer to "3.8 How to back up the license management database" and back up the license management database after backing up the environment settings files.

When using AdvancedCopy Manager CCM of the installed ETERNUS SF Manager, refer to "3.9 How to back up the ETERNUS SF Manager database" and back up the ETERNUS SF Manager database after backing up the environment settings files.

3.5.1 Backing up environment settings files

This section explains how to back up environment settings files.

In the case of non-cluster operation

Copy the following files to a temporary directory.

- For Windows

File name	Remarks
- \$ENV_DIR\CCM\etc\db\eternus.xml - All files under \$ENV_DIR\CCM\etc\db\cg directory	
- \$ENV_DIR\CCM\etc\prop\user.properties - \$ENV_DIR\CCM\etc\stxc.alias - \$ENV_DIR\CCM\etc\stxc_ext.alias - \$ENV_DIR\CCM\etc\stxcvolinf	Only when any files exist.
- \$TMP_DIR\CCM\var\micc\database\DeviceRegList.xml	

\$ENV_DIR is the "Environment Directory" as specified during AdvancedCopy Manager CCM installation.

\$TMP_DIR is the "Work Directory" as specified during AdvancedCopy Manager CCM installation.

- For Solaris, Linux

File name	Remarks
- /etc/opt/FJSVccm/db/eternus.xml - All files under /etc/opt/FJSVccm/db/cg directory	
- /etc/opt/FJSVccm/prop/user.properties - /etc/opt/FJSVccm/accc/etc/stxc.alias - /etc/opt/FJSVccm/accc/etc/stxc_ext.alias - /etc/opt/FJSVccm/accc/etc/stxcvolinf	Only when any files exist.

File name	Remarks
- /var/opt/FJSVccm/micc/database/DeviceRegList.xml	

In the case of cluster operation

Copy the following files to any directories.

- For Windows

File name	Remarks
- \$\$SHARE_DL:\$\$SHARE_TOP\etc\db\eternus.xml - All files in the \$\$SHARE_DL:\$\$SHARE_TOP\etc\db\cg directory	
- \$\$SHARE_DL:\$\$SHARE_TOP\etc\prop\user.properties - \$\$SHARE_DL:\$\$SHARE_TOP\etc\stxc.alias - \$\$SHARE_DL:\$\$SHARE_TOP\etc\stxc_ext.alias - \$\$SHARE_DL:\$\$SHARE_TOP\etc\stxcvolinf	Only when any files exist.
- \$\$SHARE_DL:\$\$SHARE_TOP\var\micc\database\DeviceRegList.xml	
- \$INS_DIR\micc\sys\install.sys - \$INS_DIR\bin\stxc_install.sys - \$INS_DIR\sys\sys.properties - \$INS_DIR\noncluster\micc\sys\install.sys - \$INS_DIR\noncluster\bin\stxc_install.sys - \$INS_DIR\noncluster\sys\sys.properties	Do not restore in "3.5.2 Restoring environment settings files" or "3.7 Changing the cluster environment".

\$\$SHARE_DL is the drive letter of the shared disk for AdvancedCopy Manager CCM shared data.

\$\$SHARE_TOP is the directory that contains "Environment Directory" and "Work Directory" of the shared disk for AdvancedCopy Manager CCM shared data.

\$INS_DIR is the "Program Directory" as specified during AdvancedCopy Manager CCM installation.

- For Solaris, Linux

File name	Remarks
- \$\$SHARE_MNT/etc/opt/FJSVccm/db/eternus.xml - All files in the \$\$SHARE_MNT/etc/opt/FJSVccm/db/cg directory	
- \$\$SHARE_MNT/etc/opt/FJSVccm/prop/user.properties - \$\$SHARE_MNT/etc/opt/FJSVccm/accc/etc/stxc.alias - \$\$SHARE_MNT/etc/opt/FJSVccm/accc/etc/stxc_ext.alias - \$\$SHARE_MNT/etc/opt/FJSVccm/accc/etc/stxcvolinf	Only when any files exist.
- \$\$SHARE_MNT/var/opt/FJSVccm/micc/database/DeviceRegList.xml	
- /opt/FJSVccm/micc/sys/install.sys - /opt/FJSVccm/bin/stxc_install.sys - /opt/FJSVccm/sys/sys.properties - /opt/FJSVccm/noncluster/micc/sys/install.sys - /opt/FJSVccm/noncluster/bin/stxc_install.sys - /opt/FJSVccm/noncluster/sys/sys.properties	Do not restore in "3.5.2 Restoring environment settings files" or "3.7 Changing the cluster environment".

\$\$SHARE_MNT is the mount point of the shared disk for AdvancedCopy Manager CCM shared data.

This completes the backup for environment settings files.

3.5.2 Restoring environment settings files

This section explains how to restore the environment settings files that were backed up in "[3.5.1 Backing up environment settings files](#)".

In the case of non-cluster operation

Use the following procedure to restore the environment setting files.

1. Delete the following files.

- For Windows

File name	Remarks
- All files under \$ENV_DIR\CCM\etc\db\cg directory	
- \$ENV_DIR\CCM\etc\prop\user.properties - \$ENV_DIR\CCM\etc\stxc.alias - \$ENV_DIR\CCM\etc\stxc_ext.alias - \$ENV_DIR\CCM\etc\stxcvolinf	Only when any files exist.

\$ENV_DIR is the "Environment Directory" as specified during AdvancedCopy Manager CCM installation.

- For Solaris, Linux

File name	Remarks
- All files under /etc/opt/FJSVccm/db/cg directory	
- /etc/opt/FJSVccm/prop/user.properties - /etc/opt/FJSVccm/acc/et/stxc.alias - /etc/opt/FJSVccm/acc/et/stxc_ext.alias - /etc/opt/FJSVccm/acc/et/stxcvolinf	Only when any files exist.

2. Copy the files that were backed up in "[3.5.1 Backing up environment settings files](#)" to the following directory:

- For Windows

File name	Remarks
- \$ENV_DIR\CCM\etc\db\eternus.xml - All files under \$ENV_DIR\CCM\etc\db\cg directory	
- \$ENV_DIR\CCM\etc\prop\user.properties - \$ENV_DIR\CCM\etc\stxc.alias - \$ENV_DIR\CCM\etc\stxc_ext.alias - \$ENV_DIR\CCM\etc\stxcvolinf	Only when any files was backed up.
- \$TMP_DIR\CCM\var\micc\database\DeviceRegList.xml	

\$ENV_DIR is the "Environment Directory" as specified during AdvancedCopy Manager CCM installation.

\$TMP_DIR is the "Work Directory" as specified during AdvancedCopy Manager CCM installation.

- For Solaris, Linux

File name	Remarks
- /etc/opt/FJSVccm/db/eternus.xml - All files under /etc/opt/FJSVccm/db/cg directory	
- /etc/opt/FJSVccm/prop/user.properties - /etc/opt/FJSVccm/acc/et/stxc.alias - /etc/opt/FJSVccm/acc/et/stxc_ext.alias - /etc/opt/FJSVccm/acc/et/stxcvolinf	Only when any files was backed up.
- /var/opt/FJSVccm/micc/database/DeviceRegList.xml	

This completes the restoration for environment settings files.

In the case of cluster operation

Use the following procedure to restore the environment setting files.

1. Delete the following files.

- For Windows

File name	Remarks
- All files in \$SHARE_DL:\$SHARE_TOP\etc\db\cg directory	
- \$SHARE_DL:\$SHARE_TOP\etc\prop\user.properties - \$SHARE_DL:\$SHARE_TOP\etc\stxc.alias - \$SHARE_DL:\$SHARE_TOP\etc\stxc_ext.alias - \$SHARE_DL:\$SHARE_TOP\etc\stxcvolinf	Only when any files exist.

\$SHARE_DL is the drive letter of the shared disk for AdvancedCopy Manager CCM shared data.

\$SHARE_TOP is the directory that contains "Environment Directory" and "Work Directory" of the shared disk for AdvancedCopy Manager CCM shared data.

- For Solaris, Linux

File name	Remarks
- All files in the \$SHARE_MNT/etc/opt/FJSVccm/db/cg directory	
- \$SHARE_MNT/etc/opt/FJSVccm/prop/user.properties - \$SHARE_MNT/etc/opt/FJSVccm/acc/et/stxc.alias - \$SHARE_MNT/etc/opt/FJSVccm/acc/et/stxc_ext.alias - \$SHARE_MNT/etc/opt/FJSVccm/acc/et/stxcvolinf	Only when any files exist.

\$SHARE_MNT is the mount point of the shared disk for AdvancedCopy Manager CCM shared data.

2. Copy the backed up files in "[3.5.1 Backing up environment settings files](#)" to the following files and directories.

- For Windows

File name	Remarks
- \$SHARE_DL:\$SHARE_TOP\etc\db\eternus.xml - All files in the \$SHARE_DL:\$SHARE_TOP\etc\db\cg directory	
- \$SHARE_DL:\$SHARE_TOP\etc\prop\user.properties - \$SHARE_DL:\$SHARE_TOP\etc\stxc.alias	Only when any files was backed up.

File name	Remarks
- \$\$SHARE_DL:\$\$SHARE_TOP\etc\stxc_ext.alias	
- \$\$SHARE_DL:\$\$SHARE_TOP\etc\stxcvolinf	
- \$\$SHARE_DL:\$\$SHARE_TOP\var\micc\database\DeviceRegList.xml	

\$\$SHARE_DL is the drive letter of the shared disk for AdvancedCopy Manager CCM shared data.

\$\$SHARE_TOP is the directory that contains "Environment Directory" and "Work Directory" of the shared disk for AdvancedCopy Manager CCM shared data.

- For Solaris, Linux

File name	Remarks
- \$\$SHARE_MNT/etc/opt/FJSVccm/db/eternus.xml	
- All files in the \$\$SHARE_MNT/etc/opt/FJSVccm/db/cg directory	
- \$\$SHARE_MNT/etc/opt/FJSVccm/prop/user.properties - \$\$SHARE_MNT/etc/opt/FJSVccm/accc/etc/stxc.alias - \$\$SHARE_MNT/etc/opt/FJSVccm/accc/etc/stxc_ext.alias - \$\$SHARE_MNT/etc/opt/FJSVccm/accc/etc/stxcvolinf	Only when any files was backed up.
- \$\$SHARE_MNT/var/opt/FJSVccm/micc/database/DeviceRegList.xml	

\$\$SHARE_MNT is the mount point of the shared disk for AdvancedCopy Manager CCM shared data.

This completes the restoration for environment settings files.

3.6 Changing the configuration

This section explains the procedures for changing the configuration of AdvancedCopy Manager CCM.

3.6.1 Registering additional ETERNUS Disk storage system

Register additional information for ETERNUS Disk storage system with AdvancedCopy Manager CCM.

Register the ETERNUS Disk storage system by following the procedure in "[2.4 Registering ETERNUS Disk storage system](#)".

3.6.2 Changing the registered information for ETERNUS Disk storage system

This section explains how to change the registered information for ETERNUS Disk storage system that has been set up with AdvancedCopy Manager CCM.

The registration information for ETERNUS Disk storage system includes the following items:

- ETERNUS name
- Access volume
- Box ID
- IP address
- User
- Password

The registration information for remote ETERNUS Disk storage system includes the following items:

- ETERNUS name
- Box ID

Changing ETERNUS name or access volume

Change ETERNUS names or access volumes by referring to [acarray change \(ETERNUS name and access volume for ETERNUS Disk storage system change command\)](#).

When AdvancedCopy Manager CCM is being operated using the Web Console, after changing the ETERNUS name, implement the following procedures as well.

1. Using the ETERNUS Web GUI, configure a device name that is the same as the changed ETERNUS name.
2. Refer to the "Reload ETERNUS Disk storage system configuration information" in the *ETERNUS SF Web Console Guide* to reload ETERNUS disk storage system configuration information.

Using the access volume automatic setting function to change access volume

Execute [acarray pathscan \(Access volume automatic setting command\)](#) to change the access volume.

Changing information other than ETERNUS names and access volumes

Use the following procedure to change information other than ETERNUS names and access volumes.

1. Delete the registration information
Execute [acarray remove \(ETERNUS Disk storage system registration information deletion command\)](#) to delete the registration information for ETERNUS Disk storage system that has been set up with AdvancedCopy Manager CCM.
2. Change the information for ETERNUS Disk storage systems [only when changing device information]
3. Reregister the ETERNUS Disk storage system
Register the ETERNUS Disk storage system (whose registration information was deleted) again using the new information.
Register the ETERNUS Disk storage system by following the procedure in "[2.4 Registering ETERNUS Disk storage system](#)".



Note

When changing other information than ETERNUS names and access volumes, perform step 1 and then change the information for the ETERNUS Disk storage system.

3.6.3 Deleting the registered information for ETERNUS Disk storage system

This section explains how to delete registration information for ETERNUS Disk storage system that has been set up with AdvancedCopy Manager CCM.

Use the following procedure to delete registration information for ETERNUS Disk storage system:

1. Delete copy groups
Delete all of the copy groups that have been set up for ETERNUS Disk storage system for which registration information is to be deleted.
Delete the copy groups by referring to "[3.6.6 Deleting copy groups](#)".

2. Delete the registration information for ETERNUS Disk storage system

Execute [acarray remove \(ETERNUS Disk storage system registration information deletion command\)](#) to delete the registration information for ETERNUS Disk storage system that has been set up with AdvancedCopy Manager CCM.

3.6.4 Adding copy groups

This section explains how to add copy groups to AdvancedCopy Manager CCM.

The procedure for adding extra copy groups is the same as for "[2.5 Creating copy groups](#)".

3.6.5 Changing copy group configurations

The configurations of copy groups can be changed by adding or deleting copy pairs to or from AdvancedCopy Manager CCM.

Use the following procedures to change the configuration of copy groups.

Adding copy pairs

Add copy pairs to the ETERNUS Disk storage system that has been set up with AdvancedCopy Manager CCM. Add copy pairs by referring to "[2.6 Adding copy pairs](#)".

Deleting copy pairs

Delete the copy pairs for the ETERNUS Disk storage system that has been set up with AdvancedCopy Manager CCM.

Use the following procedure to delete copy pairs:

1. Stop Advanced Copies

Use one of the following commands (depending on the type of Advanced Copy) to stop all of the Advanced Copies that are executing for the copy pairs to be deleted.

- [acopc cancel \(OPC/QuickOPC copy stop command\)](#)
- [acsnap cancel \(SnapOPC+ copy stop command\)](#)
- [acec cancel \(Synchronous high-speed copy stop command\)](#)

2. Check the status of copy pairs

Use one of the following commands (depending on the type of Advanced Copy) to check that all of the Advanced Copies that are executing for the copy pairs to be deleted have stopped.

- [acopc query \(OPC/QuickOPC copy status display command\)](#)
- [acsnap query \(SnapOPC+ copy status display command\)](#)
- [acec query \(Synchronous high-speed copy status display command\)](#)

3. Delete copy pairs

Execute [acpair remove \(Copy pair deletion command\)](#) to delete the copy pairs.

Information

If copy pairs have been deleted by mistake:

If a copy pair has been deleted by mistake, take one the following actions:

- Use ETERNUS Web GUI to stop the Advanced Copy for the copy pair.
 - Add the same copy pair again, and then stop the Advanced Copy.
-

3.6.6 Deleting copy groups

This section explains how to delete copy groups that have been set up with AdvancedCopy Manager CCM.

Note that all copy pairs in the copy group will be deleted together with the copy group.

Use the following procedure to delete copy groups:

1. Stop Advanced Copies

Use one of the following commands (depending on the type of Advanced Copy) to stop all of the Advanced Copies that are executing for the copy group to be deleted.

- `acopc cancel` (OPC/QuickOPC copy stop command)
- `acsnap cancel` (SnapOPC+ copy stop command)
- `acec cancel` (Synchronous high-speed copy stop command)

2. Check the status of the copy group

Use one of the following commands (depending on the type of Advanced Copy) to check that all of the Advanced Copies that are executing for the copy group to be deleted have stopped.

- `acopc query` (OPC/QuickOPC copy status display command)
- `acsnap query` (SnapOPC+ copy status display command)
- `acec query` (Synchronous high-speed copy status display command)

3. Delete the copy group

Execute `acgroup remove` (Copy group deletion command) to delete the copy group from AdvancedCopy Manager CCM.



Information

If copy groups have been deleted by mistake:

If a copy group has been deleted by mistake, take one the following actions:

- Use ETERNUS Web GUI to stop the Advanced Copies that have been registered with the copy group that was deleted.
 - Create another group and add the same copy pairs, then stop the Advanced Copies.
-

3.6.7 Changing timeout value for concurrent suspend function

This section explains the method of setting or changing the timeout value for concurrent suspend function.

File name for setting

The timeout value must be defined in the following file.

- In the case of non-cluster operation

OS	File name
Windows	<code>\$INS_DIR\etc\prop\user.properties</code>
Solaris Linux	<code>/etc/opt/FJSVccm/prop/user.properties</code>

`$INS_DIR` means "Program Directory" specified at the AdvancedCopy Manager CCM installation.

- In the case of cluster operation

OS	File name
Windows	\$SHARE_DL:\$SHARE_TOP\etc\prop\user.properties
Solaris Linux	\$SHARE_MNT/etc/opt/FJSVccm/user.properties

\$SHARE_DL is the drive letter of the shared disk for AdvancedCopy Manager CCM shared data.

\$SHARE_TOP is the directory that contains "Environment Directory" and "Work Directory" of the shared disk for AdvancedCopy Manager CCM shared data.

\$SHARE_MNT is the mount point of the shared disk for AdvancedCopy Manager CCM shared data.

When the timeout value is never set, creating above file is needed because it does not exist.

Setting method the timeout value

Describe the timeout value in above file.

Item name	Explanations
concur.timeout	Specify the timeout value from 1 to 86400 (unit: seconds). The default is 60.



Example

To set the timeout value at 300 seconds:

```
concur.timeout=300
```

3.6.8 Adding user accounts

This section explains how to add user accounts that can operate AdvancedCopy Manager CCM.

Refer to "Creating user account for using AdvancedCopy Manager CCM" in the *ETERNUS SF Installation and Setup Guide* for the procedure for adding user accounts.

3.6.9 Model upgrade for ETERNUS Disk storage system

This section explains how to apply Model upgrade options for ETERNUS DX60, ETERNUS DX80 S2, ETERNUS DX90 S2, or ETERNUS DX410 S2.

When using AdvancedCopy Manager CCM installed as a standalone program

Use the following procedure for applying Model upgrade options.

1. Stop Advanced Copy.

If Advanced Copy is in progress on the target device, stop all Advanced Copy processing including REC with other devices.

2. Apply Model upgrade options.

Apply Model upgrade options for ETERNUS Disk storage system.

3. Delete the device information. (For applying Model upgrade options for ETERNUS DX80 S2 or ETERNUS DX90 S2 to ETERNUS DX410 S2 or ETERNUS DX440 S2)

Delete the old device information by using [acarray remove \(ETERNUS Disk storage system registration information deletion command\)](#).

4. Delete the license.

Delete the license registered with the old device by using the `esflm remove` command.

Refer to "Removal of license" in the *ETERNUS SF Installation and Setup Guide* for details on how to delete licenses.

5. Register the license.

Register the appropriate license to the new device by using the `esflm add` command.

Refer to "Registration of license" in the *ETERNUS SF Installation and Setup Guide* for details on how to register licenses.

6. Register the device information. (For applying Model upgrade options for ETERNUS DX80 S2/DX90 S2 to ETERNUS DX410 S2/DX440 S2)

Register the new device information by using `acarray add` ([ETERNUS Disk storage system registration command](#)).

7. Perform Advanced Copy.

As necessary, perform Advanced Copy which you have stopped in step 1.

When performing Agent-based operation or using AdvancedCopy Manager CCM of installed ETERNUS SF Manager

Perform "Operation on Model upgrade for ETERNUS Disk storage system" in the *ETERNUS SF Web Console Guide*.

3.7 Changing the cluster environment

This section explains the procedures for starting and stopping a cluster operation.

3.7.1 Start a cluster operation

Use the following procedure to start a cluster operation.

1. Back up the environment files in reference to "[In the case of non-cluster operation](#)".
2. Restore the environment files in reference to "[In the case of cluster operation](#)".
3. If the access volume after restoration is different from the access volume before backup, perform the following procedure.
 1. Delete the registered information of ETERNUS Disk storage system using `acarray remove` ([ETERNUS Disk storage system registration information deletion command](#)).
 2. Register ETERNUS Disk storage system using `acarray add` ([ETERNUS Disk storage system registration command](#)).

3.7.2 Stop a cluster operation

Use the following procedure to stop a cluster operation.

1. Back up the environment files in reference to "[In the case of cluster operation](#)".
2. Restore the environment files in reference to "[In the case of non-cluster operation](#)".
3. If the access volume after restoration is different from the access volume before backup, perform the following procedure.
 1. Delete the registered information of ETERNUS Disk storage system using `acarray remove` ([ETERNUS Disk storage system registration information deletion command](#)).
 2. Register ETERNUS Disk storage system using `acarray add` ([ETERNUS Disk storage system registration command](#)).



.....
AdvancedCopy Manager CCM can be operated after stopping the cluster operation using the environment setting files.
.....

3.8 How to back up the license management database

This section explains how to back up the license management database.

When using AdvancedCopy Manager CCM of the installed ETERNUS SF Manager, refer to "[3.9 How to back up the ETERNUS SF Manager database](#)" and back up the ETERNUS SF Manager database.

Information

About description in the procedure

Directory name	Explanation
\$BAK_DIR	Backup destination directory
\$INS_DIR	"Program Directory" as specified during AdvancedCopy Manager CCM installation

3.8.1 Backing up the license management database

Back up the license management database.

In the case of cluster operation, perform the backup on the primary node. If the shared disk is not mounted, mount and back it up.

- For Windows

1. Using Explorer, create the following backup directory:

- \$BAK_DIR\LM

2. Execute the following command. The file specified with *<fileName>* will be created as a backup file.

```
$INS_DIR\LM\bin\esflm backup $BAK_DIR\LM\<fileName>
```

- For Solaris/Linux

1. Create a backup directory:

```
mkdir -p $BAK_DIR/LM
```

2. Execute the following command. The file specified with *<fileName>* will be created as a backup file.

```
/opt/FJVSesflm/bin/esflm backup $BAK_DIR/LM/<fileName>
```

3.8.2 Restoring the license management database

Restore the license management database that was backed up at "[3.8.1 Backing up the license management database](#)".

In the case of cluster operation, perform the backup on the primary node. If the shared disk is not mounted, mount and back it up.

- For Windows

Execute the following command. The file name of the created backup data is *<fileName>*.

```
$INS_DIR\LM\bin\esflm restore $BAK_DIR\LM\<fileName>
```

- For Solaris/Linux

Execute the following command. The file name of the created backup data is *<fileName>*.

```
/opt/FJVSesflm/bin/esflm restore $BAK_DIR/LM/<fileName>
```

3.9 How to back up the ETERNUS SF Manager database

When using AdvancedCopy Manager CCM of the installed ETERNUS SF Manager, back up the ETERNUS SF Manager database.

Refer to "Operation Maintenance" in the *ETERNUS SF AdvancedCopy Manager Operation Guide* relevant to the operating system of the CCM Server for details.

3.10 Backup of NAS environment

This chapter explains the backup operation of a NAS environment in the AdvancedCopy Manager CCM.

3.10.1 Backup / Restoration with the Web Console

Backup and restoration of the NAS volume created with NAS management can be implemented from the Web Console.

3.10.1.1 Preparing for Execution of Backup

In order to implement backup, it is required that the following NAS backup configurations have been implemented.

Preferences	Configuration Requirements
NAS Backup Volume	<ul style="list-style-type: none">- The volume is created in the same storage device as the NAS volume- The detailed purpose is "NAS Backup"- The volume is of the same capacity as the NAS volume
NAS Copy Group	<ul style="list-style-type: none">- The copy type is QuickOPC
NAS Copy Pair	<ul style="list-style-type: none">- The copying source is the NAS volume- The copying destination is the NAS backup volume

When NAS backup configurations have not been implemented, or when the above configuration requirements of the NAS backup configurations have not been satisfied, implement the creation of a NAS backup volume. Refer to "Create NAS Backup Volume" in the *ETERNUS SF Web Console Guide* for information on the procedures for creating the NAS backup volume.

3.10.1.2 How To Execute Backup

Execute backup of the NAS volume with QuickOPC from the Web Console.

Refer to "Backup of NAS Volume" in the *ETERNUS SF Web Console Guide* for information on the procedures for executing backup.

Information

If a NAS backup volume is mounted, setup values (shared status, access settings, etc.) in the shared folder within the NAS backup volume are setup values for the NAS volume at the time of execution of the backup.

3.10.1.3 How To Execute Restoration

Execute restoration of the NAS volume from the Web Console.

Refer to "Restore to NAS Volume" in the *ETERNUS SF Web Console Guide* for information on the procedures for executing restoration.

Information

When executing restoration of the NAS volume, it is required that backup has already been implemented. Confirm whether backup has already been implemented by referring to "Display Shared Folder" in the *ETERNUS SF Web Console Guide*.

Note

If the restore fails, data corruption may be occurring on the NAS volume. Remove the cause of the failure and retry the restore.

3.10.1.4 Suspending / Confirming the Status of Backup / Restoration

Confirming the Status of Backup / Restoration

The status of the backup and restoration of the NAS volume can be confirmed from the Web Console.

Refer to "Add/Display/Delete Copy Pair" in the *ETERNUS SF Web Console Guide* for information on the procedures for confirming the status.

Information

Confirm the copy group belonging to the copy pair by referring to "Display Shared Folder" in the *ETERNUS SF Web Console Guide*.

Note

There may be cases when the copy status that can be confirmed with the Web Console does not match the success or failure of the backup / restoration of the NAS volume. Determine the success or failure of the backup from the operation history of backup / restoration. Refer to "Display Operation History" in the *ETERNUS SF Web Console Guide* for the display method of the operation history of backup/restoration.

Suspending Backup / Restoration

Suspend backup / restoration of the NAS volume from the Web Console.

Refer to "Cancel Copy Session of Copy Pair" in the *ETERNUS SF Web Console Guide* for information on the procedures for suspension.

Information

Confirm the copy group belonging to the copy pair by referring to "Display Shared Folder" in the *ETERNUS SF Web Console Guide*.

Note

- Suspension of the copying from the NAS volume to the NAS backup volume is implemented by the procedures for performing a secondary backup of the NAS volume.
- When copying is suspended while physical copying is taking place, even if the backup is a success, the backed up data cannot be guaranteed.

3.10.2 Backup with Commands

The NAS volume created with the Web Console can also be backed up with commands.

Commands can be used in cases such as when automatically scheduling backup of the NAS volume.

3.10.2.1 Preparing for Execution of Backup Commands

Be sure to implement the NAS backup configurations in advance with the Web Console.

When performing a backup of the NAS volume with commands, the copy group name of the NAS backup configurations is required. Confirm the copy group name of the NAS backup configurations with the Web Console.

3.10.2.2 How To Execute Backup Commands

With the Management Server, execute [acnas backup \(NAS volume backup command\)](#). Specify the copy group name of the NAS backup configurations with the -g option.

[Execution example]

```
acnas backup -g NAS_QuickOPC_0
```

Point

Even if backup of the NAS volume is performed with the Command Line Interface, it is necessary to restore the NAS volume using the Web Console.

Information

If a NAS backup volume is mounted, setup values (shared status, access settings, etc.) in the shared folder within the NAS backup volume are setup values for the NAS volume at the time of execution of the backup.

3.10.2.3 Confirming the Copy Status of Backup and Stopping the Backup

Backup of the NAS volume copies data in relation to the NAS backup volume from the NAS volume by utilizing QuickOPC.

Stopping or confirming the status of Advanced Copy of the NAS volume can be performed with the following commands.

Confirming the Status of Backup

The status of the copying from the NAS volume to the NAS backup volume can be confirmed with [acopc query \(OPC/QuickOPC copy status display command\)](#).

[Execution example]

```
acopc query -g NAS_QuickOPC_0
```

Note

There may be cases when the copy status that can be confirmed with the acopc query command does not match the success or failure of the backup of the NAS volume. Determine the success or failure of the backup from the results of the backup command.

Stopping of Backup

When stopping the copying from the NAS volume to the NAS backup volume using QuickOPC, execute [acopc cancel \(OPC/QuickOPC copy stop command\)](#).

[Execution example]

```
acopc cancel -g NAS_QuickOPC_0
```

Note

- Stopping of the copying from the NAS volume to the NAS backup volume is implemented by the procedures for performing a secondary backup of the NAS volume.
- When copying is stopped while physical copying is taking place, even if the acnas backup command is successfully completed, the backed up data cannot be guaranteed.

3.10.3 Mounting / Unmounting the Backup Destination

The NAS volume that has been backed up can be referred to or configured from the Web Console.

With this function, it is possible for the NAS backup volume to be referenced as Read-Only, writing back from the NAS backup volume to the NAS volume is possible in units of individual files.

3.10.3.1 Mounting / Unmounting Procedures

Mounting the NAS Backup Volume

Mount the NAS backup volume from the Web Console.

After implementing the mounting, the shared folder within the NAS backup volume can be referenced as Read-Only.

When performing restoration in units of individual files, after executing the mounting, manually move the files from the shared folder within the NAS backup volume to the shared folder within the NAS volume.

Refer to "Mount/Unmount Backup Destination" in the *ETERNUS SF Web Console Guide* for information on the procedures for mounting.

To access the shared folder within the NAS backup volume, refer to "[3.10.4 How to Access Backup Destination Volume](#)".

Information

- When executing mounting of the NAS backup volume, it is required that backup has already been implemented. Confirm whether backup has already been implemented by referring to "Display Shared Folder" in the *ETERNUS SF Web Console Guide*.
- When accessing it by the CIFS protocol, the shared folder within the NAS backup volume will have a suffix (\$bak) assigned to its name and will be shared as Read-Only.
For example, when the shared folder is created with the name NAS_Share, the shared folder within the NAS backup volume can be referenced with the name NAS_Share\$bak.
- When the NAS backup volume is mounted, the name of the shared folder within the NAS backup volume will not be displayed in the Web Console.
- While the NAS backup volume is mounted, the following operations cannot be implemented in relation to the shared folder.
 - Creating / Changing / Deleting the Shared Folder
 - Starting / Suspending Sharing
 - Backup / Restoration
- Setup values (shared status, access settings, etc.) in the shared folder within the NAS backup volume are setup values for the NAS volume at the time of execution of the backup.
The settings of the shared folder in the NAS backup volume cannot be changed.
- Before unmounting the NAS backup volume, disconnect the network from the client. If unmounted while the network is connected to the client, the NAS backup volume may fail in use.

Unmounting the NAS Backup Volume

Unmount the NAS backup volume from the Web Console.

Refer to "Mount/Unmount Backup Destination" in the *ETERNUS.SF Web Console Guide* for information on unmounting procedures.

3.10.4 How to Access Backup Destination Volume

If the NAS backup volume used as backup destination is mounted, it is accessible in Read-Only mode.

The section explains how to access the NAS backup volume:

Access using the CIFS protocol

The NAS backup volume is accessible by the Windows file sharing or network drive mapping.

Enter the following to the address bar or to the network drive mapping window:

```
\\nasInterfaceIpAddress\sharedFolderName$bak
```

When authenticating by Active Directory, the operation method varies depending on the presence of setup of an authentication server.

- If Active Directory is configured as an authentication server:
Enter the user name and password registered to Active Directory.
When connecting from the client participating in Active Directory, authentication is not needed.
- If an authentication server is not set up:
Enter the user name and password described in the ETERNUS Disk storage system manuals.

Information

Entering the IP address for NAS interface in the address bar can view sharable folders.

Access using the NFS protocol

The NAS backup volume is accessible by performing the NFS mount from a UNIX server using the following procedure:

When authenticating through LDAP, there is no difference in operation method with the presence of setup of an authentication server. Make the UNIX server participate in the LDAP domain to perform the NFS mount.

1. Check the volume number of the NAS backup volume.
For the procedure to check the volume number, refer to "Display Shared Folder" in the *ETERNUS.SF Web Console Guide*.
"Backup Volume No." displayed in the Basic tab for shared folder detail information is the volume number.
2. Log in to the UNIX server with administrator privileges.
3. Execute the mount command to mount the shared folder.
When executing the mount command, specify the following:

[For Solaris]

```
mount -F nfs nasInterfaceIpAddress:/mnt/nas/nv/nasBackupVolumeNumber/data/sharedFolderName  
mountDestinationDir
```

[For Linux]

```
mount -t nfs nasInterfaceIpAddress:/mnt/nas/nv/nasBackupVolumeNumber/data/sharedFolderName  
mountDestinationDir
```

Information

Executing the showmount command on the UNIX server can view NFS mountable shared folders.

```
showmount -e nasInterfaceIpAddress
```

After NFS mounted, logging in to the UNIX server as the user registered to LDAP can access the shared folder with the owner/group permissions set to the shared folder.

When not authenticating through LDAP, logging in to the UNIX server can access the shared folder.

3.10.5 Concerning Secondary Backup of the NAS Volume

When performing a secondary backup of the NAS volume, implement a standard Advanced Copy where the copying source is the NAS backup volume.

The types of Advanced Copy that can be utilized with secondary backup of the NAS volume are as follows.

- QuickOPC
- SnapOPC+

Procedures for Secondary Backup / Restoration of NAS Volume

Preparations

1. Create a logical volume that will be the secondary backup destination of the NAS volume.
2. Create a copy group for secondary backup having the NAS backup volume and the logical volume of the secondary backup destination of the NAS volume as a copy pair.

Backup Procedures

1. According to the backup operation of the NAS environment, backup the NAS volume to the NAS backup volume.
2. Using the copy group for the secondary backup, backup the NAS backup volume to the logical volume of the secondary backup destination.

Restoration Procedures

1. If the NAS backup volume is mounted, unmount the volume first.
2. Suspend the copying in relation to the NAS backup volume being performed from the NAS volume.
3. Using the copy group for the secondary backup, implement restoration (copying) in relation to the NAS backup volume from the logical volume of the secondary backup destination.
4. According to the backup operation of the NAS environment, restore the NAS volume from the NAS backup volume.

3.10.6 Recovery Procedure When NAS Volume or NAS Backup Volume Fails

This section explains the recovery procedure when a NAS volume or a NAS backup volume is down due to failure of all the disks in RAID:

1. Recovery of Thin Provisioning Pool

After disk replacement, create a Thin Provisioning Pool for a NAS volume or a NAS backup volume on the Web Console.

Information

Refer to "Create Thin Provisioning Pool" in the *ETERNUS SF Web Console Guide* for the procedure to create a Thin Provisioning Pool.

2. Create NAS volume or NAS backup volume

Use the ETERNUS CLI to create a NAS volume or a NAS backup volume.

 **Point**

Specify the same volume name and volume number as before failure occurrence to create a volume.

3. Recovery of NAS volume or NAS backup volume

When recovering a NAS volume, restore from a NAS backup volume.

 **Information**

Refer to "Restore to NAS Volume" in the *ETERNUS SF Web Console Guide* for information on the procedures for restoring from the NAS backup volume to the NAS volume.

 **Note**

If the restore fails, data corruption may possibly be occurring on the NAS volume. Remove the cause of the failure and try the restore again.

When recovering a NAS backup volume, restore from the secondary backup volume.

 **Information**

Refer to "[3.10.5 Concerning Secondary Backup of the NAS Volume](#)" for the restore procedure from secondary backup volume to NAS backup volume.

3.10.7 Important Points concerning Backup of NAS Environment

Do not implement Advanced Copy in relation to the NAS volume or the NAS backup volume for operations other than those described in this chapter. Doing so will create a situation where the NAS volume will not be able to be properly restored.

Chapter 4 Command References

This chapter explains the various commands that are used with AdvancedCopy Manager CCM or Express.

Refer to "Creating user account for using AdvancedCopy Manager CCM" in the *ETERNUS SF Installation and Setup Guide* for information on user accounts that can use commands.

Point

For using the commands, it is necessary to set up the PATH environment variable. Refer to "Setting PATH environment variable" in "Setup of AdvancedCopy Manager CCM" in the *ETERNUS SF Installation and Setup Guide* for information on how to set up.

4.1 Command list

The commands can be classified as follows.

Environment definition commands

Table 4.1 List of commands for controlling ETERNUS Disk storage system

Function	Command	Explanation
acarray add (ETERNUS Disk storage system registration command)	acarray add	Registers ETERNUS Disk storage system.
acarray change (ETERNUS name and access volume for ETERNUS Disk storage system change command)	acarray change	Changes the access volume and ETERNUS name for ETERNUS Disk storage system.
acarray list (ETERNUS Disk storage system information display command)	acarray list	Displays information about ETERNUS Disk storage system.
acarray detail (ETERNUS Disk storage system detail information display command)	acarray detail	Displays detailed information about ETERNUS Disk storage system.
acarray pathscan (Access volume automatic setting command)	acarray pathscan	Sets access volumes automatically by searching recognized disks for a valid ETERNUS Disk storage system access volume.
acarray remove (ETERNUS Disk storage system registration information deletion command)	acarray remove	Removes registration information about ETERNUS Disk storage system.

