ETERNUS SF
AdvancedCopy Manager 14.2

Operator's Guide for
Copy Control Module

Windows/Solaris/Linux

Preface

Purpose

This manual explains how to use the ETERNUS SF AdvancedCopy Manager Copy Control Module (known hereafter as the "AdvancedCopy Manager CCM") to deliver advanced copy functions in environments where Agents for ETERNUS SF AdvancedCopy Manager have not been installed.

This manual is for the Windows/Solaris/Linux.

Intended Readers

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

Organization

This manual consists of the following chapters and appendixes:

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 Uninstallation

> This chapter explains how to uninstall AdvancedCopy Manager CCM.

Chapter 5 Upgrades

> This chapter explains how to upgrade AdvancedCopy Manager CCM.

Appendix A Commands

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

Appendix B Messages for AdvancedCopy Manager CCM

> This appendix explains the messages that are output when AdvancedCopy Manager CCM is used.

Appendix C Troubleshooting

> This appendix explains how to collect data when problems occur.

Appendix D Notes on Operations

> This appendix explains notes on operations of AdvancedCopy Manager CCM.

Appendix E XML Format Output Function

> This appendix explains the XML format output function.

Related Manuals

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

- ETERNUS SF AdvancedCopy Manager Overview

  Provides an overview of ETERNUS SF AdvancedCopy Manager.

- ETERNUS SF AdvancedCopy Manager Installation and Setup Guide

  Describes the installation procedure.

- ETERNUS SF AdvancedCopy Manager Operator's Guide

  Describes the operating procedures.

- ETERNUS SF AdvancedCopy Manager GUI User's Guide

    Describes the operating procedures for the GUI client.

- ETERNUS SF AdvancedCopy Manager Message Guide

    Explains the messages output by ETERNUS SF AdvancedCopy Manager and the associated troubleshooting.

- ETERNUS SF AdvancedCopy Manager Operator's Guide for Cluster Environment

    Describes the installation and customization procedures in a cluster environment.

- ETERNUS SF AdvancedCopy Manager Operator's Guide for Tape Server Option

    Describes the operating procedures for tape backup.

- ETERNUS SF AdvancedCopy Manager Operation Guide for Copy Control Module (this document)

    Describes how to deliver advanced copy functions by using the ETERNUS SF AdvancedCopy Manager Copy Control Module.

- ETERNUS SF AdvancedCopy Manager Glossary

    Describes the terminology used in ETERNUS SF AdvancedCopy Manager manuals.

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

Conventions

- Microsoft(R) Windows Server(R) 2003, Standard Edition, Microsoft(R) Windows Server(R) 2003, Enterprise Edition, Microsoft(R) Windows Server(R) 2003, Enterprise Edition for Itanium-based Systems are abbreviated as "Windows Server 2003".

- Microsoft(R) Windows Server(R) 2008 Standard, Microsoft(R) Windows Server(R) 2008 Enterprise, Microsoft(R) Windows Server(R) 2008 Datacenter, and Microsoft(R) Windows Server(R) 2008 for Itanium-Based Systems are abbreviated as "Windows Server 2008".

- Microsoft(R) Windows Server(R) 2008 R2 Standard, Microsoft(R) Windows Server(R) 2008 R2 Enterprise, Microsoft(R) Windows Server(R) 2008 R2 Datacenter are abbreviated as "Windows Server 2008 R2".

- Microsoft(R) Windows(R) XP Professional and Microsoft(R) Windows(R) XP Home Edition are abbreviated as "Windows XP".

- Windows Vista(R) Home Basic, Windows Vista(R) Home Premium, Windows Vista(R) Business, Windows Vista(R) Enterprise and Windows Vista(R) Ultimate are abbreviated as "Windows Vista".

- Windows(R) 7 Home Basic, Windows(R) 7 Home Premium, Windows(R) 7 Professional, Windows(R) 7 Enterprise and Windows(R) 7 Ultimate are abbreviated as "Windows 7".

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

- "ETERNUS SF AdvancedCopy Manager" is abbreviated as "AdvancedCopy Manager".

- Manager of ETERNUS SF AdvancedCopy Manager is abbreviated as "Manager of AdvancedCopy Manager".

- Agent of ETERNUS SF AdvancedCopy Manager is abbreviated as "Agent of AdvancedCopy Manager".

- ETERNUS DX60/DX80/DX80 S2/DX90/DX90 S2, ETERNUS DX400/DX400 S2 series, ETERNUS DX8000 series, ETERNUS2000, ETERNUS4000, ETERNUS8000, ETERNUS3000, ETERNUS6000, and ETERNUS GR series are referred to as "ETERNUS disk storage systems".

- The Web GUI of ETERNUS DX series and ETERNUSmgr are referred to as "ETERNUS Web GUI".

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Contents

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 Operator's Guide" 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 systems without installing an AdvancedCopy Manager Agent on the server that is backed up (hereafter called the "backup source server").

Using AdvancedCopy Manager CCM has the following advantages:

- There is no need to install an AdvancedCopy Manager Agent on the server that is backed up.

  - Backups can be performed independently of the operating system of the server that is backed up.

  - Operational work becomes more efficient, because there is no need to spend time installing AdvancedCopy Manager Agents on each of the servers to be backed up.

- Security can be improved by isolating the LAN connected to the server to be backed up and the LAN connected to the server where AdvancedCopy Manager CCM is installed (hereafter called the "CCM server").

Figure 1.1 Overview of AdvancedCopy Manager CCM
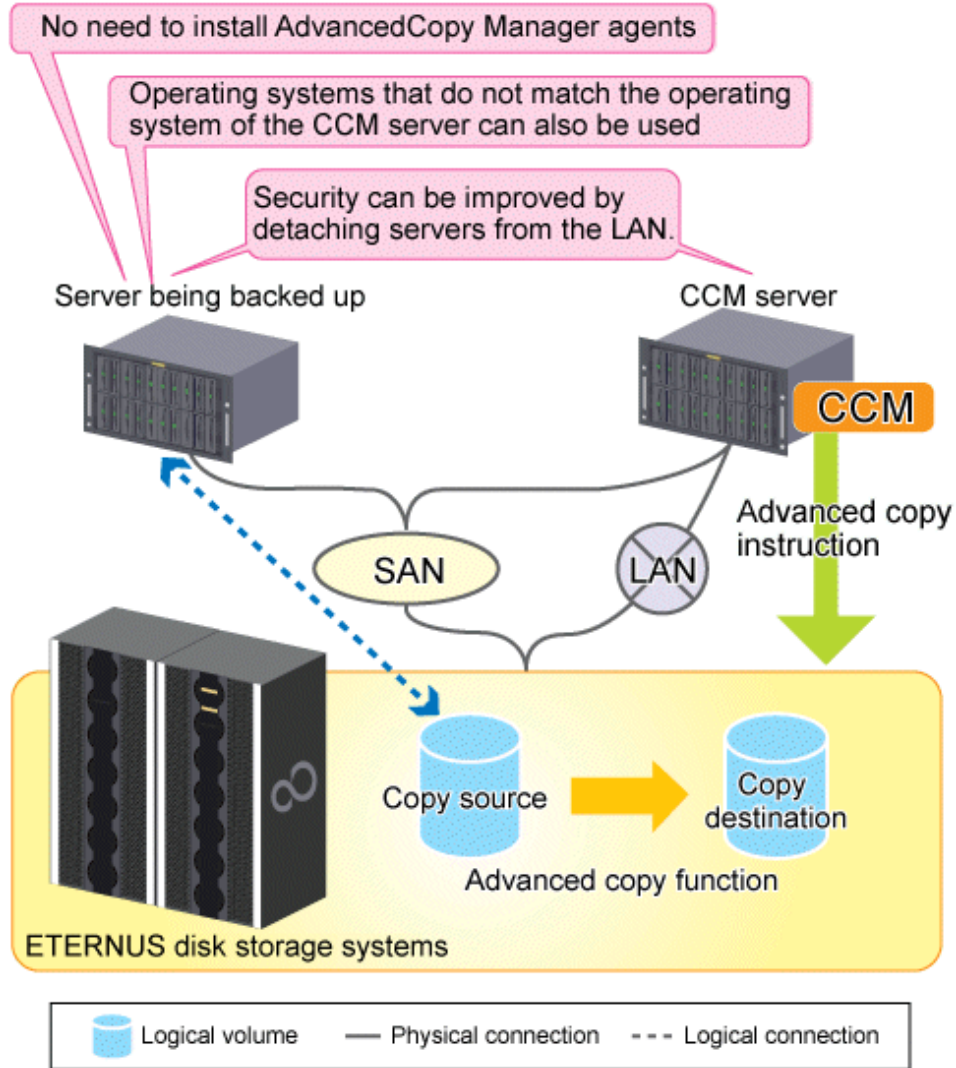
1.3 System Configuration

This section explains the system configuration for AdvancedCopy Manager CCM.

With AdvancedCopy Manager CCM, there must be a logical path between the CCM server and the ETERNUS disk storage systems so that the CCM server can issue advanced copy instructions to the ETERNUS disk storage systems. This logical path is referred to as "access path". To create an access path, the ETERNUS disk storage systems must have a logical volume for control purposes.

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

Connect one of the logical volumes on the ETERNUS disk storage systems to be backed up to the CCM server as an access path.

Figure 1.2 Sample configuration where intra-box copy is executed
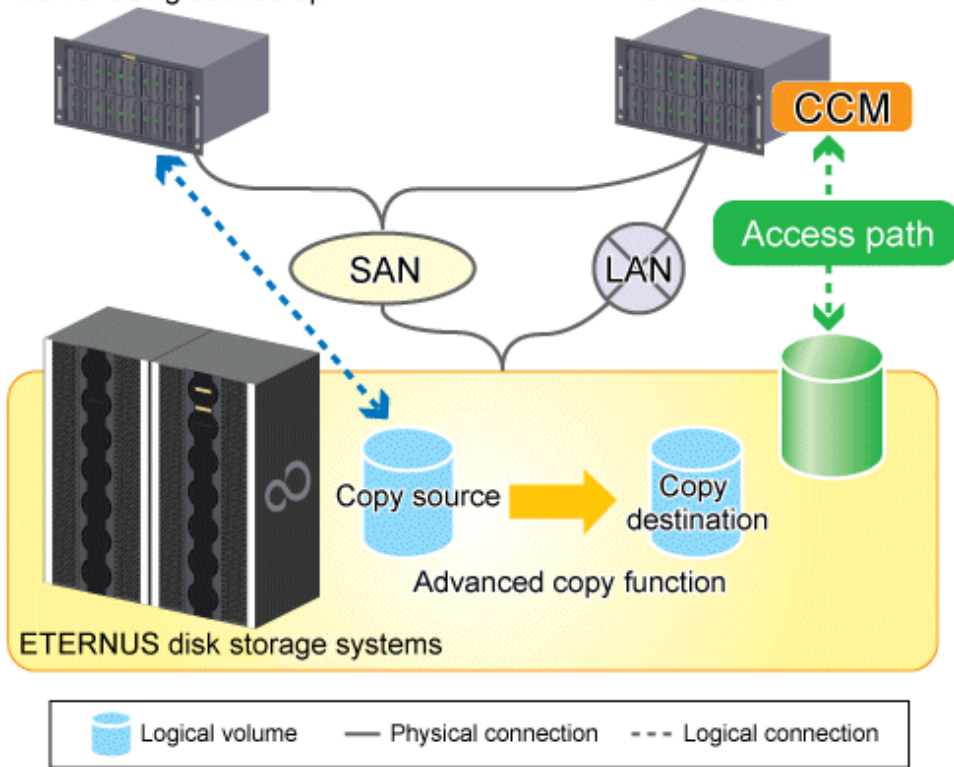
For using inter-box copy (REC)

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

Figure 1.3 Sample configuration where inter-box copy is executed
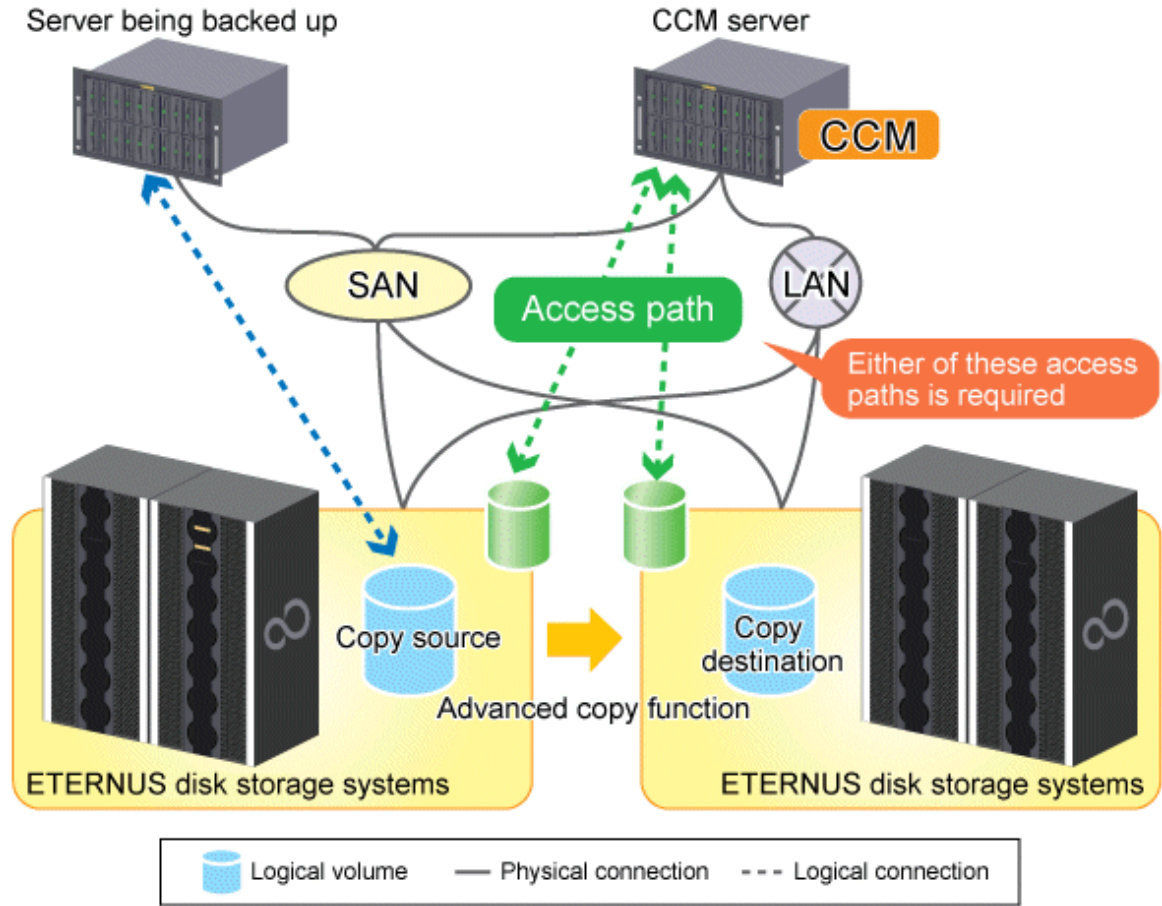
1.4 Operating Environment

This section explains the operating environment for AdvancedCopy Manager CCM.

1.4.1 Hardware requirements

This section describes the hardware requirements when using AdvancedCopy Manager CCM.

1.4.1.1 ETERNUS Disk Storage Systems

One of the following ETERNUS disk storage systems is required to use AdvancedCopy Manager CCM.

Table 1.1 Hardware requirements for ETERNUS disk storage systems

Storage device name	Corresponding firmware version
ETERNUS DX60/DX80/DX80 S2/DX90/DX90 S2	All versions

Storage device name	Corresponding firmware version
ETERNUS DX410/DX410 S2/DX440/DX440 S2	All versions
ETERNUS DX8100/DX8400/DX8700	All versions
ETERNUS2000 models 100 and 200	V10L50 or later
ETERNUS4000 models 300 and 500	V11L50 or later
ETERNUS4000 models 400 and 600	All versions
ETERNUS8000 models 700, 900, 1100 and 2100	V11L50 or later
ETERNUS8000 models 800. 1200 and 2200	All versions

1.4.1.2 CCM Server

The available disk capacity and memory required to use AdvancedCopy Manager CCM are listed below.

Table 1.2 Hardware requirements for CCM Server

Operating system	Available disk capacity	Memory
Windows	200MB or greater	512MB or greater
Solaris	200MB or greater	512MB or greater
Linux	200MB or greater	512MB or greater

1.4.2 Software requirements

This section describes the software requirements for the server used by AdvancedCopy Manager CCM.

1.4.2.1 Basic software

Operating system for the CCM server

Check that the CCM server has one of the following system environments.

Table 1.3 Software requirements for the CCM server

Operating system	Operating system level
Windows	Microsoft(R) Windows Server(R) 2003, Standard Edition SP1,SP2
	Microsoft(R) Windows Server(R) 2003, Enterprise Edition SP1,SP2
	Microsoft(R) Windows Server(R) 2003, Standard x64 Edition
	Microsoft(R) Windows Server(R) 2003, Standard x64 Edition SP2
	Microsoft(R) Windows Server(R) 2003, Enterprise x64 Edition
	Microsoft(R) Windows Server(R) 2003, Enterprise x64 Edition SP2
	Microsoft(R) Windows Server(R) 2003 R2, Standard Edition
	Microsoft(R) Windows Server(R) 2003 R2, Standard Edition SP2
	Microsoft(R) Windows Server(R) 2003 R2, Enterprise Edition
	Microsoft(R) Windows Server(R) 2003 R2, Enterprise Edition SP2
	Microsoft(R) Windows Server(R) 2003 R2, Standard x64 Edition
	Microsoft(R) Windows Server(R) 2003 R2, Standard x64 Edition SP2
	Microsoft(R) Windows Server(R) 2003 R2, Enterprise x64 Edition
	Microsoft(R) Windows Server(R) 2003 R2, Enterprise x64 Edition SP2
	Microsoft(R) Windows Server(R) 2003, Enterprise Edition for Itanium-based Systems (Note 4)
	Microsoft(R) Windows Server(R) 2003, Enterprise Edition for Itanium-based Systems SP2 (Note 4)
	Microsoft(R) Windows Server(R) 2008 Standard (x86,x64) (Note 1)
	Microsoft(R) Windows Server(R) 2008 Standard SP2 (x86,x64) (Note 1)

Operating system	Operating system level
	Microsoft(R) Windows Server(R) 2008 Enterprise (x86,x64) (Note 1) Microsoft(R) Windows Server(R) 2008 Enterprise SP2 (x86,x64) (Note 1) Microsoft(R) Windows Server(R) 2008 Datacenter (x86,x64) (Note 1) Microsoft(R) Windows Server(R) 2008 Datacenter SP2 (x86,x64) (Note 1) Microsoft(R) Windows Server(R) 2008 for Itanium-Based Systems (Note 4) Microsoft(R) Windows Server(R) 2008 for Itanium-Based Systems SP2 (Note 4) Microsoft(R) Windows Server(R) 2008 R2 Standard Microsoft(R) Windows Server(R) 2008 R2 Standard SP1 Microsoft(R) Windows Server(R) 2008 R2 Enterprise Microsoft(R) Windows Server(R) 2008 R2 Enterprise SP1 Microsoft(R) Windows Server(R) 2008 R2 Datacenter Microsoft(R) Windows Server(R) 2008 R2 Datacenter SP1
Solaris	Solaris 10 operating system The following functionality is not supported: - Containers(Zones)
Linux(Note 2)	Red Hat Enterprise Linux 5 (for x86) Red Hat Enterprise Linux 5 (for Intel64) (Note 3) Red Hat Enterprise Linux 5 (for Intel Itanium) (Note 4)

Note 1: The Hyper-V(TM) function of Windows Server 2008 is not supported.

Note 2: AdvancedCopy Manager CCM operation is not supported in an environment where SELinux (Security-Enhanced Linux) is enabled. Disable SELinux at servers that operate AdvancedCopy Manager CCM.

Note 3: Operates in 32-bit compatible mode or 64-bit mode.

Note 4: It is not able to use ETERNUS DX80 S2/DX90 S2, ETERNUS DX410 S2/DX440 S2.

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It is recommended that the copy destination logical volume should not be connected to any server, for the following reasons:

- To prevent copies between different operating systems

- Operating system behavior cannot be guaranteed if there is another logical volume with the same management information in the same ETERNUS disk storage systems

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1.4.2.2 Exclusion software

The AdvancedCopy Manager CCM cannot coexist with the following software.

- ETERNUS SF Express

The AdvancedCopy Manager CCM is internally bundled with the ETERNUS SF Express. When the ETERNUS SF Express has been installed, use the AdvancedCopy Manager CCM bundled with the ETERNUS SF Express.

1.4.2.3 Mandatory software

There is no mandatory software.

1.4.3 Supported functions

AdvancedCopy Manager CCM supports the following advanced copy functions.

Note that copies are executed for each separate logical volume of the ETERNUS disk storage systems.

Table 1.4 Advanced copy functions supported by AdvancedCopy Manager CCM

Advanced copy function		Supported by AdvancedCopy Manager?	Supported by AdvancedCopy Manager CCM?	
			Linux 5 for Intel Itanium	Windows/ Solaris/Linux 5 (for x86, for Intel64)
Snapshot type high-speed copies	OPC	A	A	A
	QuickOPC	A	A	A
	SnapOPC	A	N/A	N/A
	SnapOPC+	A	N/A	A
Synchronous high-speed copies	EC Reversing the copy direction	A	A	A
	EC Concurrent suspension function	A	N/A	A
	REC Reversing the copy direction	A	A	A
	REC Initial copy skip function	A	N/A	A
	REC Concurrent suspension function	A	N/A	A
	REC Displaying or changing information about the REC transfer buffer	A	N/A	A

In the above table, "A" means "Available" and "N/A" means "Not Available".

📙 Note
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- When using AdvancedCopy Manager and AdvancedCopy Manager CCM together, make sure that the different logical volumes do not interact with each other.

- Cluster systems are not supported in AdvancedCopy Manager CCM.

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1.5 Incompatibility Information

This section explains the incompatibility information.

1.5.1 Incompatibility in Version 14.1

Change the registration procedure for remote ETERNUS disk storage systems (Windows version only)

Incompatibility object

AdvancedCopy Manager CCM operated on Windows operating system

Incompatibility details

Version	Details
14.0 or before	Register by specifying no existent drive letter as an access path.

Version	Details
14.1	Register by specifying the BOX-ID of ETERNUS disk storage systems

 See

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For details of the registration procedure, refer to "2.2.6 Registering ETERNUS disk storage systems".

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1.5.2 Changes in Version 14.2

Changed method for adding remote ETERNUS disk storage systems [Solaris version] [Linux 5 (for x86,for Intel64) version]

Incompatibility object

Solaris and Linux 5 (for x86,for Intel64) AdvancedCopy Manager CCM

Incompatibility details

Version	Details
14.1 or before	Register by specifying a non-existent drive letter as an access path
14.2	Register by specifying the BOX-ID of ETERNUS disk storage systems

 See

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For details on how to register, refer to "2.2.6 Registering ETERNUS disk storage systems".

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Changes to messages output [Excluding Linux 5 for Intel Itanium]

Incompatibility object

AdvancedCopy Manager CCM messages [Excluding Linux 5 for Intel Itanium]

Incompatibility details

Command name	14.1 or before	14.2
ccm1001	Input parameter is illegal.	An invalid argument was specified.
ccm1002	An invalid option is specified. option=[OPTION]	An invalid option was specified. option=[OPTION]
ccm1003	An invalid parameter is specified. option=[OPTION], parameter=[PARAMETER]	An invalid parameter was specified. option=[OPTION], parameter=[PARAMETER]
ccm1004	An invalid option is specified. copy group=[COPYGROUP], copy type=[COPYTYPE], option=[OPTION]	An invalid option was specified for the copy type. copy group=[COPYGROUP], copy type=[COPYTYPE], option=[OPTION]
ccm2001	This program requires administrative privileges of the operation system.	This command requires the operating system's administrative privileges.
ccm3001	The disk array already exists. disk array=[DISKARRAY]	The specified disk array is already registered. disk array=[DISKARRAY]
ccm3002	The copy group already exists. copy group=[COPYGROUP]	The specified copy group is already registered. Copy group=[COPYGROUP]

Command name	14.1 or before	14.2
ccm3003	The pair already exists. copy group=[COPYGROUP], pair=[PAIR]	The specified copy pair is already registered. copy group=[COPYGROUP], pair=[PAIR]
ccm3004	An invalid pair is specified. pair=[PAIR], detail=[DETAIL]	An invalid copy pair was specified. pair=[PAIR], detail=[DETAIL]
ccm4001	The disk array does not exist. disk array=[DISKARRAY]	The specified disk array does not exist. disk array=[DISKARRAY]
ccm4002	The disk array does not exist. disk array=[BOX-ID]	The specified disk array does not exist. disk array=[BOX-ID]
ccm4003	The copy group is not found. copy group=[COPYGROUP]	The specified copy group was not found. copy group=[COPYGROUP]
ccm4004	The pair is not found. copy group=[COPYGROUP]	No copy pair was found for the specified copy group. copy group=[COPYGROUP]
ccm4005	The pair is not found. copy group=[COPYGROUP], pair=[PAIR]	The specified copy pair was not found. copy group=[COPYGROUP], pair=[PAIR]
ccm4006	The logical volume is not found. logical volume=[LOGICAL-VOLUME]	The specified logical volume was not found. logical volume=[LOGICAL-VOLUME]
ccm4007	An invalid copy group is specified. copy group=[COPYGROUP], copy type=[COPYTYPE]	An invalid copy group was specified. copy group=[COPYGROUP], copy type=[COPYTYPE]
ccm5005	An invalid mount point is specified. mount point=[MOUNTPOINT]	An invalid mount point was specified. mount point=[MOUNTPOINT]
ccm5006	An invalid device is specified. device=[DEVICE]	An invalid device was specified. device=[DEVICE]

Change to the name of the command for displaying a list of host affinity groups [Excluding Linux 5 for Intel Itanium]

Incompatibility object

AdvancedCopy Manager CCM commands [Excluding Linux 5 for Intel Itanium]

Incompatibility details

Version	Details
14.1 or before	acinq hag (Command for displaying a list of host affinity groups)
14.2	acinq hostag (Command for displaying a list of host affinity groups)

See

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Refer to "A.3.4 acinq hostag (Host affinity group list display command)" for details of the command for displaying a list of host affinity groups.

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Chapter 2 Setup

This chapter explains how to set up AdvancedCopy Manager CCM.

The setup procedure is shown below.

2.1 Installation

This section explains the procedure for installing AdvancedCopy Manager CCM.

Install AdvancedCopy Manager CCM on the server (the CCM Server) that will issue backup/restore (advanced copy) instructions.

2.1.1 Installation on the Windows environment

Use the following procedure to install AdvancedCopy Manager CCM.

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The AdvancedCopy Manager CCM is internally bundled with the ETERNUS SF Express. When the ETERNUS SF Express has been installed, use the AdvancedCopy Manager CCM bundled with the ETERNUS SF Express.

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1. Log in to the system where AdvancedCopy Manager CCM is to be installed.

    Log in as a user that has Administrator privileges on the terminal where AdvancedCopy Manager CCM is to be installed.

2. Insert the AdvancedCopy Manager CCM CD into the CD drive.

3. Execute the installation program (setup.exe) from the appropriate directory for the operating system being used.

OS	Path name of setup.exe
Windows Server 2003	<CD drive>:\windows\setup.exe
Windows Server 2008 Standard Windows Server 2008 Enterprise Windows Server 2008 Datacenter Windows Server 2008 R2 Standard Windows Server 2008 R2 Enterprise Windows Server 2008 R2 Datacenter	<CD drive>:\windows_x86\setup.exe

OS	Path name of setup.exe
Windows Server 2008 Itanium-Based Systems	<CD drive>:\windows_ia64\setup.exe

4. The following window will be displayed.

   Check the information displayed, and then click the [Next] button.
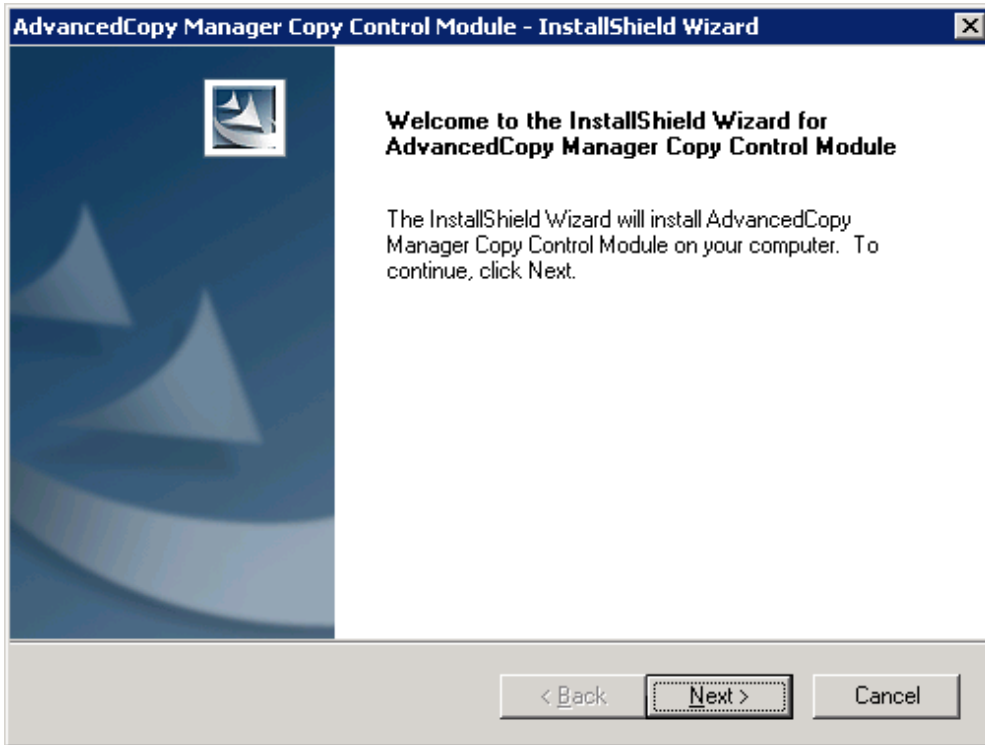
5. Agree to the license agreement in the [License Agreement] window.