Table 4.2 List of commands for displaying information relating to ETERNUS Disk storage system

Function	Command	Explanation
acinq lv (Logical volume information display command)	acinq lv	Displays information about logical volumes.
acinq lunmap (LUN Mapping information display command)	acinq lunmap	Displays LUN mapping information.
acinq ag (Affinity group list display command)	acinq ag	Displays affinity groups for ETERNUS Disk storage system.
acinq hostag (Host affinity group list display command)	acinq hostag	Displays host affinity groups for ETERNUS Disk storage system.

Table 4.3 List of commands for controlling logical volume

Function	Command	Explanation
acinhbit set (Volume protection settings command)	acinhbit set	Sets volume protection.
acinhbit unset (Volume protection settings release command)	acinhbit unset	Releases volume protection settings.

Table 4.4 List of commands for controlling REC transfer buffers

Function	Command	Explanation
acrecbuff set (REC transfer buffer setting command)	acrecbuff set	Sets up REC transfer buffers.
acrecbuff stat (REC transfer buffer status display command)	acrecbuff stat	Displays REC transfer buffer information.

Table 4.5 List of commands for setting up copy groups

Function	Command	Explanation
acgroup create (Copy group creation command)	acgroup create	Creates a copy group.
acgroup list (Copy group display command)	acgroup list	Displays the copy groups that have been set up.
acgroup detail (Copy group detail information display command)	acgroup detail	Displays the copy pairs that have been set up in copy groups.
acgroup remove (Copy group deletion command)	acgroup remove	Removes copy groups.
acpair add (Copy pair addition command)	acpair add	Adds copy pairs to copy groups.
acpair remove (Copy pair deletion command)	acpair remove	Removes copy pairs from copy groups.

Operation commands

Table 4.6 List of commands for controlling snapshot type high-speed copying

Function	Command	Explanation
acopc start (OPC/QuickOPC copy start command)	acopc start	Starts the OPC or QuickOPC copying.
acopc query (OPC/QuickOPC copy status display command)	acopc query	Displays the status of OPC or QuickOPC copying.
acopc cancel (OPC/QuickOPC copy stop command)	acopc cancel	Stops the OPC or QuickOPC copying.
acsnap start (SnapOPC+ copy start command)	acsnap start	Starts the SnapOPC+ copying.
acsnap query (SnapOPC+ copy status display command)	acsnap query	Displays the status of SnapOPC copying.
acsnap cancel (SnapOPC+ copy stop command)	acsnap cancel	Stops the SnapOPC+ copying.

Table 4.7 List of commands for controlling synchronous high-speed copying

Function	Command	Explanation
acec start (Synchronous high-speed copy start command)	acec start	Starts synchronous high-speed copying.
acec query (Synchronous high-speed copy status display command)	acec query	Displays the status of synchronous high-speed copying.
acec suspend (Synchronous high-speed copy temporary suspension command)	acec suspend	Temporarily suspends synchronous high-speed copying.
acec resume (Synchronous high-speed copy restart command)	acec resume	Restarts temporarily interrupted synchronous high-speed copying.
acec reverse (Synchronous high-speed copy reverse command)	acec reverse	Reverses the direction of synchronous high-speed copying.

Function	Command	Explanation
acec change (Synchronous high-speed copy mode change command)	acec change	Changes the mode of synchronous high-speed copying (for REC only).
acec cancel (Synchronous high-speed copy stop command)	acec cancel	Stops synchronous high-speed copying.

Table 4.8 List of commands for operating NAS environment

Function	Command	Explanation
4.9.1 acnas backup (NAS volume backup command)	acnas backup	Backup of the NAS volume coordinated with the NAS environment of the ETERNUS Disk storage system will be performed.

Table 4.9 List of commands for managing copy sessions

Function	Command	Explanation
accopy query (Copy session information display command)	accopy query	Displays the information of copy sessions.
accopy fcancel (Copy session forcible stop command)	accopy fcancel	Stops the copy session forcibly.
accopy fsuspend (REC session forcible suspend command)	accopy fsuspend	Suspends the REC copy session forcibly.

Utility commands

Table 4.10 List of server utility commands

Function	Command	Explanation
acutil devs (Logical volume information display command)	acutil devs	Displays information about logical volumes.
acgetvolinfo (Logical volume information display command)	acgetvolinfo	Displays information about logical volumes.
acutil refresh (Partition table refresh command)	acutil refresh	Refreshes the partition table for the disk on Windows servers.
acutil fsflush (File system flush command)	acutil fsflush	Flushes the file system on Windows servers.
acsdv init (Snap Data Volume initialization command)	acsdv init	Initializes Snap Data Volumes.
acsdv stat (Snap Data Volume status display command)	acsdv stat	Displays the status of a Snap Data Volume.
acsdv poolstat (Snap Data Pool status display command)	acsdv poolstat	Displays the status of a Snap Data Pool.

Maintenance commands

Table 4.11 List of maintenance commands

Function	Command	Explanation
acserv stop (Management service stop command)	acserv stop	Stops the management services.

Troubleshooting data collection commands

Table 4.12 List of troubleshooting data collection commands

Function	Command	Explanation
esfsnap (CCM Server troubleshooting data collection command)	esfsnap	Collects data for use in investigating faults on the CCM Server.

4.2 Control commands for ETERNUS Disk storage system

This section explains the commands for ETERNUS Disk storage system.

4.2.1 `acarray add` (ETERNUS Disk storage system registration command)

NAME

`acarray add` - Registration of ETERNUS Disk storage system

SYNOPSIS

To register a storage device which is operated by Copy command via SAN

```
acarray add -a diskArrayName -ip diskArrayIP -user userName -password password [-san] [-path volumeName] [-xml]
```

To register a storage device which is operated by Copy command via LAN

```
acarray add -a diskArrayName -ip diskArrayIP -user userName -password password -lan [-xml]
```

To register a remote ETERNUS Disk storage system

```
acarray add -a diskArrayName -boxid boxID -remote [-xml]
```

DESCRIPTION

This command registers ETERNUS Disk storage system.

OPTIONS

`-a diskArrayName`

This option specifies the ETERNUS names that are used by AdvancedCopy Manager CCM or Express. Specify it in the alphanumeric character within 255 characters.

When using Web Console, specify a device name of ETERNUS Disk storage system as ETERNUS name. ETERNUS names are case-sensitive. When you specify an ETERNUS name by using another command, enter the ETERNUS name specified with this option correctly.

`-ip diskArrayIP`

This option specifies the IP address of an ETERNUS Disk storage system. The following IP addresses can be specified.

- IPv4 address

Format that separates decimal digits with periods ".". (Values according to the IPv4 rules)

It is a specification example as follows:

192.168.0.1

- IPv6 address

Format that separates hexadecimal digits with colons ":".

It is a specification example as follows:

2001:0db8:0000:0000:1234:0000:0000:0001

2001:db8::1234:0:0:1(abbreviated notation)

An error will occur when an attempt is made to register an ETERNUS Disk storage system with the same IP address as an ETERNUS Disk storage system that has already been registered. Moreover, even if IP address is different, it becomes an error when the same ETERNUS Disk storage system has already been registered.

-user *userName*

This option specifies the user who has the following privileges.

Storage device	Privileges
ETERNUS Disk storage system which can operate by using Copy command via LAN	Software role of ETERNUS Disk storage system
ETERNUS Disk storage system which cannot operate by using Copy command via LAN	Administrator authorization of ETERNUS Disk storage system

Specify the user name using a string that is between 1 and 32 characters long.

Refer to the ETERNUS Web GUI manuals for more information about ETERNUS Web GUI.

Refer to "[Table 1.1 ETERNUS Disk storage system that can be operated by Copy command via SAN or via LAN](#)" for storage devices which can operate by using Copy command via LAN.

-password *password*

This option specifies the password for the user name specified with -user option.

-path *volumeName*

This option specifies the access volume in the logical volume within an ETERNUS Disk storage system that was specified with -a option.

OS type	Explanation
Windows	Specify the drive letter (e.g. X:).
Solaris	Specify a device name from the following: <ul style="list-style-type: none">- OS standard device name (/dev/rdisk/*)- Solaris standard multipath (MPxIO) device name (/dev/rdisk/*)- ETERNUS multipath device name (/dev/FJSVmplb/rdisk/*)- VxVM device name (/dev/vx/rdmp/*)
Linux	Specify a device name from the following: <ul style="list-style-type: none">- OS standard device name (/dev/sd*)- Multipath device name generated by device mapper facility of OS (/dev/mapper/*)- udev device name generated by udev facility of OS (/dev/disk/by-id/*, /dev/disk/by-path/*)

The access volume is automatically set if this option is omitted.

When registering the ETERNUS Disk storage system which is operated by Copy command via LAN, it is unnecessary to specify this option.

-san

This option specifies the Copy command via SAN as the method of sending the copy command.
This option can be omitted.

-lan

This option specifies the Copy command via LAN as the method of sending the copy command.
The method of sending the copy command is set to Copy command via SAN, if this option is omitted.

-box-id *boxID*

This option specifies the Box ID of ETERNUS Disk storage system.

An error will occur when an attempt is made to register an ETERNUS Disk storage system with the same Box ID as an ETERNUS Disk storage system that has already been registered.

-remote

This option specifies when registering the ETERNUS Disk storage system which is in a remote site.

-xml

This option specifies when displaying the result of the command execution by the XML format.

EXIT STATUS

=0 : Completed successfully

>0 : Terminated abnormally

EXAMPLES

The execution example on Windows operating system is as follows.

- Registering a storage device which is operated by Copy command via SAN:

```
> acarray add -a ET001 -ip 10.124.6.251 -user root -password root -san -path X:  
Successful completion.
```

- Registering a storage device which is operated by Copy command via LAN:

```
> acarray add -a ET001 -ip 10.124.6.251 -user root -password root -lan  
Successful completion.
```

- Registering a storage device which is at remote site:

```
> acarray add -a ET001 -boxid 00ETERNUSDXM##ET44S20A####HK000104##### -remote  
Successful completion.
```

4.2.2 acarray change (ETERNUS name and access volume for ETERNUS Disk storage system change command)

NAME

acarray change - Change of ETERNUS names and access volumes

SYNOPSIS

```
acarray change -a diskArrayName {-path volumeName | -new newDiskArrayName} [-xml]  
acarray change -a diskArrayName -new newDiskArrayName -remote [-xml]
```

DESCRIPTION

This command changes the ETERNUS names and access volumes for ETERNUS Disk storage system.

OPTIONS

-a *diskArrayName*

This option specifies the existing ETERNUS name for which the ETERNUS name or access volume is to be changed.

-path *volumeName*

This option specifies the new access volume to be set in the ETERNUS Disk storage system.

This option cannot use for the ETERNUS Disk storage system which is registered to operate by Copy command via LAN.

OS type	Explanation
Windows	Specify the drive letter (e.g. Y:).

OS type	Explanation
Solaris	Specify a device name from the following: <ul style="list-style-type: none"> - OS standard device name (/dev/rdisk/*) - Solaris standard multipath (MPxIO) device name (/dev/rdisk/*) - ETERNUS multipath device name (/dev/FJSVmplb/rdisk/*) - VxVM device name (/dev/vx/rdmp/*)
Linux	Specify a device name from the following: <ul style="list-style-type: none"> - OS standard device name (/dev/sd*) - Multipath device name generated by device mapper facility of OS (/dev/mapper/*) - udev device name generated by udev facility of OS (/dev/disk/by-id/*, /dev/disk/by-path/*)

-new *newDiskArrayName*

This option specifies the new ETERNUS name to be set for the ETERNUS Disk storage system.

-remote

This option specifies when changing the ETERNUS Disk storage system which is in a remote site.

-xml

This option specifies when displaying the result of the command execution by the XML format.

EXIT STATUS

=0 : Completed successfully

>0 : Terminated abnormally

EXAMPLES

The execution example on Windows operating system is as follows.

- Changing an ETERNUS Disk storage system which is in a local site:

```
> acarray change -a ET001 -p path Y:
Successful completion.
```

- Changing an ETERNUS Disk storage system which is in a remote site:

```
> acarray change -a ET001 -new ET001R -remote
Successful completion.
```

4.2.3 acarray list (ETERNUS Disk storage system information display command)

NAME

acarray list - Display of information on ETERNUS Disk storage system

SYNOPSIS

```
acarray list [-remote] [-xml]
```

DESCRIPTION

This command displays a list of the ETERNUS Disk storage systems that have been registered, together with information about each ETERNUS Disk storage system.

OPTIONS

-remote

This option specifies when displaying of information on the ETERNUS Disk storage system which is in a remote site.

-xml

This option specifies when displaying by the XML format.

EXIT STATUS

=0 : Completed successfully

>0 : Terminated abnormally

EXAMPLES

- Displaying ETERNUS Disk storage systems which are at local site:

```
> acarray list
```

```
Name  BOX-ID                                     IP Address
-----
ET001  00ETERNUSDXM##ET44S20A####HK000104#####  10.124.6.251
ET002  00ETERNUSDXH##ET87S20A####NC4110699004##  10.124.6.241
```

The following table shows the meanings of the information displayed.

Title	Explanation
Name	Displays the ETERNUS name.
BOX-ID	Displays the Box ID for ETERNUS Disk storage system.
IP Address	Displays the IP address for ETERNUS Disk storage system. Either following addresses are displayed. - IPv4 address Form to which decimal mark is delimited by "." (value according to rule of IPv4) Example) 192.168.0.1 - IPv6 address Form to which hexadecimal mark is delimited by ":" (It is displayed by the abbreviated notation). Example) 2001:db8::1234:0:0:1

- Displaying ETERNUS Disk storage systems which are at remote site:

```
> acarray list -remote
```

```
Name  BOX-ID
-----
ET001  00ETERNUSDXM##ET44S20A####HK000104#####
ET002  00ETERNUSDXH##ET87S20A####NC4110699004##
```

The following table shows the meanings of the information displayed.

Title	Explanation
Name	Displays the ETERNUS name.
BOX-ID	Displays the Box ID for ETERNUS Disk storage system.

4.2.4 acarray detail (ETERNUS Disk storage system detail information display command)

NAME

acarray detail - Display the detail information on ETERNUS Disk storage system

SYNOPSIS

```
acarray detail -a diskArrayName [-route] [-xml]
```

DESCRIPTION

This command displays the detail information about the ETERNUS Disk storage system that has been registered.

OPTIONS

-a diskArrayName

This option specifies the ETERNUS name.

-route

This option specifies the displaying by the extended format.
Refer to the table of EXAMPLES for the displayed items.

-xml

This option specifies when displaying by the XML format.

EXIT STATUS

=0 : Completed successfully

>0 : Terminated abnormally

EXAMPLES

- Displaying an ETERNUS Disk storage system which is at local site:

The execution example on Windows operating system is as follows.

```
> acarray detail -a ET001
```

```
Disk Array Name : ET001
BOX-ID          : 00ETERNUSDXM##ET44S20A####HK000104#####
IP Address      : 10.124.6.251
Admin User     : root
Access Volume   : X:
```

The following table shows the meanings of the information displayed.

Title	Explanation
Disk Array Name	Displays the ETERNUS name.
BOX-ID	Displays the Box ID for ETERNUS Disk storage system.
IP Address	<p>Displays the IP address for ETERNUS Disk storage system. (*1) Either following addresses are displayed.</p> <ul style="list-style-type: none"> - IPv4 address Form to which decimal mark is delimited by "." (value according to rule of IPv4) Example) 192.168.0.1 - IPv6 address Form to which hexadecimal mark is delimited by ":" (It is displayed by the abbreviated notation). Example) 2001:db8::1234:0:0:1
Admin User	<p>Displays the user name of ETERNUS Disk storage system. (*1)</p> <ul style="list-style-type: none"> - For the storage device which can operate by using Copy command via LAN: User who has Software role of ETERNUS Disk storage system - For the storage device which cannot operate by using Copy command via LAN: User who has Administrator authorization of ETERNUS Disk storage system
Access Volume	<p>Displays the access volume set up for the ETERNUS Disk storage system. (*1)(*2)</p> <ul style="list-style-type: none"> - For Windows Displays the device name of the physical drive. If the access volume is automatically set by acarray add (ETERNUS Disk storage system registration command) or acarray pathscan (Access volume automatic setting command), the form of "PhysicalDrive [disk number]" is used for display. The disk number is the same value as the "disk?" in the AdvancedCopy Manager block device name and the "Disk #" displayed in the [Disk Management] - [Computer Management] - [Management Tool] from the [Start] menu. - For Solaris Displays the RAW device name. - For Linux Displays the device name.
Access Route	<p>Displays the method of sending the copy command to the ETERNUS Disk storage system. (*1) This item is displayed only when the -route option is specified.</p> <ul style="list-style-type: none"> - lan : sends the Copy command via LAN - san : sends the Copy command via SAN

*1: If the specified ETERNUS Disk storage system exists at remote site, a hyphen (-) is displayed.

*2: If the Access Route is "lan", a hyphen (-) is displayed.

4.2.5 acarray pathscan (Access volume automatic setting command)

NAME

acarray pathscan - Automatic setting of access volumes

SYNOPSIS

```
acarray pathscan -a diskArrayName [-xml]
```

DESCRIPTION

This command searches the ETERNUS Disk storage system and sets access volumes automatically.

OPTIONS

-a *diskArrayName*

This option specifies the ETERNUS name.

-xml

This option specifies that the access volume be displayed in XML format.

EXIT STATUS

=0 :Completed successfully

>0 :Terminated abnormally

EXAMPLES

```
> acarray pathscan -a ET001  
Successful completion.
```

NOTES

- This command is not available for the following ETERNUS Disk storage systems
 - ETERNUS Disk storage system which is registered as a remote device
 - ETERNUS Disk storage system which is registered to operate by Copy command via LAN

4.2.6 acarray remove (ETERNUS Disk storage system registration information deletion command)

NAME

acarray remove - Deletion of registered information of ETERNUS Disk storage system

SYNOPSIS

```
acarray remove -a diskArrayName [-xml]
```

DESCRIPTION

This command deletes registration information for ETERNUS Disk storage system.

OPTIONS

`-a diskArrayName`

This option specifies the ETERNUS name.

`-xml`

This option specifies when displaying the result of the command execution by the XML format.

EXIT STATUS

`=0` : Completed successfully

`>0` : Terminated abnormally

EXAMPLES

```
> acararray remove -a ET001
Successful completion.
```

4.3 Commands for displaying information related to ETERNUS Disk storage system

This section explains the commands for displaying information related to ETERNUS Disk storage system.

4.3.1 acinq lv (Logical volume information display command)

NAME

`acinq lv` - Display of information on logical volumes

SYNOPSIS

```
acinq lv -a diskArrayName [-free] [-l] [-xml]
```

DESCRIPTION

This command displays a list of the logical volumes for ETERNUS Disk storage system, together with information about each logical volume.

This information can be displayed for the following types of logical volumes:

- Open Volume (Open)
- Flexible Tier Volume (FTV)
- Snap Data Volume (SDV)
- Thin Provisioning Volume
- WSV (Wide Striping Volume)

OPTIONS

-a *diskArrayName*

This option specifies the ETERNUS name.

-free

Displays list of logical volumes that meet the following requirements.

- Not registered with an affinity group
- Not used by LUN Mapping settings if the affinity function is disabled

-l

This option specifies that the logical volumes be displayed in extended format.

Refer to the table of execution examples for the items displayed when this option is specified.

Note that, in future versions, additional items may be displayed when this option is specified to support new functions provided in those versions.

-xml

This option specifies when displaying by the XML format.

EXIT STATUS

=0 : Completed successfully

>0 : Terminated abnormally

EXAMPLES

- When you specify the -free option:

```
> acinq lv -a ET001 -free
```

LV No	LV Name	LV Size	LV Type	RG No	Encrypt
0x0023		1024M	Open	5	-

- When you do not specify the -free option:

```
> acinq lv -a ET001
```

LV No	LV Name	LV Size	LV Type	RG No	Encrypt
0x0010		1024M	Open	4	-
0x0011		1024M	Open	4	-
0x0012		1024M	Open	4	-
0x0013		1024M	Open	2	-
0x0014		1024M	Open	2	-
0x0023		1024M	Open	5	-

- When you specify the -l option:

```
> acinq lv -a ET001 -l
```

LV No	LV Name	LV Size	LV Type	RG No	Encrypt	Virtual Size	Copy	Inhibit
0x0010		1024M	Open	4	-		-	Yes
0x0011		1024M	Open	4	-		-	Yes
0x0012		1024M	Open	4	-		-	Yes
0x0013		1024M	SDV	2	-	4096M	-	
0x0014		1024M	TPV	-	-		-	

The following table shows the meanings of the information displayed.

Title	Explanation
LV No	Displays the logical volume number in hexadecimal.
LV Name	Displays the alias for the logical volume (0 to 32 characters). (Only be displayed when used with an ETERNUS Disk storage system that supports logical volume alias name.)
LV Size	Displays the size of the logical volume in Megabytes.
LV Type	Displays the logical volume type. <ul style="list-style-type: none"> - Open: This refers to an "Open Volume", which means a normal volume that can be used with open systems. - FTV: This refers to a "Flexible Tier Volume", which means a hierarchy target volume that can be used with open systems. - SDV: This refers to a "Snap Data Volume", which means a volume that can be used as the copy destination for SnapOPC/SnapOPC+. The volume of this type cannot be used as the copy destination for OPC/QuickOPC/EC/REC. - TPV: This refers to a "Thin Provisioning Volume", which means a virtual volume that can be used with open systems. - WSV: This refers to a "Wide Striping Volume", which means a volume that concatenates multiple RAID groups by striping.
RG No	Displays the RAID group number. The hyphen (-) is displayed, when "TPV" is displayed in "LV Type" field. When the LV Type is "WSV", the displayed items are delimited by commas (",").
Encrypt	Displays the encryption status of the logical volume. <ul style="list-style-type: none"> - -: Indicates an unencrypted volume. - Yes: Indicates an encrypted volume.
Virtual Size	Displays the virtual size of the Snap data volume in MB if -l option is specified. If the logical volume type is other than "SDV", a hyphen (-) is displayed.
Copy Inhibit	Displays the volume protection status. The status is displayed only if the -l option is specified. <ul style="list-style-type: none"> - -: The volume is not protected. - Yes: The volume is protected. <p>If the logical volume type is "SDV" or the device does not support the volume protection function, a hyphen (-) is displayed.</p>

NOTES

- This command is not available for ETERNUS Disk storage system registered as a remote device.
- To display logical volume information of ETERNUS Disk storage systems registered as a remote device, login to ETERNUS Web GUI, and confirm the information.

4.3.2 acinq lunmap (LUN Mapping information display command)

NAME

acinq lunmap - Display of LUN Mapping information

SYNOPSIS

```
acing lunmap -a diskArrayName -agno groupNumber [-xml]
```

DESCRIPTION

This command displays LUN Mapping information for affinity groups.
This command cannot be used with the connected affinity group.

OPTIONS

-a *diskArrayName*

This option specifies the ETERNUS name.

-agno *groupNumber*

This option specifies an affinity group number.

-xml

This option specifies when displaying by the XML format.

EXIT STATUS

=0 : Completed successfully

>0 : Terminated abnormally

EXAMPLES

```
> acing lunmap -a ET001 -agno 0x004
```

```
LUN      LV No  LV Name
-----  -
0x0000  0x0003
0x0001  0x0004
0x0002  0x0005
```

The following table shows the meanings of the information displayed.

Title	Explanation
LUN	Displays the logical unit number in hexadecimal.
LV No	Displays the logical volume number in hexadecimal.
LV Name	Displays the alias for the logical volume (0 to 32 characters). (Displayed only when used with an ETERNUS Disk storage system that supports logical volume alias name.)

NOTES

- This command is not available for ETERNUS Disk storage system registered as a remote device.

4.3.3 acing ag (Affinity group list display command)

NAME

acing ag - Display of list of affinity groups

SYNOPSIS

```
acing ag -a diskArrayName [-xml]
```

DESCRIPTION

This command displays a list of affinity groups for ETERNUS Disk storage system.

The "Affinity groups" are management information on ETERNUS Disk storage systems that indicate the relationship between logical unit numbers (LUN), which can be recognized by the host, and logical volume numbers, which are managed within ETERNUS Disk storage systems.

OPTIONS

-a diskArrayName

This option specifies the ETERNUS name.

-xml

This option specifies when displaying by the XML format.

EXIT STATUS

=0 : Completed successfully

>0 : Terminated abnormally

EXAMPLES

```
> acing ag -a ET001
```

```
AG No AG Name  
-----  
0x000 ag_78  
0x001 ag_76
```

The following table shows the meanings of the information displayed.

Title	Explanation
AG No	Displays the affinity group number in hexadecimal.
AG Name	Displays the affinity group name.

NOTES

- This command is not available for ETERNUS Disk storage system registered as a remote device.

4.3.4 acing hostag (Host affinity group list display command)

NAME

acing hostag - Display of list of host affinity groups

SYNOPSIS

```
acing hostag -a diskArrayName [-xml]
```

DESCRIPTION

This command displays host affinity groups for ETERNUS Disk storage system.

The "Host affinity groups" are management information on ETERNUS Disk storage systems that indicate the relationship between the World Wide Name (WWN) for the host and its affinity groups. Disks that connect to the host can be specified as host affinity groups.

OPTIONS

-a *diskArrayName*

This option specifies the ETERNUS name.

-xml

This option specifies when displaying by the XML format.

EXIT STATUS

=0 : Completed successfully

>0 : Terminated abnormally

EXAMPLES

```
> aching hostag -a ET001
```

Host Name	Port Type	Address	AG No	AG Name
	FC	1000006069107A5A	0x002	win_78
	FC	100000AC340DA34F	0x003	win_78
	FC	10000045AA2C45GG	0x004	x86_76

The following table shows the meanings of the information displayed.

Title	Explanation
Host Name	Displays the host name or alias name. (Only ETERNUS Disk storage system attaches host names or alias names.) The host name is displayed for the FC-CA or the Serial Attached SCSI. The alias name is displayed for the iSCSI-CA.
Port Type	Displays the data transfer method. The following type is displayed. - FC: fibre channel connection - iSCSI: iSCSI connection - SAS: Serial Attached SCSI connection
Address	Displays the address for the connection destination. - The WWN is displayed for the FC-CA. - The iSCSI address is displayed for the iSCSI-CA. - The SAS address is displayed for the Serial Attached SCSI. - "*" is displayed if iSCSI address is omitted.

Title	Explanation
AG No	Displays the affinity group number in hexadecimal.
AG Name	Displays the affinity group name.

NOTES

- This command is not available for ETERNUS Disk storage system registered as a remote device.

4.4 Logical volume control commands

4.4.1 acinhibit set (Volume protection settings command)

NAME

acinhibit set - Settings for volume protection

SYNOPSIS

```
acinhibit set -v volumeName [-xml]
```

DESCRIPTION

This command sets volume protection settings.

Protection settings prevent transaction volumes being accidentally destroyed by Advanced Copy as a result of operator error.

The following type of logical volume can be specified:

- Open Volume (Open)
- Flexible Tier Volume (FTV)
- Thin Provisioning Volume
- Wide Striping Volume (WSV)

OPTIONS

-v *volumeName*

This option specifies the logical volume.

The format used to specify the logical volume is as follows:

```
DX80/0x1
└─┬─┘ └─┬─┘
  (1)  (2)
```

- (1) ETERNUS name
- (2) Logical volume number

The extent start position and the extent size cannot be specified.

-xml

This option specifies when displaying the result of the command execution by the XML format.

EXIT STATUS

=0 : Completed successfully

>0 : Terminated abnormally

EXAMPLES

```
> acinhibit set -v ET001/0x1
Successful completion
```

NOTES

The copy volume protection function cannot use for the following volumes:

- Logical volumes in remote ETERNUS Disk storage system
- REC session destination logical volumes

4.4.2 acinhibit unset (Volume protection settings release command)

NAME

acinhibit unset - Release of volume protection

SYNOPSIS

```
acinhibit unset -v volumeName [-xml]
```

DESCRIPTION

This command releases volume protection settings.

The following type of logical volume can be specified:

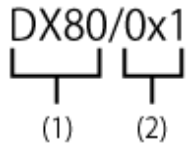
- Open Volume (Open)
- Flexible Tier Volume (FTV)
- Thin Provisioning Volume
- Wide Striping Volume (WSV)

OPTIONS

-v *volumeName*

This option specifies the logical volume.

The following example shows the format for specifying logical volumes.



- (1) ETERNUS name
- (2) Logical volume number

The extent start position and the extent size cannot be specified.

-xml

This option specifies when displaying the result of the command execution by the XML format.

EXIT STATUS

- =0 : Completed successfully
- >0 : Terminated abnormally

EXAMPLES

```
> acinhibit unset -v ET001/0x1
Successful completion
```

NOTES

The copy volume protection function cannot use for the following volumes:

- Logical volumes in remote ETERNUS Disk storage system

4.5 Commands for REC transfer buffers

This section explains the commands for REC transfer buffers of ETERNUS Disk storage system.

4.5.1 acrebuff set (REC transfer buffer setting command)

NAME

acrebuff set - Set up REC transfer buffers

SYNOPSIS

```
acrebuff set -a diskArrayName -id bufferID -use {SEND|RECV} [-xml]
```

DESCRIPTION

The settings for transfer buffers used in ETERNUS Disk storage systems are changed. To execute this command, it is required that the REC transfer buffers have been already set.

OPTIONS

`-a diskArrayName`

This option specifies the ETERNUS name.

`-id bufferID`

This option specifies a REC transfer buffer ID.

`-use {SEND|RECV}`

This option specifies the use purpose of the REC transfer buffer.

- SEND : For sending
- RECV : For receiving

`-xml`

This option specifies when displaying the result of the command execution by the XML format.

EXIT STATUS

- =0 : Completed successfully
- >0 : Terminated abnormally

EXAMPLES

```
> acrecbuf set -a ET001 -id 1 -use SEND
Successful completion
```

NOTES

- Set up buffers while no session exists in asynchronous Consistency mode, which is in ACTIVE or ERROR SUSPEND status.
- It takes tens of seconds to change buffer settings. Since REC transfer buffers are not available while their settings are changed, do not execute REC operations.
- This command is not available for ETERNUS Disk storage system registered as a remote device.

4.5.2 `acrecbuf stat` (REC transfer buffer status display command)

NAME

`acrecbuf stat` - Display REC transfer buffer information

SYNOPSIS

```
acrecbuf stat -a diskArrayName [-disk] [-xml]
```

DESCRIPTION

The information for REC transfer buffers used in an ETERNUS Disk storage system is displayed.

OPTIONS

-a *diskArrayName*

This option specifies the ETERNUS name.

-disk

This option displays REC Disk buffer information.

-xml

This option specifies when displaying by the XML format.

EXIT STATUS

=0 : Completed successfully

>0 : Terminated abnormally

EXAMPLES

- If the -disk option is specified:

```
> acrecbuf stat -a ET001 -disk
ID  Use  Rate RemoteBoxID                               DiskBuff  DiskRate
-----
1   SEND  12% 00ETERNUSDXM##ET41S20A####HM000208##### "active"    30%
2   RECV   0% 00ETERNUSDXM##ET41S20A####HM000208##### "----"     ----
```

- If the -disk option is not specified:

```
> acrecbuf stat -a ET001
ID  Use  Rate RemoteBoxID
-----
1   SEND  12% 00ETERNUSDXM##ET44S20A####HK000104#####
2   RECV   0% 00ETERNUSDXM##ET44S20A####HK000104#####
```

The following table shows the meanings of the information displayed.

Title	Description
ID	Displays a REC transfer buffer ID.
Use	Displays the use purpose of REC transfer buffer. <ul style="list-style-type: none"> - SEND: for sending - RECV: for receiving
Rate	Displays the REC transfer buffer usage as a percentage. When the REC transfer buffer is not available, "----" is displayed. <ul style="list-style-type: none"> - For sending: Displays the transfer buffer usage as a percentage. Even if REC in asynchronous Consistency mode is not executed, the usage does not become 0 %. - For receiving: "0 %" is displayed at all times.
RemoteBoxID	Displays the Box ID for the ETERNUS Disk storage system.
DiskBuff	Displays the REC Disk buffer status. This is displayed only if the -disk option is specified. <ul style="list-style-type: none"> - ---: Transfer buffer is for reception - active: REC Disk buffer is in the usable state

Title	Description
	<ul style="list-style-type: none"> - invalid: REC Disk buffer is not set - warning(code=xx): REC Disk buffer is in the usable state but the disk has a fault One of the following codes is entered at code=xx: <ul style="list-style-type: none"> - 04: Rebuild or other recovery operation is in progress (REC Disk buffer is in the usable state) - 08: RAID that comprises the REC Disk buffer includes RAID group that does not have redundancy - in active(code=xx): REC Disk buffer is not in the usable state One of the following codes is entered at code=xx: <ul style="list-style-type: none"> - 05: RAID group that comprises the REC Disk buffer has error status - 06: REC Disk buffer RAID group is being formatted - 07: Copy destination does not support REC Disk buffer - not support: REC Disk buffer is not supported
DiskRate	<p>If the REC Disk buffer state is "active" or "warning", the busy rate is displayed as a percentage The busy rate is displayed only if the -disk option is specified.</p> <p>If the REC Disk buffer is not used, "0%" is displayed. In cases other than the above, "---" is displayed.</p>

NOTES

- This command is not available for ETERNUS Disk storage system registered as a remote device.

4.6 Commands for setting up copy groups

This section explains the commands relating to copy groups and copy pairs.

4.6.1 acgroup create (Copy group creation command)

NAME

acgroup create - Creation of copy groups

SYNOPSIS

```
acgroup create -g copyGroup -type { OPC | QuickOPC | SnapOPCP | EC } -a diskArrayName [-xml]
acgroup create -g copyGroup -type REC -a diskArrayName -remote remoteDiskArrayName [-xml]
```

DESCRIPTION

This command creates a copy group.

OPTIONS

-g *copyGroup*

This option specifies the copy group name.

The copy group name is an alias for the copy group that can be used with AdvancedCopy Manager CCM or Express.

Specify using up to 64 alphanumeric characters, minus sign (-), underscore (_), number sign (#), period (.), and plus sign (+). The first character must be an alphanumeric character.

For Windows, copy group names are not case-sensitive.

For Solaris and Linux, copy group names are case-sensitive.

An error will occur when an attempt is made to create a copy group with the same name as a copy group that has already been registered.

-type { OPC | QuickOPC | SnapOPCP | EC | REC }

This option specifies the type of copy used within the copy group.

Specify one of the following copy types. The meaning of "SnapOPCP" is SnapOPC+.

- OPC
- QuickOPC
- SnapOPCP
- EC
- REC

-a *diskArrayName*

This option specifies the ETERNUS name.

Specify the following ETERNUS Disk storage system:

- ETERNUS Disk storage system which is operated by Copy command via SAN
For REC, the access volume of the ETERNUS Disk storage system specified here is used.
- ETERNUS Disk storage system which is operated by Copy command via LAN
For REC, the connection route for the ETERNUS Disk storage system specified here is used.

-remote *remoteDiskArrayName*

For REC, the ETERNUS name besides the specified ETERNUS Disk storage system is specified by -a option.

The access volume or connection route of the ETERNUS Disk storage system specified by -a option is used, instead of the access volume or connection route of the ETERNUS Disk storage system specified here.

-xml

This option specifies when displaying the result of the command execution by the XML format.

EXIT STATUS

=0 : Completed successfully

>0 : Terminated abnormally

EXAMPLES

```
> acgroup create -g group01 -type OPC -a ET001  
Successful completion.
```

4.6.2 acgroup list (Copy group display command)

NAME

acgroup list - Display of copy groups

SYNOPSIS

```
acgroup list [-xml]
```

DESCRIPTION

This command displays a list of copy groups.

OPTIONS

-xml

This option specifies when displaying by the XML format.

EXIT STATUS

=0 : Completed successfully

>0 : Terminated abnormally

EXAMPLES

```
CG Name
-----
Group01
Group02
```

The following table shows the meaning of the information displayed.

Title	Explanation
CG Name	Displays the copy group name.

4.6.3 acgroup detail (Copy group detail information display command)

NAME

acgroup detail - Display the detail information of copy groups

SYNOPSIS

```
acgroup detail -g copyGroup [-xml]
```

DESCRIPTION

This command displays the copy pairs that have been set up in copy groups.

OPTIONS

-g *copyGroup*

This option specifies the copy group name.

-xml

This option specifies when displaying by the XML format.

EXIT STATUS

- =0 : Completed successfully
- >0 : Terminated abnormally

EXAMPLES

- For OPC, QuickOPC, SnapOPCP and EC

```
> acgroup detail -g group01
```

```
Copy Group Name : group01
Copy Group Type : OPC
Disk Array Name : ET001 (00ETERNUSDXM##ET44S20A####HK000104#####)
```

```
Pair
```

```
-----
ET001/0x1:ET001/0x6
ET001/0x2:ET001/0x7
ET001/0x3:ET001/0x8
```

The displayed content is shown next.