   Check the information displayed, and then click the [Yes] button.
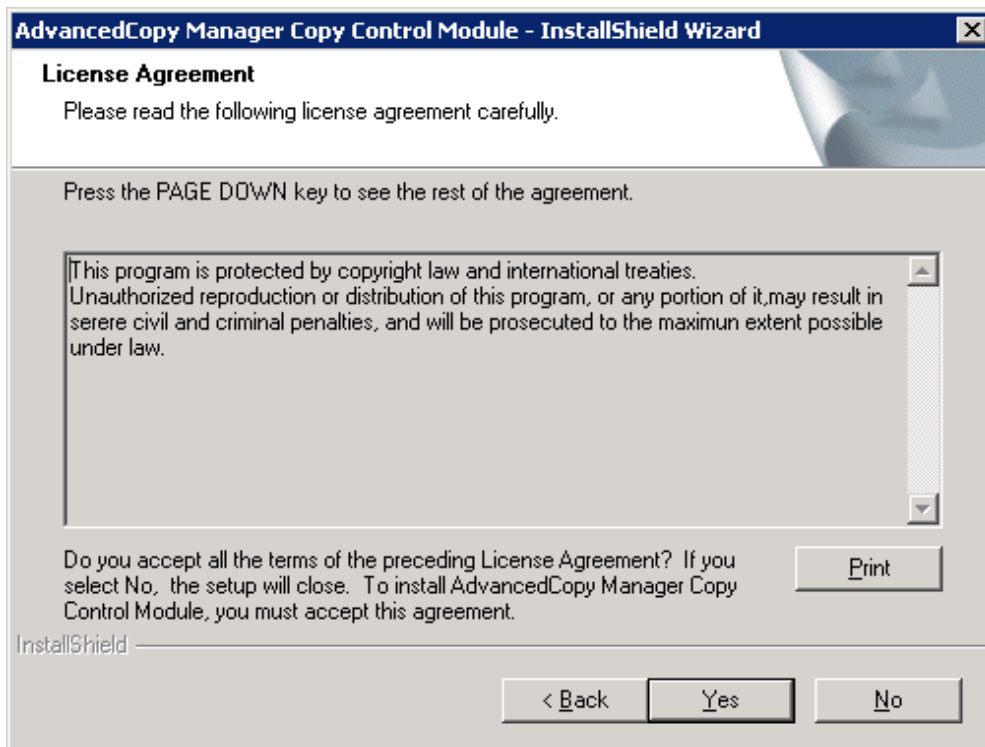
6. Specify the installation directory for AdvancedCopy Manager CCM in the [Choose Destination Location] window.

   To install AdvancedCopy Manager CCM in a directory other than the directory displayed by default, click the [Change] button and change the installation directory.
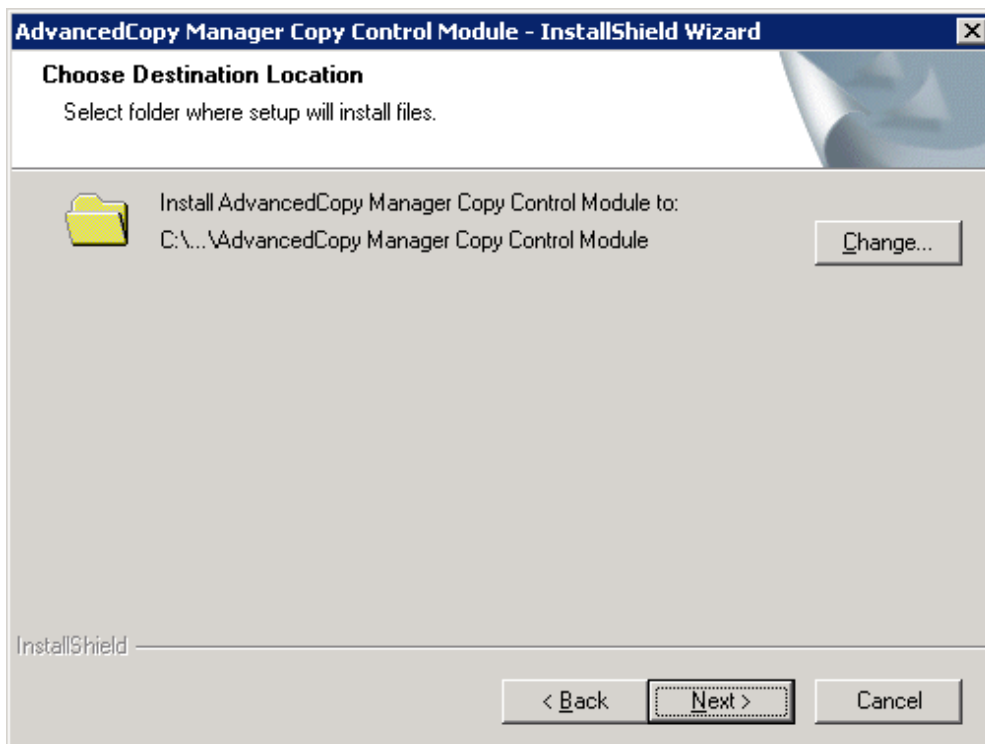
If the [Change] button is clicked, the following window will be displayed.

Select the directory where AdvancedCopy Manager CCM is to be installed, and then click the [OK] button.
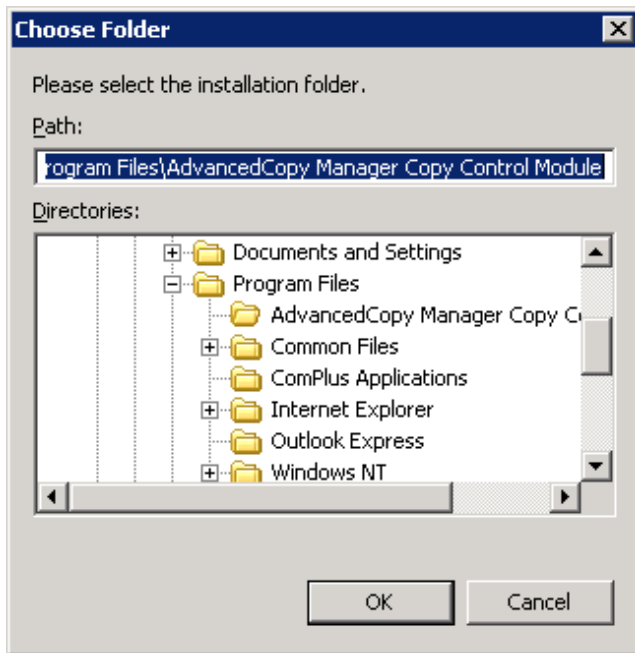
After all directories have been specified, click the [Next] button in the [Choose Destination Location] window.

7. Check the information displayed in the [Start Copying Files] window, and then click the [Next] button.

To change the settings, click the [Back] button.
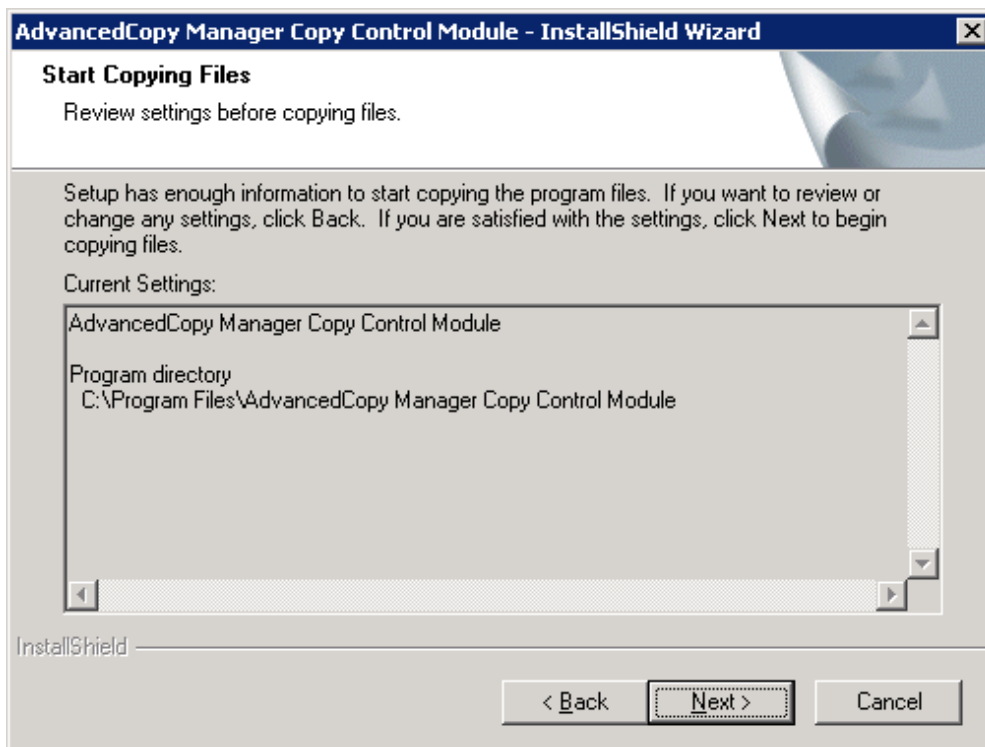
The installation of AdvancedCopy Manager CCM begins.
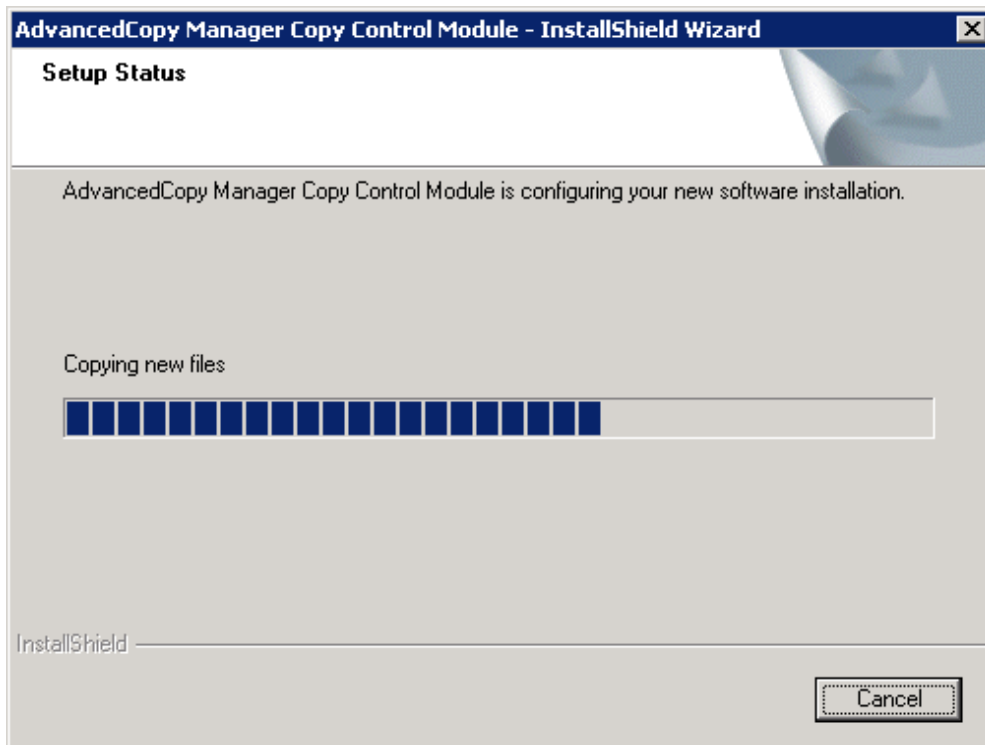
8. The installation of AdvancedCopy Manager CCM is complete when the following window is displayed.

Click the [Finish] button to close the installer.
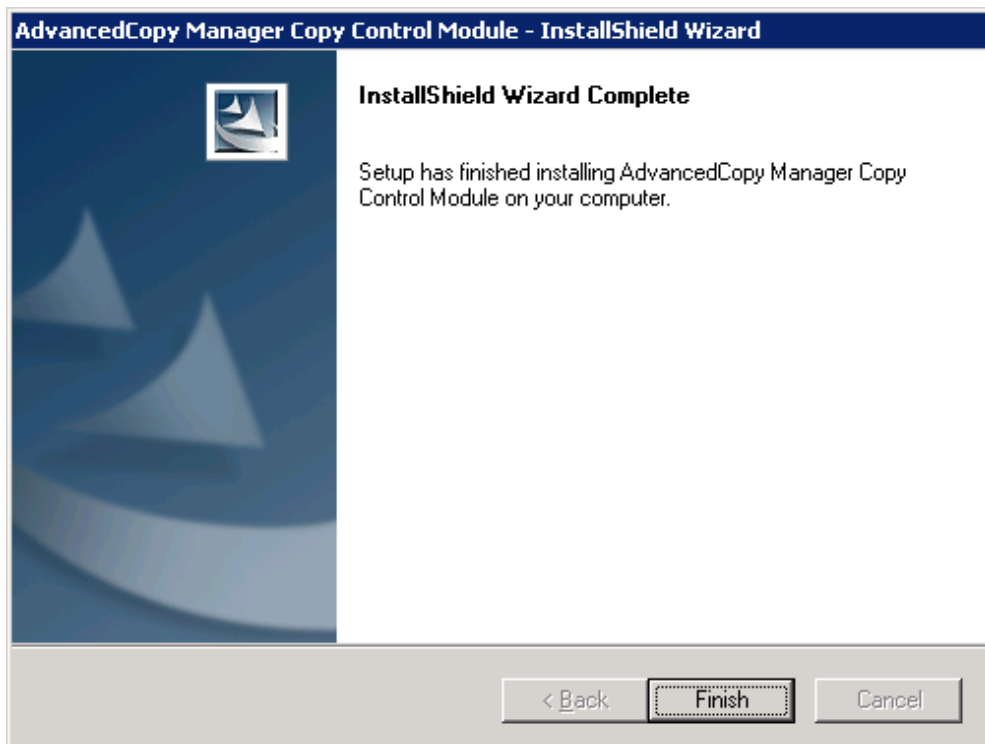
9. Confirm and Install the ETERNUS SF License Manager.

  - For Windows Server 2003

    Double-click on the [Add or Remove Programs] icon in the Control Panel. On the "Add or Remove Programs" window, check whether [ETERNUS SF License Manager] is displayed or not.

  - For Windows Server 2008 or Windows Server 2008 R2

    Double-click on the [Programs and Features] icon in the Control Panel. On the "Programs and Features" window, check whether [ETERNUS SF License Manager] is displayed or not.

If the [ETERNUS SF License Manager] is not displayed, install the ETERNUS SF License Manager by referring the "Installation of License Manager" in the "ETERNUS SF AdvancedCopy Manager Installation and Setup Guide".

2.1.2 Installation on the Solaris environment

Use the following procedure to install AdvancedCopy Manager CCM.

1. Log in as a root user.

2. Insert the AdvancedCopy Manager CCM CD into the CD drive and mount the CD-ROM.

```
# mount -F hsfs -o ro /dev/dsk/c0t4d0s0 <CD-ROM mount point>
```

Note: The device name of the CD-ROM device differs depending on the device.

3. Start the installation.

```
# pkgadd -d <CD-ROM mount point>/solaris/pkg/FJSVccm.pkg FJSVccm
```

The command will display the default installation directory and a message asking if you want to change the installation settings.

```
ETERNUS SF AdvancedCopy Manager Copy Control Module
(sparc) 14.2
Copyright FUJITSU LIMITED 2010
THIS PACKAGE CONTAINS UNPUBLISHED PROPRIETARY SOURCE CODE OF FUJITSU.
The copyright notice above does not evidence any
actual or intended publication of such source code.

Default installation settings for this setup are as follows:
              Program install directory        : /opt
              Fixed configuration directory     : /etc/opt
              Modifying configuration directory : /var/opt

Do you want to change the installation settings? (default: n) [y,n,?,q]
```

Note 1 - Program install directory (installation directory of the package)

/opt is set as the default.

Note 2 - Fixed configuration directory (installation directory of file for environment settings)

/etc/opt is set as the default.

Note 3 - Modifying configuration directory (installation directory of the file to be modified. For example: log file, temporary file)

/var/opt is set as the default.

- If not modifying, enter "n", or hit the return key to continue.

```
Do you want to change the installation settings? (default: n) [y,n,?,q] n
```

- If modifying, enter "y", and then specify the installation directory to be modified.

```
Do you want to change the installation settings? (default: n) [y,n,?,q] y

Please specify install directory: (default: /opt) [?,q] /acm/opt

Please specify fixed configuration directory: (default: /etc/opt) [?,q] /acm/etc/
opt

Please specify variable configuration directory: (default: /var/opt) [?,q] /acm/
var/opt

Installation settings for this setup are as follows:
                Program install directory        : /acm/opt
                Fixed configuration directory    : /acm/etc/opt
                Modifying configuration directory : /acm/var/opt

Do you want to change the installation settings? (default: n) [y,n,?,q]
```

A message asking for confirmation will be displayed. To accept, enter "n", or hit the return key to continue. To make another modification, enter "y".

4. A message to confirm continuation of installation is displayed. Enter "y".

```
This package contains scripts which will be executed with super-user permission during the
process of installing this package.

Do you want to continue with the installation of <FJSVccm> [y,n,?] y
```

5. When installation completes, the message below is displayed.

```
Installation of <FJSVccm> was successful.
```

6. Unmount the CD-ROM using the command below, then press the CD tray's Eject button.

```
# umount <CD-ROM mount point>
```

7. Confirm and Install the ETERNUS SF License Manager.

Check whether the ETERNUS SF License Manager is installed or not.

```
# pkginfo -l FJSVesflm
```

If the package information of the ETERNUS SF License Manager is not displayed, install the ETERNUS SF License Manager by referring the "Installation of License Manager" in the "ETERNUS SF AdvancedCopy Manager Installation and Setup Guide".

2.1.3 Installation on the Linux environment

Use the following procedure to install AdvancedCopy Manager CCM.

1. Log in as a root user.

2. Insert the AdvancedCopy Manager CCM CD into the CD drive and mount the CD-ROM.

   The example below mounts the CD to /dev/cdrom(set in /etc/fstab as the cd media default mount).

   ```
   # mount /dev/cdrom
   ```

3. Start the installation

   [For 5 for x86 system environment]

   ```
   # rpm -ivh <CD-ROM mount point>/linux5_x86/rpm/FJSVccm-14.2-1.i386.rpm
   Preparing...                ######################################### [100%]
      1:FJSVccm                ######################################### [100%]
   ```

   [For 5 for Intel64 system environment]

   ```
   # rpm -ivh <CD-ROM mount point>/linux5_x64/rpm/FJSVccm-14.2-1.x86_64.rpm
   Preparing...                ######################################### [100%]
      1:FJSVccm                ######################################### [100%]
   ```

   When the system environment applies to either of the following condition, you must adopt the case of [For 5 for Intel64 system environment].

   - Manager function of the previous version is installed.

   - Manager function which upgraded from the previous version is installed.

   [For 5 for Intel Itanium system environment]

   ```
   # rpm -ivh <CD-ROM mount point>/linux5_ia64/rpm/FJSVccm-14.1-1.ia64.rpm
   Preparing...                ######################################### [100%]
      1:FJSVccm                ######################################### [100%]
   ```

   If changing the installation directory, use the -relocate option to specify the directory set as the default, and the installation directory you wish to change. The default installation directories are displayed below:

   - Package installation directory

     /opt is set as the default.

   - Installation directory of file for environment settings

     /etc/opt is set as the default.

   - Installation directory of the file to be modified (for example: log file, temporary file)

     /var/opt is set as the default.

   Below is an execution example of changing the installation directory.

   ```
   # rpm -ivh <CD-ROM mount point>/linux5_x86/rpm/FJSVccm-14.2-1.i386.rpm --relocate /opt=/
   acm/opt --relocate /etc/opt=/acm/etc/opt --relocate /var/opt=/acm/var/opt
   ```

```
Preparing...                    ######################################## [100%]
   1:FJSVccm                     ######################################## [100%]
```

4. Unmount and eject the CD-ROM using the commands below.

```
# umount /dev/cdrom
# eject cdrom
```

5. Confirm and Install the ETERNUS SF License Manager.

   Check whether the ETERNUS SF License Manager is installed or not.

```
# rpm -qi FJSVesflm
```

   If the package information of the ETERNUS SF License Manager is not displayed, install the ETERNUS SF License Manager by referring the "Installation of License Manager" in the "ETERNUS SF AdvancedCopy Manager Installation and Setup Guide".

2.2 Environment Settings

This section explains the environment settings for using AdvancedCopy Manager CCM.

Make these settings on all CCM servers.

2.2.1 Configuring User Accounts

This section explains the user accounts that are required when using AdvancedCopy Manager CCM.

2.2.1.1 Windows Server 2003

When using AdvancedCopy Manager CCM in Windows Server 2003, operate as a user with Administrator permissions or a user in the Administrators group.

2.2.1.2 Windows Server 2008 or Windows Server 2008 R2

In Windows Server 2008 and Windows Server 2008 R2, a User Account Control function (hereafter called "UAC") has been added to enhance security.

Cases where UAC is enabled and disabled are explained below.

- When UAC is enabled

   When any user other than the built-in Administrator account (including accounts in the Administrator group) executes a process or program that requires administrator permissions, the "Permissions granted/authorized dialog" is displayed. Permissions granted or authorized must be confirmed.

- When UAC is disabled

   Processes or programs that require administrator permissions must be executed by either the built-in Administrator account or a user account in the Administrators group.

The operating conditions are shown below.

Table 2.1 Relationship between account and UAC

	UAC: Enabled	UAC: Disabled
Built-in Administrator account	A	A
User account in the Administrator group	B	A

	UAC: Enabled	UAC: Disabled
Standard user account	B	C

A: Runs without displaying the permissions granted dialog.

B: Displays the permissions granted dialog, and runs if permissions are approved.

C: Does not run, because Administrator permissions cannot be obtained.

If you do not wish to perform the dialog process using the administrator permissions dialog, and the conditions marked as "B" in the table above apply (for example, in batch processing), the program must be executed using administrator permissions with one of the following methods:

- In the Command Prompt, use the runas command to execute the program as a user with administrator permissions or the permissions required to operate AdvancedCopy Manager. A password must be entered after this.

  [Batch file (test.bat) execution example]

  ```
  runas /noprofile /user:mymachine\acmuser "cmd.exe /k test.bat
  ```

- In the Task Scheduler, specify "Execute with top level privileges" to operate the program.

- From the [Start] menu, select [All Programs]-[Accessories] and right-click on [Command Prompt]. Specify "Run as Administrator" to run the Command Prompt. Execute the program from the Command Prompt.

2.2.1.3 Solaris/Linux user accounts

Execution of AdvancedCopy Manager CCM is only possible for root users. Operate as a root user.

2.2.2 PATH environment variables settings

If using AdvancedCopy Manager CCM commands, add the AdvancedCopy Manager CCM bin directory to the PATH environment variables.

[For Windows]

1. Right-click [Start]-[My Computer] and select [Properties].

2. Select the [Advanced] tab of system properties, and click the [Environment Variables] button.

3. Add the values below to the PATH variables.

   ```
   <AdvancedCopy Manager CCM program directory>\bin
   ```

   Note: Use a semi-colon to separate multiple directories.

[For Solaris/Linux]

If using Bourne shell, add the value to the PATH variables as shown below.

```
# PATH=$PATH:/opt/FJSVccm/bin
# export PATH
```

Note: Use a colon to separate multiple directories.

2.2.3 Configuring the Network Environment

Configure the network environment to perform communications between the CCM Server and the ETERNUS disk storage systems.

Refer to the ETERNUS Web GUI manual and check the network environment settings.

If the network environment configuration is insufficient, set them with ETERNUS Web GUI.

Note

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If setting up a firewall between the CCM server and the ETERNUS disk storage systems, in addition to the ETERNUS Web GUI network environment configuration, use the following settings in the firewall.

Table 2.2 Settings for a firewall between the CCM server and the ETERNUS disk storage systems

Port Number	1999
Protocol	tcp
Communication Start Direction	From CCM server to ETERNUS disk storage systems

. . . .

2.2.4 Access Path Settings

With AdvancedCopy Manager CCM, there must be a logical path between the CCM server and the ETERNUS disk storage systems so that the former can issue advanced copy instructions to the latter. This logical path is referred to as an "access path".To create an access path, the ETERNUS disk storage systems must have a logical volume for control purposes.

Allocate one logical volume within the ETERNUS disk storage systems to the CCM server for access path use.

The settings procedure for the access path is explained below.

- For specifying the access path manually when ETERNUS disk storage systems registered.

    - [For Windows]

        1. Allocate to the server the ETERNUS logical volume to be set up as the access path.

            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 to the server the ETERNUS logical volume to be set up as the access path.

            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 to the server the ETERNUS logical volume to be set up as the access path.

            The allocated logical volume is recognized as a disk.

        2. Initialize the disk in MBR (DOS) or GPT disk format.

- For specifying the access path automatically when ETERNUS disk storage systems registered. [Excluding Linux 5 for Intel Itanium]

    Allocate to the server the ETERNUS logical volume to be set up as the access path.

    The allocated logical volume is recognized as a disk.

2.2.5 Registering Advanced Copy License

When executing the Advanced Copy function of ETERNUS DX60/DX80/DX80 S2/DX90/DX90 S2, it is necessary to register the Advanced Copy license to the License Manager.

Register the Advanced Copy license by referring to "About ETERNUS SF License Manager" in the "ETERNUS SF AdvancedCopy Manager Installation and Setup Guide".

2.2.6 Registering ETERNUS disk storage systems

Register ETERNUS disk storage systems with AdvancedCopy Manager CCM as the devices to be used for copies.

Use "A.2.1 acarray add (ETERNUS disk storage systems registration command)" to register the ETERNUS disk storage systems.

The following ETERNUS disk storage systems information is required for registration.

- ETERNUS disk storage systems 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.

- ETERNUS disk storage systems IP address

- The following user name and password

    - When using ETERNUS DX80 S2/DX90 S2, ETERNUS DX410 S2/DX440 S2:

      The user name with Software role for target storage device and password

    - When using other ETERNUS disk storage systems:

      The user name with Administrator authorization for target storage device and password

- Access path set according to "2.2.4 Access Path Settings".
  This setup can be omitted except for Linux 5 for Intel Itanium.

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For omitting access path setup

To set the access path automatically, execute A.2.1 acarray add (ETERNUS disk storage systems registration command) without -path option.

Follow these steps to find the ETERNUS disk storage system.

- [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. OS standard device (/dev/rdsk/*)

    2. ETERNUS multi path device (/dev/FJSVmplb/rdsk/*)

    3. VxVM(/dev/vx/rdmp/*)

- [For Linux]

    1. OS standard device (/dev/sd*)

    2. by-id format for udev (/dev/disk/by-id/*)

    3. by-path format for udev (/dev/disk/by-path/*)

Even if the access path is invalid because of changing device information, you can change the access path easily by "A.2.5 acarray pathscan (Access path automatic setting command) [Excluding Linux 5 for Intel Itanium]".

Finding valid access path may take a few minutes.
. . . .

For Windows, Solaris, Linux 5 (for x86, for Intel64), when using when using REC for the ETERNUS disk storage systems which is not connected with SAN environment, these ETERNUS disk storage systems must be registered by the method of non-authentication with them. The following ETERNUS disk storage systems information is required for registration.