Title	Explanation
Copy Group Name	Displays the copy group name.
Copy Group Type	Displays the copy type set in the copy group.
Disk Array Name	Displays the Box ID and ETERNUS name that was specified with -a option for acgroup create (Copy group creation command) .
Pair	Displays the copy pair that was set up.

- For REC

```
> acgroup detail -g group01
```

```
Copy Group Name      : group01
Copy Group Type      : REC
Disk Array Name      : ET001 (00ETERNUSDXM##ET44S20A####HK000104#####)
Remote Disk Array Name : ET002 (00ETERNUSDXH##ET87S20A####NC4110699004##)
```

```
Pair
```

```
-----
ET001/0x1:ET002/0x1
ET001/0x2:ET002/0x2
ET001/0x3:ET002/0x3
```

The following table shows the meanings of the information displayed.

Title	Explanation
Copy Group Name	Displays the copy group name.
Copy Group Type	Displays the copy type set in the copy group.
Disk Array Name	Displays the Box ID and ETERNUS name that was specified with -a option for acgroup create (Copy group creation command) .
Remote Disk Array Name	Displays the Box ID and ETERNUS name that was specified with -remote option for acgroup create (Copy group creation command) .
Pair	Displays the copy pairs that have been set up.

4.6.4 acgroup remove (Copy group deletion command)

NAME

acgroup remove - Deletion of copy groups

SYNOPSIS

```
acgroup remove -g copyGroup [-xml]
```

DESCRIPTION

This command removes copy groups.

OPTIONS

-g *copyGroup*

This option specifies the copy group name.

-xml

This option specifies when displaying the result of the command execution by the XML format.

EXIT STATUS

=0 : Completed successfully

>0 : Terminated abnormally

EXAMPLES

```
> acgroup remove -g group01  
Successful completion.
```

4.6.5 acpair add (Copy pair addition command)

NAME

acpair add - Addition of copy pairs

SYNOPSIS

```
acpair add -g copyGroup -p copyPair [-xml]
```

DESCRIPTION

This command adds copy pairs to copy groups.

OPTIONS

-g *copyGroup*

This option specifies the copy group name.

-p *copyPair*

This option specifies the copy pair to be added.

The following example shows the format for specifying copy pairs.

DX80/0x1:DX80/0x6

(1) (2) (3) (4)

- (1) ETERNUS name for the copy source
- (2) Logical volume number for the copy source
- (3) ETERNUS name for the copy destination
- (4) Logical volume number for the copy destination

This option can also be specified in LU to Partition format.

An example is shown below.

DX80/0x122[addr=0x0,size=0x10000]:DX80/0x121[addr=0x80]

(1) (2) (3) (4) (5) (6) (7)

- (1) ETERNUS name for the copy source
- (2) Logical volume number for the copy source
- (3) Extent start position for the copy source volume (block units)
- (4) Extent size for the copy source volume (number of blocks)
- (5) ETERNUS name for the copy destination
- (6) Logical volume number for the copy destination
- (7) Extent start position for the copy destination volume (block units)

Character strings starting with "0x" are hexadecimal expressions.

-xml

This option specifies when displaying the result of the command execution by the XML format.

EXIT STATUS

- =0 : Completed successfully
- >0 : Terminated abnormally

EXAMPLES

- Adding a copy pair in LU to LU format

```
> acpair add -g group01 -p ET001/0x1:ET001/0x6  
Successful completion.
```

- Adding a copy pair in LU to Partition format

```
> acpair add -g group01 -p ET001/0x122[addr=0x0,size=0x1]:ET001/0x121[addr=0x0]
Successful completion.
```

NOTES

- Make sure that the logical volumes specified for the copy source and the copy destination are of the same size.
- If the copy type is OPC, QuickOPC or EC
Specify the ETERNUS name that was specified with -a option for [acgroup create \(Copy group creation command\)](#).
- If the copy type is SnapOPCP
 - Specify the ETERNUS name that was specified with -a option for [acgroup create \(Copy group creation command\)](#).
 - In the case that the copy source of the specified copy pair is same with other copy pairs, an error will occur when the number of SnapOPC+ max session is exceeded.
 - An error will occur when the copy destination of the specified copy pair is not SDV.
- If the copy type is REC
 - Specify the ETERNUS name that was specified with either -a or -remote option for [acgroup create \(Copy group creation command\)](#).
 - Specify different ETERNUS names for the copy source and the copy destination.
 - The copy source ETERNUS name and the copy destination ETERNUS name for the copy pair being added must be the same as the copy source ETERNUS name and copy destination ETERNUS name for any copy pairs that have already been added to the copy group.

4.6.6 acpair remove (Copy pair deletion command)

NAME

acpair remove - Deletion of copy pairs

SYNOPSIS

```
acpair remove -g copyGroup -p copyPair [-xml]
```

DESCRIPTION

This command deletes copy pairs from copy groups.

OPTIONS

-g *copyGroup*

This option specifies the copy group name.

-p *copyPair*

This option specifies the copy pair to be deleted.

-xml

This option specifies when displaying the result of the command execution by the XML format.

EXIT STATUS

- =0 : Completed successfully
- >0 : Terminated abnormally

EXAMPLES

- Deleting a copy pair in LU to LU format

```
> acpair remove -g group01 -p ET001/0x1:ET001/0x6
Successful completion.
```

- Deleting a copy pair in LU to Partition format

```
> acpair remove -g group01 -p ET001/0x122[addr=0x0,size=0x1]:ET001/0x121[addr=0x0]
Successful completion
```

NOTES

- When this command is executed, the copy pair is deleted regardless of the Advanced Copy status. Therefore, it is essential to check the Advanced Copy status before executing this command. If a copy pair is deleted accidentally, either stop Advanced Copy of the copy pair that was added by ETERNUS Web GUI, or add the copy pair again and then stop Advanced Copy.

4.7 Control commands for snapshot type high-speed copying

This section explains the commands for snapshot type high-speed copying.

4.7.1 acopc start (OPC/QuickOPC copy start command)

NAME

acopc start - Start of OPC or QuickOPC copy

SYNOPSIS

For OPC copy groups

```
acopc start -g copyGroup [-p copyPair] [-r] [-xml]
acopc start -g copyGroup -concur [-xml]
```

For QuickOPC copy groups

```
acopc start -g copyGroup [-p copyPair] [-diff|-auto|-r] [-xml]
acopc start -g copyGroup -concur [-diff|-auto] [-xml]
```

DESCRIPTION

This command performs OPC or QuickOPC for the specified copy group or copy pair.

OPTIONS

-g *copyGroup*

This option specifies the copy group name.

-p *copyPair*

This option specifies a copy pair.

-diff

This option starts a differential copy.

If the **-diff** option is not specified, a full copy is started.

-auto

This option automatically selects full copy/differential copy of QuickOPC.

Depending on the statuses in the **OPC Status** and **Copy Phase** columns for [acopc query \(OPC/QuickOPC copy status display command\)](#), the following actions start:

OPC Status	Copy Phase	Processing action
OPC action not startup	Not set	Full copy starts.
OPC Starting	N/A	After session stops, full copy starts.
OPC Executing	Readying	After session stops, full copy starts.
	Copying	After session stops, full copy starts.
	Tracking	Differential copy starts.
	Copying/Tracking	Differential copy starts.
OPC Error Suspend	N/A	After session stops, full copy starts.

When the Concurrent OPC function is in use, snapshots of multiple logical volumes are concurrently created, so the following actions start:

QuickOPC session Status	Processing action
The statuses of Copy Phase in QuickOPC sessions are only "Tracking" and "Copying/Tracking".	Differential copy starts.
Other than those above.	<ul style="list-style-type: none"> - If no QuickOPC session exists: Full copy starts. - If QuickOPC session exists: After session stops, full copy starts.

-r

This option performs a copy in the reverse direction to the direction that has been specified.

If the copy type is QuickOPC, an OPC will be executed.

-xml

This option specifies when displaying the result of the command execution by the XML format.

-concur

This option executes OPC or QuickOPC by using Concurrent OPC function.

EXIT STATUS

=0 : Completed successfully

>0 : Terminated abnormally

EXAMPLES

- Start OPC

```
> acopc start -g group01
```

```
ET001/0x1:ET001/0x6
```

```
# DATE : 2008/06/24 16:28:00 - << OPC Started >>
```

```
# From:BoxID=303045343030304d3323232323234534353053323041232323234b44343033303633393030342323/  
Olu=1/Adr_high=0/Adr_low=0/size_high=0/size_low=0
```

```
# To :BoxID=303045343030304d3323232323234534353053323041232323234b44343033303633393030342323/  
Olu=6/Adr_high=0/Adr_low=0
```

```
ET001/0x2:ET001/0x7
```

```
# DATE : 2008/06/24 16:28:00 - << OPC Started >>
```

```
# From:BoxID=303045343030304d3323232323234534353053323041232323234b44343033303633393030342323/  
Olu=2/Adr_high=0/Adr_low=0/size_high=0/size_low=0
```

```
# To :BoxID=303045343030304d3323232323234534353053323041232323234b44343033303633393030342323/  
Olu=7/Adr_high=0/Adr_low=0
```

```
ET001/0x3:ET001/0x8
```

```
# DATE : 2008/06/24 16:28:00 - << OPC Started >>
```

```
# From:BoxID=303045343030304d3323232323234534353053323041232323234b44343033303633393030342323/  
Olu=3/Adr_high=0/Adr_low=0/size_high=0/size_low=0
```

```
# To :BoxID=303045343030304d3323232323234534353053323041232323234b44343033303633393030342323/  
Olu=8/Adr_high=0/Adr_low=0
```

```
Succeeded : 3
```

```
Failed : 0
```

- Start OPC by using Concurrent OPC function.

```
> acopc start -g group01 -concur
```

```
Successful completion.
```

NOTES

- When the copy type of copy group is EC, REC or SnapOPCP, this command cannot be executed.
- This command terminates abnormally if the copy destination logical volume of the specified copy group or pair is protected by [acinhibit set](#) (Volume protection settings command).

4.7.2 acopc query (OPC/QuickOPC copy status display command)

NAME

acopc query - Display the copy status of OPC or QuickOPC

SYNOPSIS

```
acopc query -g copyGroup [-p copyPair] [-r] [-progress] [-date] [-xml]
```

```
acopc query -g copyGroup [-p copyPair] [-r] -all [-xml]
```

DESCRIPTION

This command displays the copy status of the OPC or QuickOPC for the specified copy group or copy pair.

OPTIONS

-g *copyGroup*

This option specifies the copy group name.

-p *copyPair*

This option specifies a copy pair.

-r

This option displays the status of a copy in the reverse direction to the direction that has been specified.

-progress

This option displays the progress of copy processes.

-date

This option displays the last execution date of OPC or QuickOPC for the copy pair.

-all

This option specifies the displaying by the extended format.
Refer to the table of EXAMPLES for the displayed items.

-xml

This option specifies when displaying by the XML format.

EXIT STATUS

=0 : Completed successfully

>0 : Terminated abnormally

EXAMPLES

- For OPC

- When **-progress** and **-date** options are not specified:

```
> acopc query -g Group01
```

```
Copy Group Name : Group01
```

```
Copy Group Type : OPC
```

```
Disk Array Name : ET001 (00ETERNUSDXM##ET44S20A####HK000104#####)
```

Source	<=>	Target	SID	OPC Status	Copy Phase	Copied Block
ET001/0x1	==>	ET001/0x3	0x21	"OPC Executing"	"Copying"	0
ET001/0x2	==>	ET001/0x4	0x22	"OPC Executing"	"Copying"	1048576

- When **-progress** option is specified:

```
> acopc query -g Group01 -progress
```

```
Copy Group Name : Group01
```

```
Copy Group Type : OPC
```

```
Disk Array Name : ET001 (00ETERNUSDXM##ET44S20A####HK000104#####)
```

Source	<=>	Target	Progress	Copied Block	Total Block
ET001/0x1	==>	ET001/0x3	0%	0	1048576
ET001/0x2	==>	ET001/0x4	45%	1048576	2330168

- When -date option is specified:

```
> acopc query -g Group01 -date
```

```
Copy Group Name : Group01
Copy Group Type : OPC
Disk Array Name : ET001 (00ETERNUSDXM##ET44S20A####HK000104#####)
```

Source	<=>	Target	SID	OPC Status	Copy Phase	Copied Block	Operation Date
ET001/0x1	==>	ET001/0x3	0x21	"OPC Executing"	"Copying"	0	"2010/10/20 09:00:00"
ET001/0x2	==>	ET001/0x4	0x22	"OPC Executing"	"Copying"	1048576	"2010/10/20 09:00:00"

- When -progress and -date options are specified, or -all option is specified:

```
> acopc query -g Group01 -progress -date
```

```
Copy Group Name : Group01
Copy Group Type : OPC
Disk Array Name : ET001 (00ETERNUSDXM##ET44S20A####HK000104#####)
```

Source	<=>	Target	SID	OPC Status	Copy Phase	Progress	Copied Block	Total Block	Operation Date
ET001/0x1	==>	ET001/0x3	0x21	"OPC Executing"	"Copying"	0%	0	1048576	"2010/10/20 09:00:00"
ET001/0x2	==>	ET001/0x4	0x22	"OPC Executing"	"Copying"	45%	1048576	2330168	"2010/10/20 09:00:00"

- For QuickOPC

- When -progress and -date options are not specified:

```
> acopc query -g Group01
```

```
Copy Group Name : Group01
Copy Group Type : QuickOPC
Disk Array Name : ET001 (00ETERNUSDXM##ET44S20A####HK000104#####)
```

Source	<=>	Target	SID	OPC Status	Copy Phase	Copied Block
ET001/0x1	==>	ET001/0x3	0x21	"OPC Executing"	"Tracking"	1048576
ET001/0x2	==>	ET001/0x4	0x22	"OPC Executing"	"Tracking"	1048576

- When -progress option is specified:

```
> acopc query -g Group01 -progress
```

```
Copy Group Name : Group01
Copy Group Type : QuickOPC
Disk Array Name : ET001 (00ETERNUSDXM##ET44S20A####HK000104#####)
```

Source	<=>	Target	Progress	Copied Block	Total Block
ET001/0x1	==>	ET001/0x3	0%	0	1048576
ET001/0x2	==>	ET001/0x4	45%	471859	1048576

- When -date option is specified:

```
> acopc query -g Group01 -date
```

```
Copy Group Name : Group01
Copy Group Type : QuickOPC
Disk Array Name : ET001 (00ETERNUSDXM##ET44S20A####HK000104#####)
```



```

Source    <=> Target    SID  OPC Status    Copy Phase    Copied Block Operation Date
-----
ET001/0x1 ==> ET001/0x3 0x21 "OPC Executing" "Copying/Tracking"    0 "2010/10/20 09:00:00"
ET001/0x2 ==> ET001/0x4 0x22 "OPC Executing" "Copying/Tracking"    1048576 "2010/10/20
09:00:00"

```

- When -progress and -date options are specified, or -all option is specified:

```
> acopc query -g Group01 -progress -date
```

```

Copy Group Name : Group01
Copy Group Type : QuickOPC
Disk Array Name : ET001 (00ETERNUSDXM##ET44S20A####HK000104#####)

```

```

Source    <=> Target    SID  OPC Status    Copy Phase    Progress Copied Block Total
Block Operation Date
-----
ET001/0x1 ==> ET001/0x3 0x21 "OPC Executing" "Copying/Tracking"    0%            0    1048576
"2010/10/20 09:00:00"
ET001/0x2 ==> ET001/0x4 0x22 "OPC Executing" "Copying/Tracking"    45%          1048576    2330168
"2010/10/20 09:00:00"

```

The following table shows the meanings of the information displayed.

Table 4.13 When -progress and -date options are not specified

Title	Explanation
Copy Group Name	Displays the copy group name.
Copy Group Type	Displays the type of copy that has been set up for the copy group.
Disk Array Name	Displays the Box ID and the ETERNUS name that was specified with -a option for acgroup create (Copy group creation command).
Source	Displays the logical volume for the copy source.
<=>	Displays the copy direction. <ul style="list-style-type: none"> - N/A: No copying is performed. - ==>: Copying from the source to the target. - <==: Copying from the target to the source.
Target	Displays the logical volume for the copy destination.
SID	Displays the session ID for the copy source.
OPC Status	Displays the execution status of the OPC. <ul style="list-style-type: none"> - OPC Starting: The OPC is starting up. - OPC Executing: The OPC is executing. - OPC action not startup: The specified session does not exist. - OPC Error Suspend: An error has occurred, preventing the copy process from continuing.
Copy Phase	Displays the current phase. <ul style="list-style-type: none"> - Readyng: Concurrent OPC is defined. - Copyng: Copy processing is executing. - Tracking: Copy processing has completed, and tracking is in progress. - Copyng/Tracking: Both copy processing and tracking are in progress.

Title	Explanation
	- Not set: Copy processing has not been performed.
Copied Block	Displays the number of blocks that have been copied. If the copy process finishes and is in Tracking status, it displays the number of blocks that have not been updated since after the last execution of the logical copy. The "N/A" is displayed when the copy process is not executed. If the number of copied blocks is unknown, it is displayed "???".

Table 4.14 When -progress option is specified

Title	Explanation
Copy Group Name	Displays the copy group name.
Copy Group Type	Displays the type of copy that has been set up for the copy group.
Disk Array Name	Displays the Box ID and the ETERNUS name that was specified with -a option for acgroup create (Copy group creation command).
Source	Displays the logical volume for the copy source.
<=>	Displays the copy direction. - N/A: No copying is performed. - ==>: Copying from the source to the target - <==: Copying from the target to the source
Target	Displays the logical volume for the copy destination.
Progress	Displays the progress of copy processes as a percentage. The "N/A" is displayed when the copy process is not executed. If the progress of copy processes is unknown, it is displayed "???".
Copied Block	Displays the number of blocks that have been copied. If the copy process finishes and is in Tracking status, it displays the number of blocks that have not been updated since after the last execution of the logical copy. The "N/A" is displayed when the copy process is not executed. If the number of copied blocks is unknown, it is displayed "???".
Total Block	Displays the number of total blocks. If the number of total blocks is unknown, it is displayed "???".

Table 4.15 When -date option is specified

Title	Explanation
Copy Group Name	Displays the copy group name.
Copy Group Type	Displays the type of copy that has been set up for the copy group.
Disk Array Name	Displays the Box ID and the ETERNUS name that was specified with -a option for acgroup create (Copy group creation command).
Source	Displays the logical volume for the copy source.
<=>	Displays the copy direction. - N/A: No copying is performed. - ==>: Copying from the source to the target - <==: Copying from the target to the source
Target	Displays the logical volume for the copy destination.
SID	Displays the session ID for the copy source.
OPC Status	Displays the execution status of the OPC.

Title	Explanation
	<ul style="list-style-type: none"> - OPC Starting: The OPC is starting up. - OPC Executing: The OPC is executing. - OPC action not startup: The specified session does not exist. - OPC Error Suspend: An error has occurred, preventing the copy process from continuing.
Copy Phase	<p>Displays the current phase.</p> <ul style="list-style-type: none"> - Readyng: Concurrent OPC is defined. - Copying: Copy processing is executing. - Tracking: Copy processing has completed, and tracking is in progress. - Copying/Tracking: Both copy processing and tracking are in progress. - Not set: Copy processing has not been performed.
Copied Block	<p>Displays the number of blocks that have been copied.</p> <p>If the copy process finishes and is in Tracking status, it displays the number of blocks that have not been updated since after the last execution of the logical copy.</p> <p>The "N/A" is displayed when the copy process is not executed.</p> <p>If the number of copied blocks is unknown, it is displayed "???".</p>
Operation Date	<p>If an OPC session exists, it displays the date for when the OPC session state transitions indicated below last occurred (last execution date) in a "yyyy/mm/dd hh:mm:ss" format.</p> <p>The displaying of the date is performed on the basis of the target device's time zone.</p> <ul style="list-style-type: none"> - Starting logical copy (execution of <code>acopc start</code> or <code>acopc start -diff</code>) - State transitions to error suspend (OPC Status field displays "OPC Error Suspend") <p>If any of the following conditions apply, the date will be displayed as "----/--/-- --:--:--."</p> <ul style="list-style-type: none"> - If an OPC session does not exist (OPC Status field displays "OPC action not startup") - If the OPC session's copy status could not be acquired from the device (OPC Status field displays "???") - If using a device for which the last execution date recording function is not supported (ETERNUS DX60/DX60 S2/DX80/DX90, ETERNUS DX400 series, ETERNUS DX8000 series)

Table 4.16 When the `-progress` and `-date` options are specified, or `-all` option is specified

Title	Explanation
Copy Group Name	Displays the copy group name.
Copy Group Type	Displays the type of copy that has been set up for the copy group.
Disk Array Name	Displays the Box ID and the ETERNUS name that was specified with <code>-a</code> option for acgroup create (Copy group creation command).
Source	Displays the logical volume for the copy source.
<=>	<p>Displays the copy direction.</p> <ul style="list-style-type: none"> - N/A: No copying is performed. - ==>: Copying from the source to the target - <==: Copying from the target to the source
Target	Displays the logical volume for the copy destination.
SID	Displays the session ID for the copy source.
OPC Status	<p>Displays the execution status of the OPC.</p> <ul style="list-style-type: none"> - OPC Starting: The OPC is starting up.

Title	Explanation
	<ul style="list-style-type: none"> - OPC Executing: The OPC is executing. - OPC action not startup: The specified session does not exist. - OPC Error Suspend: An error has occurred, preventing the copy process from continuing.
Copy Phase	<p>Displays the current phase.</p> <ul style="list-style-type: none"> - Ready: Concurrent OPC is defined. - Copying: Copy processing is executing. - Tracking: Copy processing has completed, and tracking is in progress. - Copying/Tracking: Both copy processing and tracking are in progress. - Not set: Copy processing has not been performed.
Progress	<p>Displays the progress of copy processes as a percentage. The "N/A" is displayed when the copy process is not executed. If the progress of copy processes is unknown, it is displayed "???".</p>
Copied Block	<p>Displays the number of blocks that have been copied. If the copy process finishes and is in Tracking status, it displays the number of blocks that have not been updated since after the last execution of the logical copy. The "N/A" is displayed when the copy process is not executed. If the number of copied blocks is unknown, it is displayed "???".</p>
Total Block	<p>Displays the number of total blocks. If the number of total blocks is unknown, it is displayed "???".</p>
Operation Date	<p>If an OPC session exists, it displays the date for when the OPC session state transitions indicated below last occurred (last execution date) in a "yyyy/mm/dd hh:mm:ss" format. The displaying of the date is performed on the basis of the target device's time zone.</p> <ul style="list-style-type: none"> - Starting logical copy (execution of acopc start or acopc start -diff) - State transitions to error suspend (OPC Status field displays "OPC Error Suspend") <p>If any of the following conditions apply, the date will be displayed as "----/--/-- --:--:--."</p> <ul style="list-style-type: none"> - If an OPC session does not exist (OPC Status field displays "OPC action not startup") - If the OPC session's copy status could not be acquired from the device (OPC Status field displays "???") - If using a device for which the last execution date recording function is not supported (ETERNUS DX60/DX60 S2/DX80/DX90, ETERNUS DX400 series, ETERNUS DX8000 series)

NOTES

- When the copy type of copy group is EC, REC or SnapOPCP, this command cannot be executed.
 - Information such as Copy direction data and SID data may display as "???". Refer to ["5.3 Resolving for displaying "???" in Advanced Copy status"](#) and take action.
 - The copying progress for OPC and QuickOPC may not reach 100% due to such things as data updates to the copy source.
- If **Copy Phase** field is either of the following, the copying is complete.
- Not Set (when the copy type is OPC)
 - Tracking (when the copy type is QuickOPC)

4.7.3 acopc cancel (OPC/QuickOPC copy stop command)

NAME

acopc cancel - Stop of OPC or QuickOPC copy

SYNOPSIS

For OPC copy groups

```
acopc cancel -g copyGroup [-p copyPair] [-r] [-xml]
```

For QuickOPC copy groups

```
acopc cancel -g copyGroup [-p copyPair] [-r] [-force] [-xml]
```

DESCRIPTION

This command stops the OPC or QuickOPC copy for the specified copy group or copy pair.

OPTIONS

-g *copyGroup*

This option specifies the copy group name.

-p *copyPair*

This option specifies a copy pair.

-r

This option stops copying in the direction opposite to the specified one.

-force

This option stops physical copying and tracking.

If this option is not specified, only tracking is stopped. The physical copying currently being executed continues.

If this option is specified with -r option, only the physical copying is stopped.

-xml

This option specifies when displaying the result of the command execution by the XML format.

EXIT STATUS

=0 : Completed successfully

>0 : Terminated abnormally

EXAMPLES

```
> acopc cancel -g group01
ET001/0x1:ET001/0x6
# DATE : 2008/06/24 16:28:00 - << OPC Disconnected >>

ET001/0x2:ET001/0x7
# DATE : 2008/06/24 16:28:00 - << OPC Disconnected >>

ET001/0x3:ET001/0x8
# DATE : 2008/06/24 16:28:00 - << OPC Disconnected >>
```

Succeeded : 3
Failed : 0

NOTES

- When the copy type of copy group is EC, REC or SnapOPCP, this command cannot be executed.

4.7.4 acsnap start (SnapOPC+ copy start command)

NAME

acsnap start - Start of SnapOPC+

SYNOPSIS

```
acsnap start -g copyGroup [-p copyPair | -v volumeName] [-r] [-xml]  
acsnap start -g copyGroup -concur [-xml]  
acsnap start -estimate -v volumeName [-xml]
```

DESCRIPTION

The SnapOPC+ is executed onto a specified copy group or copy pair.

- If only the -g option is specified, start the SnapOPC+ copy for copy pair in a copy group.
If there are multiple copy pairs from the same copy source, start SnapOPC+ copy by auto-selecting a copy destination which has no sessions. If all copy destination volumes are generation-managed, discard the oldest snap generation and select it for creating a new copy destination.
- If a copy pair is specified by the -p option, start the SnapOPC+ copy for the specified copy pair.
If a past snap generation (excluding the oldest snap generation) is specified as a copy destination, this command ends abnormally.
- If a logical volume of copy source is specified by the -v option and all copy destination volumes are generation-managed, discard the oldest snap generation and select it for creating a new copy destination.

If the -estimate option is specified, start to estimate the number of updated blocks generated for the copy source volume.

OPTIONS

-g *copyGroup*

This option specifies the copy group name.

-p *copyPair*

This option specifies a copy pair.

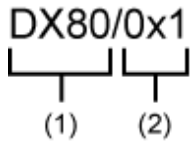
-r

This option performs a copy in the reverse direction to the direction that has been specified.
The latest snap generation is selected as a copy source when the copy pair is not specified.

-v *volumeName*

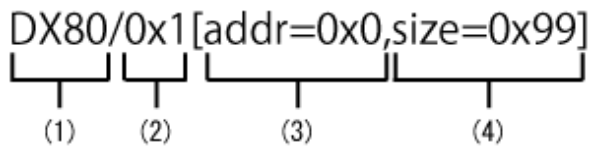
Specify a copy-source logical volume. The copy destination is selected automatically.
When starting to estimate the amount of snap data volume updates, specify a copy-source logical volume.

The following is an example of a format to specify a logical volume.



- (1) ETERNUS name
- (2) Logical volume number

The extent start position and the extent size can be specified.



- (1) ETERNUS name
- (2) Logical volume number
- (3) Extent start position (block units)
- (4) Extent size (number of blocks)

A character string starting with "0x" expresses a hexadecimal value.

-estimate

This option starts the estimation of amount of snap data volume updates.

-xml

This option specifies when displaying the result of the command execution by the XML format.

-concur

This option executes SnapOPC+ by using Concurrent OPC function.

EXIT STATUS

- =0 : Completed successfully
- >0 : Terminated abnormally

EXAMPLES

- Start the SnapOPC+

```
> acsnap start -g group01

ET001/0x1:ET001/0x6
# DATE : 2008/06/24 16:28:00 - << SnapOPCP Started >>

ET001/0x2:ET001/0x7
# DATE : 2008/06/24 16:28:00 - << SnapOPCP Started >>

ET001/0x3:ET001/0x8
# DATE : 2008/06/24 16:28:00 - << SnapOPCP Started >>

Succeeded : 3
Failed    : 0
```

- Start the estimation of the amount of snap data volume updates.

```
> acsnap start -estimate -v ET001/0x1
Successful completion
```

- Execute SnapOPC+ by using Concurrent OPC function.

```
> acsnap start -g group01 -concur
Successful completion.
```

NOTES

- When the copy type of copy group is OPC, QuickOPC, EC or REC, this command cannot be executed.
- This command is not available for ETERNUS Disk storage system registered as a remote device.
- This command terminates abnormally if the copy destination logical volume of the specified copy group or pair is protected by [acinhibit set \(Volume protection settings command\)](#).

4.7.5 acsnap query (SnapOPC+ copy status display command)

NAME

acsnap query - Display the copy status of SnapOPC+

SYNOPSIS

```
acsnap query -g copyGroup [-p copyPair] [-r] [-date] [-xml]
acsnap query -g copyGroup [-p copyPair] [-r] -all [-xml]
acsnap query -estimate -v volumeName [-xml]
```

DESCRIPTION

This command displays the copy status of the SnapOPC+ for the specified copy group or copy pair.

If the -estimate option is specified, the number of updated blocks for the copy destination volume is displayed.

The copy-source logical volume and snap generation number are sorted and displayed. (However, a copy pair that has no session is displayed at the bottom of the sort column.)

OPTIONS

-g *copyGroup*

This option specifies the copy group name.

-p *copyPair*

This option specifies a copy pair.

-r

This option displays the status of a copy in the reverse direction to the direction that has been specified.

-date

This option displays the last execution date of SnapOPC+ for the copy pair.

-all

This option specifies the displaying by the extended format.

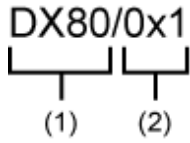
Refer to the table of EXAMPLES for the displayed items.

-estimate

This option displays the amount of snap data volume updates.

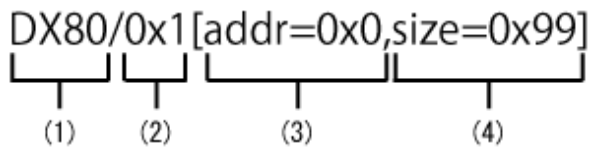
-v volumeName

When referring to the estimation of the amount of snap data volume updates, specify a copy-source logical volume. The following is an example of a format to specify a logical volume.



- (1) ETERNUS name
- (2) Logical volume number

The extent start position and the extent size can be specified.



- (1) ETERNUS name
- (2) Logical volume number
- (3) Extent start position (block units)
- (4) Extent size (number of blocks)

A character string starting with "0x" expresses a hexadecimal value.

-xml

This option specifies when displaying by the XML format.

EXIT STATUS

- =0 : Completed successfully
- >0 : Terminated abnormally

EXAMPLES

- Displaying the SnapOPC+ copy status
- When -date option is not specified:

```
> acsnap query -g group01
```

```
Copy Group Name : group01
Copy Group Type : SnapOPCP
Disk Array Name : ET001 (00ETERNUSDXM##ET44S20A####HK000104#####)
```

Source	<=> Target	SID	Snap Status	Gen Date	Copied Block
ET001/0x1	==> ET001/0x5	0x23	"Copy On Write(Active)"	3 10minute	1048576
ET001/0x1	==> ET001/0x4	0x22	"Copy On Write(Inactive)"	2 3hour	1048576
ET001/0x1	==> ET001/0x3	0x21	"Copy On Write(Inactive)"	1 1day	1048576

- When -date or -all option is specified:

```
> acsnap query -g Group01 -date
```

```
Copy Group Name : Group01
Copy Group Type : SnapOPCP
Disk Array Name : ET001 (00ETERNUSDXM##ET44S20A####HK000104#####)
Source    <=> Target    SID  Snap Status                Gen Date    Copied Block Operation Date
-----
-----
ET001/0x1 ==> ET001/0x5 0x23 "Copy On Write(Active)"    3  10minute    1048576 "2010/10/19
12:10:00"
ET001/0x1 ==> ET001/0x4 0x22 "Copy On Write(Inactive)"  2  3hour       1048576 "2010/10/19
09:00:00"
ET001/0x1 ==> ET001/0x3 0x21 "Copy On Write(Inactive)"  1  1day        1048576 "2010/10/18
09:00:00"
```

The following table shows the meanings of the information displayed.

Table 4.17 When the -date option is not specified

Title	Explanation
Copy Group Name	Displays the copy group name.
Copy Group Type	Displays the type of copy that has been set up for the copy group.
Disk Array Name	Displays the Box ID and the ETERNUS name that was specified with -a option for acgroup create (Copy group creation command) .
Source	Displays a copy-source logical volume.
<=>	Displays a copy direction. The following information is displayed. <ul style="list-style-type: none"> - N/A: No copy process is executed - ==>: Copy process from source to target - <==: Copy process from target to source
Target	Displays a copy-destination logical volume.
SID	Displays a copy source session ID.
Snap Status	Displays the SnapOPC+ execution status. If -r option is specified, no information is displayed. <ul style="list-style-type: none"> - Snap action not startup: No specified session exists. - Snap Starting: SnapOPC+ is starting. (The starting process of SnapOPC+ logical copy is in progress) - Copy On Write(Readying): Concurrent OPC is defined. (Latest snap generation) - Copy On Write(Active): SnapOPC+ is in process. (Latest snap generation) - Copy On Write(Inactive): SnapOPC+ is in process. (Past snap generations) - Snap Error Suspend: Error that cannot continue copy process occurred.
OPC Status	Displays OPC executed status. The information is only displayed when -r option is specified. <ul style="list-style-type: none"> - OPC action not startup: No specified session exists. - OPC Starting: OPC is being started. (OPC logical copy is in boot process.) - OPC Executing: OPC is in process. (OPC logical copy completed, physical copy being in process.) - OPC Error Suspend: Error that cannot continue copy process occurred.
Copy Phase	Displays the current phase. The information is only displayed when -r option is specified.

Title	Explanation
	<ul style="list-style-type: none"> - Not set: No copy process is executed. - Copying: Copy is in process.
Gen	<p>Displays snap generation numbers. If -r option is specified, no information is displayed. For snap generation numbers, 1 is the oldest and as the number is larger, it shows more new generations.</p> <p>If no copy process is executed, it is displayed as "N/A".</p>
Date	<p>Displays the elapsed time of Snapshot type copy execution. If -r option is specified, no information is displayed. The output format is as follows.</p> <ul style="list-style-type: none"> - N/A: No copy process is executed. - Less than 1H: Displayed on a per minute basis. If below one minute, it is displayed as "0minute". - Less than 24H: Displayed on a per hour basis. - 24H or more: Displayed on a per day basis.
Copied Block	<p>Displays the number of copied blocks.</p> <p>If no copy process is executed, it is displayed as "N/A".</p> <p>If the number of copied blocks is unknown, it is displayed "???".</p>

Table 4.18 When -date or -all option is specified:

Title	Explanation
Copy Group Name	Displays the copy group name.
Copy Group Type	Displays the type of copy that has been set up for the copy group.
Disk Array Name	Displays the Box ID and the ETERNUS name that was specified with -a option for acgroup create (Copy group creation command) .
Source	Displays a copy-source logical volume.
<=>	<p>Displays a copy direction. The following information is displayed.</p> <ul style="list-style-type: none"> - N/A: No copy process is executed - ==>: Copy process from source to target - <==: Copy process from target to source
Target	Displays a copy-destination logical volume.
SID	Displays a copy source session ID.
Snap Status	<p>Displays the SnapOPC+ execution status. If -r option is specified, no information is displayed.</p> <ul style="list-style-type: none"> - Snap action not startup: No specified session exists. - Snap Starting: SnapOPC+ is starting. (The starting process of SnapOPC+ logical copy is in progress) - Copy On Write(Readying): Concurrent OPC is defined. (Latest snap generation) - Copy On Write(Active): SnapOPC+ is in process. (Latest snap generation) - Copy On Write(Inactive): SnapOPC+ is in process. (Past snap generations) - Snap Error Suspend: Error that cannot continue copy process occurred.
OPC Status	<p>Displays OPC executed status. The information is only displayed when -r option is specified.</p> <ul style="list-style-type: none"> - OPC action not startup: No specified session exists. - OPC Starting: OPC is being started. (OPC logical copy is in boot process.)