- ETERNUS disk storage systems name (hereafter called "ETERNUS name")

- ETERNUS disk storage systems BOX-ID

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Note for REC

Both ETERNUS disk storage systems of the copy source and the copy destination must be registered.

Perform the following procedure on the CCM server.

1. Register the one of ETERNUS disk storage systems.

   From two ETERNUS disk storage systems, register the ETERNUS disk storage systems that have the access path set by "2.2.4 Access Path Settings". When both ETERNUS disk storage systems have the access path, register either one.

   Specify the existing drive letter or device name in the access path.

2. Register another one of ETERNUS disk storage systems.

   From two ETERNUS disk storage systems, register another one that is different from the ETERNUS disk storage system registered by step 1.

   - When its ETERNUS disk storage system has the access path:

     Specify the existing drive letter or device name in the access path as well as step 1.

   - When its ETERNUS disk storage system does not have the access path:

     - For Windows, Solaris, Linux 5 (for x86, for Intel64)

       Register it by executing the "A.2.1 acarray add (ETERNUS disk storage systems registration command)" command with -boxid option. It cannot be registered by specifying nonexistent drive letter as an access path.

     - For Linux 5 for Intel Itanium

       Specify any device name as an access path. Nonexistent drive name is also allowed.

3. Create copy groups by referring the "2.2.7 Creating copy groups".

   Specify the ETERNUS name of step 1 in the "-a" option.
   Specify the ETERNUS name of step 2 in the "-remote" option.

. . . .

Execution examples are shown below.

Register the ETERNUS disk storage systems.

```
> acarray add -a E4000 -ip 10.124.6.251 -path c: -user root -password root
Successful completion.
```

To check whether the ETERNUS disk storage systems has been registered, use "A.2.3 acarray list (ETERNUS disk storage systems information display command)".

```
> acarray list

Name  BOX-ID                                  IP Address
----- --------------------------------------- ------------
E4000 00E4000M3#####E450S20A####KD4030639004## 10.124.6.251
```

Register the remote ETERNUS disk storage systems.

For Windows, Solaris, Linux 5 (for x86, for Intel64), execute "A.2.1 acarray add (ETERNUS disk storage systems registration command)" command with -boxid option.

```
> acarray add -a E4000 -boxid 00E4000M3#####E450S20A####KD4030639004## -remote
Successful completion.
```

To check whether the ETERNUS disk storage systems has been registered, use "A.2.3 acarray list (ETERNUS disk storage systems information display command)". The -remote option can be only used in Windows, Solaris, Linux 5 (for x86, for Intel64).

```
> acarray list -remote

Name  BOX-ID
----- ---------------------------------------
E4000 00E4000M3#####E450S20A####KD4030639004##
E8000 00E8000M9#####E890S20A####KO4070639003##
```

2.2.7 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 systems to use.

Refer to "A.6.1 acgroup create (Copy group creation command)" for more information.

```
> acgroup create -g GRP1 -type OPC -a E4000
Successful completion.
```

2.2.8 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

(3) ETERNUS name for the copy destination

(4) Logical volume number for the copy destination

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.

[For Windows, Solaris, Linux 5 (for x86, for Intel64)]

1. Install the AdvancedCopy Manager CCM.

2. Execute "A.9.1 acutil devs (Logical volume information display command) [Excluding Linux 5 for Intel Itanium]" to check the correspondence between the OS device name and the Logical Volume Number.

[For Linux 5 for Intel Itanium, HP-UX, AIX]

1. Check the operating OS.

   For the operating OS, refer to "A.9.2 acgetvolinfo (Logical volume information display command)".

2. Execute "A.9.2 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

  Operation that is not connected to the server is recommended for the logical volume of the copy destination.

  Specify the "-free" option in the "A.3.1 acinq lv (Logical volume information display command)" with the CCM server to check a logical volume number that is not connected to the server.

Note

When adding logical volume of remote ETERNUS disk storage systems registered to copy pair, confirm the logical volume number of the object in ETERNUS Web GUI beforehand.

2. Add the copy pair to a copy group using "A.6.5 acpair add (Copy pair addition command)".

The execution example of making the copy group "GRP1" state in the "Figure 2.2 Adding copy pairs" is as follows.

```
> acpair add -g GRP1 -p E4000/0x25:E4000/0x29
Successful completion.

> acpair add -g GRP1 -p E4000/0x26:E4000/0x30
Successful completion.

> acpair add -g GRP1 -p E4000/0x27:E4000/0x31
Successful completion.

> acpair add -g GRP1 -p E4000/0x28:E4000/0x32
Successful completion.
```

In the case when the copy type is SnapOPCP, the execution example of making the copy group "GRP2" state in the "Figure 2.2 Adding copy pairs" is as follows. This execution example is for Windows, Solaris, Linux 5 (for x86, for Intel64).

```
> acpair add -g GRP2 -p E4000/0x33:E4000/0x35
Successful completion.

> acpair add -g GRP2 -p E4000/0x33:E4000/0x36
Successful completion.

> acpair add -g GRP2 -p E4000/0x34:E4000/0x37
Successful completion.

> acpair add -g GRP2 -p E4000/0x34:E4000/0x38
Successful completion.
```

Figure 2.2 Adding copy pairs
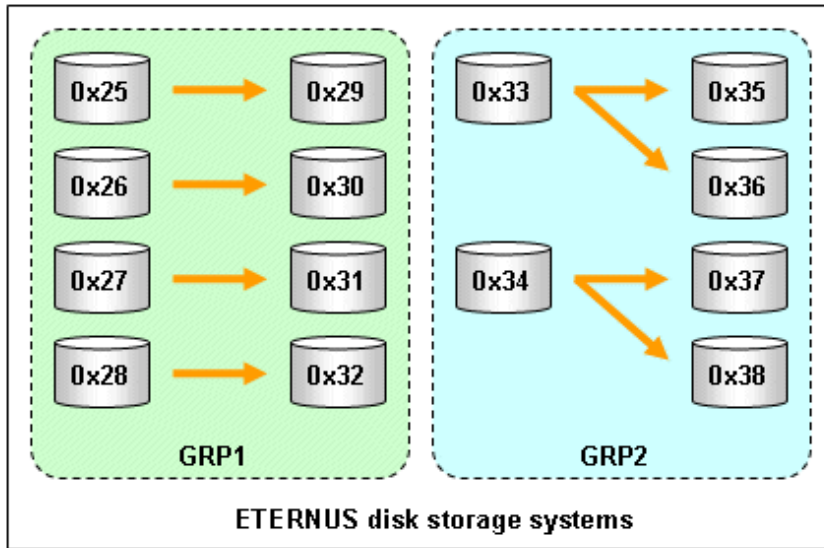
3. Check the logical volume numbers of the copy pairs that have been added.

Display information about the ETERNUS disk storage systems using A.6.3 acgroup detail (Copy group detail information display command), and check that the copy pairs have been added using the specified logical volume numbers.

```
> acgroup detail -g GRP1

Copy Group Name : GRP1
Copy Group Type : OPC
Disk Array Name : E4000 (00E4000M3#####E450S20A####KD4030639004##)


Pair
--------------------
E4000/0x25:E4000/0x29
E4000/0x26:E4000/0x30
E4000/0x27:E4000/0x31
E4000/0x28:E4000/0x32

```

2.2.9 Setting Copy Volume Protection [Excluding Linux 5 for Intel Itanium]

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 systems to protect logical volumes from all advanced copy functions.

This function is supported in Windows, Solaris, Linux 5 (for x86, for Intel64).

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

- A.4.1 acinhibit set (Volume protection settings command) [Excluding Linux 5 for Intel Itanium]

- A.4.2 acinhibit unset (Volume protection settings release command) [Excluding Linux 5 for Intel Itanium]

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

- A.3.1 acinq lv (Logical volume information display command)

 Note

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

The following logical volumes can not be set this function.

- The logical volume in the remote ETERNUS disk storage system

- The destination logical volume with REC session

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

2.2.9.1 Copy Volume Protection Unit

Copy volumes can be protected in logical volume units. They cannot be protected in partition or slice units.

The only type of logical volume that can be protected is the Open (including thin provisioning volume) type.

2.2.9.2 Advanced Copy of Protected Volumes

This section describes advanced copy operations for protected logical volumes.

a. The volume-protected logical volume A can be set as the copy source (backup source).
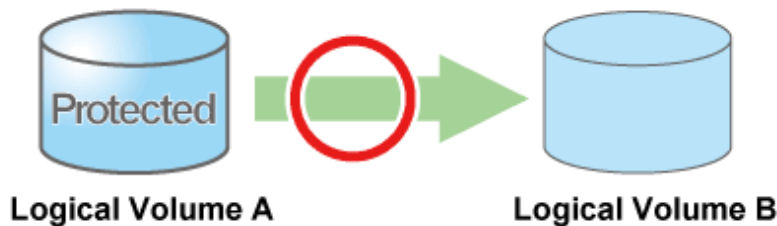
b. The volume-protected logical volume B cannot be set as the copy destination (backup destination).

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

```
> acopc start -g group01

DX440/0x1:DX440/0x6
ccm5007 The target logical volume is write protected. target logical volume=DX440/0x6

  Succeeded : 0
  Failed    : 1
```

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

- "A.7.1 acopc start (OPC/QuickOPC copy start command)"

- "A.7.4 acsnap start (SnapOPC+ copy start command) [Excluding Linux 5 for Intel Itanium]"

- "A.8.1 acec start (Synchronous high-speed copy start command)"

- "A.8.4 acec resume (Synchronous high-speed copy restart command)"

2.2.9.3 Volume Protection Function for Logical Volumes not performed

Volume protection can be set for logical volumes to prevent wrong 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.

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- AdvancedCopy Manager CCM performs backups and restorations regardless of the state of the server to be backed up. Make sure that the server to be backed up has stopped before executing backups and restorations.

- If using commands, perform "2.2.2 PATH environment variables settings".
....

3.1 Executing Advanced Copies

This section explains the procedures for executing advanced copies using AdvancedCopy Manager CCM.

Refer to "Advanced Copies" in the "ETERNUS SF AdvancedCopy Manager Operator's Guide" for more information about each type of copy.

3.1.1 Executing snapshot type high-speed copies

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

3.1.1.1 Backup via OPC

This section explains the operation methods of following processes.

- 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

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

Use A.4.1 acinhibit set (Volume protection settings command) [Excluding Linux 5 for Intel Itanium] at the copy source logical volume to set volume protection.

This function is supported in Windows, Solaris, Linux 5 (for x86, for Intel64).

```
> acinhibit set -v DX440/0x1
Successful completion
```

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

Execute A.3.1 acinq lv (Logical volume information display command) with the -l option added to check the volume protection status.

This function is supported in Windows, Solaris, Linux 5 (for x86, for Intel64).

```
> acinq lv -a DX440 -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

Use "A.7.1 acopc start (OPC/QuickOPC copy start command)" to execute backups via OPC.

[Execution example]

```
> acopc start -g OpcGroup

DX440/0x1:DX440/0x3
# DATE : 2008/06/25 00:00:00 - << OPC Started >>
# From:BoxID=303045343030304d33323232323234534353053323041232323234b44343033303633393030342323/
Olu=1/Adr_high=0/Adr_low=0/size_high=0/size_low=0
# To  :BoxID=303045343030304d33323232323234534353053323041232323234b44343033303633393030342323/
Olu=3/Adr_high=0/Adr_low=0

DX440/0x2:DX440/0x4
# DATE : 2008/06/25 00:00:02 - << OPC Started >>
# From:BoxID=303045343030304d33323232323234534353053323041232323234b44343033303633393030342323/
Olu=2/Adr_high=0/Adr_low=0/size_high=0/size_low=0
# To  :BoxID=303045343030304d33323232323234534353053323041232323234b44343033303633393030342323/
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 "A.7.2 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 : DX440 (00ETERNUSDXM##ET44S20A####HK000104######)

Source    <=> Target    SID  OPC Status      Copy Phase Copied Block
--------- --- --------- ---- --------------- ---------- ------------
DX440/0x1 ==> DX440/0x3 0x21 "OPC Executing" "Copying"         6912
DX440/0x2 ==> DX440/0x4 0x22 "OPC Executing" "Copying"         5760
```

Check the OPC copy progress status

The OPC copy progress status of the backup can be checked by specifying the -progress option for "A.7.2 acopc query (OPC/QuickOPC copy status display command)".

This function is supported in Windows, Solaris, Linux 5 (for x86, for Intel64).

[Execution example]

```
> acopc query -g OpcGroup -progress

Copy Group Name : OpcGroup
Copy Group Type : OPC
```

```
Disk Array Name : DX440 (00ETERNUSDXM##ET44S20A####HK000104######)

Source    <=> Target    Progress Copied Block Total Block
--------- --- --------- -------- ------------ -----------
DX440/0x1 ==> DX440/0x3      0%            0     1048576
DX440/0x2 ==> DX440/0x4     45%       471859     1048576
```

3.1.1.2 Restore on OPC backup environment

This section explains the operation methods of following processes.

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

- Checking volume protection status (only if volume protection is already set)

- Execution of restore

- Check the restore execution status

- Check the OPC copy progress status

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, use A.4.2 acinhibit unset (Volume protection settings release command) [Excluding Linux 5 for Intel Itanium] to release the volume protection settings.

This function is supported in Windows, Solaris, Linux 5 (for x86, for Intel64).

```
> acinhibit unset -v DX440/0x1

Successful completion
```

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

Execute A.3.1 acinq lv (Logical volume information display command) with the -l option added to check the volume protection status.

This function is supported in Windows, Solaris, Linux 5 (for x86, for Intel64).

```
> acinq lv -a DX440 -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 specifying the -r option for "A.7.1 acopc start (OPC/QuickOPC copy start command)".