Title	Explanation
	<ul style="list-style-type: none"> - OPC Executing: OPC is in process. (OPC logical copy completed, physical copy being in process.) - OPC Error Suspend: Error that cannot continue copy process occurred.
Copy Phase	<p>Displays the current phase. The information is only displayed when -r option is specified.</p> <ul style="list-style-type: none"> - Not set: No copy process is executed. - Copying: Copy is in process.
Gen	<p>Displays snap generation numbers. If -r option is specified, no information is displayed. For snap generation numbers, 1 is the oldest and as the number is larger, it shows more new generations.</p> <p>If no copy process is executed, it is displayed as "N/A".</p>
Date	<p>Displays the elapsed time of Snapshot type copy execution. If -r option is specified, no information is displayed. The output format is as follows.</p> <ul style="list-style-type: none"> - N/A: No copy process is executed. - Less than 1H: Displayed on a per minute basis. If below one minute, it is displayed as "0minute". - Less than 24H: Displayed on a per hour basis. - 24H or more: Displayed on a per day basis.
Copied Block	<p>Displays the number of copied blocks.</p> <p>If no copy process is executed, it is displayed as "N/A".</p> <p>If the number of copied blocks is unknown, it is displayed "???".</p>
Operation Date	<p>If an SnapOPC+ session exists, it displays the date for when the SnapOPC+ session state transitions indicated below last occurred (last execution date) in a "yyyy/mm/dd hh:mm:ss" format.</p> <p>The displaying of the date is performed on the basis of the target device's time zone.</p> <ul style="list-style-type: none"> - Starting logical copy (execution of acsnap start) - State transitions to error suspend (Snap Status field displays "Snap Error Suspend") - State transitions to error suspend (OPC Status field displays "OPC Error Suspend") <p>If any of the following conditions apply, the date will be displayed as "----/--/-- --:--:--."</p> <ul style="list-style-type: none"> - If an OPC session does not exist (OPC Status field displays "OPC action not startup") - If the OPC session's copy status could not be acquired from the device (OPC Status field displays "???") - If using a device for which the last execution date recording function is not supported (ETERNUS DX60/DX60 S2/DX80/DX90, ETERNUS DX400 series, ETERNUS DX8000 series)

- Referring the estimation of the amount of snap data volume updates

```
> acsnap query -estimate -v ET001/0x1
Update
-----
    10M
```

The following table shows the meanings of the information displayed.

Title	Explanation
Update	Displays the amount of snap data volume updates in MB.

NOTES

- When the copy type of copy group is OPC, QuickOPC, EC or REC, this command cannot be executed.
- Information such as Copy direction data and SID data may display as "???". Refer to "[5.3 Resolving for displaying "???" in Advanced Copy status](#)" and take action.
- This command is not available for ETERNUS Disk storage system registered as a remote device.

4.7.6 acsnap cancel (SnapOPC+ copy stop command)

NAME

acsnap cancel - Stop of SnapOPC+ copy

SYNOPSIS

```
acsnap cancel -g copyGroup [-p copyPair | -v volumeName] [-r | -force][-xml]
acsnap cancel -estimate -v volumeName [-xml]
```

DESCRIPTION

The SnapOPC+ copy for a specified copy group or pair is cancelled.

If the -estimate option is specified, stop to estimate the number of updated blocks generated for the copy source volume.

OPTIONS

-g *copyGroup*

This option specifies the copy group name.

-p *copyPair*

This option specifies a copy pair.

When specifying the copy pair of the past snap generation (except the oldest snap generation), execute this command with -force option.

When the acsnap start command was executed by specifying both -r option and -p option, it is necessary to specify this option to cancel the SnapOPC+ copy.

-r

This option stops copying in the reverse direction to the direction that has been specified.

-force

This option forcibly stops the session.

Cancelling SnapOPC+ process forcibly stops all the snap generations of a pair specified to stop and earlier snap operations.

If no pair is specified, SnapOPC+ process is forcibly cancelled for the latest snap generation, so that all snap generations are stopped.

This option is specifiable even if there is only one snap generation.

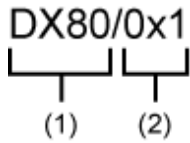
-v *volumeName*

The copy process of a specified logical volume is cancelled.

- If the -force option is not specified, the copy process of the oldest snap generation is cancelled.
- If the -force option is specified, the copy process of the latest snap generation is cancelled.
- If the -r option is specified, the restore process of the latest snap generation is cancelled.

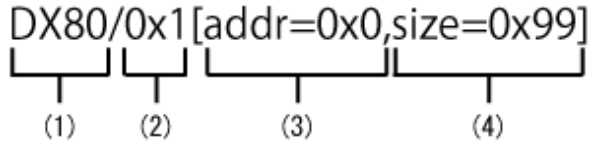
When cancelling the estimation of the amount of snap data volume updates, specify a copy-source logical volume.

The following is an example of a format to specify a logical volume.



- (1) ETERNUS name
- (2) Logical volume number

The extent start position and the extent size can be specified.



- (1) ETERNUS name
- (2) Logical volume number
- (3) Extent start position (block units)
- (4) Extent size (number of blocks)

A character string starting with "0x" expresses a hexadecimal value.

-estimate

This option stops the estimation of amount of snap data volume updates.

-xml

This option specifies when displaying the result of the command execution by the XML format.

EXIT STATUS

- =0 : Completed successfully
- >0 : Terminated abnormally

EXAMPLES

- Stopping the SnapOPC+ copy

```
> acsnap cancel -g group01
```

```
ET001/0x1:ET001/0x6  
# DATE : 2008/06/24 16:28:00 - << SnapOPCP Disconnected >>
```

```
ET001/0x2:ET001/0x7  
# DATE : 2008/06/24 16:28:00 - << SnapOPCP Disconnected >>
```

```
ET001/0x3:ET001/0x8  
# DATE : 2008/06/24 16:28:00 - << SnapOPCP Disconnected >>
```

```
Succeeded : 3  
Failed : 0
```

- Stopping the estimation of amount of snap data volume updates

```
> acsnap cancel -estimate -v ET001/0x1  
Successful completion
```

NOTES

- If you stop a session of defined Concurrent OPC (Readying), specify a copy pair by using the -p option.
- When the copy type of copy group is OPC, QuickOPC, EC or REC, this command cannot be executed.
- This command is not available for ETERNUS Disk storage system registered as a remote device.
- Use ETERNUS Web GUI or ETERNUS CLI to stop the monitor session started by the following methods.
 - Operation by Copy command via SAN
 - Started by Copy command via LAN
 - Started by ETERNUS Web GUI
 - Started by ETERNUS CLI
 - Operation by Copy command via LAN
 - Started by Copy command via SAN

4.8 Control commands for synchronous high-speed copying

This section explains the commands for synchronous high-speed copying.

4.8.1 acec start (Synchronous high-speed copy start command)

NAME

acec start - Start of synchronous high-speed copying

SYNOPSIS

When the copy type set in the copy group is EC

```
acec start -g copyGroup [-p copyPair] [-r] [-da] [-xml]
```

When the copy type set in the copy group is REC

```
acec start -g copyGroup [-p copyPair] [-r] [-transfer {sync [-split {auto|manual}]|through|consistent|stack}] [-recovery {auto|manual}] [-skip] [-da] [-xml]
```

DESCRIPTION

This command starts synchronous processing for the synchronous high-speed copy for the specified copy group or copy pair.

OPTIONS

-g *copyGroup*

This option specifies the copy group name.

-p *copyPair*

This option specifies a copy pair.

-r

This option performs a copy in the reverse direction to the direction that has been specified.

-transfer {sync [-split {auto|manual}]]through|consist|stack}

This option specifies the transfer mode. (Only for REC)

The default mode is "stack". Refer to "[3.2.2.5 REC operating modes](#)" for information on each mode.

- sync: Synchronous mode

This option specifies the split mode when sync was specified with -transfer option (Only for REC)

-split

The default mode is "auto".

- auto: Automatic Split

- manual: Manual Split

- through: Through mode

When the storage device is registered to operate by Copy command via LAN, this transfer mode cannot be specified.

- consist: Consistency mode

- stack: Stack mode

-recovery {auto|manual}

This option specifies the recovery mode. (Only for REC)

The default mode is "auto". Refer to "[3.2.2.5 REC operating modes](#)" for information on each mode.

- auto: Automatic Recovery

- manual: Manual Recovery

-skip

This option specifies when the synchronous process is suspended by using the initial copy skip function.

This option can be specified when the synchronous high-speed copy for inter-box is started.

-da

From the start of the EC/REC synchronous high-speed copy process until its suspension, always set the copy destination logical volume to unreadable.

It is not possible to use this option if one registered the device as a device which is operated by Copy command via SAN and moreover has specified "through" with -transfer option.

-xml

This option specifies when displaying the result of the command execution by the XML format.

EXIT STATUS

=0 : Completed successfully

>0 : Terminated abnormally

EXAMPLES

```
> acec start -g group01
```

```
ET001/0x1:ET001/0x6
```

```
# DATE : 2008/06/24 16:28:00 - << EC Started >>
```

```
# From:BoxID=3030453430304d3323232323234534353053323041232323234b443430333036333393030342323/Olu=1/  
Adr_high=0/Adr_low=0/size_high=0/size_low=0
```

```
# To :BoxID=3030453430304d3323232323234534353053323041232323234b443430333036333393030342323/Olu=6/  
Adr_high=0/Adr_low=0
```



```
ET001/0x2:ET001/0x7
# DATE : 2008/06/24 16:28:00 - << EC Started >>
# From:BoxID=303045343030304d3323232323234534353053323041232323234b44343033303633393030342323/Olu=2/
Adr_high=0/Adr_low=0/size_high=0/size_low=0
# To :BoxID=303045343030304d3323232323234534353053323041232323234b44343033303633393030342323/Olu=7/
Adr_high=0/Adr_low=0
```

```
ET001/0x3:ET001/0x8
# DATE : 2008/06/24 16:28:00 - << EC Started >>
# From:BoxID=303045343030304d3323232323234534353053323041232323234b44343033303633393030342323/Olu=3/
Adr_high=0/Adr_low=0/size_high=0/size_low=0
# To :BoxID=303045343030304d3323232323234534353053323041232323234b44343033303633393030342323/Olu=8/
Adr_high=0/Adr_low=0
```

```
Succeeded : 3
Failed : 0
```

NOTES

- When the copy type of copy group is OPC, QuickOPC or SnapOPCP, this command cannot be executed.
- This command terminates abnormally if the copy destination logical volume of the specified copy group or pair is protected by [acinhibit set \(Volume protection settings command\)](#).

4.8.2 acec query (Synchronous high-speed copy status display command)

NAME

acec query - Display the copy status of synchronous high-speed copying

SYNOPSIS

```
acec query -g copyGroup [-p copyPair] [-r] [-progress] [-da] [-date] [-xml]
acec query -g copyGroup [-p copyPair] [-r] -all [-xml]
```

DESCRIPTION

This command displays the status of the synchronous high-speed copy for the specified copy group or copy pair.

OPTIONS

-g *copyGroup*

This option specifies the copy group name.

-p *copyPair*

This option specifies a copy pair.

-r

This option displays the status of a copy in the reverse direction to the direction that has been specified.

-progress

This option displays the progress of copy processes.

-da

This option displays the suppression settings for access to the EC/REC copy destination area.

-date

This option displays the last execution date of synchronous high-speed copy for the copy pair.

-all

This option specifies the displaying by the extended format.
Refer to the table of EXAMPLES for the displayed items.

-xml

This option specifies when displaying by the XML format.

EXIT STATUS

=0 : Completed successfully

>0 : Terminated abnormally

EXAMPLES

- For EC

- When -progress, -da and -date options are not specified:

```
> acec query -g ECGroup
```

```
Copy Group Name : ECGroup
Copy Group Type : EC
Disk Array Name : ET002 (00ETERNUSDXH##ET87S20A####NC4110699004##)
```

Source	<=>	Target	SID	EC Status	Copy Phase	Copied Block
ET002/0x1	N/A	ET002/0x3	N/A	"EC action not startup"	"Not set"	0
ET002/0x2	==>	ET002/0x4	0x41	"EC Executing"	"Copying"	1048576

- When -progress option is specified:

```
> acec query -g ECGroup -progress
```

```
Copy Group Name : ECGroup
Copy Group Type : EC
Disk Array Name : ET002 (00ETERNUSDXH##ET87S20A####NC4110699004##)
```

Source	<=>	Target	Progress	Copied Block	Total Block
ET002/0x1	N/A	ET002/0x3	N/A	N/A	N/A
ET002/0x2	==>	ET002/0x4	45%	471859	1048576

- When -da option is specified:

```
> acec query -g ECGroup -da
```

```
Copy Group Name : ECGroup
Copy Group Type : EC
Disk Array Name : ET002 (00ETERNUSDXH##ET87S20A####NC4110699004##)
```

Source	<=>	Target	SID	EC Status	Copy Phase	Copied Block	Copy DA
ET002/0x1	N/A	ET002/0x3	N/A	"EC action not startup"	"Not set"	N/A	off
ET002/0x2	==>	ET002/0x4	0x41	"EC Executing"	"Copying"	471859	on

- When -date option is specified:

```
> acec query -g ECGroup -date
```

```
Copy Group Name : ECGroup
Copy Group Type : EC
Disk Array Name : ET002 (00ETERNUSDHXH##ET87S20A####NC4110699004##)
```

```
Source    <=> Target    SID  EC Status          Copy Phase Copied Block Operation Date
-----
ET002/0x1 N/A ET002/0x3 N/A  "EC action not startup" "Not set"          N/A "----/--/-- --:--:--"
ET002/0x2 ==> ET002/0x4 0x41 "EC Suspend"          "Paired"          471859 "2010/10/20
09:00:00"
```

- When -progress, -da and -date options are specified, or -all option is specified:

```
> acec query -g ECGroup -progress -da -date
```

```
Copy Group Name : ECGroup
Copy Group Type : EC
Disk Array Name : ET002 (00ETERNUSDHXH##ET87S20A####NC4110699004##)
```

```
Source    <=> Target    SID  EC Status          Copy Phase Progress Copied Block Total
Block Copy DA Operation Date
-----
ET002/0x1 N/A ET002/0x3 N/A  "EC action not startup" "Not set"          N/A          N/A
N/A      off "----/--/-- --:--:--"
ET002/0x2 ==> ET002/0x4 0x41 "EC Suspend"          "Paired"          100%          1048576
1048576   on "2010/10/20 09:00:00"
```

The following table shows the meanings of the information displayed.

Table 4.19 When -progress, -da and -date options are not specified

Title	Explanation
Copy Group Name	Displays the copy group name.
Copy Group Type	Displays the type of copy that has been set up for the copy group.
Disk Array Name	Displays the Box ID and ETERNUS name that was specified with -a option for acgroup create (Copy group creation command).
Source	Displays the logical volume for the copy source.
<=>	Displays the copy direction. <ul style="list-style-type: none"> - N/A: No copying is performed. - ==>: Copying from the source to the target. - <==: Copying from the target to the source.
Target	Displays the logical volume for the copy destination.
SID	Displays the session ID.
EC Status	Displays the execution status of the EC. <ul style="list-style-type: none"> - EC Starting: The EC is starting up. - EC Executing: The EC is executing. - EC Suspend: The EC is suspended. - EC action not startup: The specified session does not exist. - EC Error Suspend: An error has occurred, preventing the copy process from continuing.
Copy Phase	Displays the current phase. <ul style="list-style-type: none"> - Copying: Copy processing is executing.

Title	Explanation
	<ul style="list-style-type: none"> - Paired: The copy is in the equivalency maintenance state. - Not set: Either the specified session does not exist, or the copy process is not running.
Copied Block	Displays the number of blocks that have been copied.

Table 4.20 When -progress option is specified

Title	Explanation
Copy Group Name	Displays the copy group name.
Copy Group Type	Displays the type of copy that has been set up for the copy group.
Disk Array Name	Displays the Box ID and ETERNUS name that was specified with -a option for acgroup create (Copy group creation command) .
Source	Displays the logical volume for the copy source.
<=>	Displays the copy direction. <ul style="list-style-type: none"> - N/A: No copying is performed. - ==>: Copying from the source to the target. - <==: Copying from the target to the source.
Target	Displays the logical volume for the copy destination.
Progress	Displays the progress of copy processes as a percentage. The "N/A" is displayed when the copy process is not executed. If the progress of copy processes is unknown, it is displayed "???".
Copied Block	Displays the number of blocks that have been copied. The "N/A" is displayed when the copy process is not executed. If the number of copied blocks is unknown, it is displayed "???".
Total Block	Displays the number of total blocks. If the number of total blocks is unknown, it is displayed "???".

Table 4.21 When -da option is specified

Title	Explanation
Copy Group Name	Displays the copy group name.
Copy Group Type	Displays the type of copy that has been set up for the copy group.
Disk Array Name	Displays the Box ID and ETERNUS name that was specified with -a option for acgroup create (Copy group creation command) .
Source	Displays the logical volume for the copy source.
<=>	Displays the copy direction. <ul style="list-style-type: none"> - N/A: No copying is performed. - ==>: Copying from the source to the target. - <==: Copying from the target to the source.
Target	Displays the logical volume for the copy destination.
SID	Displays the session ID.
EC Status	Displays the execution status of the EC. <ul style="list-style-type: none"> - EC Starting: The EC is starting up. - EC Executing: The EC is executing. - EC Suspend: The EC is suspended.

Title	Explanation
	<ul style="list-style-type: none"> - EC action not startup: The specified session does not exist. - EC Error Suspend: An error has occurred, preventing the copy process from continuing.
Copy Phase	<p>Displays the current phase.</p> <ul style="list-style-type: none"> - Copying: Copy processing is executing. - Paired: The copy is in the equivalency maintenance state. - Not set: Either the specified session does not exist, or the copy process is not running.
Copied Block	Displays the number of blocks that have been copied.
Copy DA	<p>If the copy type is EC/REC, this displays the suppression settings for access to the copy destination area.</p> <ul style="list-style-type: none"> - on : Access is suppressed. - off: Access is not suppressed. <p>If the access suppression setting is unknown, it is displayed "???".</p>

Table 4.22 When -date option is specified

Title	Explanation
Copy Group Name	Displays the copy group name.
Copy Group Type	Displays the type of copy that has been set up for the copy group.
Disk Array Name	Displays the Box ID and ETERNUS name that was specified with -a option for acgroup create (Copy group creation command) .
Source	Displays the logical volume for the copy source.
<=>	<p>Displays the copy direction.</p> <ul style="list-style-type: none"> - N/A: No copying is performed. - ==>: Copying from the source to the target. - <==: Copying from the target to the source.
Target	Displays the logical volume for the copy destination.
SID	Displays the session ID.
EC Status	<p>Displays the execution status of the EC.</p> <ul style="list-style-type: none"> - EC Starting: The EC is starting up. - EC Executing: The EC is executing. - EC Suspend: The EC is suspended. - EC action not startup: The specified session does not exist. - EC Error Suspend: An error has occurred, preventing the copy process from continuing.
Copy Phase	<p>Displays the current phase.</p> <ul style="list-style-type: none"> - Copying: Copy processing is executing. - Paired: The copy is in the equivalency maintenance state. - Not set: Either the specified session does not exist, or the copy process is not running.
Copied Block	Displays the number of blocks that have been copied.
Operation Date	<p>If an EC session exists, it displays the date for when the EC session state transitions indicated below last occurred (last execution date) in a "yyyy/mm/dd hh:mm:ss" format.</p> <p>The displaying of the date is performed on the basis of the target device's time zone.</p>

Title	Explanation
	<ul style="list-style-type: none"> - Suspend (execution of acec suspend) - Concurrent suspend (execution of acec suspend -concur) - State transition to an error Suspend (EC Status field displays "EC Error Suspend"). <p>If any of the following conditions apply, the date will be displayed as "----/-- --:--:--."</p> <ul style="list-style-type: none"> - If an EC session does not exist (EC Status field displays "EC action not startup") - If the initial copy (acec start) was started from a status of an EC session not existing - If the EC session's copy status could not be acquired from the device (EC Status field displays "??") - If using a device for which the last execution date recording function is not supported (ETERNUS DX60/DX60 S2/DX80/DX90, ETERNUS DX400 series, ETERNUS DX8000 series)

Table 4.23 When -progress, -da and -date options are specified, or -all option is specified

Title	Explanation
Copy Group Name	Displays the copy group name.
Copy Group Type	Displays the type of copy that has been set up for the copy group.
Disk Array Name	Displays the Box ID and ETERNUS name that was specified with -a option for acgroup create (Copy group creation command) .
Source	Displays the logical volume for the copy source.
<=>	<p>Displays the copy direction.</p> <ul style="list-style-type: none"> - N/A: No copying is performed. - ==>: Copying from the source to the target. - <==: Copying from the target to the source.
Target	Displays the logical volume for the copy destination.
SID	Displays the session ID.
EC Status	<p>Displays the execution status of the EC.</p> <ul style="list-style-type: none"> - EC Starting: The EC is starting up. - EC Executing: The EC is executing. - EC Suspend: The EC is suspended. - EC action not startup: The specified session does not exist. - EC Error Suspend: An error has occurred, preventing the copy process from continuing.
Copy Phase	<p>Displays the current phase.</p> <ul style="list-style-type: none"> - Copying: Copy processing is executing. - Paired: The copy is in the equivalency maintenance state. - Not set: Either the specified session does not exist, or the copy process is not running.
Progress	<p>Displays the progress of copy processes as a percentage.</p> <p>The "N/A" is displayed when the copy process is not executed.</p> <p>If the progress of copy processes is unknown, it is displayed "??".</p>
Copied Block	Displays the number of blocks that have been copied.
Total Block	<p>Displays the number of total blocks.</p> <p>If the number of total blocks is unknown, it is displayed "??".</p>

Title	Explanation
Copy DA	<p>If the copy type is EC/REC, this displays the suppression settings for access to the copy destination area.</p> <ul style="list-style-type: none"> - on : Access is suppressed. - off: Access is not suppressed. <p>If the access suppression setting is unknown, it is displayed "???"</p>
Operation Date	<p>If an EC session exists, it displays the date for when the EC session state transitions indicated below last occurred (last execution date) in a "yyyy/mm/dd hh:mm:ss" format. The displaying of the date is performed on the basis of the target device's time zone.</p> <ul style="list-style-type: none"> - Suspend (execution of acec suspend) - Concurrent suspend (execution of acec suspend -concur) - State transition to an error Suspend (EC Status field displays "EC Error Suspend"). <p>If any of the following conditions apply, the date will be displayed as "----/--/-- --:--:--."</p> <ul style="list-style-type: none"> - If an EC session does not exist (EC Status field displays "EC action not startup") - If the initial copy (acec start) was started from a status of an EC session not existing - If the EC session's copy status could not be acquired from the device (EC Status field displays "???") - If using a device for which the last execution date recording function is not supported (ETERNUS DX60/DX60 S2/DX80/DX90, ETERNUS DX400 series, ETERNUS DX8000 series)

- For REC

- When the -progress, -da and -date options are not specified:

```
> acec query -g RECGroup
```

```
Copy Group Name      : RECGroup
Copy Group Type      : REC
Disk Array Name      : ET001 (00ETERNUSDXM##ET44S20A####HK000104#####)
Remote Disk Array Name : ET002 (00ETERNUSDXH##ET87S20A####NC4110699004##)
```

```
Source  <=> Target  SID(RSID)  EC Status          Copy Phase Copied Block Rcv  Split Xfer
-----
-----
ET001/0x1 N/A ET002/0x6 N/A          "EC action not startup" "Not set"          0 ---- ---- ----
ET001/0x2 ==> ET002/0x7 0x4A(0x11) "EC Executing"        "Copying"          0 auto ----
through
ET001/0x3 ==> ET002/0x8 0x4C(0x13) "EC Suspend"          "Paired"          1048576 auto ----
through
```

- When the -progress option is specified:

```
> acec query -g RECGroup -progress
```

```
Copy Group Name      : RECGroup
Copy Group Type      : REC
Disk Array Name      : ET001 (00ETERNUSDXM##ET44S20A####HK000104#####)
Remote Disk Array Name : ET002 (00ETERNUSDXH##ET87S20A####NC4110699004##)
```

```
Source  <=> Target  Progress Copied Block Total Block
-----
-----
ET001/0x1 N/A ET002/0x6      N/A          N/A          N/A
ET001/0x2 ==> ET002/0x7      45%          471859       1048576
ET001/0x3 ==> ET002/0x8      100%         1048576       1048576
```

- When the -da option is specified:

```
> acec query -g RECGroup -da
```

```
Copy Group Name      : RECGroup
Copy Group Type      : REC
Disk Array Name      : ET001 (00ETERNUSDXM##ET44S20A####HK000104#####)
Remote Disk Array Name : ET002 (00ETERNUSDXH##ET87S20A####NC4110699004##)
Source <=> Target    SID(RSID)  EC Status          Copy Phase Copied Block Rcv  Split
Xfer   Copy DA
-----
-----
ET001/0x1 N/A ET002/0x6 N/A      "EC action not startup" "Not set"          0 ---- ----
----      off
ET001/0x2 ==> ET002/0x7 0x4A(0x11) "EC Executing"      "Copying"          471859 auto ----
through   on
ET001/0x3 ==> ET002/0x8 0x4C(0x13) "EC Suspend"        "Paired"           1048576 auto ----
through   on
```

- When the -date option is specified:

```
> acec query -g RECGroup -date
```

```
Copy Group Name      : RECGroup
Copy Group Type      : REC
Disk Array Name      : ET001 (00ETERNUSDXM##ET44S20A####HK000104#####)
Remote Disk Array Name : ET002 (00ETERNUSDXH##ET87S20A####NC4110699004##)
Source <=> Target    SID(RSID)  EC Status          Copy Phase Copied Block Rcv  Split
Xfer   Operation Date
-----
-----
ET001/0x1 N/A ET002/0x6 N/A      "EC action not startup" "Not set"          0 ---- ----
----      "----/--/-- -:-:--"
ET001/0x2 ==> ET002/0x7 0x4A(0x11) "EC Executing"      "Copying"          471859 auto ----
through "----/--/-- -:-:--"
ET001/0x3 ==> ET002/0x8 0x4C(0x13) "EC Suspend"        "Paired"           1048576 auto ----
through "2010/10/18 13:00:00"
```

- When the -progress, -da and -date options are specified or -all option is specified:

```
> acec query -g RECGroup -progress -da -date
```

```
Copy Group Name      : RECGroup
Copy Group Type      : REC
Disk Array Name      : ET001 (00ETERNUSDXM##ET44S20A####HK000104#####)
Remote Disk Array Name : ET002 (00ETERNUSDXH##ET87S20A####NC4110699004##)

Source <=> Target    SID(RSID)  EC Status          Copy Phase Progress Copied Block
Total Block Rcv  Split Xfer   Copy DA Operation Date
-----
-----
ET001/0x1 N/A ET002/0x6 N/A      "EC action not startup" "Not set"          0%
0          0 ---- ---- ----      off "----/--/-- -:-:--"
ET001/0x2 ==> ET002/0x7 0x4A(0x11) "EC Executing"      "Copying"          45%          471859
1048576 auto ---- through   on "----/--/-- -:-:--"
ET001/0x3 ==> ET002/0x8 0x4C(0x13) "EC Suspend"        "Paired"           100%          1048576
1048576 auto ---- through   on "2010/10/18 13:00:00"
```

The following table shows the meanings of the information displayed.

Table 4.24 When -progress, -da and -date options are not specified

Title	Explanation
Copy Group Name	Displays the copy group name.

Title	Explanation
Copy Group Type	Displays the type of copy that has been set up for the copy group.
Disk Array Name	Displays the Box ID and ETERNUS name that was specified with -a option for acgroup create (Copy group creation command) .
Remote Disk Array Name	Displays the Box ID and ETERNUS name that was specified with -remote option for acgroup create (Copy group creation command) .
Source	Displays the logical volume for the copy source.
<=>	<p>Displays the copy direction.</p> <ul style="list-style-type: none"> - N/A: No copying is performed. - ==>: Copying from the source to the target. - <==: Copying from the target to the source.
Target	Displays the logical volume for the copy destination.
SID(RSID)	Displays the Session ID of ETERNUS Disk storage system (i.e. the Disk Array Name) and the Session ID of remote ETERNUS Disk storage system (i.e. the Remote Disk Array Name).
EC Status	<p>Displays the execution status of the REC.</p> <ul style="list-style-type: none"> - EC Starting: The REC is starting up. - EC Executing: The REC is executing. - EC Suspend: The REC is suspended - EC action not startup: The specified session does not exist. - EC Error Suspend: An error has occurred, preventing the copy process from continuing. - EC Hardware Suspend: The REC has paused because of a hardware error, such as a problem with the path between hardware devices. - EC Hardware Suspend(Use REC DISK): The REC Disk buffer is in use because of a hardware error, such as a problem with the path between hardware devices. - EC Hardware Suspend(Use REC BUFFER): The REC transfer buffer is in use because of a hardware error, such as a problem with the path between hardware devices. <p>"EC Hardware Suspend(Use REC DISK)" and "EC Hardware Suspend(Use REC BUFFER)" are displayed in the following case.</p> <ul style="list-style-type: none"> - When the ETERNUS Disk storage system that was specified with -a option for acgroup create (Copy group creation command) is the copy source device of REC.
Copy Phase	<p>Displays the current phase.</p> <ul style="list-style-type: none"> - Copying: Copy processing is executing. - Paired: The copy is in the equivalency maintenance state. - Not set: Either the specified session does not exist, or the copy process is not running.
Copied Block	Displays the number of blocks that have been copied.
Rcv	<p>Displays the recovery mode for REC copies.</p> <ul style="list-style-type: none"> - auto: Indicates that the recovery mode is "Automatic". - manual: Indicates that the recovery mode is "Manual". - ----: Indicates that a REC copy is not being performed.

Title	Explanation
Split	Displays the split mode for REC copies. <ul style="list-style-type: none"> - auto: Indicates that the split mode is "Automatic". - manual: Indicates that the split mode is "Manual". - ----: Indicates that either a REC copy is not being performed or that the mode is not synchronous mode.
Xfer	Displays the transfer mode for REC copies. <ul style="list-style-type: none"> - sync: Indicates that the transfer mode is "Synchronous". - through: Indicates that the transfer mode is "Through". - consist: Indicates that the transfer mode is "Consistency". - stack: Indicates that the transfer mode is "Stack". - ----: REC copy is not being performed.

Table 4.25 When -progress option is specified

Title	Explanation
Copy Group Name	Displays the copy group name.
Copy Group Type	Displays the type of copy that has been set up for the copy group.
Disk Array Name	Displays the Box ID and ETERNUS name that was specified with -a option for acgroup create (Copy group creation command) .
Remote Disk Array Name	Displays the Box ID and ETERNUS name that was specified with -remote option for acgroup create (Copy group creation command) .
Source	Displays the logical volume for the copy source.
<=>	Displays the copy direction. <ul style="list-style-type: none"> - N/A: No copying is performed. - ==>: Copying from the source to the target. - <==: Copying from the target to the source.
Target	Displays the logical volume for the copy destination.
Progress	Displays the progress of copy processes as a percentage. The "N/A" is displayed when the copy process is not executed. If the progress of copy processes is unknown, it is displayed "???".
Copied Block	Displays the number of blocks that have been copied. The "N/A" is displayed when the copy process is not executed. If the number of copied blocks is unknown, it is displayed "???".
Total Block	Displays the number of total blocks. If the number of total blocks is unknown, it is displayed "???".

Table 4.26 When -da option is specified

Title	Explanation
Copy Group Name	Displays the copy group name.
Copy Group Type	Displays the type of copy that has been set up for the copy group.
Disk Array Name	Displays the Box ID and ETERNUS name that was specified with -a option for acgroup create (Copy group creation command) .
Remote Disk Array Name	Displays the Box ID and ETERNUS name that was specified with -remote option for acgroup create (Copy group creation command) .

Title	Explanation
Source	Displays the logical volume for the copy source.
<=>	Displays the copy direction. <ul style="list-style-type: none"> - N/A: No copying is performed. - ==>: Copying from the source to the target. - <==: Copying from the target to the source.
Target	Displays the logical volume for the copy destination.
SID(RSID)	Displays the Session ID of ETERNUS Disk storage system (i.e. the Disk Array Name) and the Session ID of remote ETERNUS Disk storage system (i.e. the Remote Disk Array Name).
EC Status	Displays the execution status of the REC. <ul style="list-style-type: none"> - EC Starting: The REC is starting up. - EC Executing: The REC is executing. - EC Suspend: The REC is suspended - EC action not startup: The specified session does not exist. - EC Error Suspend: An error has occurred, preventing the copy process from continuing. - EC Hardware Suspend: The REC has paused because of a hardware error, such as a problem with the path between hardware devices. - EC Hardware Suspend(Use REC DISK): The REC Disk buffer is in use because of a hardware error, such as a problem with the path between hardware devices. - EC Hardware Suspend(Use REC BUFFER): The REC transfer buffer is in use because of a hardware error, such as a problem with the path between hardware devices. <p>"EC Hardware Suspend(Use REC DISK)" and "EC Hardware Suspend(Use REC BUFFER)" are displayed in the following case.</p> <ul style="list-style-type: none"> - When the ETERNUS Disk storage system that was specified with -a option for acgroup create (Copy group creation command) is the copy source device of REC.
Copy Phase	Displays the current phase. <ul style="list-style-type: none"> - Copying: Copy processing is executing. - Paired: The copy is in the equivalency maintenance state. - Not set: Either the specified session does not exist, or the copy process is not running.
Copied Block	Displays the number of blocks that have been copied.
Rcv	Displays the recovery mode for REC copies. <ul style="list-style-type: none"> - auto: Indicates that the recovery mode is "Automatic". - manual: Indicates that the recovery mode is "Manual". - ----: Indicates that a REC copy is not being performed.
Split	Displays the split mode for REC copies. <ul style="list-style-type: none"> - auto: Indicates that the split mode is "Automatic". - manual: Indicates that the split mode is "Manual".

Title	Explanation
	<ul style="list-style-type: none"> - ----: Indicates that either a REC copy is not being performed or that the mode is not synchronous mode.
Xfer	<p>Displays the transfer mode for REC copies.</p> <ul style="list-style-type: none"> - sync: Indicates that the transfer mode is "Synchronous". - through: Indicates that the transfer mode is "Through". - consist: Indicates that the transfer mode is "Consistency". - stack: Indicates that the transfer mode is "Stack". - ----: REC copy is not being performed.
Copy DA	<p>If the copy type is EC/REC, this displays the suppression settings for access to the copy destination area.</p> <ul style="list-style-type: none"> - on : Access is suppressed. - off: Access is not suppressed. <p>If the access suppression setting is unknown, it is displayed "???"</p>

Table 4.27 When -date option is specified

Title	Explanation
Copy Group Name	Displays the copy group name.
Copy Group Type	Displays the type of copy that has been set up for the copy group.
Disk Array Name	Displays the Box ID and ETERNUS name that was specified with -a option for acgroup create (Copy group creation command) .
Remote Disk Array Name	Displays the Box ID and ETERNUS name that was specified with -remote option for acgroup create (Copy group creation command) .
Source	Displays the logical volume for the copy source.
<=>	<p>Displays the copy direction.</p> <ul style="list-style-type: none"> - N/A: No copying is performed. - ==>: Copying from the source to the target. - <==: Copying from the target to the source.
Target	Displays the logical volume for the copy destination.
SID(RSID)	Displays the Session ID of ETERNUS Disk storage system (i.e. the Disk Array Name) and the Session ID of remote ETERNUS Disk storage system (i.e. the Remote Disk Array Name).
EC Status	<p>Displays the execution status of the REC.</p> <ul style="list-style-type: none"> - EC Starting: The REC is starting up. - EC Executing: The REC is executing. - EC Suspend: The REC is suspended - EC action not startup: The specified session does not exist. - EC Error Suspend: An error has occurred, preventing the copy process from continuing. - EC Hardware Suspend: The REC has paused because of a hardware error, such as a problem with the path between hardware devices. - EC Hardware Suspend(Use REC DISK): The REC Disk buffer is in use because of a hardware error, such as a problem with the path between hardware devices.