[Execution example]

```
> acopc start -g OpcGroup -r

DX440/0x1:DX440/0x3
# DATE : 2008/06/25 12:00:00 - << OPC Started >>
# From:BoxID=303045343030304d33323232323234534353053323041232323234b44343033330363339303034232
3/
Olu=3/Adr_high=0/Adr_low=0/size_high=0/size_low=0
# To  :BoxID=303045343030304d33323232323234534353053323041232323234b4434303333036333930303423
23/
```

```
Olu=1/Adr_high=0/Adr_low=0

DX440/0x2:DX440/0x4
# DATE : 2008/06/25 12:00:02 - << OPC Started >>
# From:BoxID=303045543030304d33323232323234534353053323041232323234b4434303330363333930303042323/
Olu=4/Adr_high=0/Adr_low=0/size_high=0/size_low=0
# To  :BoxID=303045543030304d33323232323234534353053323041232323234b4434303330363333930303042323/
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 specifying the -r option for "A.7.2 acopc query (OPC/QuickOPC copy status display command)".

[Execution example]

```
> acopc query -g OpcGroup -r

Copy Group Name : OpcGroup
Copy Group Type: OPC
Disk Array Name : DX440 (00ETERNUSDXM##ET44S20A####HK000104######)

Source    <=> Target    SID  OPC Status       Copy Phase Copied Block
--------- --- --------- ---- --------------- ---------- ------------
DX440/0x1 <== DX440/0x3 0x42 "OPC Executing" "Copying"          9408
DX440/0x2 <== DX440/0x4 0x43 "OPC Executing" "Copying"          3728
```

Check the OPC copy progress status

The OPC copy progress status of the restoration can be checked by specifying the -r option and -progress option for "A.7.2 acopc query (OPC/QuickOPC copy status display command)".

This function is supported in Windows, Solaris, Linux 5 (for x86, for Intel64).

[Execution example]

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

Copy Group Name : OpcGroup
Copy Group Type : OPC
Disk Array Name : DX440 (00ETERNUSDXM##ET44S20A####HK000104######)

Source    <=> Target    Progress Copied Block Total Block
--------- --- --------- -------- ------------ -----------
DX440/0x1 <== DX440/0x3     1%           9408     1048576
DX440/0x2 <== DX440/0x4     1%           3728     1048576
```

 Point
....

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

3.1.1.3 Backup via QuickOPC

This section explains the operation methods of following processes.

- 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 QuickOPC copy progress status

- Check the tracking status

- Execution of backup for the second or subsequent time

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

Use A.4.1 acinhibit set (Volume protection settings command) [Excluding Linux 5 for Intel Itanium] to set volume protection for the copy source logical volume.

This function is supported in Windows, Solaris, Linux 5 (for x86, for Intel64).

```
> acinhibit set -v DX440/0x1
Successful completion
```

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

Execute A.3.1 acinq lv (Logical volume information display command) with the -l option added to check the volume protection status.

This function is supported in Windows, Solaris, Linux 5 (for x86, for Intel64).

```
> acinq lv -a DX440 -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

Use "A.7.1 acopc start (OPC/QuickOPC copy start command)" to execute backups via QuickOPC.

For the first QuickOPC, execute "A.7.1 acopc start (OPC/QuickOPC copy start command)" without specifying the -diff option.

[Execution example]

```
> acopc start -g QuickOpcGroup

DX440/0x1:DX440/0x3
# DATE : 2008/06/25 00:00:00 - << Differential OPC Started >>
# From:BoxID=303045343030304d33323232323234534353053323041232323234b444430333303633393030342323/
Olu=1/Adr_high=0/Adr_low=0/size_high=0/size_low=0
# To  :BoxID=303045343030304d33323232323234534353053323041232323234b444430333303633393030342323/
Olu=3//Adr_high=0/Adr_low=0

DX440/0x2:DX440/0x4
# DATE : 2008/06/25 00:00:02 - << Differential OPC Started >>
#  From:BoxID=303045343030304d33323232323234534353053323041232323234b444430333303633393030342323/
Olu=2/Adr_high=0/Adr_low=0/size_high=0/size_low=0
# To  :BoxID=303045343030304d33323232323234534353053323041232323234b444430333303633393030342323/
```

```
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 3.1 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 "A.7.2 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 : DX440 (00ETERNUSDXM##ET44S20A####HK000104######)

Source    <=> Target    SID  OPC Status      Copy Phase         Copied Block
--------- --- --------- ---- --------------- ------------------ ------------
DX440/0x1 ==> DX440/0x3 0x21 "OPC Executing" "Copying/Tracking"        6912
DX440/0x2 ==> DX440/0x4 0x22 "OPC Executing" "Copying/Tracking"        5760
```

Check the QuickOPC copy progress status

The QuickOPC copy progress status of the backup can be checked by specifying the -progress option for "A.7.2 acopc query (OPC/QuickOPC copy status display command)".

This function is supported in Windows, Solaris, Linux 5 (for x86, for Intel64).

[Execution example]

```
> acopc query -g QuickOpcGroup -progress

Copy Group Name : QuickOpcGroup
Copy Group Type : QuickOPC
Disk Array Name : DX440 (00ETERNUSDXM##ET44S20A####HK000104######)

Source      <=> Target     Progress Copied Block Total Block
---------- --- ---------- -------- ------------ -----------
DX440/0x1 ==> DX440/0x3      1%         6912      1048576
DX440/0x2 ==> DX440/0x4      1%         5760      1048576
```

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

Figure 3.2 What happens when the snapshot processing finishes
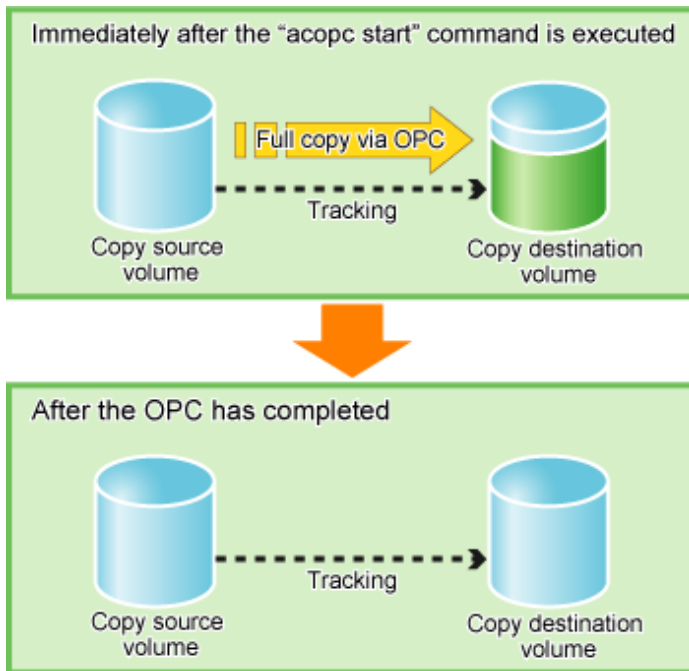
Check the tracking status

The tracking status can be checked using "A.7.2 acopc query (OPC/QuickOPC copy status display command)".

[Execution example]

```
> acopc query -g QuickOpcGroup

Copy Group Name : QuickOpcGroup
Copy Group Type: QuickOPC
Disk Array Name : DX440 (00ETERNUSDXM##ET44S20A####HK000104######)

Source     <=> Target     SID  OPC Status       Copy Phase Copied Block
---------- --- ---------- ---- --------------- ---------- ------------
DX440/0x1 ==> DX440/0x3 0x21 "OPC Executing" "Tracking"      1048576
DX440/0x2 ==> DX440/0x4 0x22 "OPC Executing" "Tracking"      1048576
```

Execution of backup for the second or subsequent time

If the "A.7.1 acopc start (OPC/QuickOPC copy start command)" is executed with the -diff option specified 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

DX440/0x1:DX440/0x3
# DATE : 2008/06/26 00:00:00 - << Differential OPC Started >>
# From:BoxID=303045343030304d33232323232345343530533230412323234b44343033303633393030342323/
Olu=1/Adr_high=0/Adr_low=0/size_high=0/size_low=0
# To   :BoxID=303045343030304d33232323232345343530533230412323234b44343033303633393030342323/
Olu=3/Adr_high=0/Adr_low=0

DX440/0x2:DX440/0x4
# DATE : 2008/06/26 00:00:02 - << Differential OPC Started >>
# From:BoxID=303045343030304d33232323232345343530533230412323234b44343033303633393030342323/
Olu=2/Adr_high=0/Adr_low=0/size_high=0/size_low=0
# To   :BoxID=303045343030304d33232323232345343530533230412323234b44343033303633393030342323/
Olu=4/Adr_high=0/Adr_low=0

  Succeeded : 2
  Failed    : 0
```

Figure 3.3 What happens when the "acopc start" command is executed (for the second or subsequent time)
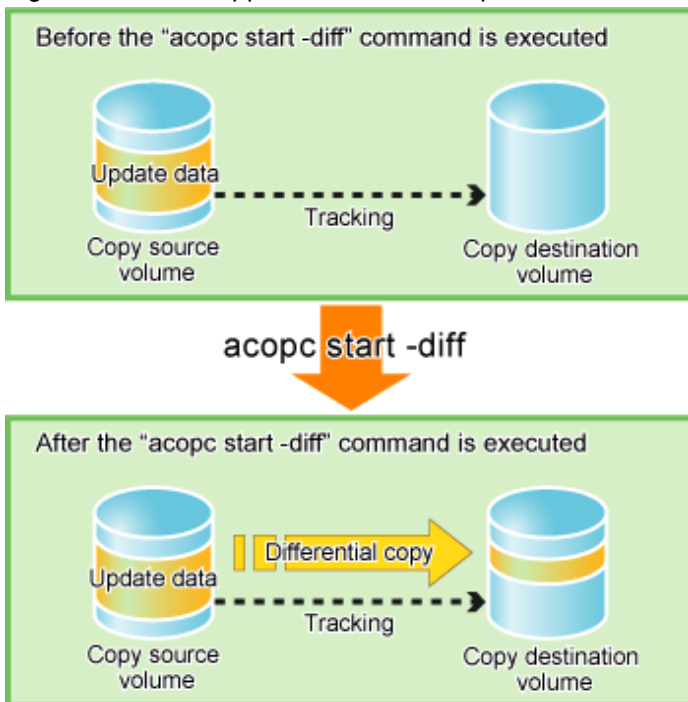
3.1.1.4 Restore on QuickOPC backup environment

This section explains the operation methods of following processes.

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

- Check volume protection status (only if volume protection is already set)

- Execution of restore

- Check the restore execution status

- Check the QuickOPC copy progress status

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, use A.4.2 acinhibit unset (Volume protection settings release command) [Excluding Linux 5 for Intel Itanium] to release the volume protection settings.

This function is supported in Windows, Solaris, Linux 5 (for x86, for Intel64).

```
> acinhibit unset -v DX440/0x1

Successful completion
```

Check volume protection status (only if volume protection is already set)

Execute A.3.1 acinq lv (Logical volume information display command) with the -l option added to check the volume protection status.

This function is supported in Windows, Solaris, Linux 5 (for x86, for Intel64).

```
> acinq lv -a DX440-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 specifying the -r option for "A.7.1 acopc start (OPC/QuickOPC copy start command)".

[Execution example]

```
> acopc start -g QuickOpcGroup -r

DX440/0x1:DX440/0x3
# DATE : 2008/06/26 12:00:00 - << OPC Started >>
# From:BoxID=303045343030304d33232323232323453435305332304123232323234b44343033303633393030342323/
Olu=3/Adr_high=0/Adr_low=0/size_high=0/size_low=0
# To  :BoxID=303045343030304d33232323232323453435305332304123232323234b44343033303633393030342323/
Olu=1/Adr_high=0/Adr_low=0

DX440/0x2:DX440/0x4
# DATE : 2008/06/26 12:00:02 - << OPC Started >>
# From:BoxID=303045343030304d33232323232323453435305332304123232323234b44343033303633393030342323/
Olu=4/Adr_high=0/Adr_low=0/size_high=0/size_low=0
# To  :BoxID=303045343030304d33232323232323453435305332304123232323234b44343033303633393030342323/
Olu=2/Adr_high=0/Adr_low=0

  Succeeded : 2
  Failed    : 0
```
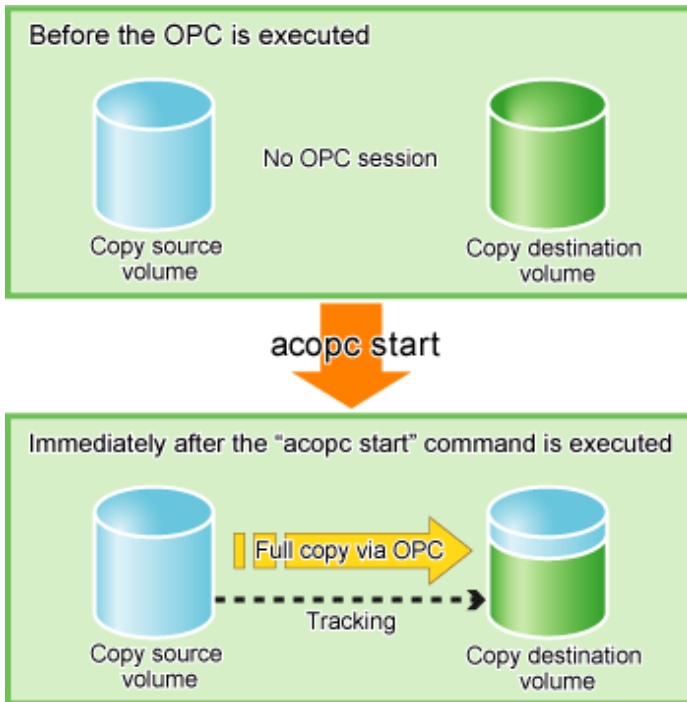
Check the restore execution status

The execution status of the restoration can be checked by specifying the -r option for "A.7.2 acopc query (OPC/QuickOPC copy status display command)".

[Execution example]

```
> acopc query -g QuickOpcGroup -r

Copy Group Name : QuickOpcGroup
Copy Group Type: QuickOPC
Disk Array Name : DX440 (00ETERNUSDXM##ET44S20A####HK000104######)

Source    <=> Target    SID  OPC Status      Copy Phase Copied Block
--------- --- --------- ---- --------------- ---------- ------------
DX440/0x1 <== DX440/0x3 0x42 "OPC Executing" "Copying"        974848
DX440/0x2 <== DX440/0x4 0x43 "OPC Executing" "Copying"        786432
```

P Point

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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 when 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 specifying the -r option and -progress option for "A.7.2 acopc query (OPC/QuickOPC copy status display command)".

This function is supported in Windows, Solaris, Linux 5 (for x86, for Intel64).

[Execution example]

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

Copy Group Name : QuickOpcGroup
Copy Group Type : QuickOPC
Disk Array Name : DX440 (00ETERNUSDXM##ET44S20A####HK000104######)

Source    <=> Target    Progress Copied Block Total Block
--------- --- --------- -------- ------------ -----------
DX440/0x1 <== DX440/0x3     93%       974848     1048576
DX440/0x2 <== DX440/0x4     75%       786432     1048576
```

3.1.1.5 Backup via SnapOPC+ [Excluding Linux 5 for Intel Itanium]

This section explains the operation methods of following processes.