Title	Explanation
	<ul style="list-style-type: none"> - EC Hardware Suspend(Use REC BUFFER): The REC transfer buffer is in use because of a hardware error, such as a problem with the path between hardware devices. <p>"EC Hardware Suspend(Use REC DISK)" and "EC Hardware Suspend(Use REC BUFFER)" are displayed in the following case.</p> <ul style="list-style-type: none"> - When the ETERNUS Disk storage system that was specified with -a option for acgroup create (Copy group creation command) is the copy source device of REC.
Copy Phase	<p>Displays the current phase.</p> <ul style="list-style-type: none"> - Copying: Copy processing is executing. - Paired: The copy is in the equivalency maintenance state. - Not set: Either the specified session does not exist, or the copy process is not running.
Copied Block	<p>Displays the number of blocks that have been copied.</p>
Rcv	<p>Displays the recovery mode for REC copies.</p> <ul style="list-style-type: none"> - auto: Indicates that the recovery mode is "Automatic". - manual: Indicates that the recovery mode is "Manual". - ----: Indicates that a REC copy is not being performed.
Split	<p>Displays the split mode for REC copies.</p> <ul style="list-style-type: none"> - auto: Indicates that the split mode is "Automatic". - manual: Indicates that the split mode is "Manual". - ----: Indicates that either a REC copy is not being performed or that the mode is not synchronous mode.
Xfer	<p>Displays the transfer mode for REC copies.</p> <ul style="list-style-type: none"> - sync: Indicates that the transfer mode is "Synchronous". - through: Indicates that the transfer mode is "Through". - consist: Indicates that the transfer mode is "Consistency". - stack: Indicates that the transfer mode is "Stack". - ----: REC copy is not being performed.
Operation Date	<p>If an REC session exists, it displays the date for when the REC session state transitions indicated below last occurred (last execution date) in a "yyyy/mm/dd hh:mm:ss" format. The displaying of the date is performed on the basis of the target device's time zone.</p> <ul style="list-style-type: none"> - Starting of REC using the initial copy skip function (execution of <code>acec start -skip</code>) - Suspend (execution of <code>acec suspend</code>) <ul style="list-style-type: none"> - If a forced suspension was performed to an REC session in Hardware Suspend status, the last execution date will be initialized as "----/-- --:--:--." - If a forced suspension was performed to an REC session while the execution of a copy was in progress, the last execution date will not be updated. - Concurrent suspend (execution of <code>acec suspend -concur</code>) - State transition to an error Suspend (EC Status field displays "EC Error Suspend"). - State transition to a hardware Suspend (EC Status field displays "EC Hardware Suspend").

Title	Explanation
	<p>If any of the following conditions apply, the date will be displayed as "----/--/--:--:--."</p> <ul style="list-style-type: none"> - If an REC session does not exist (EC Status field displays "EC action not startup") - If the initial copy (acec start) was started from a status of an REC session not existing - If the REC session's copy status could not be acquired from the device (EC Status field displays "??") - If using a device for which the last execution date recording function is not supported (ETERNUS DX60/DX60 S2/DX80/DX90, ETERNUS DX400 series, ETERNUS DX8000 series)

Table 4.28 When -progress, -da and -date options are specified, or -all option is specified

Title	Explanation
Copy Group Name	Displays the copy group name.
Copy Group Type	Displays the type of copy that has been set up for the copy group.
Disk Array Name	Displays the Box ID and ETERNUS name that was specified with -a option for acgroup create (Copy group creation command) .
Remote Disk Array Name	Displays the Box ID and ETERNUS name that was specified with -remote option for acgroup create (Copy group creation command) .
Source	Displays the logical volume for the copy source.
<=>	<p>Displays the copy direction.</p> <ul style="list-style-type: none"> - N/A: No copying is performed. - ==>: Copying from the source to the target. - <==: Copying from the target to the source.
Target	Displays the logical volume for the copy destination.
SID(RSID)	Displays the Session ID of ETERNUS Disk storage system (i.e. the Disk Array Name) and the Session ID of remote ETERNUS Disk storage system (i.e. the Remote Disk Array Name).
EC Status	<p>Displays the execution status of the REC.</p> <ul style="list-style-type: none"> - EC Starting: The REC is starting up. - EC Executing: The REC is executing. - EC Suspend: The REC is suspended - EC action not startup: The specified session does not exist. - EC Error Suspend: An error has occurred, preventing the copy process from continuing. - EC Hardware Suspend: The REC has paused because of a hardware error, such as a problem with the path between hardware devices. - EC Hardware Suspend(Use REC DISK): The REC Disk buffer is in use because of a hardware error, such as a problem with the path between hardware devices. - EC Hardware Suspend(Use REC BUFFER): The REC transfer buffer is in use because of a hardware error, such as a problem with the path between hardware devices. <p>"EC Hardware Suspend(Use REC DISK)" and "EC Hardware Suspend(Use REC BUFFER)" are displayed in the following case.</p>

Title	Explanation
	<ul style="list-style-type: none"> - When the ETERNUS Disk storage system that was specified with -a option for acgroup create (Copy group creation command) is the copy source device of REC.
Copy Phase	<p>Displays the current phase.</p> <ul style="list-style-type: none"> - Copying: Copy processing is executing. - Paired: The copy is in the equivalency maintenance state. - Not set: Either the specified session does not exist, or the copy process is not running.
Progress	<p>Displays the progress of copy processes as a percentage. The "N/A" is displayed when the copy process is not executed. If the progress of copy processes is unknown, it is displayed "???".</p>
Copied Block	<p>Displays the number of blocks that have been copied.</p>
Total Block	<p>Displays the number of total blocks. If the number of total blocks is unknown, it is displayed "???".</p>
Rcv	<p>Displays the recovery mode for REC copies.</p> <ul style="list-style-type: none"> - auto: Indicates that the recovery mode is "Automatic". - manual: Indicates that the recovery mode is "Manual". - ----: Indicates that a REC copy is not being performed.
Split	<p>Displays the split mode for REC copies.</p> <ul style="list-style-type: none"> - auto: Indicates that the split mode is "Automatic". - manual: Indicates that the split mode is "Manual". - ----: Indicates that either a REC copy is not being performed or that the mode is not synchronous mode.
Xfer	<p>Displays the transfer mode for REC copies.</p> <ul style="list-style-type: none"> - sync: Indicates that the transfer mode is "Synchronous". - through: Indicates that the transfer mode is "Through". - consist: Indicates that the transfer mode is "Consistency". - stack: Indicates that the transfer mode is "Stack". - ----: REC copy is not being performed.
Copy DA	<p>If the copy type is EC/REC, this displays the suppression settings for access to the copy destination area.</p> <ul style="list-style-type: none"> - on : Access is suppressed. - off: Access is not suppressed. <p>If the access suppression setting is unknown, it is displayed "???"</p>
Operation Date	<p>If an REC session exists, it displays the date for when the REC session state transitions indicated below last occurred (last execution date) in a "yyyy/mm/dd hh:mm:ss" format. The displaying of the date is performed on the basis of the target device's time zone.</p> <ul style="list-style-type: none"> - Starting of REC using the initial copy skip function (execution of acec start -skip) - Suspend (execution of acec suspend) - If a forced suspension was performed to an REC session in Hardware Suspend status, the last execution date will be initialized as "----/-- --:--:--."

Title	Explanation
	<ul style="list-style-type: none"> - If a forced suspension was performed to an REC session while the execution of a copy was in progress, the last execution date will not be updated. - Concurrent suspend (execution of <code>acec suspend -concur</code>) - State transition to an error Suspend (EC Status field displays "EC Error Suspend"). - State transition to a hardware Suspend (EC Status field displays "EC Hardware Suspend"). <p>If any of the following conditions apply, the date will be displayed as "----/--/--:--:--."</p> <ul style="list-style-type: none"> - If an REC session does not exist (EC Status field displays "EC action not startup") - If the initial copy (<code>acec start</code>) was started from a status of an REC session not existing - If the REC session's copy status could not be acquired from the device (EC Status field displays "??") - If using a device for which the last execution date recording function is not supported (ETERNUS DX60/DX60 S2/DX80/DX90, ETERNUS DX400 series, ETERNUS DX8000 series)

NOTES

- When the copy type of copy group is OPC, QuickOPC or SnapOPCP, this command cannot be executed.
- Information such as Copy direction data and SID data may display as "??". Refer to ["5.3 Resolving for displaying "??" in Advanced Copy status"](#) and take action.

4.8.3 `acec suspend` (Synchronous high-speed copy temporary suspension command)

NAME

`acec suspend` - Suspension of synchronous high-speed copying

SYNOPSIS

For EC copy groups

```
acec suspend -g copyGroup [-p copyPair | -concur] [-r] [-xml]
```

For REC copy groups

```
acec suspend -g copyGroup [-p copyPair] [-r] [-force] [-xml]
acec suspend -g copyGroup -concur [-r] [-xml]
```

DESCRIPTION

This command temporarily suspends the synchronous high-speed copy for the specified copy group or copy pair.

OPTIONS

-g *copyGroup*

This option specifies the copy group.

-p *copyPair*

This option specifies a copy pair.

-concur

This option suspends synchronous high-speed copy using the concurrent suspend function.

When the copy type of the copy group is REC, this option can be specified only if the transfer mode is not Stack mode.

-r

This option temporarily suspends copying in the direction opposite to the specified one.

-force

This option forcibly and temporarily suspends the REC session.

If the execution status (EC Status) displayed with [acec query \(Synchronous high-speed copy status display command\)](#) is either of the following, it is impossible to forcibly suspend the REC session.

- EC Hardware Suspend(Use REC DISK) : The REC Disk buffer is in use because of a hardware error, such as a problem with the path between hardware devices.
- EC Hardware Suspend(Use REC BUFFER) : The REC transfer buffer is in use because of a hardware error, such as a problem with the path between hardware devices.

-xml

This option specifies when displaying the result of the command execution by the XML format.

EXIT STATUS

=0 : Completed successfully

>0 : Terminated abnormally

EXAMPLES

- Suspending synchronous high-speed copy (no using the concurrent suspend function)

```
> acec suspend -g group01
```

```
ET001/0x1:ET001/0x6
```

```
# DATE : 2008/06/24 16:28:00 - << EC Suspended >>
```

```
ET001/0x2:ET001/0x7
```

```
# DATE : 2008/06/24 16:28:00 - << EC Suspended >>
```

```
ET001/0x3:ET001/0x8
```

```
# DATE : 2008/06/24 16:28:00 - << EC Suspended >>
```

```
Succeeded : 3
```

```
Failed : 0
```

- Suspending synchronous high-speed copy using the concurrent suspend function

```
> acec suspend -g group01 -concur
```

```
Successful completion.
```

NOTES

- When the copy type of copy group is OPC, QuickOPC or SnapOPCP, this command cannot be executed.
- One of the following messages may be displayed when this command is executed by specifying -concur option for the REC copy group.

```
ccm5004 Operation failed. function=stxcec.SUSPEND.concur, message=STXC1002 ERROR Invalid logical volume name. Volume name=(0xa@00ETERNUSDHX##ET87S20A####NC4110699004##).
```

```
ccm5004 Operation failed. function=stxcec.SUSPEND.concur, message=STXC1034 ERROR The set Alias name for the option to specify the target to which the copy request is issued is not the copy source or is not the copy target.
```

```
ccm5004 Operation failed. function=stxcec.SUSPEND.concur, message=STXC1035 ERROR The set Alias name for the option to specify the target to which the copy request is issued exists, but access path information does not exist.
```

Check that ETERNUS Disk storage system of the copy source is not registered as a remote device, if the above message is displayed.

If the problem is not resolved, follow the procedure in "[Changing information other than ETERNUS names and access volumes](#)" and execute this command after re-registering the copy source ETERNUS Disk storage system.

4.8.4 acec resume (Synchronous high-speed copy restart command)

NAME

acec resume - Resumption of synchronous high-speed copying

SYNOPSIS

When the copy type set in the copy group is EC

```
acec resume -g copyGroup [-p copyPair] [-r] [-xml]
```

When the copy type set in the copy group is REC

```
acec resume -g copyGroup [-p copyPair] [-r] [-remain] [-xml]
```

DESCRIPTION

This command restarts the synchronous high-speed copy for the specified copy group or copy pair.

OPTIONS

-g *copyGroup*

This option specifies the copy group name.

-p *copyPair*

This option specifies a copy pair.

-r

This option restarts copying in the reverse direction to the direction that has been specified.

-remain

This option restarts the synchronous high-speed copy for the copy group or copy pair that suspended by using the initial copy skip function.

-xml

This option specifies when displaying the result of the command execution by the XML format.

EXIT STATUS

=0 : Completed successfully

>0 : Terminated abnormally

EXAMPLES

```
> acec resume -g group01

ET001/0x1:ET001/0x6
# DATE : 2008/06/24 16:28:00 - << EC Resumed >>

ET001/0x2:ET001/0x7
# DATE : 2008/06/24 16:28:00 - << EC Resumed >>

ET001/0x3:ET001/0x8
# DATE : 2008/06/24 16:28:00 - << EC Resumed >>

Succeeded : 3
Failed    : 0
```

NOTES

- When the copy type of copy group is OPC, QuickOPC or SnapOPCP, this command cannot be executed.
- This command terminates abnormally if the copy destination logical volume of the specified copy group or pair is protected by [acinhibit set \(Volume protection settings command\)](#).

4.8.5 acec reverse (Synchronous high-speed copy reverse command)

NAME

acec reverse - Reversal of synchronous high-speed copying

SYNOPSIS

```
acec reverse -g copyGroup [-p copyPair] [-r] [-xml]
```

DESCRIPTION

This command reverses the direction of the synchronous high-speed copy for the specified copy group or copy pair.

OPTIONS

-g *copyGroup*

This option specifies the copy group name.

Only the following types of copy set in the copy group can be specified:

- EC

- REC

-p *copyPair*

This option specifies a copy pair.

-r

This option reverses the copying in the reverse direction to the direction that has been specified, so that the copy direction becomes the direction that has been specified.

-xml

This option specifies when displaying the result of the command execution by the XML format.

EXIT STATUS

=0 : Completed successfully

>0 : Terminated abnormally

EXAMPLES

```
> acec reverse -g group01
```

```
ET001/0x1:ET001/0x6  
# DATE : 2008/06/24 16:28:00 - << EC Change >>
```

```
ET001/0x2:ET001/0x7  
# DATE : 2008/06/24 16:28:00 - << EC Change >>
```

```
ET001/0x3:ET001/0x8  
# DATE : 2008/06/24 16:28:00 - << EC Change >>
```

```
Succeeded : 3  
Failed    : 0
```

NOTES

- When the copy type of copy group is OPC, QuickOPC or SnapOPCP, this command cannot be executed.

4.8.6 acec change (Synchronous high-speed copy mode change command)

NAME

acec change - Mode change of synchronous high-speed copying

SYNOPSIS

```
acec change -g copyGroup [-p copyPair] [-r] [-transfer {sync [-split {auto|manual}]|through|consistent|stack}] [-recovery {auto|manual}] [-xml]
```

DESCRIPTION

This command changes the mode of the synchronous high-speed copy for the specified copy group or copy pair.

Suspend the REC session before execution.

This command is only enabled when the copy type that was set in the copy group is REC.

OPTIONS

-g *copyGroup*

This option specifies the copy group.

-p *copyPair*

This option specifies a copy pair.

-r

This option changes the mode for copying in the reverse direction.

-transfer {sync [-split {auto|manual}][through|consist|stack]}

This option specifies the transfer mode. Refer to "[3.2.2.5 REC operating modes](#)" for information on each mode.

- sync: Synchronous mode

This option specifies the split mode when sync was specified with the "-transfer" option.

-split

- auto: Automatic Split

- manual: Manual Split

- through: Through mode

- consist: Consistency mode

- stack: Stack mode

-recovery

This option specifies the recovery mode. Refer to "[3.2.2.5 REC operating modes](#)" for information on each mode.

- auto: Automatic Recovery

- manual: Manual Recovery

-xml

This option specifies when displaying the result of the command execution by the XML format.

EXIT STATUS

=0 : Completed successfully

>0 : Terminated abnormally

EXAMPLES

```
> acec change -g group01 -transfer sync
```

```
ET001/0x1:ET002/0x1
```

```
# DATE : 2008/06/24 16:28:00 - << EC Change >>
```

```
ET001/0x2:ET002/0x2
```

```
# DATE : 2008/06/24 16:28:00 - << EC Change >>
```

```
ET001/0x3:ET002/0x3
```

```
# DATE : 2008/06/24 16:28:00 - << EC Change >>
```

```
Succeeded : 3
```

```
Failed : 0
```

NOTES

- When the copy type of copy group is OPC, QuickOPC or SnapOPCP, this command cannot be executed.
- Specify `-force` option for [acec suspend \(Synchronous high-speed copy temporary suspension command\)](#) and forcibly suspend REC session to execute this command if the REC transfer mode is Consistency mode or Stack mode.

4.8.7 acec cancel (Synchronous high-speed copy stop command)

NAME

acec cancel - Stop of synchronous high-speed copying

SYNOPSIS

```
acec cancel -g copyGroup [-p copyPair] [-r] [-force] [-xml]
```

DESCRIPTION

This command stops the synchronous high-speed copy for the specified copy group or copy pair.

OPTIONS

`-g copyGroup`

This option specifies the copy group name.

`-p copyPair`

This option specifies a copy pair.

`-r`

This option stops copying in the reverse direction to the direction that has been specified.

`-force`

This option forcibly stops the session.

`-xml`

This option specifies when displaying the result of the command execution by the XML format.

EXIT STATUS

=0 : Completed successfully

>0 : Terminated abnormally

EXAMPLES

```
> acec cancel -g group01
```

```
ET001/0x1:ET001/0x6  
# DATE : 2008/06/24 16:28:00 - << EC Disconnected >>
```

```
ET001/0x2:ET001/0x7  
# DATE : 2008/06/24 16:28:00 - << EC Disconnected >>
```

```
ET001/0x3:ET001/0x8
```

DATE : 2008/06/24 16:28:00 - << EC Disconnected >>

Succeeded : 3
Failed : 0

NOTES

- When the copy type of copy group is OPC, QuickOPC or SnapOPCP, this command cannot be executed.
- Specify -force option to forcibly suspend REC session by executing this command if the REC transfer mode is Consistency mode or Stack mode. In this case, the consistency of the copy destination is not guaranteed.

Follow the procedure below to forcibly stop REC session.

1. Forcibly suspend the REC session by executing [acec suspend \(Synchronous high-speed copy temporary suspension command\)](#) with -force option.
2. Change the REC transfer mode to Through mode by executing [acec change \(Synchronous high-speed copy mode change command\)](#).
3. Restart the REC by executing [acec resume \(Synchronous high-speed copy restart command\)](#).
4. Check the copy phase is in the equivalency maintenance state by executing [acec query \(Synchronous high-speed copy status display command\)](#).
5. Suspend the REC session by executing [acec suspend \(Synchronous high-speed copy temporary suspension command\)](#).
Do not specify - force option.
6. Stop the REC session by executing this command.
Do not specify - force option.

4.9 Commands for NAS Volume

4.9.1 acnas backup (NAS volume backup command)

NAME

acnas backup - Backup of NAS volume

SYNOPSIS

acnas backup -g *copyGroup*

DESCRIPTION

Backup of the NAS volume coordinated with the NAS environment of the ETERNUS Disk storage system will be performed.

OPTIONS

-g *copyGroup*

Specify the copy group name of the NAS backup configurations. The copy group name of the NAS backup configurations can be confirmed with the Web Console.

Refer to "Display Shared Folder" of the *ETERNUS SF Web Console Guide* for information on how to confirm the copy group name with the Web Console.

EXAMPLES

=0 : Completed successfully
>0 : Terminated abnormally

EXAMPLES

- The NAS volume will be backed up.

```
> acnas backup -g NAS_QuickOPC_0  
Successful completion.
```

NOTES

- This command is to be executed with the Management Server. It is not possible to execute this command with an environment where only the CCM has been installed.
- In order to implement backup of the NAS volume, it is necessary to perform NAS backup configurations in advance with the Web Console.
- In relation to the copy group of the NAS backup configurations, do not implement operations other than suspending copying or displaying the status.
- When the NAS backup volume is in a state of being mounted, this command cannot be executed. Execute this command after unmounting the NAS backup volume. Refer to "Mount/Unmount Backup Destination" in the *ETERNUS SF Web Console Guide* for information on the procedures for mounting / unmounting the NAS backup volume.

4.10 Copy session management commands

This section explains the commands to manage copy sessions of ETERNUS Disk storage system.

4.10.1 accopy query (Copy session information display command)

NAME

accopy query - Display the copy session information

SYNOPSIS

If displaying copy session information by device unit

```
accopy query -a diskArrayName -type { local | remote | odx | all } [-xml]
```

If displaying REC session information

```
accopy query -a diskArrayName -sa srcDiskArrayName -ta dstDiskArrayName [-xml]
```

DESCRIPTION

This command displays the status of the copy sessions being performed in the specified ETERNUS Disk storage system.

OPTIONS

-a *diskArrayName*

This option specifies the name of ETERNUS Disk storage system for which the execution status of copy sessions is displayed.

-type { local | remote | odx | all }

This option specifies the type of copy sessions to display.

- local: Displays only OPC, QuickOPC, EC, SnapOPC, SnapOPC+, monitor sessions, and Extended Copy.
- remote: Displays only REC sessions.
- odx: Displays ODX.
- all: Displays all sessions.

-sa *srcDiskArrayName* -ta *dstDiskArrayName*

This option specifies the display of information for all REC sessions set up from the device specified with -sa option towards the device specified with -ta option.

Either *srcDiskArrayName* or *dstDiskArrayName* must match with the ETERNUS name specified to -a option.

If specifying a device other than a management device for AdvancedCopy Manager CCM or Express, specify the Box ID (40 characters) instead of the ETERNUS name of AdvancedCopy Manager CCM or Express.

-xml

This option specifies when displaying by the XML format.

EXIT STATUS

=0 : Completed successfully

>0 : Terminated abnormally

EXAMPLES

- Displaying the information of copy sessions in storage device units

```
> accopy query -a ET001
```

```
Disk Array Name : ET001
```

```
BOX-ID          : 00ETERNUSDXM##ET44S20A####HK000104#####
```

Source		<=>	Target	SID(RSID)	Copy Type	Copy Status
Copy Phase	Progress	Copied	Block Total	Block Operation	Date	
ET001/0x1		==>	ET001/0x3	0x19(----	OPC	"Executing"
Copying	N/A	471859	N/A	"2010/10/20 09:02:03"		
ET001/0x2[addr=0x800,size=0xC800000]		==>	ET001/0x4[addr=0x800]	0x22(----	EC	"Executing"
Copying	68%	142606336	209715200	"2010/10/20 10:23:30"		
ET001/0x5		==>	ET001/0x6	0x24(----	SnapOPCP	"Executing"
Copying	N/A	524288	N/A	"2010/10/20 11:45:34"		
ET001/0x7[addr=0x3F,size=0x1400000]		==>	ET001/0x8[addr=0x7F]	0x35(----	SnapOPCP	"Executing"
Copying	N/A	20971520	20971520	"2010/10/19 12:00:45"		
ET002/0x9		==>	ET001/0x9	0x48(0x42)	REC	"Executing"
Paired	N/A	4294967295	N/A	"2010/10/20 03:35:03"		
ET001/0xA[addr=0x3F,size=0x7FFFFFFC0]		==>	----	0x88(----	Estimate	"Executing"
Copying	N/A	3456777	2147483584	"2010/10/20 10:30:03"		
ET001/0xB		==>	ET001/0xC	0x92(----	QuickOPC	"Executing"
Readying	N/A	0	N/A	"----/--/-- --:--:--"		
ET001/0xD[addr=0x3F,size=0x1400000]		==>	ET001/0xE[addr=0x7F]	0x19(----	Xcopy	"Executing"
Copying	N/A	512	N/A	"2010/10/20 10:02:03"		

- Displaying the information of REC copy sessions

```
> accopy query -a ET001 -sa ET002 -ta ET001
```

```
Disk Array Name : ET001
```

```
BOX-ID          : 00ETERNUSDXM##ET44S20A####HK000104#####
```

```
Source    <=> Target    SID(RSID)  Copy Type Copy Status Copy Phase Progress Copied Block Total
Block Operation Date
-----
ET002/0x9 ==> ET001/0x9 0x48(0x42) REC          "Executing" Paired          N/A    4294967295
N/A "2010/10/20 03:35:03"
```

The following table shows the meanings of the information displayed.

Title	Explanation
Source	<p>Displays the logical volume for the copy source.</p> <ul style="list-style-type: none"> - When the copy is executed in logical volume units: <ul style="list-style-type: none"> - ETERNUS name or Box ID - Logical volume number - When the copy is executed in extent units: <ul style="list-style-type: none"> - ETERNUS name or Box ID - Logical volume number[addr=copy_start_location,size=copy_size] <p>The logical volume number, copy start location and copy size are displayed in hexadecimal.</p>
<=>	<p>Displays the copy direction.</p> <ul style="list-style-type: none"> - "==" (Copying from the source to the target) is always displayed.
Target	<p>Displays the logical volume for the copy destination.</p> <ul style="list-style-type: none"> - When the copy is executed in logical volume units: <ul style="list-style-type: none"> - ETERNUS name or Box ID - Logical volume number - When the copy is executed in extent units: <ul style="list-style-type: none"> - ETERNUS name or Box ID - Logical volume number[addr=copy_start_location,size=copy_size] <p>The logical volume number, copy start location and copy size are displayed in hexadecimal.</p> <p>When Copy Type field is "Estimate", "----" is displayed.</p>
SID(RSID)	<p>Displays the session ID and REC session ID in "x(y)" format.</p> <ul style="list-style-type: none"> - For OPC, QuickOPC, EC, SnapOPC, SnapOPC+, Extended Copy, and Offloaded Data Transfer: <ul style="list-style-type: none"> - x: Session ID - y: ---- - For REC: <ul style="list-style-type: none"> - x: Session ID (the ID for the session in the device specified with -a option) - y: REC session ID (the ID for the session in the copy destination device specified with -a option)
Copy Type	<p>Displays the copy type.</p> <ul style="list-style-type: none"> - OPC: The OPC is executing.

Title	Explanation
	<ul style="list-style-type: none"> - QuickOPC: The QuickOPC is executing. - SnapOPCP: The SnapOPC+ or SnapOPC is executing. - EC: The EC is executing. - REC: The REC is executing. - Estimate: monitor session is executing. - Xcopy: The Extended Copy is executing. - ODX: Offloaded Data Transfer is executing.
Copy Status	<p>Displays the copy execution status.</p> <ul style="list-style-type: none"> - Starting: The copy is starting up. - Executing: The copy is executing. - Suspend: The EC or REC is suspended. - Error Suspend: An error has occurred, preventing the copy process from continuing. - Hardware Suspend: The copy is temporarily stopped due to a path error between devices. (If using REC) - Hardware Suspend(Use REC DISK): The copy is using the REC Disk buffer due to a path error between devices. (If using REC) - Hardware Suspend(Use REC BUFFER): The copy is doing REC buffering due to a path error between devices. (If using REC) <p>"EC Hardware suspend (Use REC DISK)" and "EC Hardware suspend (Use REC BUFFER)" is displayed in the following circumstance.</p> <ul style="list-style-type: none"> - If the device specified with -a option for acgroup create (Copy group creation command) has become the REC copy source device
Copy Phase	<p>Displays the current phase.</p> <ul style="list-style-type: none"> - Ready: Concurrent OPC is defined. - Copying: Copy processing is executing. - Paired: The copy is in the equivalency maintenance state. - Tracking: QuickOPC copy processing has completed, and tracking is in progress. - Copying/Tracking: Both QuickOPC copy processing and tracking are in progress. - N/A: Copy processing has not been performed.
Progress	<p>Displays the progress of copy processes as a percentage. The "N/A" is displayed in the following case.</p> <ul style="list-style-type: none"> - When Copy Type field is SnapOPCP or Estimate - When the copy is executed in logical volume units on the following ETERNUS Disk storage systems. <ul style="list-style-type: none"> - ETERNUS DX80/DX80 S2 (for firmware version numbers before V10L30) - ETERNUS DX90/DX90 S2 (for firmware version numbers before V10L30) - ETERNUS DX400/DX400 S2 series (for firmware version numbers before V10L30) - ETERNUS DX8000/DX8000 S2 series (for firmware version numbers before V10L30)
Copied Block	<p>Displays the number of blocks that have been copied.</p> <p>If Copy Phase field displays "Tracking", it displays the number of blocks that have not been updated after the last execution of the logical copy.</p>

Title	Explanation
Total Block	Displays the number of total blocks. When the copy is executed in logical volume units, it is displayed "N/A".
Operation Date	<p>If a copy session exists, it displays the date for when the EC session state transitions indicated below last occurred (last execution date) in a "yyyy/mm/dd hh:mm:ss" format. The displaying of the date is performed on the basis of the target device's time zone.</p> <ul style="list-style-type: none"> - For OPC, QuickOPC, Extended Copy, and Offloaded Data Transfer: <ul style="list-style-type: none"> - Starting logical copy - State transition to error suspend (Copy Status field displays "Error Suspend") - For SnapOPC+ and SnapOPC: <ul style="list-style-type: none"> - Starting logical copy - State transition to error suspend (Copy Status field displays "Error Suspend") - For EC: <ul style="list-style-type: none"> - Suspend - Concurrent suspend - State transition to error suspend (Copy Status field displays "Error Suspend") - For REC: <ul style="list-style-type: none"> - Start of REC by initial copy skip function - Suspend <ul style="list-style-type: none"> - If a forced suspension was performed to an REC session in a Hardware suspend status, the last execution date will be initialized as "----/--/-- --:--:--." - If a forced suspension was performed to an REC session with the execution of a copy in progress, the last execution date is not updated. - Concurrent suspend <ul style="list-style-type: none"> - During a not-yet transmitted suspension, the last execution date is not updated. - State transition to an Error suspend (Copy Status field displays "Error Suspend") - State transition to a Hardware suspend (Copy Status field displays "Hardware Suspend") <p>If any of the following conditions apply, the date will be displayed as "----/--/-- --:--:--."</p> <ul style="list-style-type: none"> - If an EC/REC initial copy was started from a status of a copy session not existing - If the REC session underwent an automatic recovery from a Hardware suspend status (Copy Status field displays "Hardware Suspend") - If using a device for which the last execution date recording function is not supported (ETERNUS DX60/DX60 S2/DX80/DX90, ETERNUS DX400 series, ETERNUS DX8000 series)

NOTES

- If the information acquisition operation has failed, this command outputs the following message and then terminates with an error.

```
ccm5004 Operation failed. function=stxccopy.QUERY, message=message
```

It is possible that the access volume is incorrect. Therefore, check it using [acarray detail \(ETERNUS Disk storage system detail information display command\)](#) and check that the CCM Server can access to the access volume.

If inaccessible, set up a volume for which access is possible by using [acarray change \(ETERNUS name and access volume for ETERNUS Disk storage system change command\)](#).

- The information is displayed in ascending order of the copy source session IDs.
- For the Source and Target, either of the following information is displayed.
 - ETERNUS name
If using a device registered to AdvancedCopy Manager CCM or Express
 - Box ID
If using a device not registered to AdvancedCopy Manager CCM or Express.

There are cases of [***Other-Storage***] being displayed for the **Source** or **Target** field. If, after specifying the device which is correctly displayed and executing `acarray remove` (ETERNUS Disk storage system registration information deletion command), one then re-executes `acarray add` (ETERNUS Disk storage system registration command), both ETERNUS names will be correctly displayed.

4.10.2 accopy fcancel (Copy session forcible stop command)

NAME

`accopy fcancel` - Stop the copy session forcibly

SYNOPSIS

If forcibly stopping copy sessions by device unit

```
accopy fcancel -a diskArrayName -type { local | remote | odx | all } [-xml]
```

If forcibly stopping REC sessions

```
accopy fcancel -a diskArrayName -sa srcDiskArrayName -ta dstDiskArrayName [-xml]
```

If forcibly stopping copy sessions by session unit

```
accopy fcancel -a diskArrayName -s srcVolume -t dstVolume [-xml]
```

If forcibly stopping monitor sessions by session unit

```
accopy fcancel -v srcVolume -estimate [-xml]
```

If forcibly stopping multiple copy sessions

```
accopy fcancel -a diskArrayName -stdin [-xml]
```

DESCRIPTION

This command forcibly stops the copy sessions being performed in the specified ETERNUS Disk storage system.

OPTIONS

`-a diskArrayName`

This option specifies the name of ETERNUS Disk storage system for which the forcible stop of copy sessions is to be executed.

`-type { local | remote | odx | all }`

This option specifies the type of copy session that is to undergo a forcible stop.

- local: Stops only OPC, QuickOPC, EC, SnapOPC, SnapOPC+, monitor sessions, and Extended Copy forcibly.
- remote: Stops only REC sessions forcibly.
- odx: Stops ODX forcibly.
- all: Stops all sessions forcibly.

-sa srcDiskArrayName -ta dstDiskArrayName

This option specifies the forcible stop of all REC sessions set up from the device set with -sa option toward the device set with -ta option. Either *SOURCE-DISKARRAY-NAME* or *TARGET-DISKARRAY-NAME* must match with the ETERNUS name specified to -a option.

If specifying a device other than a AdvancedCopy Manager CCM management device, specify the Box ID (40 characters) instead of the ETERNUS name of the AdvancedCopy Manager CCM.

-s srcVolume -t dstVolume

This option specifies the forcible stopping of the copy session from the volume specified with -s option to the volume specified with -t option.

Either *SOURCE-VOLUME* or *TARGET-VOLUME* must be the same volume for the device specified with -a option.

For *SOURCE-VOLUME* and *TARGET-VOLUME*, specify the names of the volumes displayed as **Source** and **Target** fields respectively with [accopy query \(Copy session information display command\)](#). However, one cannot specify volumes that are displayed as [***Other-Storage***].

-v srcVolume -estimate

This option specifies the forcible stop of monitor sessions which has been set to -v option.

For *SOURCE-VOLUME*, specify the name of the volume displayed as **Source** field with [accopy query \(Copy session information display command\)](#).

-stdin

This option specifies the forcible stop of multiple copy sessions read from standard input.

Specify the copy sessions which are to be forcibly stopped in Tab Separated Values (TSV) format as follows.

- When the copy type is not "Estimate":

```
Copy_source_volume<TAB>Copy_destination_volume<RETURN>
```

- When the copy type is "Estimate":

```
Copy_source_volume<RETURN>
```

-xml

This option specifies when displaying the result of the command execution by the XML format.

EXIT STATUS

=0 : Completed successfully

>0 : Terminated abnormally

EXAMPLES

- Stopping copy sessions in storage device units forcibly

```
> accopy fcancel -type all -a ET001
```

```
ET001/0x1:ET001/0x2
# DATE : 2008/06/24 16:28:00 - << OPC Disconnected >>
ET001/0x3:ET001/0x4
# DATE : 2008/06/24 16:28:01 - << OPC Disconnected >>
[Omission]
ET001/0x146:ET002/0x146
# DATE : 2008/06/24 16:40:20 - << EC Disconnected >>
```

```
Succeeded : 720
Failed    : 0
```

- Stopping REC sessions forcibly

```
> accopy fcancel -a ET001 -sa ET002 -ta ET001
ET002/0x1:ET001/0x1
# DATE : 2010/06/24 16:28:00 - << EC Disconnected >>
ET002/0x2:ET001/0x2
# DATE : 2010/06/24 16:28:01 - << EC Disconnected >>
[Omission]
ET002/0x159:ET001/0x159
# DATE : 2010/06/24 16:40:34 - << EC Disconnected >>

Succeeded : 345
Failed : 0
```

- Stopping a copy session in session units forcibly

```
> accopy fcancel -a ET001 -s ET001/0x1[addr=0x3F,size=0x7FFF] -t ET001/0x2[addr=0x3F]
ET001/0x3[addr=0x3F,size=0x7FFF]:ET001/0x3[addr=0x3F]
# DATE : 2010/06/24 16:40:34 - << Disconnected >>
Succeeded : 1
Failed : 0
```

- Stopping a monitor session in session units forcibly

```
> accopy fcancel -v ET001/0xA[addr=0x3F,size=0x7FFFFFFC0] -estimate
ET001/0xA[addr=0x3F,size=0x7FFFFFFC0]
# DATE : 2010/06/24 16:28:00 - << Estimate Disconnected >>

Succeeded : 1
Failed : 0
```

- Stopping multiple copy sessions forcibly

```
> type SESSIONS.txt
ET001/0x1 ET001/0x3
ET001/0x2[addr=0x800,size=0xC800000] ET001/0x4[addr=0x800]
ET001/0x5 ET001/0x6
ET001/0x7[addr=0x3F,size=0x1400000] ET001/0x8[addr=0x7F]
ET002/0x9 ET001/0x9
ET001/0xA[addr=0x3F,size=0x7FFFFFFC0]
ET001/0xB ET001/0xC
ET001/0xD[addr=0x3F,size=0x1400000] ET001/0xE[addr=0x7F]

> accopy fcancel -a ET001 -stdin < SESSIONS.txt
ET001/0x1:ET001/0x3
# DATE : 2010/06/24 16:28:00 - << EC Disconnected >>
ET001/0x2[addr=0x800,size=0xC800000]:ET001/0x4[addr=0x800]
# DATE : 2010/06/24 16:28:00 - << OPC Disconnected >>
ET001/0x5:ET001/0x6
# DATE : 2010/06/24 16:28:00 - << SnapOPCP Disconnected >>
ET001/0x7[addr=0x3F,size=0x1400000]:ET001/0x8[addr=0x7F]
# DATE : 2010/06/24 16:28:00 - << SnapOPCP Disconnected >>
ET002/0x9:ET001/0x9
# DATE : 2010/06/24 16:28:00 - << REC Disconnected >>
ET001/0xA[addr=0x3F,size=0x7FFFFFFC0]
# DATE : 2010/06/24 16:28:00 - << Estimate Disconnected >>
ET001/0xB:ET001/0xC
# DATE : 2010/06/24 16:28:00 - << QuickOPC Disconnected >>
ET001/0xD[addr=0x3F,size=0x1400000] ET001/0xE[addr=0x7F]
# DATE : 2010/06/24 16:28:00 - << Xcopy Disconnected >>

Succeeded : 8
Failed : 0
```

NOTES

- Use ETERNUS Web GUI or ETERNUS CLI to stop the monitor session started by the following methods.
 - Operation by Copy command via SAN
 - Started by Copy command via LAN
 - Started by ETERNUS Web GUI
 - Started by ETERNUS CLI
 - Operation by Copy command via LAN
 - Started by Copy command via SAN

4.10.3 accopy fsuspend (REC session forcible suspend command)

NAME

accopy fsuspend - Stop the REC session forcibly

SYNOPSIS

If forcibly suspending REC sessions by device unit

```
accopy fsuspend -a diskArrayName [-xml]
```

If forcibly suspending REC sessions

```
accopy fsuspend -a diskArrayName -sa srcDiskArrayName -ta dstDiskArrayName [-xml]
```

If forcibly suspending REC sessions by session unit

```
accopy fsuspend -a diskArrayName -s srcVolume -t dstVolume [-xml]
```

If forcibly suspending multiple REC sessions

```
accopy fsuspend -a diskArrayName -stdin [-xml]
```

DESCRIPTION

This command forcibly suspends the copy session being performed in the specified ETERNUS Disk storage system.

OPTIONS

-a *diskArrayName*

This option specifies the name of the ETERNUS Disk storage system for which the forcible suspend of the REC sessions is to be executed.

-sa *srcDiskArrayName* -ta *dstDiskArrayName*

This option specifies the forcible suspend of all REC sessions set up from the device set with -sa option toward the device set with -ta option.

Either *SOURCE-DISKARRAY-NAME* or *TARGET-DISKARRAY-NAME* must match with the ETERNUS name specified to -a option.

If specifying a device other than a management device for AdvancedCopy Manager CCM or Express, specify the Box ID (40 characters) instead of the ETERNUS name of AdvancedCopy Manager CCM or Express.

-s srcVolume -t dstVolume

This option specifies the forcible suspend the REC sessions from the volume specified with -s option to the volume specified with -t option.

Either *srcVolume* or *dstVolume* must be the same volume for the device specified with -a option.

For *srcVolume* and *dstVolume*, specify the names of the volumes displayed as **Source** and **Target** fields respectively with [accopy query \(Copy session information display command\)](#).

However, one cannot specify volumes that are displayed as [***Other-Storage***].

-stdin

This option specifies the forcible suspend of multiple copy sessions read from standard input.

Specify the copy sessions which are to be forcibly suspended in Tab Separated Value (TSV) format as follows.

```
Copy_source_volume<TAB>Copy_destination_volume<RETURN>
```

-xml

This option specifies when displaying the result of the command execution by the XML format.

EXIT STATUS

=0 : Completed successfully

>0 : Terminated abnormally

EXAMPLES

- Suspending REC sessions in storage device units forcibly

```
> accopy fsuspend -a ET001
ET001/0x1:ET002/0x1
# DATE : 2010/06/24 16:28:00 - << EC Suspended >>
ET001/0x2:ET002/0x2
# DATE : 2010/06/24 16:28:01 - << EC Suspended >>
[Omission]
ET001/0x2D0:ET002/0x2D0
# DATE : 2010/06/24 16:49:00 - << EC Suspended >>

Succeeded : 720
Failed    : 0
```

- Suspending REC sessions forcibly

```
> accopy fsuspend -a ET001 -sa ET002 -ta ET001
ET002/0x1:ET001/0x1
# DATE : 2010/06/24 16:28:00 - << EC Suspended >>
ET002/0x2:ET001/0x2
# DATE : 2010/06/24 16:28:01 - << EC Suspended >>
[Omission]
ET002/0x159:ET001/0x159
# DATE : 2010/06/24 16:40:34 - << EC Suspended >>

Succeeded : 345
Failed    : 0
```

- Suspending a REC session in session units forcibly

```
> accopy fsuspend -a ET001 -s ET001/0x3[addr=0x3F,size=0x7FFF] -t ET002/0x3[addr=0x3F]
ET001/0x3[addr=0x3F,size=0x7FFF]:ET001/0x3[addr=0x3F]
# DATE : 2010/06/24 16:40:34 - << EC Suspended >>

Succeeded : 1
Failed    : 0
```

- Suspending multiple REC sessions forcibly

```
> type SESSIONS.txt
ET002/0x9      ET001/0x9
ET001/0xA      ET002/0xA
> accopy fsuspend -a ET001 -stdin < SESSIONS.txt
ET002/0x9:ET001/0x9
# DATE : 2010/06/24 16:28:00 - << EC Suspended >>
ET001/0xA:ET002/0xA
# DATE : 2010/06/24 16:28:01 - << EC Suspended >>

Succeeded : 2
Failed    : 0
```

NOTES

- If **Copy Status** field displayed with [accopy query \(Copy session information display command\)](#) is either of the following, it is not possible to forcibly suspend the copy session.
 - EC Hardware Suspend(Use REC DISK): A line error has occurred and the REC Disk buffer is being used
 - EC Hardware Suspend(Use REC BUFFER): A line error has occurred and the REC buffer is being used

4.11 Server utility commands

This section explains the utility commands that are used on each server.

4.11.1 acutil devs (Logical volume information display command)

NAME

acutil devs - Display the logical volume information

SYNOPSIS

```
acutil devs [-xml]
```

DESCRIPTION

This command displays information about the logical volumes on ETERNUS Disk storage systems.

OPTIONS

-xml

This option specifies when displaying by the XML format.

EXIT STATUS

=0 : Completed successfully
>0 : Terminated abnormally

EXAMPLES

- For Windows

```
> acutil devs
```

```
Device          BOX-ID          LV No Size
-----
PHYSICALDRIVE4 00ETERNUSDXH##ET87S20A####NC4110699004## 0x61 1048576
PHYSICALDRIVE5 00ETERNUSDXH##ET87S20A####NC4110699004## 0x62 1048576
PHYSICALDRIVE6 00ETERNUSDXH##ET87S20A####NC4110699004## 0x63 1048576
```

- For Solaris

```
>acutil devs
```

```
Device          BOX-ID          LV No Size
-----
/dev/rdisk/c1t16d0s2 00ETERNUSDXH##ET87S20A####NC4110699004## 0x0208 8388608
/dev/FJSMplb/rdisk/mplb1s2 00ETERNUSDXH##ET87S20A####NC4110699004## 0x0062 8388608
/dev/vx/rdmp/c2t16d0s2 00ETERNUSDXH##ET87S20A####NC4110699004## 0x0061 8388608
```

- For Linux

```
>acutil devs
```

```
Device          BOX-ID          LV No Size
-----
/dev/mapper/mpath0 00ETERNUSDXH##ET87S20A####NC4110699004##
0x0084 12582912
/dev/sdb 00ETERNUSDXH##ET87S20A####NC4110699004##
0x0084 12582912
/dev/disk/by-id/scsi-36000b5d0006a0000006a000200840000 00ETERNUSDXH##ET87S20A####NC4110699004##
0x0084 12582912
/dev/disk/by-path/pci-0000:00:10.0-scsi-0:0:1:0 00ETERNUSDXH##ET87S20A####NC4110699004##
0x0084 12582912
```

The following table shows the meanings of the information displayed.

Title	Explanation
Device	<ul style="list-style-type: none"> - For Windows Displays the name of the physical device using the following format: "PHYSICALDRIVE [disk number]". This is the same value as the "disk?" in the AdvancedCopy Manager block device name and the "Disk #" displayed in the [Disk Management] window displayed by selecting [Administrative Tools], [Computer Management] and then [Disk Management] from the [Start] menu. - For Solaris Displays the RAW device name. - For Linux Displays the device name.
BOX-ID	Displays the Box ID for ETERNUS Disk storage system.
LV No	Displays the logical volume number in hexadecimal.
Size	Displays the size (in blocks) of the logical volume in decimal.

NOTES

- This command is not available for ETERNUS Disk storage system which has been registered to operate by Copy command via LAN.

4.11.2 acgetvolinfo (Logical volume information display command)

NAME

acgetvolinfo - Display the logical volume information

SYNOPSIS

```
acgetvolinfo deviceName
```

DESCRIPTION

This command displays information about the logical volumes on ETERNUS Disk storage systems.

This command is used on the business server.

This command can be used with the following operating systems:

- Windows Server 2003
- Windows Server 2008 or later
- Solaris 9
- Solaris 10
- Solaris 11 (11/11 or later)
- Red Hat Enterprise Linux 5 (for x86)
- Red Hat Enterprise Linux 5 (for Intel64)
- Red Hat Enterprise Linux 6 (for x86)
- Red Hat Enterprise Linux 6 (for Intel64)
- SUSE Linux Enterprise Server 11 Service Pack 1 for x86
- SUSE Linux Enterprise Server 11 Service Pack 1 for EM64T
- SUSE Linux Enterprise Server 11 Service Pack 2 for x86
- SUSE Linux Enterprise Server 11 Service Pack 2 for EM64T
- AIX V6.1
- AIX V7.1
- HP-UX 11i v3

Depending on a business server OS, the command installation procedure varies between installing and using AdvancedCopy Manager CCM, or copying and using a utility file supported by the OS. Refer to the points below regarding installation.



Point

Install commands using the installation procedure supported by the business server OS.

- For Solaris, Linux, and Windows

Install and use AdvancedCopy Manager CCM on the business server. Or, copy the utility file supported by the OS from the CCM Server where AdvancedCopy Manager CCM is installed to the business server, and then use it.

- For HP-UX and AIX

Copy the utility file supported by the OS from the CCM Server where AdvancedCopy Manager CCM is installed to the business server, and then use it.

If installing AdvancedCopy Manager CCM on the business server and using it, refer to "Installation of ETERNUS SF Manager" or "Installation of AdvancedCopy Manager CCM" in the *ETERNUS SF Installation and Setup Guide*.

If copying the utility file to the business server and then using it, copy using the procedures below.

1. Copy the utility file to an arbitrary location on the business server.

The utility file can be found in the following directory on the CCM Server.

- For Windows

Operating system	Utility file (*1)
Windows Server 2003 Windows Server 2008 or later	\$INS_DIR\tools\server_utility_windows.zip
Solaris 9 Solaris 10 Solaris 11	\$INS_DIR\tools\server_utility_solaris.tar
Red Hat Enterprise Linux 5 (for x86)	\$INS_DIR\tools\server_utility_rhel5x86.tar
Red Hat Enterprise Linux 5 (for Intel64)	\$INS_DIR\tools\server_utility_rhel5x64.tar
Red Hat Enterprise Linux 6 (for x86) Red Hat Enterprise Linux 6 (for Intel64)	\$INS_DIR\tools\server_utility_rhel6x86.tar
SUSE Linux Enterprise Server 11 for x86 SUSE Linux Enterprise Server 11 for EM64T	\$INS_DIR\tools\server_utility_sles11x86.tar
AIX V6.1 AIX V7.1	\$INS_DIR\tools\server_utility_aix.tar
HP-UX 11i v3	\$INS_DIR\tools\server_utility_hp-ux.tar

*1: \$INS_DIR is the "Program Directory" specified at the AdvancedCopy Manager CCM installation.

- For Solaris and Linux

Operating system	Utility file
Windows Server 2003 Windows Server 2008 or later	/opt/FJSVccm/tools/server_utility_windows.zip
Solaris 9 Solaris 10 Solaris 11	/opt/FJSVccm/tools/server_utility_solaris.tar
Red Hat Enterprise Linux 5 (for x86)	/opt/FJSVccm/tools/server_utility_rhel5x86.tar
Red Hat Enterprise Linux 5 (for Intel64)	/opt/FJSVccm/tools/server_utility_rhel5x64.tar
Red Hat Enterprise Linux 6 (for x86) Red Hat Enterprise Linux 6 (for Intel64)	/opt/FJSVccm/tools/server_utility_rhel6x86.tar
SUSE Linux Enterprise Server 11 for x86 SUSE Linux Enterprise Server 11 for EM64T	/opt/FJSVccm/tools/server_utility_sles11x86.tar
AIX V6.1 AIX V7.1	/opt/FJSVccm/tools/server_utility_aix.tar
HP-UX 11i v3	/opt/FJSVccm/tools/server_utility_hp-ux.tar

2. Uncompress the utility file, and then change the active directory.

- For Windows

Uncompress the zip file, and then change the active directory by using the Command prompt tool etc.

- For Solaris, Linux, HP-UX, and AIX

```
# cd <Directory where the file was copied>
# tar xvf <Utility file>
# cd ./server_utility/bin
```



OPERANDS

- Install and use AdvancedCopy Manager CCM on the business server

deviceName

Specifies the device name.

OS type	Explanation
Windows	Specify the drive letter (e.g. X:).
Solaris	Specify a device name from the following: <ul style="list-style-type: none"> - OS standard device name (/dev/rdisk/*) - Solaris standard multipath (MPxIO) device name (/dev/rdisk/*) - ETERNUS multipath device name (/dev/FJSVmplb/rdisk/*) - VxVM device name (/dev/vx/rdmp/*)
Linux	Specify a device name from the following: <ul style="list-style-type: none"> - OS standard device name (/dev/sd*) - Multipath device name generated by device mapper facility of OS (/dev/mapper/*) - udev device name generated by udev facility of OS (/dev/disk/by-id/*, /dev/disk/by-path/*)

- Copy utility file to the business server and use

deviceName

Specifies the device name.

OS type	Explanation
Windows	Specify the drive letter (e.g. X:).
Solaris	Specify a device name from the following: <ul style="list-style-type: none"> - OS standard device name (/dev/rdisk/*) - Solaris standard multipath (MPxIO) device name (/dev/rdisk/*) - ETERNUS multipath device name (/dev/FJSVmplb/rdisk/*) - VxVM device name (/dev/vx/rdmp/*)
Linux	Specify a device name from the following: <ul style="list-style-type: none"> - OS standard device name (/dev/sd*) - Multipath device name generated by device mapper facility of OS (/dev/mapper/*) - udev device name generated by udev facility of OS (/dev/disk/by-id/*, /dev/disk/by-path/*)
HP-UX	Specifies the RAW device name (e.g. /dev/rdisk/c1t0d20).

OS type	Explanation
AIX	Specifies the physical device name (e.g. /dev/hdisk10).

EXIT STATUS

- =0 : Completed successfully
- >0 : Terminated abnormally

EXAMPLES

- Install and use AdvancedCopy Manager CCM on the business server

- For Windows

```
C:\> acgetvolinfo X:
BOX-ID,LV No,Address,Size
00ETERNUSDXM##ET44S20A####HK000104##### ,0x043,0x0,0x800000
```

- For Solaris

```
# acgetvolinfo /dev/rdisk/c4t0d10s2
BOX-ID,LV No,Address,Size
00ETERNUSDXM##ET44S20A####HK000104##### ,0x041,0x0,0x800000
```

- For Linux

```
# acgetvolinfo /dev/sdo
BOX-ID,LV No,Address,Size
00ETERNUSDXM##ET44S20A####HK000104##### ,0x042,0x0,0x800000
```

The following table shows the meanings of the information displayed.

Title	Explanation
BOX-ID	Displays the Box ID for ETERNUS Disk storage system.
LV No	Displays the logical volume numbers for ETERNUS Disk storage system in hexadecimal.
Address	Displays the extent start position (in blocks) in hexadecimal.
Size	Displays the extent size (in blocks) in hexadecimal.

- Copy utility file to the business server and use

- For Windows

```
C:\> .\acgetvolinfo X:
BOX-ID,LV No,Address,Size
00ETERNUSDXM##ET44S20A####HK000104##### ,0x043,0x0,0x800000
```

- For Solaris

```
# ./acgetvolinfo /dev/rdisk/c4t0d10s2
BOX-ID,LV No,Address,Size
00ETERNUSDXM##ET44S20A####HK000104##### ,0x041,0x0,0x800000
```

- For Linux

```
# ./acgetvolinfo /dev/sdo
BOX-ID,LV No,Address,Size
00ETERNUSDXM##ET44S20A####HK000104##### ,0x042,0x0,0x800000
```

- For HP-UX

```
# ./acgetvolinfo /dev/rdisk/clt0d20
BOX-ID,LV No,Address,Size
00ETERNUSDXM##ET44S20A####HK000104##### ,0x043,0x0,0x800000
```

- For AIX

```
# ./acgetvolinfo /dev/hdisk10
BOX-ID,LV No,Address,Size
00ETERNUSDXM##ET44S20A####HK000104##### ,0x044,0x0,0x800000
```

The following table shows the meanings of the information displayed.

Title	Explanation
BOX-ID	Displays the Box ID for ETERNUS Disk storage system.
LV No	Displays the logical volume numbers for ETERNUS Disk storage system in hexadecimal.
Address	Displays the extent start position (in blocks) in hexadecimal.
Size	Displays the extent size (in blocks) in hexadecimal.

NOTES

- On the CCM Server, this command is not available for ETERNUS Disk storage system which has been registered to operate by Copy command via LAN.

SEE ALSO

- Refer to the *ETERNUS SF Messages* for information on messages output by this command.

4.11.3 acutil refresh (Partition table refresh command) [Windows only]

NAME

acutil refresh - Refreshing of partition tables

SYNOPSIS

```
acutil refresh -d deviceName [-xml]
```

DESCRIPTION

This command refreshes the partition table to update partition information for the specified disk.

This command is only supported on Windows Version.

OPTIONS

-d *deviceName*

Displays the name of the physical device using the following format: "PhysicalDrive [disk number]".

This is the same value as the "disk?" in the AdvancedCopy Manager block device name and the "Disk #" displayed in the [Disk Management] window displayed by selecting [Administrative Tools], [Computer Management] and then [Disk Management] from the [Start] menu.

-xml

This option specifies when displaying the result of the command execution by the XML format.

EXIT STATUS

=0 : Completed successfully

>0 : Terminated abnormally

EXAMPLES

```
> acutil refresh -d PhysicalDrive2  
Successful completion.
```

NOTES

- This command is not available for ETERNUS Disk storage system which has been registered to operate by Copy command via LAN.

4.11.4 acutil fsflush (File system flush command) [Windows only]

NAME

acutil fsflush - flush file system

SYNOPSIS

```
acutil fsflush -m mountPoint [-xml]
```

DESCRIPTION

This command explicitly writes the data within the buffer to the disk.

This command is used for file server operations and the like which do not unmount the copy source logical volume.

OPTIONS

-m *mountPoint*

This option specifies a drive letter or a mount point. (e.g. F:\, C:\mnt\)

-xml

This option specifies when displaying the result of the command execution by the XML format.

EXIT STATUS

=0 : Completed successfully

>0 : Terminated abnormally

EXAMPLES

```
> acutil fsflush -m F:\
Successful completion.
```

NOTES

- If using this command, it is necessary to first stop all writing processes to the copy source logical volume. If Advanced Copy is performed without stopping the write processes, the integrity of the copy source logical volume data cannot be guaranteed.
- This command is not available for ETERNUS Disk storage system which has been registered to operate by Copy command via LAN.

4.11.5 acsdv init (Snap Data Volume initialization command)

NAME

acsdv init - Initialize Snap Data Volumes

SYNOPSIS

```
acsdv init -v volumeName [-xml]
```

DESCRIPTION

This command initializes a Snap Data Volume.

OPTIONS

-v *volumeName*

Specify a Snap Data Volume to be initialized by the following format.

DX80/0x1
└──┬──┘ └──┬──┘
 (1) (2)

- (1) ETERNUS name
- (2) Logical volume number

-xml

This option specifies when displaying the result of the command execution by the XML format.

EXIT STATUS

=0 : Completed successfully
>0 : Terminated abnormally

EXAMPLES

```
> acsdv init -v ET001/0x1
Successful completion
```

NOTES

- This command is not available for ETERNUS Disk storage system registered as a remote device.

4.11.6 acsdv stat (Snap Data Volume status display command)

NAME

acsdv stat - Display the status of a Snap Data Volume

SYNOPSIS

```
acsdv stat -v volumeName [-xml]
```

DESCRIPTION

This command displays the status of a Snap Data Volume.

OPTIONS

-v *volumeName*

Specify a Snap Data Volume to be displayed by the following format.

```
DX80/0x1
┌───┬───┐
│   │   │
└───┴───┘
  (1) (2)
```

- (1) ETERNUS name
- (2) Logical volume number

-xml

This option specifies when displaying by the XML format.

EXIT STATUS

- =0 : Completed successfully
- >0 : Terminated abnormally

EXAMPLES

```
> acsdv stat -v ET001/0x1
```

```
Rate Logical Physical Used Copy Host Pool
-----
0% 8388608 1048576 0 0 0 0
```

The following table shows the meanings of the information displayed.

Title	Explanation
Rate	Displays the usage of a Snap Data Volume as a percentage.

Title	Explanation
Logical	Displays the logical capacity of a Snap Data Volume in blocks.
Physical	Displays the physical capacity of a Snap Data Volume in blocks.
Used	Displays the capacity of a Snap Data Volume used area in blocks. Displays the sum capacity of copy usage(*1) and host usage(*1).
Copy	Displays the copy usage(*1) out of Snap Data Volume used capacity in blocks.
Host	Displays the host usage(*1) out of Snap Data Volume used capacity in blocks.
Pool	Displays the usage of a Snap Data Pool allocated to a snap data volume in blocks.

(*1)

Copy usage: Usage of updates performed during SnapOPC+ execution.

Host usage: Usage of Snap Data Volume updates performed when SnapOPC+ is not executed.

NOTES

- This command is not available for ETERNUS Disk storage system registered as a remote device.

4.11.7 acsdv poolstat (Snap Data Pool status display command)

NAME

acsdv poolstat - Display the status of a Snap Data Pool

SYNOPSIS

```
acsdv poolstat -a diskArrayName [-xml]
```

DESCRIPTION

This command displays the status of a Snap Data Pool.

OPTIONS

-a *diskArrayName*

This option specifies the ETERNUS names.

-xml

This option specifies when displaying by the XML format.

EXIT STATUS

=0 : Completed successfully

>0 : Terminated abnormally

EXAMPLES

```
> acsdv poolstat -a ET001
```

```
Pool-Type Rate Total      Used      Copy Host      Free
-----
```

```

Normal      10% 20971520 2097152      0 2097152 18874368
Encrypted   0% 20971520      0      0      0 20971520

```

The following table shows the meanings of the information displayed.

Title	Explanation
Pool-Type	Displays the type of a Snap Data Pool. - Normal: Normal (unencrypted) - Encrypted: Encrypted
Rate	Displays the usage of a Snap Data Pool as a percentage.
Total	Displays the total capacity of a Snap Data Pool in blocks.
Used	Displays the capacity of a Snap Data Pool used area in blocks. Displays the sum capacity of copy usage(*1) and host usage(*1).
Copy	Displays the copy usage(*1) out of Snap Data Pool used capacity in blocks.
Host	Displays the host usage(*1) out of Snap Data Pool used capacity in blocks.
Free	Displays the capacity of Snap Data Pool unused area in blocks.

(*1)

Copy usage: Usage of updates performed during SnapOPC+ execution.

Host usage: Usage of snap data volume updates performed when SnapOPC+ is not executed.

NOTES

- This command is not available for ETERNUS Disk storage system registered as a remote device.

4.12 Maintenance command

This section explains the command used to maintain AdvancedCopy Manager CCM.

4.12.1 acservice stop (Management service stop command)

NAME

acservic stop - stop management services.

SYNOPSIS

```
acservic stop -lan [-xml]
```

DESCRIPTION

This command stops the management services of AdvancedCopy Manager CCM.

OPTIONS

-lan

This option specifies to stop the management services which are used by Copy command via LAN.

-xml

This option specifies when displaying the result of the command execution by the XML format.

EXIT STATUS

=0 : Completed successfully

>0 : Terminated abnormally

EXAMPLES

```
> acservice stop -lan  
Successful completion.
```

NOTES

Execute this command after AdvancedCopy Manager CCM processing has been stopped.

4.13 Troubleshooting data collection command

This section explains the command used to collect troubleshooting data when an AdvancedCopy Manager CCM or Express fault occurs.

4.13.1 esfsnap (CCM Server troubleshooting data collection command)

NAME

esfsnap - Collect the troubleshooting information on the CCM Server

SYNOPSIS

For Windows

```
$INS_DIR\Common\bin\esfsnap -dir dirName [-all]
```

(\$INS_DIR is the "Program Directory" as specified during ETERNUS SF Manager installation.)

For Solaris and Linux

```
/opt/FJVSesfcm/bin/esfsnap -dir dirName [-all]
```

DESCRIPTION

This command collects the troubleshooting information on the CCM Server when a problem occurs. Only user has the OS administrator privilege can execute this command.

Please send the collected data to a Fujitsu Technical Support

OPTIONS

-dir *dirName*

Specify a directory where the troubleshooting data is stored.

- For Windows

It is necessary to specify the full path name that begins with a drive letter for *dirName*.
The maximum length that can be specified for *dirName* is 70 bytes.

- For Solaris and Linux

It is necessary to specify the full path name for *dirName*.

The collected troubleshooting data is stored in the directory which its name begins with "esfsnap_". Before executing this command, please check that *dirname* directory has the following free space.

Collected information	Required free space
Initial investigation information	more than 40MB
All troubleshooting information	more than "80 + (2 * number of registered device)" MB

-all

Collects all troubleshooting data on the CCM Server. Data includes lots of information, which will increase the size of the data. This option is not necessary for initial investigation.

EXIT STATUS

- =0 : Completed successfully
- >0 : Terminated abnormally

EXAMPLES

- For Windows

Collect the troubleshooting data for initial investigation on D:\temp directory.

```
> esfsnap -dir D:\temp
```

- For Solaris and Linux

Collect the troubleshooting data for initial investigation on /tmp directory.

```
> esfsnap -dir /tmp
```

NOTES

- When using AdvancedCopy Manager, execute this command when other commands or GUI processing of AdvancedCopy Manager are in the stopped state. Data collection may not be performed correctly if other commands or GUI processing of AdvancedCopy Manager are running.
- When using Express, execute this command when other commands or GUI processing of Express are in the stopped state. Data collection may not be performed correctly if other commands or GUI processing of Express are running.
- Collect the following data if the install destination directory is changed when AdvancedCopy Manager CCM installation.
 - All files in the "Environment Directory" as specified during AdvancedCopy Manager CCM installation.
 - All files in the "Work Directory" as specified during AdvancedCopy Manager CCM installation.
- When operating in the cluster environment, execute this command on all nodes. Execute the command after mounting the shared disk on any node for collecting information of the shared disk.
- Collect the following data when operating in the cluster environment.
 - Data in the shared disk for AdvancedCopy Manager CCM shared data.

Chapter 5 Troubleshooting

This appendix explains how to resolve problems that may occur with AdvancedCopy Manager CCM.

5.1 Collecting the troubleshooting information

Log into the CCM Server, and execute [esfsnap \(CCM Server troubleshooting data collection command\)](#) to collect data for investigating the problem.

Send the collected data to a Fujitsu Technical Support.

5.2 Resolving hardware error

If, as a result of a hardware error, the Advanced Copy cannot continue, ETERNUS Disk storage system will automatically suspend it.

If a problem occurs, check the copy status and error code, and take action.

- Procedure for checking copy status

If the copy is suspended, then its status will be changed to one of the following:

- OPC Error Suspend
- EC Error Suspend
- EC Hardware Suspend
- EC Hardware Suspend (Use REC DISK)
- EC Hardware Suspend (Use REC BUFFER)
- Snap Error Suspend

Use either [acopc query \(OPC/QuickOPC copy status display command\)](#) or [acec query \(Synchronous high-speed copy status display command\)](#).

- Procedure for checking error code

Use ETERNUS Web GUI to check error codes:

1. In the ETERNUS Web GUI [Status display] menu, click [Advanced copy status display].
2. In "Session status", click the "Number of active sessions" link for the relevant copy type.
3. Refer to the value of **Error Code** field for the relevant copy process.

This section explains how to resolve problems.

Table 5.1 Causes and action in response to hardware error

Advanced Copy status	Error code	Cause / Action
OPC Error Suspend	0xBA	[Cause] QuickOPC has not finished physical copy, and a bad sector occurred in the logical volume of the copy source during tracking processing. [Action] <ol style="list-style-type: none">1. Use acopc cancel (OPC/QuickOPC copy stop command) to cancel the copy. If it cannot be cancelled using commands, then use ETERNUS Web GUI.

Advanced Copy status	Error code	Cause / Action
		<p>2. The bad sector area is recovered by overwriting it. Select an appropriate recovery method from the methods below, according to the usage status of the copy source volume.</p> <ul style="list-style-type: none"> - Recovery method 1 <p>If the area can be recovered from the parent software (for example, the file system or DBMS), then recover it.</p> <ul style="list-style-type: none"> - Recovery method 2 <p>Use a system command (for example, the UNIX dd command or the Windows format command) to perform write in the case of an unused area. For example, if the bad sector area has not yet been used, or if it is a temporary area.</p> <ul style="list-style-type: none"> - Recovery method 3 <p>Copy in the reverse direction, and recover data from the logical volume of the copy destination (it is also possible to perform recovery from the copy source volume of the copy process where the bad sector occurred).</p>
	Other than 0xBA	<p>[Cause]</p> <p>An error other than 0xBA occurred. For error details, confirm with a Fujitsu Technical Support.</p> <p>[Action]</p> <ol style="list-style-type: none"> 1. Use acopc cancel (OPC/QuickOPC copy stop command) to cancel the copy. If it cannot be cancelled using commands, then use ETERNUS Web GUI. 2. Use acpair remove (Copy pair deletion command) to remove the copy pair. 3. Use acpair add (Copy pair addition command) to add a new copy pair.
EC Error Suspend	0xBA	<p>[Cause]</p> <p>EC/REC is in suspend status (copy establishment status) and a bad sector has occurred in the logical volume of the copy source.</p> <p>[Action]</p> <ol style="list-style-type: none"> 1. Use acec cancel (Synchronous high-speed copy stop command) to cancel the copy. If it cannot be cancelled using commands, then use ETERNUS Web GUI. 2. The bad sector area is recovered by overwriting it. Select an appropriate recovery method from the methods below, according to the usage status of the copy source volume. <ul style="list-style-type: none"> - Recovery method 1 <p>If the area can be recovered from the parent software (for example, the file system or DBMS), then recover it.</p> <ul style="list-style-type: none"> - Recovery method 2 <p>Use a system command (for example, the UNIX dd command or the Windows format command) to perform write in the case of an unused area. For example, if the bad sector area has not yet been used, or if it is a temporary area.</p> <ul style="list-style-type: none"> - Recovery method 3 <p>Copy in the reverse direction, and recover data from the logical volume of the copy destination (it is also possible to perform recovery from the copy source volume of the copy process where the bad sector occurred).</p>
	Other than 0xBA	<p>[Cause]</p>

Advanced Copy status	Error code	Cause / Action
		<p>An error other than 0xBA occurred. For error details, confirm with a Fujitsu Technical Support.</p> <p>[Action]</p> <ol style="list-style-type: none"> 1. Use acec cancel (Synchronous high-speed copy stop command) to cancel the copy. If it cannot be cancelled using commands, then use ETERNUS Web GUI. 2. Use acpair remove (Copy pair deletion command) to remove the copy pair. 3. Use acpair add (Copy pair addition command) to add a new copy pair.
EC Hardware Suspend	---	<p>[Cause]</p> <p>An all path halt occurred.</p> <p>[Action]</p> <p>The REC resume procedure varies according to the REC Recovery mode.</p> <ul style="list-style-type: none"> - [In Automatic Recovery mode] <ol style="list-style-type: none"> 1. Remove the cause of the all path halt. 2. REC is automatically restarted (resumed) by ETERNUS Disk storage system. - [In Manual Recovery mode] <ol style="list-style-type: none"> 1. Remove the cause of the all path halt. 2. Forcibly and temporarily suspend the REC by executing acec suspend (Synchronous high-speed copy temporary suspension command) with -force option. 3. Resume the REC using acec resume (Synchronous high-speed copy restart command).
EC Hardware Suspend (Use REC DISK)	---	<p>[Cause]</p> <p>An all path halt occurred while transfer data was in the saved state in the REC Disk buffer.</p> <p>[Action]</p> <ol style="list-style-type: none"> 1. Remove the cause of the all path halt. 2. REC is automatically restarted (resumed) by ETERNUS Disk storage system.
EC Hardware Suspend (Use REC BUFFER)	---	<p>[Cause]</p> <p>An all path halt occurred while transfer data was in the saved state in the REC transfer buffer.</p> <p>[Action]</p> <ol style="list-style-type: none"> 1. Remove the cause of the all path halt. 2. REC is automatically restarted (resumed) by ETERNUS Disk storage system.
Snap Error Suspend	0xBB	<p>[Cause]</p> <p>A capacity shortage occurred for a Snap Data Volume or a Snap Data Pool.</p> <p>[Action 1 (Snap Data Volume capacity shortage recovery method)]</p> <p>Use acsnap cancel (SnapOPC+ copy stop command) to cancel the process for which the error occurred. If this command cannot be used to cancel the process, cancel it from the ETERNUS Web GUI.</p> <p>The following are possible causes of a Snap Data Volume capacity shortage:</p> <ol style="list-style-type: none"> a. The estimate for the physical capacity of the Snap Data Volume is not suitable.

Advanced Copy status	Error code	Cause / Action
		<p>b. The estimate for the physical capacity of the Snap Data Volume is suitable, but a large number of updates were performed for the Snap Data Volume at a time when SnapOPC+Session did not exist. This caused excessive consumption of the Snap Data Volume physical capacity.</p> <p>Use acsdv stat (Snap Data Volume status display command) to check the Snap Data Volume usage state.</p> <p>In the case of a, above, re-estimate the Snap Data Volume physical capacity and create the Snap Data Volume again.</p> <p>In the case of b. above, use the ETERNUS Web GUI or acsdv init (Snap Data Volume initialization command) to initialize the Snap Data Volume.</p> <p>Note that, after a Snap Data Volume is re-created and initialized, partitions (slices) must be created again.</p> <p>[Action 2 (Snap Data Pool capacity shortage recovery method)]</p> <p>Use acsnap cancel (SnapOPC+ copy stop command) to cancel the process for which the error occurred. If this command cannot be used to cancel the process, cancel it from the ETERNUS Web GUI.</p> <p>The following are possible causes of a Snap Data Pool capacity shortage:</p> <p>a. The estimate for the capacity of the Snap Data Pool is not suitable.</p> <p>b. The estimate for the capacity of the Snap Data Pool is suitable, but large numbers of updates were performed for the Snap Data Volume at a time when SnapOPC+Session did not exist. This caused excessive consumption of the Snap Data Pool capacity.</p> <p>Use acsdv poolstat (Snap Data Pool status display command) to check the Snap Data Pool usage state.</p> <p>In the case of a. above, re-estimate the Snap Data Pool capacity and increase the capacity, and then create the Snap Data Volume again.</p> <p>In the case of b. above, use the ETERNUS Web GUI or acsdv init (Snap Data Volume initialization command) to initialize the Snap Data Volume.</p> <p>Note that, after a Snap Data Volume is re-created and initialized, partitions (slices) must be created again.</p>

5.3 Resolving for displaying "???" in Advanced Copy status

Information such as Copy direction data and SID data may display as "???" in Advanced Copy status.

Check a cause in the following table and take action.

Cause	Action
An access volume of registered ETERNUS Disk storage system is incorrect (For operation by Copy command via SAN only)	<p>Check access volumes by executing acarray detail (ETERNUS Disk storage system detail information display command).</p> <p>If the access volume is incorrect, refer to "2.2 Access volume settings" and set an appropriate access volume.</p>
A connection route between CCM Server and ETERNUS Disk storage system is disconnected. (For operation by Copy command via LAN only)	Check the connection route between CCM Server and ETERNUS Disk storage system.

Cause	Action
Logical volume sizes of copy-source and copy-destination are different. (For SnapOPC+ only)	Check logical volume sizes of copy-source and copy-destination. If it is different, register the copy pair that the copy-source logical volume size and copy destination logical volume size are same.

When this occurs while utilizing REC, confirm the following table as well.

Cause	Troubleshooting
The copy path of REC is not configured with the ETERNUS Disk storage system.	Confirm that copy path of REC is configured with the ETERNUS Disk storage system.
The ETERNUS Disk storage system was registered before the copy path of REC was configured with the ETERNUS Disk storage system.	After Confirmation, Refer to " Changing information other than ETERNUS names and access volumes " and register ETERNUS Disk storage system again.
Delete the ETERNUS Disk storage system that is defined to the copy group, and re-register this as a remote ETERNUS Disk storage system.	Execute acgroup detail (Copy group detail information display command) and confirm the ETERNUS Disk storage system that is displayed under "Disk Array Name". <ul style="list-style-type: none"> - When this is a remote ETERNUS Disk storage system, delete the remote ETERNUS Disk storage system and re-register this as a standard ETERNUS Disk storage system. - When this is not a report ETERNUS Disk storage system, Refer to "Changing information other than ETERNUS names and access volumes" and register ETERNUS Disk storage system again.