- 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

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

Use A.4.1 acinhibit set (Volume protection settings command) [Excluding Linux 5 for Intel Itanium] at the copy source logical volume to set volume protection.

```
> acinhibit set -v DX440/0x1
Successful completion
```

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

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

```
> acinq lv -a DX440 -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

Use "A.7.4 acsnap start (SnapOPC+ copy start command) [Excluding Linux 5 for Intel Itanium]" to execute backups via SnapOPC+.

[Execution example]

```
> acsnap start -g SnapOPCPGroup

DX440/0x1:DX440/0x4
# DATE : 2008/06/24 16:28:00 - << SnapOPCP Started >>

DX440/0x2:DX440/0x5
# 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 "A.7.5 acsnap query (SnapOPC+ copy status display command) [Excluding Linux 5 for Intel Itanium]".

[Execution example]

```
> acsnap query -g SnapOPCPGroup

Copy Group Name : SnapOPCPGroup
Copy Group Type : SnapOPCP
Disk Array Name : DX440 (00ETERNUSDXM##ET44S20A####HK000104######)

Source    <=> Target    SID  Snap Status              Gen  Date     Copied Block
--------- --- --------- ---- ------------------------ ---- -------- ------------
DX440/0x1 ==> DX440/0x4 0x22 "Copy On Write(Active)"    2  10minute     1048576
DX440/0x1 ==> DX440/0x3 0x21 "Copy On Write(Inactive)"  1  1day         1048576
DX440/0x2 ==> DX440/0x5 0x21 "Copy On Write(Active)"    1  10minute     1048576
DX440/0x2 N/A DX440/0x6 0x22 "Snap action not startup"  N/A N/A               0
```

3.1.1.6 Restore on SnapOPC+ backup environment [Excluding Linux 5 for Intel Itanium]

This section explains the operation methods of following processes.

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

- Checking volume protection status (only if volume protection is already set)

- 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 DX410/DX410 S2/DX440/DX440 S2

- ETERNUS DX8100/DX8400/DX8700

- ETERNUS4000 models 400 and 600

- ETERNUS8000 models 800, 1200 and 2200
・・

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, use A.4.2 acinhibit unset (Volume protection settings release command) [Excluding Linux 5 for Intel Itanium] to release the volume protection settings.

```
> acinhibit unset -v DX440/0x1

Successful completion
```

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

Execute A.3.1 acinq lv (Logical volume information display command) with the -l option added to check the volume protection status.

```
> acinq lv -a DX440 -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 specifying the -r option for "A.7.4 acsnap start (SnapOPC+ copy start command) [Excluding Linux 5 for Intel Itanium]"A.7.1 acopc start (OPC/QuickOPC copy start command).

[Execution example]

```
> acsnap start -g SnapOPCPGroup -r

DX440/0x1:DX440/0x4
# DATE : 2008/06/24 16:28:00 - << SnapOPCP Started >>

DX440/0x2:DX440/0x5
# 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 specifying the -r option for "A.7.5 acsnap query (SnapOPC+ copy status display command) [Excluding Linux 5 for Intel Itanium]".

[Execution example]

```
> acsnap query -g SnapOPCPGroup -r

Copy Group Name : SnapOPCPGroup
Copy Group Type : SnapOPCP
Disk Array Name : DX440 (00ETERNUSDXM##ET44S20A####HK000104######)

Source    <=> Target    SID  OPC Status                 Copy Phase   Copied Block
--------- --- --------- ---- ------------------------- ---- -------- ------------
DX440/0x1 <== DX440/0x4 0x22 "Copy On Write(Active)"   "Copying"         1048576
DX440/0x1 N/A DX440/0x3 0x21 "OPC action not startup"  "Not set"               0
DX440/0x2 N/A DX440/0x5 0x21 "OPC action not startup"  "Not set"               0
DX440/0x2 N/A DX440/0x6 0x22 "OPC action not startup"  "Not set"               0
```

P Point

. . . .

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

. . . .

3.1.2 Executing synchronous high-speed copies

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

3.1.2.1 Backup via EC

This section explains the operation methods of following processes.

- 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

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

Use A.4.1 acinhibit set (Volume protection settings command) [Excluding Linux 5 for Intel Itanium] at the copy source logical volume to set volume protection.

This function is supported in Windows, Solaris, Linux 5 (for x86, for Intel64).

```
> acinhibit set -v DX440/0x1
Successful completion
```

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

Execute A.3.1 acinq lv (Logical volume information display command) with the -l option added to check the volume protection status.

This function is supported in Windows, Solaris, Linux 5 (for x86, for Intel64).

```
> acinq lv -a DX440 -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

Use "A.8.1 acec start (Synchronous high-speed copy start command)" to start an EC.

[Execution example]

```
> acec start -g EcGroup

DX440/0x1:DX440/0x3
# DATE : 2008/06/24 07:00:00 - << EC Started >>
# From:BoxID=303045343030304d3332323232323234534353053323041232323234b444343033303633393030342323/Olu=1/
Adr_high=0/Adr_low=0/size_high=0/size_low=0
# To  :BoxID=303045343030304d3332323232323234534353053323041232323234b444343033303633393030342323/Olu=3/
Adr_high=0/Adr_low=0

DX440/0x2:DX440/0x4
# DATE : 2008/06/24 07:00:02 - << EC Started >>
# From:BoxID=303045343030304d3332323232323234534353053323041232323234b444343033303633393030342323/Olu=2/
Adr_high=0/Adr_low=0/size_high=0/size_low=0
# To  :BoxID=303045343030304d3332323232323234534353053323041232323234b444343033303633393030342323/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 "A.8.2 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 : DX440 (00ETERNUSDXM##ET44S20A####HK000104######)

Source    <=> Target   SID  EC Status       Copy Phase Copied Block
--------- --- --------- ---- --------------- ---------- ------------
DX440/0x1 ==> DX440/0x3 0x1  "EC Executing"  "Paired"       1048576
DX440/0x2 ==> DX440/0x4 0x2  "EC Executing"  "Paired"       1048576
```

Check the EC copy progress status

The EC copy progress status of the backup can be checked by specifying the -progress option for "A.8.2 acec query (Synchronous high-speed copy status display command)".

This function is supported in Windows, Solaris, Linux 5 (for x86, for Intel64).

[Execution example]

```
> acec query -g EcGroup -progress

Copy Group Name : EcGroup
Copy Group Type : EC
Disk Array Name : DX440 (00ETERNUSDXM##ET44S20A####HK000104######)


Source     <=> Target    Progress Copied Block Total Block
---------  --- --------- -------- ------------ -----------
DX440/0x1 ==> DX440/0x3    100%      1048576     1048576
DX440/0x2 ==> DX440/0x4    100%      1048576     1048576
```

Suspend of EC

Use "A.8.3 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

DX440/0x1:DX440/0x3
# DATE : 2008/06/25 00:00:00 - << EC Suspended >>

DX440/0x2:DX440/0x4
# 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, use "A.8.3 acec suspend (Synchronous high-speed copy temporary suspension command)" with -concur option.

This function is supported in Windows, Solaris, Linux 5 (for x86, for Intel64).

[Execution example]

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

Resume of EC

If backup data is no longer required, use "A.8.4 acec resume (Synchronous high-speed copy restart command)" to restart ECs in preparation for the next backup.

[Execution example]

```
> acec resume -g EcGroup

DX440/0x1:DX440/0x3
# DATE : 2008/06/25 07:00:00 - << EC Resumed >>

DX440/0x2:DX440/0x4
# DATE : 2008/06/25 07:00:02 - << EC Resumed >>

  Succeeded : 2
  Failed    : 0
```

3.1.2.2 Restore on EC backup environment

This section explains the operation methods of following processes.

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

- Checking volume protection status (only if volume protection is already set)

- Start of EC

- Check the EC execution status

- Check the EC copy progress status

- Suspend of EC

- Resume of EC

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, use A.4.2 acinhibit unset (Volume protection settings release command) [Excluding Linux 5 for Intel Itanium] to release the volume protection settings.

This function is supported in Windows, Solaris, Linux 5 (for x86, for Intel64).

```
> acinhibit unset -v DX440/0x1

Successful completion
```

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

Execute A.3.1 acinq lv (Logical volume information display command) with the -l option added to check the volume protection status.

This function is supported in Windows, Solaris, Linux 5 (for x86, for Intel64).

```
> acinq lv -a DX440 -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 using "A.8.5 acec reverse (Synchronous high-speed copy reverse command)".

    [Execution example]

```
> acec reverse -g EcGroup

DX440/0x1:DX440/0x3
# DATE : 2008/06/25 12:00:00 - << EC Change >>

DX440/0x2:DX440/0x4
# 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 A.8.5 acec reverse (Synchronous high-speed copy reverse command) is executed (the command terminates normally).

```
> acec reverse -g RecEcGroup

DX440/0x1:DX440/0x3
# DATE : 2008/06/24 16:28:00 - << EC Change >>
Warning:ccm7001 The target logical volume is write protected. target logical
volume=DX440/0x1

  Succeeded : 1
  Failed    : 0
```

Use A.4.2 acinhibit unset (Volume protection settings release command) [Excluding Linux 5 for Intel Itanium] to release the volume protection settings.

2. Restart the EC by specifying the -r option for "A.8.4 acec resume (Synchronous high-speed copy restart command)".

[Execution example]

```
> acec resume -g EcGroup -r

DX440/0x1:DX440/0x3
# DATE : 2008/06/25 12:01:00 - << EC Resumed >>

DX440/0x2:DX440/0x4
# 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 specifying the -r option for "A.8.1 acec start (Synchronous high-speed copy start command)".

[Execution example]

```
> acec start -g EcGroup -r

DX440/0x1:DX440/0x3
# DATE : 2008/06/25 12:00:00 - << EC Started >>
# From:BoxID=303045343030304d33232323232323234534353053323041232323234b44343033330363339303030342323/
Olu=3/Adr_high=0/Adr_low=0/size_high=0/size_low=0
# To  :BoxID=303045343030304d33232323232323234534353053323041232323234b44343033330363339303030342323/
Olu=1/Adr_high=0/Adr_low=0

DX440/0x2:DX440/0x4
# DATE : 2008/06/25 12:00:02 - << EC Started >>
# From:BoxID=303045343030304d33232323232323234534353053323041232323234b44343033330363339303030342323/
Olu=4/Adr_high=0/Adr_low=0/size_high=0/size_low=0
# To  :BoxID=303045343030304d33232323232323234534353053323041232323234b44343033330363339303030342323/
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 "A.8.2 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 -r

Copy Group Name : EcGroup
Copy Group Type : EC
Disk Array Name : DX440 (00ETERNUSDXM##ET44S20A####HK000104######)

Source    <=> Target    SID  EC Status       Copy Phase Copied Block
--------- --- --------- ---- --------------- ---------- ------------
DX440/0x1 <== DX440/0x3 0x1  "EC Executing" "Paired"        1048576
DX440/0x2 <== DX440/0x4 0x2  "EC Executing" "Paired"        1048576
```

Check the EC copy progress status

The EC copy progress status of the restoration can be checked by specifying the -progress option for "A.8.2 acec query (Synchronous high-speed copy status display command)".

This function is supported in Windows, Solaris, Linux 5 (for x86, for Intel64).

[Execution example]

```
> acec query -g EcGroup -progress

Copy Group Name : EcGroup
Copy Group Type : EC
Disk Array Name : DX440 (00ETERNUSDXM##ET44S20A####HK000104######)

Source    <=> Target    Progress Copied Block Total Block
--------- --- --------- -------- ------------ -----------
DX440/0x1 <== DX440/0x3    100%      1048576     1048576
DX440/0x2 <== DX440/0x4    100%      1048576     1048576
```

P Point

Protection settings can be set for a logical volume even when 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 specifying the -r option for "A.8.3 acec suspend (Synchronous high-speed copy temporary suspension command)". The restoration process is now complete.

[Execution example]

```
> acec suspend -g EcGroup -r

DX440/0x1:DX440/0x3
# DATE : 2008/06/25 15:00:00 - << EC Suspended >>

DX440/0x2:DX440/0x4
# DATE : 2008/06/25 15:00:02 - << EC Suspended >>
```

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

For suspend many ECs at the same time by using the concurrent suspend function, use "A.8.3 acec suspend (Synchronous high-speed copy temporary suspension command)" with -concur option.

This function is supported in Windows, Solaris, Linux 5 (for x86, for Intel64).

[Execution example]

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

Resume of EC

Reverse the EC by specifying the -r option for "A.8.5 acec reverse (Synchronous high-speed copy reverse command)" in preparation for the next backup.

[Execution example]

```
> acec reverse -g EcGroup -r

DX440/0x1:DX440/0x3
# DATE : 2008/06/25 15:10:00 - << EC Change >>

DX440/0x2:DX440/0x4
# DATE : 2008/06/25 15:10:02 - << EC Change >>

  Succeeded : 2
  Failed    : 0
```

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

    Use A.4.1 acinhibit set (Volume protection settings command) [Excluding Linux 5 for Intel Itanium] at the copy source logical volume to set volume protection.

    This function is supported in Windows, Solaris, Linux 5 (for x86, for Intel64).

    ```
    > acinhibit set -v DX440/0x1
    Successful completion
    ```

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

Execute A.3.1 acinq lv (Logical volume information display command) with the -l option added to check the volume protection status.

This function is supported in Windows, Solaris, Linux 5 (for x86, for Intel64).

```
> acinq lv -a DX440 -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 -                - -
   :
```

3. Use "A.8.1 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

DX440/0x1:DX8700/0x1
# DATE : 2008/06/24 07:00:00 - << EC Started >>
# From:BoxID=303045343030304d33323232323232345343353053323041232323234b44343033303633393030342323/
Olu=1//Adr_high=0/Adr_low=0/size_high=0/size_low=0
# To  :BoxID=303045383030304d39323232323232345383930533230412323232334b4f34303730363333393030332323/Olu=1/
Adr_high=0/Adr_low=0

DX440/0x2:DX8700/0x2
# DATE : 2008/06/24 07:00:02 - << EC Started >>
# From:BoxID=303045343030304d33323232323232345343353053323041232323234b44343033303633393030342323/Olu=2/
Adr_high=0/Adr_low=0/size_high=0/size_low=0
# To  :BoxID=303045383030304d39323232323232345383930533230412323232334b4f34303730363333393030332323/Olu=2/
Adr_high=0/Adr_low=0

  Succeeded : 2
  Failed    : 0
```

4. Use "A.8.2 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        : DX440 (00ETERNUSDXM##ET44S20A####HK000104######)
Remote Disk Array Name : DX8700 (00ETERNUSDXH##ET87S20A####NC4110699004##)

Source    <=> Target    SID(RSID) EC Status       Copy Phase Copied Block Rcv  Split Xfer
--------- --- --------- ---------- -------------- ---------- ------------ ---- ----- ----
DX440/0x1 ==> DX8700/0x1 0x49(0x10) "EC Executing"  "Paired"      1048576 auto auto  sync
DX440/0x2 ==> DX8700/0x2 0x4A(0x11) "EC Executing"  "Paired"      1048576 auto auto  sync
```

The REC copy progress status of the backup can be checked by specifying the -progress option for "A.8.2 acec query (Synchronous high-speed copy status display command)".