Chapter 6 Notes on operations

This appendix explains the notes for AdvancedCopy Manager CCM operation.

6.1 Calculate the physical capacity for the Snap Data Volume

It is necessary to create the Snap Data Volume for the SnapOPC+ operation.

The formula for estimating the physical capacity of Snap Data Volume is as follows:

Physical capacity = (number of updated blocks for the copy source volume) x (safety factor)

Strictly speaking, both the number of blocks that have been updated on the Snap Data Volume and the management area used by the hardware (about 0.1% of the logical capacity) should also be taken into account before the SnapOPC+ is taken, however this can be covered by increasing the safety factor.

The number of blocks that have been updated on the copy source volume can be estimated by using updated estimation function. The estimation can be performed by the following procedure:

1. Start the estimation of the update amount by configuring a monitor session on the copy source volume.

[Execution example]

```
> acsnap start -estimate -v ET001/0x1
Successful completion
```

2. Start transactions. Blocks that are updated by transactions will be recorded on the hardware.
3. After the estimation period has elapsed, check the number of blocks that have been updated.

[Execution example]

```
> acsnap query -estimate -v ET001/0x1
Update
-----
      10M
```

4. After the estimation is completed, cancel the monitor session.

[Execution example]

```
> acsnap cancel -estimate -v ET001/0x1
```



See

Refer to the following sections for detail of commands.

- "4.7.4 acsnap start (SnapOPC+ copy start command)"
- "4.7.5 acsnap query (SnapOPC+ copy status display command)"
- "4.7.6 acsnap cancel (SnapOPC+ copy stop command)"

6.2 Notes about cluster operation

There are the following cautions for backups in a clustered system.

- Use the same access volume is required when a cluster operation using Copy command via SAN. If you specify the access volume in "2.4 Registering ETERNUS Disk storage system", execute `acarray add` (ETERNUS Disk storage system registration command) with `-path` option.
- In a cluster operation, execute AdvancedCopy Manager CCM commands on active nodes that can use the shared disk for AdvancedCopy Manager CCM shared data. AdvancedCopy Manager CCM command cannot be executed on standby nodes.
- If a failover occurs while running a command, execute `acservice stop` (Management service stop command) with `-lan` option. After that, turn the failed over server into the active server.

6.3 Notes on combining cascade copy and Concurrent OPC in operation

If you specify a volume used in cascade copy as the copy source and then execute a Concurrent OPC by `acopc start` (OPC/QuickOPC copy start command) or `acsnap start` (SnapOPC+ copy start command), it may not be possible to preserve the sequence of data updates across multiple volumes. In this case, an error message will be displayed and the command terminates in an error.

If the error cannot be resolved by responding to the message, we recommend you to change the operating method of AdvancedCopy or reconfigure the system.

If you cannot change the operation method of AdvancedCopy or reconfigure the system, create a file (`user.properties`) that sets the sequence of data updates across multiple volumes. Then, disable sequence preservation before you retry Concurrent OPC.

Create `user.properties` on the following path of the server on which to execute `acopc start` (OPC/QuickOPC copy start command) or `acsnap start` (SnapOPC+ copy start command):

- In a non-cluster environment

OS	Location of file creation
Windows	<code>\$INS_DIR\etc\prop</code>
Solaris Linux	<code>/etc/opt/FJSVccm/prop</code>

`$INS_DIR` is the "Program Directory" as specified during AdvancedCopy Manager CCM installation.

- In cluster environment

OS	Location of file creation
Windows	<code>\$\$SHARE_DL:\$\$SHARE_TOP\etc\prop</code>
Solaris Linux	<code>\$\$SHARE_MNT/etc/opt/FJSVccm</code>

`$$SHARE_DL` is the drive letter of the shared disk for AdvancedCopy Manager CCM shared data.

`$$SHARE_TOP` is the directory that contains "Environment Directory" and "Work Directory" of the shared disk for AdvancedCopy Manager CCM shared data.

`$$SHARE_MNT` is the mount point of the shared disk for AdvancedCopy Manager CCM shared data.

Table 6.1 File format of the `user.properties` file

Key name	Description
<code>concurOPC.cascade</code>	Set preservation of the sequence of data updates across multiple volumes. By setting "off", preservation of the sequence will be disabled. By setting any value other than "off", preservation of the sequence will be enabled.

[Example for disabling sequence preservation]

<code>concurOPC.cascade=off</code>

Point

For any of the ETERNUS Disk storage systems below, Concurrent OPC can be executed regardless of sequence preservation of data updates. However, the sequence of data updates will not be preserved across multiple volumes.

- ETERNUS DX80/DX80 S2 (for firmware version numbers before V10L30)
 - ETERNUS DX90/DX90 S2 (for firmware version numbers before V10L30)
 - ETERNUS DX400/DX400 S2 series (for firmware version numbers before V10L30)
 - ETERNUS DX8000/DX8000 S2 series (for firmware version numbers before V10L30)
-

6.4 Notes about changing disk configuration

When changing disk configuration of CCM Server in the operation using Copy command via SAN, check that the access volume of the registered ETERNUS Disk storage system is correct.

6.5 Use in combination with ODX (Offloaded Data Transfer)

When using an ETERNUS Disk storage system that supports the Offloaded Data Transfer (hereinafter referred to as "ODX") function, ODX session starts within the ETERNUS Disk storage system by Windows Server 2012 or later Offloaded Data Transfer function when files are copied or transferred. However, Advanced Copy cannot be performed by AdvancedCopy Manager on the condition that a volume on which ODX session is running is taken as copy destination. For this reason, if [acopc start \(OPC/QuickOPC copy start command\)](#) or [acec start \(Synchronous high-speed copy start command\)](#) is executed on the condition that a volume containing the area in which files are being copied or transferred by the Offloaded Data Transfer function is taken as copy destination, an error message is displayed and the command may terminate abnormally.

If the command terminates abnormally, check on the Web Console or by [accopy query \(Copy session information display command\)](#) that no ODX session exists on the copy destination volume and then re-execute the command.

If the error is not resolved, review the copied volume or take either of the following actions to temporarily prevent the ODX session from running and then re-execute the command:

- Disabling Windows Server 2012 or later Offloaded Data Transfer (ODX)

Refer to the procedure released by Microsoft at the following URL for how to disable:

<http://technet.microsoft.com/en-us/library/jj200627.aspx>

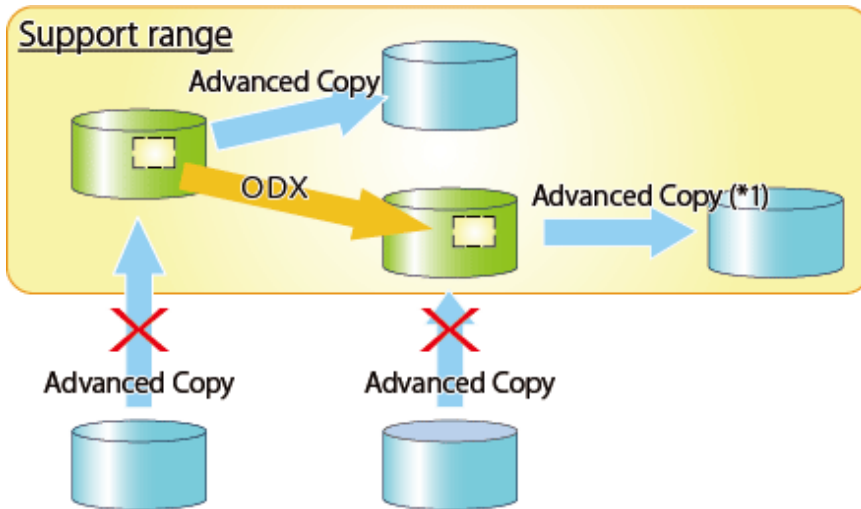
This setting affects only the servers on which the operation is performed.

- Stopping the Offloaded Data Transfer function of the ETERNUS Disk storage system

Refer to the ETERNUS Disk storage system manual for how to stop.

This setting affects all the servers that use the ETERNUS Disk storage system.

Figure 6.1 Use in combination with ODX



*1: In the following ETERNUS Disk storage systems whose firmware version number is V10L50 or earlier, Advanced Copy cannot be performed by AdvancedCopy Manager for a volume on which ODX session is running.

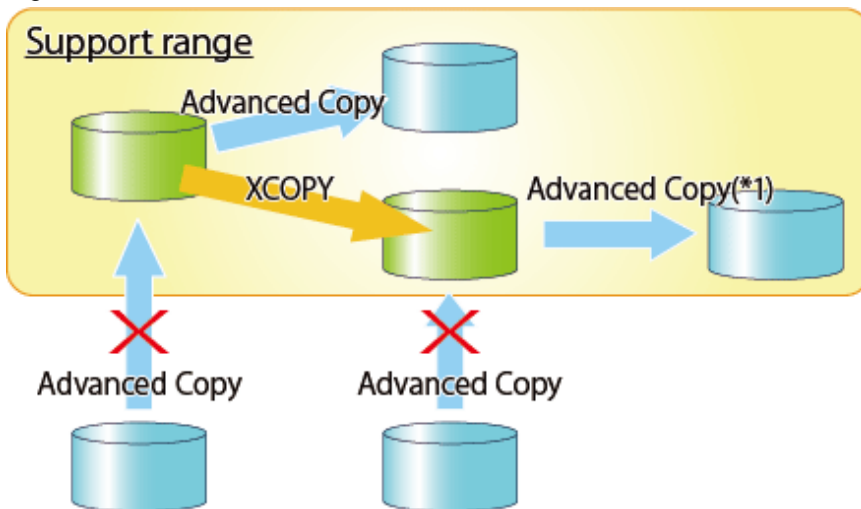
- ETERNUS DX80/DX80 S2
- ETERNUS DX90/DX90 S2
- ETERNUS DX400/DX400 S2 series
- ETERNUS DX8000/DX8000 S2 series

6.6 Use in combination with XCOPY (Extended Copy)

When copying data by replicating VMware vSphere virtual machines or running Storage vMotion, Extended Copy (hereinafter referred to as "XCOPY") session starts by the Full Copy function of VMware vStorage APIs for Array Integration (VMware VAAI). However, Advanced Copy cannot be performed by AdvancedCopy Manager on the condition that a volume on which XCOPY session is running is taken as copy destination. For this reason, if you execute `acopc start (OPC/QuickOPC copy start command)` or `acec start (Synchronous high-speed copy start command)` on the condition that a volume which is copying data by replicating virtual machines or running Storage vMotion is taken as copy destination, an error message is displayed and the command may terminate abnormally.

If the command terminates abnormally, check on the Web Console or by `acopy query (Copy session information display command)` that no XCOPY session exists on the copy destination volume and then re-execute the command.

Figure 6.2 Use in combination with XCOPY



*1: In the following ETERNUS Disk storage systems whose firmware version number is V10L50 or earlier, Advanced Copy cannot be performed by AdvancedCopy Manager for a volume on which XCOPY session is running:

- ETERNUS DX80/DX80 S2
- ETERNUS DX90/DX90 S2
- ETERNUS DX400/DX400 S2 series
- ETERNUS DX8000/DX8000 S2 series

Appendix A Preliminary checks of Advanced Copy status

This appendix explains the circumstances for check errors with the various commands for AdvancedCopy Manager CCM which has a feature which determines the Advanced Copy's various statuses and then checks beforehand whether or not the status allows for the execution of commands. It also explains the ID's for the error messages output during these check errors.

Table A.1 Commands which have a preliminary check function and check error condition

Commands	Check error condition and error message ID
acopc start (OPC/QuickOPC copy start command)	<ul style="list-style-type: none"> - Copy Group Type is QuickOPC. - There are no copy sessions. - The -diff option has been specified. - Error message ID is ccm4012.
	<ul style="list-style-type: none"> - Copy Group Type is QuickOPC. - Copy Phase is "Copying/Tracking" or "Tracking". - The -diff option has not been specified. - Error message ID is ccm4013.
	<ul style="list-style-type: none"> - Copy Group Type is QuickOPC. - Copy Phase is "Copying". - The -diff option has been specified. - Error message ID is ccm4014.
	<ul style="list-style-type: none"> - Copy Group Type is OPC or QuickOPC. - OPC Status is "OPC Error Suspend". - Error message ID is ccm4014.
acopc cancel (OPC/QuickOPC copy stop command)	<ul style="list-style-type: none"> - Copy Group Type is OPC or QuickOPC. - There are no copy sessions. - Error message ID is ccm4012.
	<ul style="list-style-type: none"> - Copy Group Type is QuickOPC. - Copy phase is "Copying". - The -force option has not been specified. - Error message ID is ccm4014.
acsnap start (SnapOPC+ copy start command)	<ul style="list-style-type: none"> - Copy Group Type is SnapOPCP. - Snap Status is "Copy On Write(Active)" or "Copy On Write(Inactive)". - The -p option has been specified. (Generation number is not "1".) - Error message ID is ccm4014.
	<ul style="list-style-type: none"> - Copy Group Type is SnapOPCP. - Snap Status is "Snap Error Suspend". - The -p option has been specified. (Generation number is not "1".) - Error message ID is ccm4014.
acsnap cancel (SnapOPC+ copy stop command)	<ul style="list-style-type: none"> - Copy Group Type is SnapOPCP.

Commands	Check error condition and error message ID
	<ul style="list-style-type: none"> - There are no copy sessions. - The -p option has been specified. - Error message ID is ccm4012. <hr/> <ul style="list-style-type: none"> - Copy Group Type is SnapOPCP. - Snap Status is "Copy On Write(Active)" or "Copy On Write(Inactive)". - The -p option has been specified. (Generation number is not "1".) - The -force option has not been specified. - Error message ID is ccm4014. <hr/> <ul style="list-style-type: none"> - Copy Group Type is SnapOPCP. - Snap Status is "Snap Error Suspend". - The -p option has been specified. (Generation number is not "1".) - The -force option has not been specified. - Error message ID is ccm4014.
acec start (Synchronous high-speed copy start command)	<ul style="list-style-type: none"> - Copy Group Type is EC or REC. - There are copy sessions. - Error message ID is ccm4013. <hr/> <ul style="list-style-type: none"> - Copy Group Type is EC or REC. - EC Status is "EC Error Suspend", "EC Hardware Suspend", "EC Hardware Suspend(Use REC DISK)" or "EC Hardware Suspend(Use REC BUFFER)". - Error message ID is ccm4013. <hr/> <ul style="list-style-type: none"> - Copy Group Type is EC or REC. - There are copy sessions. (Copy direction is reverse to the specified.) - Error message ID is ccm4016.
acec suspend (Synchronous high-speed copy temporary suspension command)	<ul style="list-style-type: none"> - Copy Group Type is EC or REC. - There are no copy sessions. - Error message ID is ccm4012. <hr/> <ul style="list-style-type: none"> - Copy Group Type is EC. - Copy Phase is "Copying". - The -force option has not been specified. - Error message ID is ccm4015. <hr/> <ul style="list-style-type: none"> - Copy Group Type is EC. - EC Status is "EC Suspend". - Error message ID is ccm4014. <hr/> <ul style="list-style-type: none"> - Copy Group Type is EC. - EC Status is "EC Error Suspend".

Commands	Check error condition and error message ID
	<ul style="list-style-type: none"> - Error message ID is ccm4014. - Copy Group Type is REC. - Transfer mode is "Synchronous" or "Through". - EC Status is "EC Starting" or "EC Executing". - Copy Phase is "Copying". - The -force option has not been specified. - Error message ID is ccm4015. - Copy Group Type is REC. - Transfer mode is "Consistency" or "Stack". - EC Status is "EC Starting" or "EC Executing". - Copy Phase is "Copying". - The -force option has not been specified. - Error message ID is ccm4014. - Copy Group Type is REC. - EC Status is "EC Suspend". - Error message ID is ccm4014. - Copy Group Type is REC. - EC Status is "EC Error Suspend", "EC Hardware Suspend", "EC Hardware Suspend(Use REC DISK)" or "EC Hardware Suspend(Use REC BUFFER)". - The -force option has not been specified. - Error message ID is ccm4014.
acec resume (Synchronous high-speed copy restart command)	<ul style="list-style-type: none"> - Copy Group Type is EC or REC. - There are no copy sessions. - Error message ID is ccm4012. - Copy Group Type is EC or REC. - EC Status is not "EC Suspend". - Error message ID is ccm4014.
acec reverse (Synchronous high-speed copy reverse command)	<ul style="list-style-type: none"> - Copy Group Type is EC or REC. - There are no copy sessions. - Error message ID is ccm4012. - Copy Group Type is EC or REC. - EC Status is not "EC Suspend". - Error message ID is ccm4014.
acec change (Synchronous high-speed copy mode change command)	<ul style="list-style-type: none"> - Copy Group Type is REC. - There are no copy sessions. - Error message ID is ccm4012. - Copy Group Type is REC.

Commands	Check error condition and error message ID
	<ul style="list-style-type: none"> - EC Status is not "EC Suspend". - Error message ID is ccm4014.
acec cancel (Synchronous high-speed copy stop command)	<ul style="list-style-type: none"> - Copy Group Type is EC or REC. - There are no copy sessions. - Error message ID is ccm4012.
	<ul style="list-style-type: none"> - Copy Group Type is EC. - Copy Phase is "Copying". - The -force option has not been specified. - Error message ID is ccm4015.
	<ul style="list-style-type: none"> - Copy Group Type is REC. - Transfer mode is "Synchronous" or "Through". - EC Status is "EC Starting" or "EC Executing". - Copy Phase is "Copying". - The -force option has not been specified. - Error message ID is ccm4015.
	<ul style="list-style-type: none"> - Copy Group Type is REC. - Transfer mode is "Synchronous" or "Through". - EC Status is "EC Suspend". - Copy Phase is "Copying". - The -force option has not been specified. - Error message ID is ccm4014.
	<ul style="list-style-type: none"> - Copy Group Type is REC. - Transfer mode is "Synchronous" or "Through". - EC Status is "EC Hardware Suspend", "EC Hardware Suspend(Use REC DISK)" or "EC Hardware Suspend(Use REC BUFFER)". - The -force option has not been specified. - Error message ID is ccm4014.
	<ul style="list-style-type: none"> - Copy Group Type is REC. - Transfer mode is "Consistency" or "Stack". - Copy Phase is "Copying". - The -force option has not been specified. - Error message ID is ccm4014.

Appendix B Backup and restoration of ZFS file systems

Refer to "Backup and Restoration of ZFS File Systems" in the *ETERNUS SF AdvancedCopy Manager Operation Guide (for Solaris)* for backup and restoration of ZFS file systems using AdvancedCopy Manager CCM.

Appendix C XML Format Output Function

This appendix explains the XML format output function.

C.1 List of commands support the XML format output function

The following commands support the XML format output function.

Table C.1 Command that support the XML format output function

Command name	Command type	
	Display type	Execution type
acarray add	-	YES
acarray change	-	YES
acarray list	YES	-
acarray detail	YES	-
acarray remove	-	YES
acarray pathscan	-	YES
acinq lv	YES	-
acinq lunmap	YES	-
acinq ag	YES	-
acinq hostag	YES	-
acgroup create	-	YES
acgroup list	YES	-
acgroup detail	YES	-
acgroup remove	-	YES
acpair add	-	YES
acpair remove	-	YES
acopc start	-	YES
acopc query	YES	-
acopc cancel	-	YES
acsnap start	-	YES
acsnap query	YES	-
acsnap cancel	-	YES
acsdv init	-	YES
acsdv stat	YES	-
acsdv poolstat	YES	-
acec start	-	YES
acec query	YES	-
acec suspend	-	YES
acec resume	-	YES
acec reverse	-	YES

Command name	Command type	
	Display type	Execution type
acec change	-	YES
acec cancel	-	YES
accopy query	YES	-
accopy fcancel	-	YES
accopy fsuspend	-	YES
acrecbuff set	-	YES
acrecbuff stat	YES	-
acinhibit set	-	YES
acinhibit unset	-	YES
acutil devs	YES	-
acutil refresh	-	YES
acutil fsflush	-	YES
acservic stop	-	YES



See

The XML format between display type command and execution type command is different. Refer to "[C.2.1 XML format of display type command](#)" or "[C.2.2 XML format of execution type command](#)" for the each XML format.

C.2 XML format

C.2.1 XML format of display type command

The XML format of display type command is follows:

- List part only
- Table part only
- List part and table part

The display example for each XML format shows the followings.

Display example of list part only

Without -xml option

```
> acarray detail -a ET001

Disk Array Name : ET001
BOX-ID          : 00ETERNUSDXM##ET44S20A####HK000104#####
IP Address      : 10.124.6.251
Admin User     : root
Access Volume   : X:
```

With -xml option

```
> acarray detail -a ET001 -xml
<?xml version="1.0" encoding="UTF-8"?>
```



```
<Response version="1.0">
  <ReturnCode>0</ReturnCode>
  <Message></Message>
  <List>
    <Data id="Disk Array Name">ET001</Data>
    <Data id="BOX-ID">00ETERNUSDXM##ET44S20A####HK000104#####</Data>
    <Data id="IP Address">10.124.6.251</Data>
    <Data id="Admin User">root</Data>
    <Data id="Access Volume">X:</Data>
  </List>
</Response>
```

Display example of table part only

Without -xml option

```
> acarray list

Name   BOX-ID                                     IP Address
-----
ET001  00ETERNUSDXM##ET44S20A####HK000104#####  10.124.6.251
ET002  00ETERNUSDXH##ET87S20A####NC4110699004##  10.124.6.241
```

With -xml option

```
> acarray list -xml
<?xml version="1.0" encoding="UTF-8"?>
<Response version="1.0">
  <ReturnCode>0</ReturnCode>
  <Message></Message>
  <Table>
    <Row>
      <Data id="Name">ET001</Data>
      <Data id="BOX-ID">00ETERNUSDXM##ET44S20A####HK000104#####</Data>
      <Data id="IP Address">10.124.6.251</Data>
    </Row>
    <Row>
      <Data id="Name">ET002</Data>
      <Data id="BOX-ID">00ETERNUSDXH##ET87S20A####NC4110699004##</Data>
      <Data id="IP Address">10.124.6.241</Data>
    </Row>
  </Table>
</Response>
```

NOTE: If there is no data in the table part, the Table tag is not displayed.

Display example of list part and table part

Without -xml option

```
> acec query -g ECGroup

Copy Group Name : ECGroup
Copy Group Type : EC
Disk Array Name : ET002 (00ETERNUSDXH##ET87S20A####NC4110699004##)

Source   <=> Target   SID   EC Status           Copy Phase Copied Block
-----
ET002/0x1 N/A ET002/0x3 N/A "EC action not startup" "Not set"           N/A
ET002/0x2 ==> ET002/0x4 0x41 "EC Executing"       "Copying"           1048576
```

With -xml option

```
> acec query -g ECGroup -xml
<?xml version="1.0" encoding="UTF-8"?>
```

```

<Response version="1.0">
  <ReturnCode>0</ReturnCode>
  <Message></Message>
  <List>
    <Data id="Copy Group Name">ECGroup</Data>
    <Data id="Copy Group Type">EC</Data>
    <Data id="Disk Array Name">ET002 (00ETERNUSDXH##ET87S20A####NC4110699004##)</Data>
  </List>
  <Table>
    <Row>
      <Data id="Source">ET002/0x1</Data>
      <Data id="&lt;=&gt;">N/A</Data>
      <Data id="Target">ET002/0x3</Data>
      <Data id="SID">N/A</Data>
      <Data id="EC Status">"EC action not startup"</Data>
      <Data id="Copy Phase">"Not set"</Data>
      <Data id="Copied Block">N/A</Data>
    </Row>
    <Row>
      <Data id="Source">ET002/0x2</Data>
      <Data id="&lt;=&gt;">=&gt;</Data>
      <Data id="Target">ET002/0x4</Data>
      <Data id="SID">0x41</Data>
      <Data id="EC Status">"EC Executing"</Data>
      <Data id="Copy Phase">"Copying"</Data>
      <Data id="Copied Block">1048576</Data>
    </Row>
  </Table>
</Response>

```

NOTE: If there is no data in the table part, the Table tag is not displayed.

Information

If the error occurs when the command is executed (e.g. parameter error), the command outputs the error information like as follows.

Without -xml option

```

> acarray detail -a ET001
ccm8003 Could not open the file. file=C:\Program Files\AdvancedCopy Manager Copy Control Module\etc
\db\eternus.xml.lck

```

With -xml option

```

> acarray detail -a ET001 -xml
<?xml version="1.0" encoding="UTF-8"?>
<Response version="1.0">
  <ReturnCode>8</ReturnCode>
  <Message>ccm8003 Could not open the file. file=C:\Program Files\AdvancedCopy Manager Copy Control
Module\etc\db\eternus.xml.lck</Message>
</Response>

```

C.2.2 XML format of execution type command

The XML format of execution type command is follows:

- Execution result message only
- Execution result including the detail information

The display example for each XML format shows the followings.

Display example of execution result message only

Without -xml option

```
> acgroup create -g group01 -type OPC -a ET001
Successful completion.
```

With -xml option

```
> acgroup create -g group01 -type OPC -a ET001 -xml
<?xml version="1.0" encoding="UTF-8"?>
<Response version="1.0">
  <ReturnCode>0</ReturnCode>
  <Message>Successful completion.</Message>
</Response>
```

Display example of execution result including the detail information

Without -xml option

```
>acec start -g ECGroup

ET001/0x1:ET001/0x6
# DATE : 2008/06/24 16:28:00 - << EC Started >>
# From:BoxID=303045343030304d3323232323234534353053323041232323234b44343033303633393030342323/
Olu=1/Adr_high=0/Adr_low=0/size_high=0/size_low=0
# To :BoxID=303045343030304d3323232323234534353053323041232323234b44343033303633393030342323/
Olu=6/Adr_high=0/Adr_low=0

ET001/0x2:ET001/0x7
ccm5004 Operation failed. function=STXCopyEC.START, message=invalid BoxID.

Succeeded : 1
Failed : 1
```

With -xml option

```
>acec start -g ECGroup -xml
<?xml version="1.0" encoding="UTF-8"?>
<Response version="1.0">
  <ReturnCode>6</ReturnCode>
  <Message></Message>
  <ResultList>
    <Result>
      <Object>ET001/0x1:ET001/0x6</Object>
      <Status>Succeeded</Status>
      <Message></Message>
      <Detail>DATE : 2008/06/24 16:28:00 - &lt;&lt; EC Started &gt;&gt; &#13;
From:BoxID=303045343030304d3323232323234534353053323041232323234b44343033303633393030342323/
Olu=1/Adr_high=0/Adr_low=0/size_high=0/size_low=0&#13;
To :BoxID=303045343030304d3323232323234534353053323041232323234b44343033303633393030342323/
Olu=6/Adr_high=0/Adr_low=0</Detail>
    </Result>
    <Result>
      <Object>ET001/0x2:ET001/0x7</Object>
      <Status>Failed</Status>
      <Message>ccm5004 Operation failed. function=STXCopyEC.START, message=invalid BoxID.</
Message>
      <Detail></Detail>
    </Result>
  </ResultList>
</Response>
```

Information

If the error occurs when the command is executed (e.g. parameter error), the command outputs the error information like as follows.

Without -xml option

```
> acec start -g
ccm1001 An invalid argument was specified.

Usage:
  acec start -g COPY-GROUP(EC) [-p PAIR] [-r] [-xml]
  acec start -g COPY-GROUP(REC) [-p PAIR] [-r]
          [-transfer {sync [-split {auto|manual}]]|through|consist|stack}]
          [-recovery {auto|manual}]
          [-skip]
          [-xml]
```

With -xml option

```
> acec start -g -xml
<?xml version="1.0" encoding="UTF-8"?>
<Response version="1.0">
  <ReturnCode>1</ReturnCode>
  <Message>ccm1001 An invalid argument was specified.</Message>
</Response>
```

If the warning message by executing the command is output as follows.

Without -xml option

```
> acec reverse -g group01

ET001/0x1:ET001/0x6
# DATE : 2008/06/24 16:28:00 - << EC Change >>
Warning:ccm7001 The target logical volume is write protected. target logical volume=ET001/0x1

ET001/0x2:ET001/0x7
# DATE : 2008/06/24 16:28:00 - << EC Change >>

Succeeded : 2
Failed    : 0
```

With -xml option

```
> acec reverse -g group01 -xml
<?xml version="1.0" encoding="UTF-8"?>
<Response version="1.0">
  <ReturnCode>0</ReturnCode>
  <Message>Successful completion.</Message>
  <ResultList>
    <Result>
      <Object>ET001/0x1:ET001/0x6</Object>
      <Status>Succeeded</Status>
      <Message>Warning:ccm7001 The target logical volume is write protected. target logical
volume=ET001/0x1</Message>
      <Detail>DATE : 2008/06/24 16:28:00 - &lt;&lt; EC Change &gt;&gt;</Detail>
    </Result>
    <Result>
      <Object>ET001/0x2:ET001/0x7</Object>
      <Status>Succeeded</Status>
      <Message></Message>
      <Detail>DATE : 2008/06/24 16:28:00 - &lt;&lt; EC Change &gt;&gt;</Detail>
    </Result>
  </ResultList>
</Response>
```

```
</ResultList>  
</Response>
```



Appendix D Operation in Oracle VM Server for SPARC

Refer to "Operation in Oracle VM Server for SPARC" in the *ETERNUS SF AdvancedCopy Manager Operation Guide (for Solaris)* for Oracle VM Server for SPARC in the operation using AdvancedCopy Manager CCM.

Appendix E VMware Virtual Machine Automatic Backup/Restore (Script)

This chapter explains the scripts used for automated backup/restoration of the VMware virtual machine environment using functions provided by the AdvancedCopy Manager CCM.

In the explanations, it is assumed that AdvancedCopy Manager CCM environment configuration, described in the following sections of the *ETERNUS SF Installation and Setup Guide*, has been completed.

- "Registering AdvancedCopy Manager license"
- "Setup of AdvancedCopy Manager CCM"

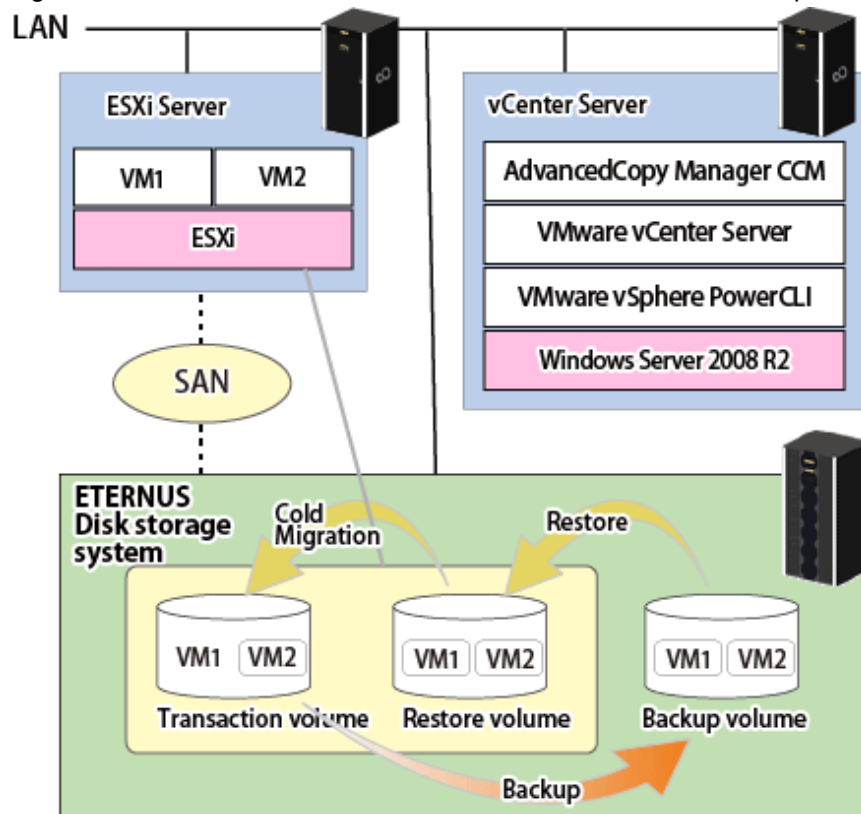
E.1 Overview

The script in a VMware environment is provided. This script automatic backup/restores a virtual disk (hereinafter called "System Area") where OS of a virtual machine is installed by using the snapshot function and AdvancedCopy Manager CCM of a virtual machine.

Backup is performed by copying LU to LU from the transaction volume to the backup volume of a virtual machine using QuickOPC. Restoration is performed by copying from the backup volume to the restore volume and then restoring to a specific transaction volume of a virtual machine using SnapOPC+.

Scripts allow you to run this series of operations automatically.

Figure E.1 Overview of VMware Virtual Machine Automated Backup/Restore



These scripts operate based on the following volume configuration.

Table E.1 Volume configuration

Item number	Volume type	Explanation	Type	Size	Quantity	Comments
1	Transaction volume	Volume containing the System Area of a virtual machine in which operation takes place	Open	Arbitrary	Arbitrary	It must be connected to the ESXi Server.
2	Backup volume	Backup destination volume	Open	Same as the transaction volume	Same as the transaction volume	QuickOPC destination volume must be an Open Volume because it is a complete backup of the source volume. Do not connect to the ESXi Server.
3	Restore volume	Restore destination volume	SDV	Same as the transaction volume	One restore volume is required by size of each transaction volume.	SnapOPC+ destination must be a Snap Data Volume (SDV). It must be connected to the ESXi Server because virtual machines are restored after restore.

E.2 Script Configuration

Script configuration is as follows.

Figure E.2 Script configuration

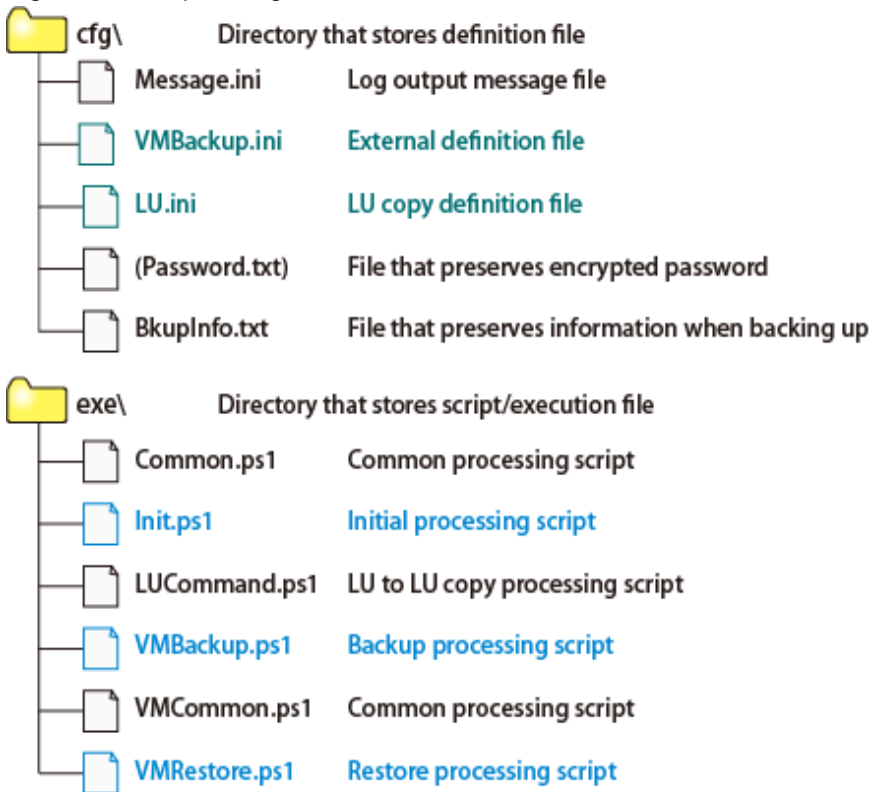


Table E.2 Definition file to be edited

Item number	File name	Type	Explanation
1	VMBackup.ini	External definition file	Defines external information for performing backups
2	LU.ini	LU copy definition file	Defines LU information of backup/restore targets

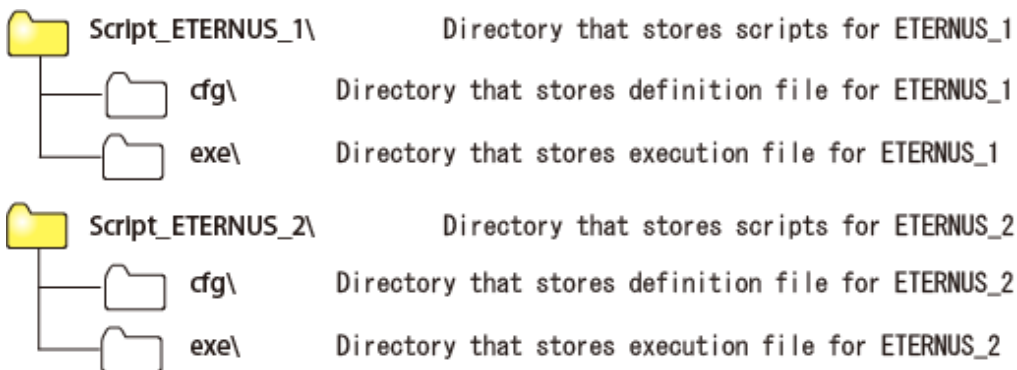
Table E.3 Scripts to be executed

Item number	Script name	Type	Explanation
1	Init.ps1	Initial processing	Password encryption
2	VMBackup.ps1	Backup	Automated backup execution
3	VMRestore.ps1	Restore	Automated restore execution

 **Point**

When using scripts in an environment where multiple ETERNUS Disk storage systems exist, it is required to create script execution files and definition files for each ETERNUS Disk storage system.

As shown in the following figure, perform a directory in which to store scripts for each ETERNUS Disk storage system.



E.3 Operating Conditions

Software Requirements

Software requirements for executing the provided scripts are as follows:

Table E.4 Supported OS

Item number	Product name	Explanation
1	Windows Server 2008 R2	Supported operating system (*1) (*2)

*1: OS supported by VMware vSphere PowerCLI, which is essential software.

*2: To execute this script, the OS user must have administrator rights.

Table E.5 Required software

Item number	Software	Version
1	VMware vSphere(ESXi)	5.0, 5.1 or 5.5
2	VMware vCenter Server	5.x (*1)

Item number	Software	Version
3	VMware vSphere PowerCLI	5.x (*2)

*1: To execute this script, the vCenter Server login user must have administrator rights.

*2: Download individually from the following VMware website and install.

<http://communities.vmware.com/community/vmtn/server/vsphere/automationtools/powercli>

Hardware Requirements

Refer to "Operating environment of AdvancedCopy Manager CCM" in the *ETERNUS SF Installation and Setup Guide*.

About Internet protocol (IP)

This script does not support IPv6. Use it in an IPv4 environment.

E.4 Operation Design

Designing server configuration

vCenter Server

This server manages and operates all virtual machines.

It installs AdvancedCopy Manager CCM and acts as a backup server.

ESXi Server

This server provides a virtual machine execution environment.

Designing Volume Configuration

Design a volume (LU) configuration that meets the following requirements.

- The transaction volume, backup volume, and restore volume are placed on the same ETERNUS Disk storage system.
- The transaction volume and backup volume are an Open Volume of the same size.
- The restore volume is a Snap Data Volume, and is of the same size (logical capacity) as the transaction volume.
- The transaction volume and restore volume are connected to the ESXi Server.
- The backup volume is not connected to the ESXi Server.
- The formula for estimating the transaction volume size is as follows. If the capacity that is bigger than the estimated size can be allocated, bigger capacity is recommended to be allocated.

```
[System Area size : for 20GB or higher]
transaction volume size = System Area size (size of virtual disk for guest OS) * 2

[System Area size : less than 20GB]
transaction volume size = System Area size (size of virtual disk for guest OS) + 20GB
```

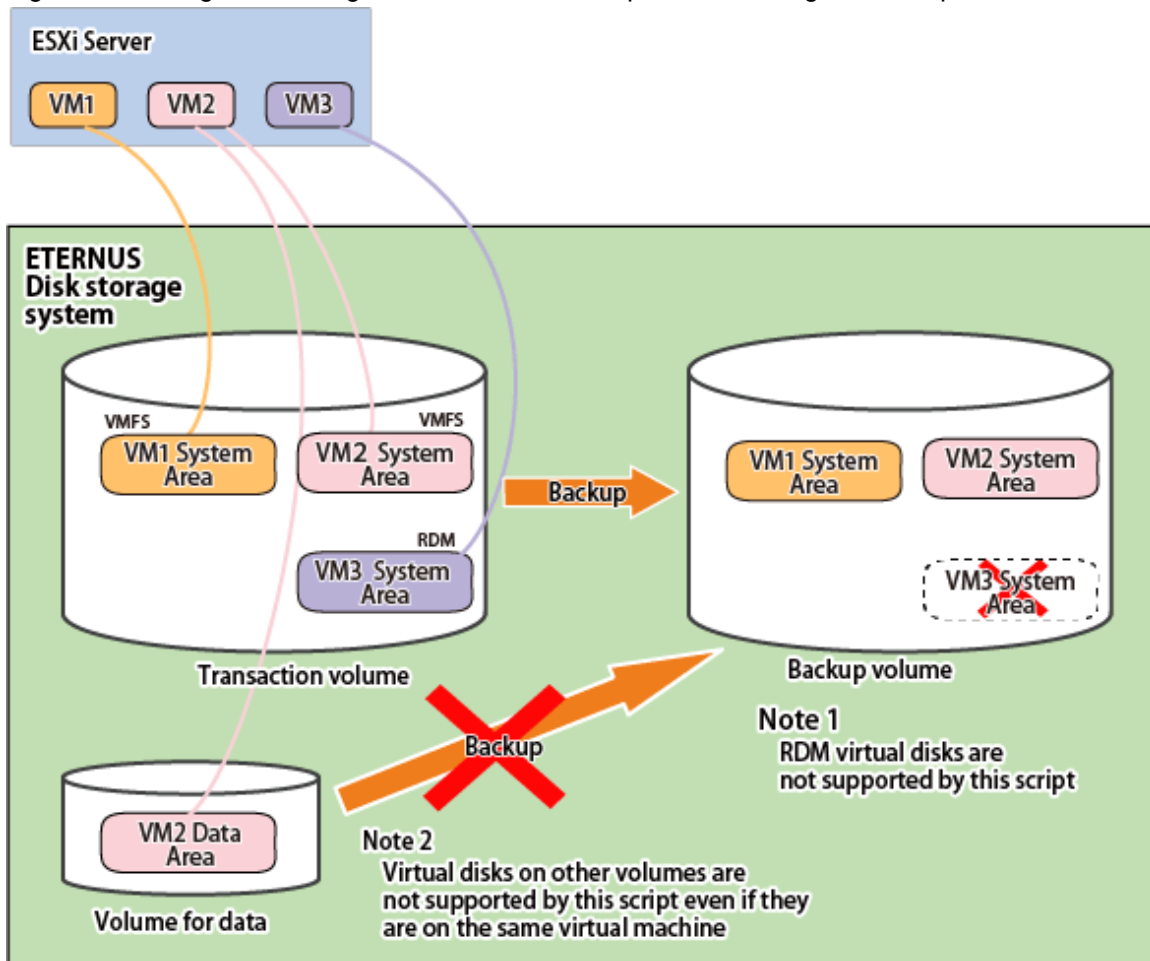
Notes when virtual machine is constructed

The following notes apply when building a virtual machine (VM) on the ESXi Server.

- Virtual machines to be backed up/restored using these scripts are those created on a VMFS-5 datastore. Always select a VMFS-5 datastore when building a virtual machine.
- Only the System Area on the transaction volume will be backed up/restored using these scripts. You may create multiple virtual machines on a single transaction volume.
- Create a virtual disk (hereinafter called "Data Area") where the data of a virtual machine is stored for other volumes different from the transaction volume. In that case, select "Independent (Persistent)" as the mode of a virtual disk.

- Connect all virtual disks including the System Area of a virtual machine with SCSI.
- The following guest OS are supported:
 - Windows Server 2008 R2
 - Windows Server 2012
 - Windows Server 2012 R2
 - Red Hat Enterprise Linux 6.2 (for Intel64)
 - Red Hat Enterprise Linux 6.3 (for Intel64)
- In this script, the virtual machine snapshot is acquired in the snapshot name called "ETERNUS_Backup". Do not acquire the snapshot of the same name to avoid the repetition of the snapshot name.

Figure E.3 Configuration image of volumes backed up/restored using these scripts



E.5 Preparations for Executing Scripts

The following preparations are required to execute the provided scripts.

Perform steps 2 to 6 for each ETERNUS Disk storage system.

1. Set the execution policy for the PowerShell script
2. Unzip the script
3. Configure the initial settings for the script operating environment
4. Prepare a backup volume and a restore volume

5. Configure the environment for AdvancedCopy Manager CCM
6. Configure the LU copy definition file

E.5.1 Execution Policy Settings for PowerShell Script

Set the script execution policy.

Set the execution policy to RemoteSigned or Unrestricted according to the method described in following URL.

<http://technet.microsoft.com/en-us/library/ee176961.aspx>

E.5.2 Unzip Script

Scripts are saved in the following location.

```
installDir\tools\vmware_scripts.zip
```

Note: *installDir* is the "Program directory" when AdvancedCopy Manager CCM has been installed.

Perform an optional directory for each ETERNUS Disk storage system and copy the above file to the directory to unzip it.

"C:\Script_ETERNUS_1" is used as the unzip destination directory in the explanations in the following sections.

E.5.3 Configure the Initial Settings for the Script Operating Environment

Perform VMBackup.ini file setup and password encryption to configure the initial settings for the script operating environment.

VMBackup.ini File Setting

Write the following information to the VMBackup.ini file (external definition file).

Parameter name	Explanation
Server	Specifies the vCenter Server IP address or server name.
User	Specifies the vCenter Server user name.
VM	List all the VM names to be backed up with comma separation among VMs on the ETERNUS Disk storage system for which this script is intended. VM names may contain a wildcard ("*"). Do not specify any VM name on other ETERNUS Disk storage system.
LUCmdPath	Specifies the AdvancedCopy Manager CCM bin directory with the full path.

The following is a VMBackup.ini file example.

```
Server=vcserver
User=administrator
VM=VM*,Template
LUCmdPath=C:\ETERNUS_SF\CCM\bin
```

Password Encryption

In Command Prompt, execute Init.ps1 (initial processing script) in PowerShell. The following is an example.

```
> powershell C:\Script_ETERNUS_1\exe\Init.ps1
```

A password prompt message is displayed. Enter the user password to log into the vCenter Server specified in the VMBackup.ini file.

When the process ends normally, a Password.txt file is created in the directory where the VMBackup.ini file is saved.



Note

Execute Init.ps1 to update the Password.txt file, when you change the vCenter Server password.

E.5.4 Prepare a backup volume and a restore volume

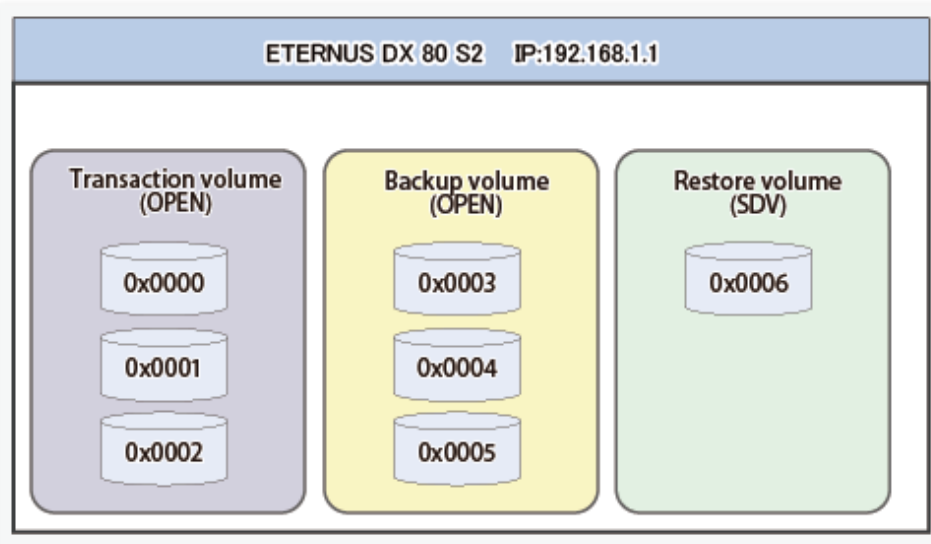
Prepare a backup volume and a restore volume that meet the requirements described in "Table E.1 Volume configuration".

E.5.5 Configure the Environment for AdvancedCopy Manager CCM

Configure the environment for backing up/restoring volumes using AdvancedCopy Manager CCM on the vCenter Server.

This AdvancedCopy Manager CCM command example is based on the following volume configuration.

Figure E.4 Volume Configuration in the Command Example



Volume type	OLU number	Type of volume
Transaction volume	0x0000,0x0001,0x0002	Open Volume
Backup volume	0x0003,0x0004,0x0005	Open Volume
Restore volume	0x0006	Snap Data Volume

ETERNUS Disk Storage System Registration

Execute `acarray add` (ETERNUS Disk storage system registration command) to register the ETERNUS Disk storage system used for backup to AdvancedCopy Manager CCM. The following is an example of a command using the copy control function through LAN.

```
# acarray add -a ET001 -ip 192.168.1.1 -user ccmuser -password ccmuser -lan
Successful completion.
#
```

Execute `acarray list` (ETERNUS Disk storage system information display command) to check the list of registered ETERNUS Disk storage systems.

```
# acarray list

Name    BOX-ID                                IP Address
-----
ET001  00ETERNUSDXLS2ET082DC#####KN4521045063## 192.168.1.1
#
```

Execute `acarray detail` (ETERNUS Disk storage system detail information display command) to check the detailed information about the registered ETERNUS Disk storage system.

```
# acarray detail -a ET001 -route
```

```

Disk Array Name : ET001
Box-ID          : 00ETERNUSDXLS2ET082DC#####KN4521045063##
IP Address      : 192.168.1.1
Admin User      : ccmuser
Access Volume   : -
Access Route    : lan
#

```

Copy Group Creation

Execute `acgroup create` (Copy group creation command) to create a copy group for backup and a copy group for restoration.

```

# acgroup create -g bk -type QuickOPC -a ET001
Successful completion.
# acgroup create -g rst_snap -type SnapOPCP -a ET001
Successful completion.
#

```

Point

- When creating a copy group for backup, set "QuickOPC" in the -type option.
- When creating a copy group for restoration, set "SnapOPCP" in the -type option.

Copy Pair Addition

Execute `acinq lv` (Logical volume information display command) to check the list of ETERNUS Disk storage system logical volume numbers.

```

# acinq lv -a ET001

LV No  LV Name  LV Size  LV Type  RG No  Encrypt
-----
0x0000      30720M  Open      0  -
0x0001      30720M  Open      0  -
0x0002      30720M  Open      0  -
0x0003      30720M  Open      1  -
0x0004      30720M  Open      1  -
0x0005      30720M  Open      1  -
0x0006      30720M  SDV       2  -
#

```

Execute `acpair add` (Copy pair addition command) to add a copy pair to the copy group for backup and the copy group for restoration.

```

# acpair add -g bk -p ET001/0x0000:ET001/0x0003
Successful completion.
#
# acpair add -g rst_snap -p ET001/0x0003:ET001/0x0006
Successful completion.
#

```

Point

Specify a volume that meets the requirements described in "Table E.1 Volume configuration" for a copy pair.

Execute `acgroup detail` (Copy group detail information display command) to check the copy group and copy pair information.

```
# acgroup detail -g bk

Copy Group Name : bk
Copy Group Type : QuickOPC
Disk Array Name : ET001 (00ETERNUSDXLS2ET082DC#####KN4521045063##)

Pair
-----
ET001/0x0000:ET001/0x0003
#
```

E.5.6 LU.ini File Setting

Write to LU.ini file (LU copy definition file) information set in "E.5.5 Configure the Environment for AdvancedCopy Manager CCM". Write to LU.ini file only the copy group information for the ETERNUS Disk storage system for which this script is intended.

The LU.ini file format is as follows:

Column	Explanation
Column 1	Name of copy group for backup
Column 2	Name of copy group for restoration
Column 3	Copy source information of copy group for backup
Column 4	Copy destination information for Column 3
Column 5	Information about LU for restoration

The following is an example of a LU.ini file.

```
bk,rst_snap,ET001/0x0000,ET001/0x0003,ET001/0x0006
bk,rst_snap,ET001/0x0001,ET001/0x0004,ET001/0x0006
bk,rst_snap,ET001/0x0002,ET001/0x0005,ET001/0x0006
```

E.6 Virtual Machine Backup

The following is a description of the procedures used to perform automated backup using the script provided.

1. Stop business applications on target virtual machine to stop I/O of business applications

Before executing the backup script, stop business applications running on a virtual machine to be backed up to stop all I/O of business applications.



It is recommended that backup be performed while the virtual machine is stopped in order to perform a backup with maximum data integrity.

2. Execute the backup script

Execute the backup script from the command prompt on vCenter Server for each ETERNUS Disk storage system. The following is an example.

```
> powershell C:\Script_ETERNUS_1\exe\VMBackup.ps1 -l C:\Script_ETERNUS_1\log\backup.log
```

The backup script is processed in the following sequence.

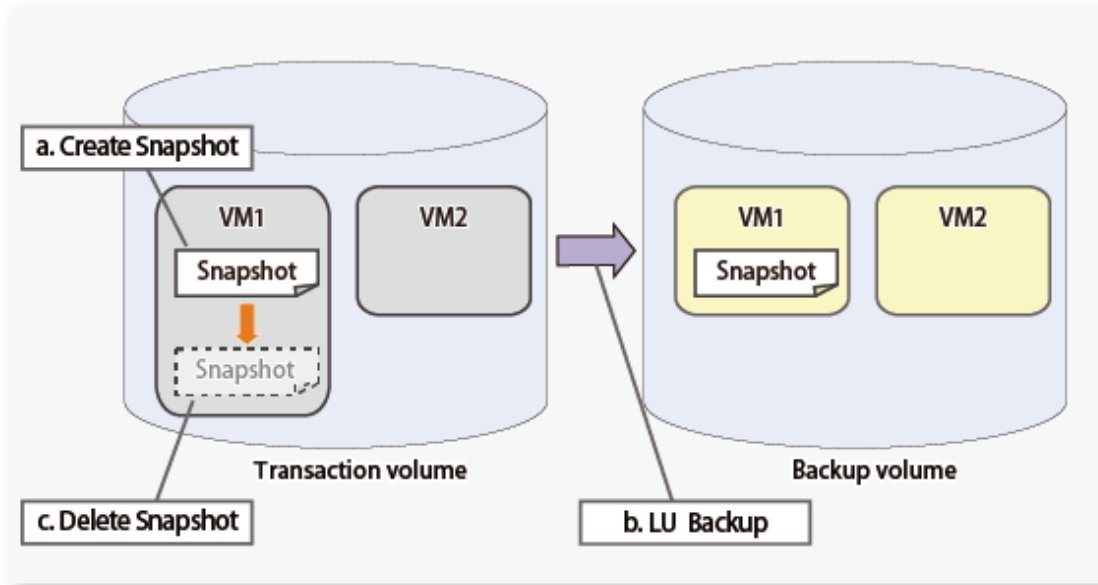
- a. Virtual machine snapshots are created using the snapshot function of the virtual machine.
- b. The transaction volume is backed up (copied) to the backup volume using AdvancedCopy Manager CCM.
- c. When backup is complete, the first snapshot created is deleted.

3. Restart business applications after backup

Restart business applications on the virtual machine after the backup script executing has been completed.

The following is an overview of backup script processing executed in step 2.

Figure E.5 Overview of Backup Script Processing (When "VM1" is specified for the VM parameter of VMBackup.ini)



 Note

The backup script retains one-time backup data alone. Performing backup makes the previous backup data invalid.

E.7 Virtual Machine Restoration

The following is a description of the procedures used to perform automated restoration using the script provided.

1. Stopping the virtual machine to be restored
Stop the virtual machine to be restored.
2. Deletion of all snapshots of virtual machine to be restored
Delete all snapshots of the virtual machine to be restored.
3. Execute the restore script

Execute the restore script in the same directory as the backup script from the command prompt on vCenter Server. The following is an example.

```
> powershell C:\Script_ETERNUS_1\exe\VMRestore.ps1 -vm VM1 -l C:\Script_ETERNUS_1\log\backup.log
```

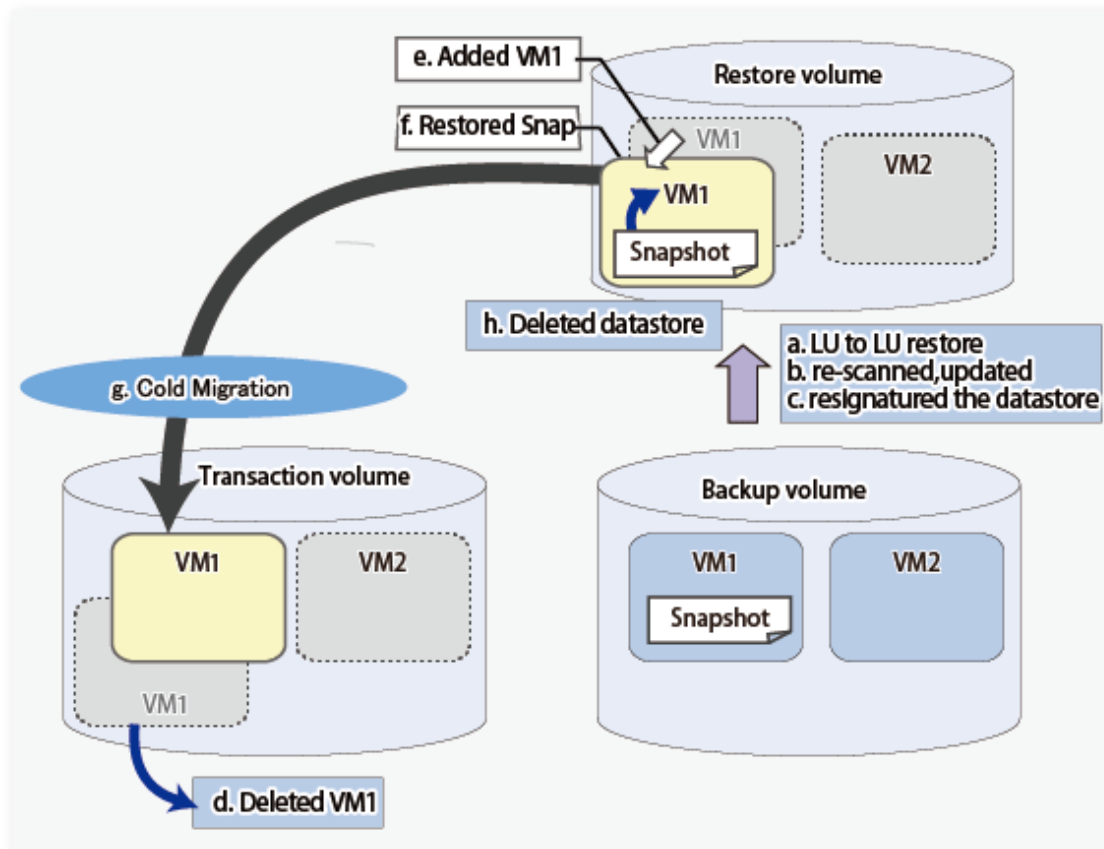
The restore script is processed in the following sequence.

- a. The data of backup volume is restored to the restore volume.
- b. Storage adapter is re-scanned and datastore is updated.
- c. The restore volume is resignatured with the datastore.
- d. The System Area of a virtual machine on a transaction volume to be restored is deleted from the disk.
- e. A virtual machine to be restored is added from the resignatured datastore on the restore volume.

- f. The snapshots of the restored virtual machine are restored.
 - g. The virtual machine restored to the restore volume is moved to the original transaction volume through Cold Migration.
 - h. The datastore resignatured for restoration is deleted.
4. Start the restored virtual machine
- Start the virtual machine restored in step 3.

The following is an overview of restore script processing executed in step 3.

Figure E.6 Overview of Restore Script Processing (When "VM1" is specified for -vm option at the time the restore script is executed)



E.8 Script References

E.8.1 Init.ps1 (Initial Processing Script)

NAME

Init.ps1 - password encryption

SYNOPSIS

```
powershell scriptDir\exe\Init.ps1
```

(*scriptDir* is the folder to which the script has been unzipped)

DESCRIPTION

Enter the user password used to connect to the vCenter Server, and save it encrypted.
This file is used to log into the vCenter Server, when executing the backup or restore script.
The name and contents of the generated file are as follows:

File name	Contents
Password.txt	Encrypted vCenter Server login password

EXAMPLES

```
> powershell C:\Script_ETERNUS_1\exe\Init.ps1  
input password.  
Server: vcserver User: Administrator: *****
```

NOTES

Execute this script after installation and after changing the password.

E.8.2 VMBackup.ps1 (Backup Script)

NAME

VMBackup.ps1 - Automated backup execution

SYNOPSIS

```
powershell scriptDir\exe\VMBackup.ps1 [-l logFileName] [-e]
```

(*scriptDir* is the folder to which the script has been unzipped)

DESCRIPTION

This script backs up the System Area of any virtual machine after acquiring virtual machine snapshots. When backup is complete, the acquired snapshots are deleted.

The transaction volume of the virtual machine is copied to the backup volume for each LU.

Refer to "Execute the backup script" in "[E.6 Virtual Machine Backup](#)" for the automated processes executed with this script.

OPTIONS

-l *logFileName*

Specify the name of the script execution log output file with an absolute path. The log output destination directory must be created in advance.

This option can be specified concurrently with the -e option.

Refer to "[E.9 Log Format and Messages](#)" for information on the output log.

-e

Output a log to Windows event log.

This option can be specified concurrently with the -l option.

EXIT STATUS

- =0 : Completed successfully
- >0 : Terminated abnormally

EXAMPLES

```
> powershell C:\Script_ETERNUS_1\exe\VMBackup.ps1 -l C:\Script_ETERNUS_1\log\backup.log
```

NOTES

- A warning about electronic authentication may appear when connecting to the vCenter Server because this script uses VMware vSphere PowerCLI. This warning appears when a default test certificate is used. It can therefore be ignored.
- Do not restore virtual machines for which the backup process (physical copy in the ETERNUS Disk storage system) has not been completed. Virtual machines restored before backup is complete do not operate normally.
- Always execute this script after the applications on the target virtual machine are stopped (I/O is stopped).
- This script acquires target virtual machine snapshots at backup. Acquiring "Snapshot the virtual machine's memory" and "Quiesce guest file system", which are options for acquisition, are disabled (OFF).

E.8.3 VMRestore.ps1 (Restore Script)

NAME

VMRestore.ps1 - Automated restore execution

SYNOPSIS

```
powershell scriptDir\exe\VMRestore.ps1 -vm vmName [-l logFileName] [-e]
```

(*scriptDir* is the folder to which the script has been unzipped)

DESCRIPTION

This script restores any backed up virtual machines. When a virtual machine to be restored on the transaction volume is deleted, transaction volume data is restored to the restore volume, the virtual machine is recovered, and snapshots are restored. When the virtual machine has been restored to the restore volume, it is moved to the transaction volume by way of Cold Migration.

Refer to "Execute the restore script" in ["E.7 Virtual Machine Restoration"](#) for the automated processes executed with this script.

OPTIONS

-vm *vmName*

Specify the name of a virtual machine to be restored.

-l *logFileName*

Specify the name of the script execution log output file with an absolute path. The log output destination directory must be created in advance.

This option can be specified concurrently with the -e option.

Refer to ["E.9 Log Format and Messages"](#) for information on the output log.

-e

Output a log to Windows event log.

This option can be specified concurrently with the -l option.

EXIT STATUS

- =0 : Completed successfully
- >0 : Terminated abnormally

EXAMPLES

```
> powershell C:\Script_ETERNUS_1\exe\VMRestore.ps1 -vm VM1 -l C:\Script_ETERNUS_1\log\backup.log
```

NOTES

- A warning about electronic authentication may appear when connecting to the vCenter Server because this script uses VMware vSphere PowerCLI. This warning appears when a default test certificate is used. It can be ignored.
- Do not restore virtual machines for which the backup process (physical copy in the ETERNUS Disk storage system) has not been completed. Virtual machines restored before backup is complete do not operate normally.

E.9 Log Format and Messages

This section explains the log format and messages generated by the backup script and restore script.

E.9.1 Log Format

Regular Log

This log is generated when the scripts are executed with the -l option.

The log is generated in the following format.

```
yyyy/mm/dd hh:MM:ss : level : message
```

level is the message level. "Info" (information), "Warn" (warning), or "ERROR" (error) will be shown.
message is the message itself. Refer to ["E.9.2 List of Messages"](#) for details.

Event Log (Application)

This log is written to the Windows Event Log when the scripts are executed with the -e option.

Item	Explanation
EntryType	This is the type of event log entry. "Information", "Warning", or "Error" will be shown.
Source	This is the event source. It will always show "WSH".
EventID	This is the event identifier. It will always show "0".
Message	This is the event message. Refer to "E.9.2 List of Messages" for details.

E.9.2 List of Messages

The following messages will appear in the log.

Message level	Message	Explanation
Information : Info :	script started.	The script has started processing.
	vCenter Server connected.	Logged in to the vCenter Server.
	vCenter Server disconnected.	Logged out of the vCenter Server.

Message level	Message	Explanation
	script ended normally.	The script has finished processing.
	execute CCM. <i>command operand copyGroup orgLu:backupLu</i>	LU to LU copying has been executed. An AdvancedCopy Manager CCM command will appear after this message.
	output password file.	A password file has been generated.
	create snapshot.	A snapshot has been created.
	delete snapshot.	Snapshots have been deleted.
	rescan storage. <i>esxName</i>	Storage has been re-scanned on the ESXi Server.
	update storage. <i>esxName</i>	Storage has been updated on the ESXi Server.
	complete resignature datastore for restore. <i>luName datastoreName</i>	The datastore for restoration has been resignatured.
	delete datastore for restore. <i>datastoreName</i>	The datastore for restoration has been deleted.
	remove harddisk of target VM. <i>harddiskName</i>	The hard disk of the virtual machine to be restored has been removed.
	delete Snapshot of target VM. <i>vmName</i>	Snapshots of the virtual machine to be restored have been deleted.
	delete target VM. <i>vmName</i>	The virtual machine to be restored has been deleted.
	add VM to inventory. <i>datastoreName vmName vmxFileName</i>	The backup data virtual machine has been added to the inventory.
	delete VM. <i>vmName</i>	The backup data virtual machine has been deleted.
	move to target Snapshot. <i>vmName snapshotName</i>	Snapshots have been restored using the backup data virtual machine.
	delete Snapshot. <i>vmName snapshotName</i>	Snapshots restored from the backup data virtual machine have been deleted.
	execute Cold Migration. <i>vmName srcDatastoreName -> dstDatastoreName</i>	The backup data virtual machine has been moved to the running datastore.
	Failed to delete snapshot.	Failed to delete snapshots. Delete it if you confirm the existence of the snapshot called "ETERNUS_Backup" at Snapshot Manager.
Warning	<i>parameter</i> : Not found in <i>fileName</i>	Cannot find the definition file parameter. Check the contents of the definition file.
" : < Warn > : "	<i>Message</i>	Check the contents of <i>Message</i> generated by the system.
Error	parameter incorrect. <i>fileName</i>	The definition file format is incorrect.
" : ## ERROR ## : "	can not make LogFile. <i>logFilePath</i> .	Cannot create a log file. Check for errors in the specified path.
	vCenter Server connection failed. <i>serverName userName</i>	Could not log in to the vCenter Server. Check the PowerCLI (Connect-VIServer) error information shown after this message.
	vCenter Server disconnection failed.	Could not log out of the vCenter Server. Check the PowerCLI (Connect-VIServer) error information shown after this message.
	password file not found. <i>path</i>	Cannot find Password.txt file. Execute initial processing.

Message level	Message	Explanation
	password file incorrect.	Password.txt file is unusable. Recreate by executing initial processing.
	failed to CCM. <i>command copyGroup orgLu:backupLu</i>	LU to LU copying has failed. Check the AdvancedCopy Manager CCM error information shown after this message.
	do not set CCM path. <i>fileName parameter</i>	The definition file does not include the parameter indicating the bin directory path of AdvancedCopy Manager CCM.
	do not get VM. <i>vmName</i>	Failed to acquire virtual machine information. <i>vmName</i> shows the name of the failed virtual machine. Check the PowerCLI (Get-VM) error information shown after this message.
	data not found. <i>path</i>	There is no valid data in the file shown in <i>path</i> . Check the contents.
	do not get LU to target datastore. <i>datastoreName</i>	Cannot acquire LU information storing the datastore shown in <i>datastoreName</i> . Check the PowerCLI (Get-Datastore, Get-ScsiLun) error information shown after this message.
	definition of LU that target VM not found. <i>vmName lunVNo</i>	Copy definition about LU stored in the virtual machine has not been written to LU.ini. Add a definition to LU.ini or review the VM to be backed up.
	failed to create snapshot.	Failed to create snapshots. Check the PowerCLI (Remote-Snapshot) error information shown after this message.
	do not set VM Name.	In startup parameter "-vm", specify the name of the virtual machine to be restored.
	not exist VM.	The specified virtual machine does not exist. Specify the name of an existing virtual machine. Check the PowerCLI (Get-VM) error information shown after this message.
	VM is not unique. <i>vmName</i>	There are several virtual machines with the same name. Specify a unique virtual machine.
	do not get datastore of target VM. <i>datastoreName</i>	Cannot acquire information for the datastore storing the vmx file of the virtual machine. Check the PowerCLI (Get-Datastore) error information shown after this message.
	found datastore in LU for Restore. <i>luName datastoreName</i>	The ESXi Server found an LU for restoration. Delete the LU for restoration from the datastore.
	backup setting is not found. <i>vmName</i>	The virtual machine to be restored has not been backed up or the BkupInfo.txt file is broken.
	do not set LU of Restore. <i>backupLu</i>	The LU for restoration for the backup destination LU has not been defined. Check the contents of the LU.ini file.
	LU for restore not found. <i>backupLu</i>	Several LUs for restoration for the backup destination LU have been defined. Check the contents of the LU.ini file.
	failed to rescan storage devices. <i>esxName</i>	Failed to re-scan storage. Check the PowerCLI (Get-VMHostStorage) error information shown after this message.

Message level	Message	Explanation
	failed to update storage. <i>esxName</i>	Failed to update storage. Check the PowerCLI (Get-VMHostStorage) error information shown after this message.
	LU for restore not found. <i>luName</i>	The ESXi Server could not find the LU for restoration. Check the connection between the LU for restoration specified in the LU.ini file and the ESXi Server of the virtual machine to be restored.
	failed to resignature datastore for restore. <i>luName</i>	Failed to resignature the LU for restoration. Check the PowerCLI (ResignatureUnresolvedVmfsVolume method) error information shown after this message.
	failed to get datastore for restore. <i>luName</i> <i>datastoreID</i>	Failed to acquire datastore information for restoration. Check the PowerCLI (Get-Datastore) error information shown after this message.
	failed to delete datastore for restore. <i>datastoreName</i>	Failed to delete datastore information for restoration. Check the PowerCLI (Remove-Datastore) error information shown after this message.
	failed to remove harddisk of target VM. <i>hardDiskName</i>	Failed to remove the hard disk for the Data Area of the virtual machine to be restored. Check the PowerCLI (Remove-HardDisk) error information shown after this message.
	failed to delete Snapshot of target VM. <i>vmName</i>	Failed to delete the snapshots of the virtual machine for restoration. Check the PowerCLI (Remove-Snapshot) error information shown after this message.
	failed to delete target VM. <i>vmName</i>	Failed to delete the virtual machine for restoration. Check the PowerCLI (Remove-VM) error information shown after this message.
	failed to add inventory. <i>datastoreName</i> <i>vmName</i> <i>vmxFileName</i>	Could not add the backup data virtual machine to the inventory. Check the PowerCLI (New-VM) error information shown after this message.
	failed to delete VM. <i>vmName</i>	Could not delete the backup data virtual machine to the inventory. Check the PowerCLI (Remove-VM) error information shown after this message.
	Snapshot of target VM not found. <i>vmName</i> <i>snapshotName</i>	There is no snapshot called "ETERNUS_Backup" in the backup data virtual machine. Virtual machines not backed up using the backup script cannot be restored.
	backup setting is not specified. <i>vmName</i>	Cannot identify backup information. The virtual machine to be restored has not been backed up or the BkupInfo.txt file is broken.
	failed to move of target Snapshot. <i>vmName</i> <i>snapshotName</i>	Failed to restore snapshots in the virtual machine restored from the backup data. A PowerCLI (Set-VM) error information will appear after this message.
	failed to delete Snapshot. <i>vmName</i> <i>snapshotName</i>	Failed to delete snapshots in the virtual machine restored from the backup data. A PowerCLI (Remove-Snapshot) error information will appear after this message.
	do not get datastore of target VM. <i>datastoreName</i> <i>vmName</i>	Failed to acquire datastore information containing the hard disk of the virtual machine to be restored. Check the PowerCLI (Get-Datastore) error information shown after this message.

Message level	Message	Explanation
	failed to Cold Migration. <i>vmName</i> <i>srcDatastoreName dstDatastoreName</i>	The virtual machine restored from the backup data could not be moved from <i>srcDatastoreName</i> to <i>dstDatastoreName</i> . A PowerCLI (RelocateVM method) error information will appear after this message.

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