This function is supported in Windows, Solaris, Linux 5 (for x86, for Intel64).

[Execution example]

```
> acec query -g RecEcGroup -progress

Copy Group Name        : RecEcGroup
Copy Group Type        : REC
Disk Array Name        : DX440 (00ETERNUSDXM##ET44S20A####HK000104######)
Remote Disk Array Name : DX8700 (00ETERNUSDXH##ET87S20A####NC4110699004##)


Source     <=> Target    Progress Copied Block Total Block
--------- --- --------- -------- ------------ -----------
DX440/0x1 ==> DX8700/0x1      0%            0     1048576
DX440/0x1 ==> DX8700/0x2    100%      1048576     1048576
```

5. Temporarily suspend the REC by using "A.8.3 acec suspend (Synchronous high-speed copy temporary suspension command)".

   The backup process is now complete.

   [Execution example]

```
> acec suspend -g RecGroup

DX440/0x1:DX8700/0x1
# DATE : 2008/06/25 00:00:00 - << EC Suspended >>

DX440/0x2:DX8700/0x2
# 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, use "A.8.3 acec suspend (Synchronous high-speed copy temporary suspension command)" with -concur option.

   This function is supported in Windows, Solaris, Linux 5 (for x86, for Intel64).

   [Execution example]

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

6. If backup data is no longer required, restart the REC by using "A.8.4 acec resume (Synchronous high-speed copy restart command)" in preparation for the next backup.

   [Execution example]

```
> acec resume -g RecGroup

DX440/0x1:DX8700/0x1
# DATE : 2008/06/25 07:00:00 - << EC Resumed >>

DX440/0x2:DX8700/0x2
# 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. Setting volume protection (only if volume protection is to be set)

   Use A.4.1 acinhibit set (Volume protection settings command) [Excluding Linux 5 for Intel Itanium] at the copy source logical volume to set volume protection.

   This function is supported in Windows, Solaris, Linux 5 (for x86, for Intel64).

   ```
   > acinhibit set -v DX440/0x1
   Successful completion
   ```

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

   Execute A.3.1 acinq lv (Logical volume information display command) with the -l option added to check the volume protection status.

   This function is supported in Windows, Solaris, Linux 5 (for x86, for Intel64).

   ```
   > acinq lv -a DX440 -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 -                  - -
     :
   ```

3. Use "A.8.1 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

     DX440/0x1:DX8700/0x1
     # DATE : 2008/06/24 07:00:00 - << EC Started >>
     #
     From:BoxID=303045343030304d33232323232323453435330533230412323234b443430333036333930304232323
     /Olu=1/Adr_high=0/Adr_low=0/size_high=0/size_low=0
     #
     To  :BoxID=303045383030304d39232323232323453839305332304123232324b4f343037303633393030332323/
     Olu=1/Adr_high=0/Adr_low=0

     DX440/0x2:DX8700/0x2
     # DATE : 2008/06/24 07:00:02 - << EC Started >>
     #
     From:BoxID=303045343030304d33232323232323453435330533230412323234b443430333036333930304232323
     /Olu=2/Adr_high=0/Adr_low=0/size_high=0/size_low=0
     #
     To  :BoxID=303045383030304d39232323232323453839305332304123232324b4f343037303633393030332323/
     Olu=2/Adr_high=0/Adr_low=0

       Succeeded : 2
       Failed    : 0
     ```

- To copy in consistency mode

  Specify -transfer stack option.

  [Execution example]

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

DX440/0x1:DX8700/0x1
# DATE : 2008/06/24 07:00:00 - << EC Started >>
#
From:BoxID=303045343030304d33323232323234534353053323041232323234b44343033303633393030342323
/Olu=1/Adr_high=0/Adr_low=0/size_high=0/size_low=0
#
To  :BoxID=303045383030304d39323232323234534538393053323041232323234b4f343037303633393030332323/
Olu=1/Adr_high=0/Adr_low=0

DX440/0x2:DX8700/0x2
# DATE : 2008/06/24 07:00:02 - << EC Started >>
#
From:BoxID=303045343030304d33323232323234534353053323041232323234b44343033303633393030342323
/Olu=2/Adr_high=0/Adr_low=0/size_high=0/size_low=0
#
To  :BoxID=303045383030304d39323232323234534538393053323041232323234b4f343037303633393030332323/
Olu=2/Adr_high=0/Adr_low=0

  Succeeded : 2
  Failed    : 0
```

4. Use "A.8.2 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.

     [Execution example]

```
> acec query -g RecGroup

Copy Group Name       : RecGroup
Copy Group Type       : REC
Disk Array Name       : DX440 (00ETERNUSDXM##ET44S20A####HK000104######)
Remote Disk Array Name : DX8700 (00ETERNUSDXH##ET87S20A####NC4110699004##)

Source    <=> Target   SID(RSID) EC Status      Copy Phase Copied Block Rcv  Split
Xfer
--------- --- --------- ---------- -------------- ---------- ------------ ----
----- -----
DX440/0x1 ==> DX8700/0x1 0x49(0x10) "EC Executing" "Copying"       1048576 auto
----   stack
DX440/0x2 ==> DX8700/0x2 0x4A(0x11) "EC Executing" "Copying"       1048576 auto
----   stack
```

   - 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
```

- 50 -

```
Copy Group Type       : REC
Disk Array Name       : DX440 (00ETERNUSDXM##ET44S20A####HK000104######)
Remote Disk Array Name : DX8700 (00ETERNUSDXH##ET87S20A####NC4110699004##)


Source   <=> Target   SID(RSID) EC Status     Copy Phase Copied Block Rcv  Split
Xfer
--------- --- --------- ---------- -------------- ---------- ------------ ----
----- -------
DX440/0x1 ==> DX8700/0x1 0x49(0x10) "EC Executing" "Paired"        1048576 auto
----  consist
DX440/0x2 ==> DX8700/0x2 0x4A(0x11) "EC Executing" "Paired"        1048576 auto
----  consist
```

The REC copy progress status of the backup can be checked by specifying the -progress option for "A.8.2 acec query (Synchronous high-speed copy status display command)".

This function is supported in Windows, Solaris, Linux 5 (for x86, for Intel64).

[Execution example]

```
> acec query -g RECGroup -progress

Copy Group Name       : RECGroup
Copy Group Type       : REC
Disk Array Name       : DX440 (00ETERNUSDXM##ET44S20A####HK000104######)
Remote Disk Array Name : DX8700 (00ETERNUSDXH##ET87S20A####NC4110699004##)


Source   <=> Target   Progress Copied Block Total Block
--------- --- --------- -------- ------------ -----------
DX440/0x1 ==> DX8700/0x1    45%      471859    1048576
DX440/0x2 ==> DX8700/0x2   100%     1048576    1048576
```

5. Forcibly and temporarily suspend the REC by specifying the "-force" option for "A.8.3 acec suspend (Synchronous high-speed copy temporary suspension command)".

    [Execution example]

```
> acec suspend -g RecGroup -force

DX440/0x1:DX8700/0x1
# DATE : 2008/06/25 00:00:00 - << EC Suspended >>

DX440/0x2:DX8700/0x2
# DATE : 2008/06/25 00:00:02 - << EC Suspended >>

  Succeeded : 2
  Failed    : 0
```

6. Use "A.8.6 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

DX440/0x1:DX8700/0x1
# DATE : 2008/06/25 00:01:00 - << EC Change >>

DX440/0x2:DX8700/0x2
# DATE : 2008/06/25 00:01:02 - << EC Change >>

  Succeeded : 2
```

```
    Failed     : 0
```

7. Use "A.8.4 acec resume (Synchronous high-speed copy restart command)" to restart RECs.

[Execution example]

```
> acec resume -g RecGroup

DX440/0x1:DX8700/0x1
# DATE : 2008/06/25 00:02:00 - << EC Resumed >>

DX440/0x2:DX8700/0x2
# DATE : 2008/06/25 00:02:02 - << EC Resumed >>

  Succeeded : 2
  Failed    : 0
```

8. Use "A.8.2 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        : DX440 (00ETERNUSDXM##ET44S20A####HK000104######)
Remote Disk Array Name : DX8700 (00ETERNUSDXH##ET87S20A####NC4110699004##)

Source    <=> Target    SID(RSID)  EC Status      Copy Phase Copied Block Rcv  Split Xfer
--------- --- --------- ---------- -------------- ---------- ------------ ---- -----
-------
DX440/0x1 ==> DX8700/0x1 0x49(0x10) "EC Executing" "Paired"       1048576 auto ----
through
DX440/0x2 ==> DX8700/0x2 0x4A(0x11) "EC Executing" "Paired"       1048576 auto ----
through
```

9. Temporarily suspend the REC using "A.8.3 acec suspend (Synchronous high-speed copy temporary suspension command)".

The backup process is now complete.

[Execution example]

```
> acec suspend -g RecGroup

DX440/0x1:DX8700/0x1
# DATE : 2008/06/25 00:10:00 - << EC Suspended >>

DX440/0x2:DX8700/0x2
# DATE : 2008/06/25 00:10:02 - << EC Suspended >>

  Succeeded : 2
  Failed    : 0
```

10. If backup data is no longer required, use "A.8.6 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

DX440/0x1:DX8700/0x1
# DATE : 2008/06/25 07:00:00 - << EC Change >>

DX440/0x2:DX8700/0x2
# 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

DX440/0x1:DX8700/0x1
# DATE : 2008/06/25 07:00:00 - << EC Change >>

DX440/0x2:DX8700/0x2
# DATE : 2008/06/25 07:00:02 - << EC Change >>

  Succeeded : 2
  Failed    : 0
```

11. Restart the REC using "A.8.4 acec resume (Synchronous high-speed copy restart command)".

```
> acec resume -g RecGroup

DX440/0x1:DX8700/0x1
# DATE : 2008/06/25 07:01:00 - << EC Resumed >>

DX440/0x2:DX8700/0x2
# DATE : 2008/06/25 07:01:02 - << EC Resumed >>

  Succeeded : 2
  Failed    : 0
```

3.1.2.4 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. 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, use A.4.2 acinhibit unset (Volume protection settings release command) [Excluding Linux 5 for Intel Itanium] to release the volume protection settings.

   This function is supported in Windows, Solaris, Linux 5 (for x86, for Intel64).

   ```
   > acinhibit unset -v DX440/0x1
   Successful completion
   ```

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

   Execute A.3.1 acinq lv (Logical volume information display command) with the -l option added to check the volume protection status.

   This function is supported in Windows, Solaris, Linux 5 (for x86, for Intel64).

   ```
   > acinq lv -a DX440 -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 -                 - -
     :
   ```

3. 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 an REC session already.

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

     a. Reverse the REC copy direction using "A.8.5 acec reverse (Synchronous high-speed copy reverse command)".

        [Execution example]

        ```
        > acec reverse -g RecGroup

        DX440/0x1:DX8700/0x1
        # DATE : 2008/06/25 12:00:00 - << EC Change >>

        DX440/0x2:DX8700/0x2
        # 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 A.8.5 acec reverse (Synchronous high-speed copy reverse command) is executed (the command terminates normally).

        ```
        > acec reverse -g RecEcGroup

        DX440/0x1:DX8700/0x3
        # DATE : 2008/06/24 16:28:00 - << EC Change >>
        Warning:ccm7001 The target logical volume is write protected. target logical
        volume=DX440/0x1

          Succeeded : 1
          Failed    : 0
        ```

Use A.4.2 acinhibit unset (Volume protection settings release command) [Excluding Linux 5 for Intel Itanium] to release the volume protection settings.

b. Restart the REC by specifying the -r option for "A.8.4 acec resume (Synchronous high-speed copy restart command)".

[Execution example]

```
> acec resume -g RecGroup -r

DX440/0x1:DX8700/0x1
# DATE : 2008/06/25 12:01:00 - << EC Resumed >>

DX440/0x2:DX8700/0x2
# 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 specifying the -r option for "A.8.1 acec start (Synchronous high-speed copy start command)".

[Execution example]

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

DX440/0x1:DX8700/0x1
# DATE : 2008/06/25 12:00:00 - << EC Started >>
#
From:BoxID=303045383030304d39232323232345383930533230412323234b4f3430373036333930303332323/
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

DX440/0x2:DX8700/0x2
# DATE : 2008/06/25 12:00:02 - << EC Started >>
#
From:BoxID=303045383030304d39232323232345383930533230412323234b4f3430373036333930303332323/
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
```

4. Check the status of all of the RECs in the copy group using "A.8.2 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         : DX440 (00ETERNUSDXM##ET44S20A####HK000104######)
Remote Disk Array Name : DX8700 (00ETERNUSDXH##ET87S20A####NC4110699004##)

Source    <=> Target    SID(RSID)  EC Status        Copy Phase Copied Block Rcv  Split Xfer
--------- --- --------- ---------- --------------- ---------- ------------ ---- ----- ----
DX440/0x1 <== DX8700/0x1 0x49(0x10) "EC Executing" "Copying"      1048576 auto ----  sync
```

```
DX440/0x2 <== DX8700/0x2 0x4A(0x11) "EC Executing" "Copying"     1048576 auto ----  sync
```

5. Temporarily suspend the REC by specifying the -r option for "A.8.3 acec suspend (Synchronous high-speed copy temporary suspension command)".

The restoration process is now complete.

[Execution example]

```
> acec suspend -g RecGroup -r

DX440/0x1:DX8700/0x1
# DATE : 2008/06/25 15:00:00 - << EC Suspended >>

DX440/0x2:DX8700/0x2
# DATE : 2008/06/25 15:00:02 - << EC Suspended >>

  Succeeded : 2
  Failed    : 0
```

6. Reverse the REC copy direction by specifying the -r option for "A.8.5 acec reverse (Synchronous high-speed copy reverse command)" in preparation for the next backup.

[Execution example]

```
> acec reverse -g RecGroup -r

DX440/0x1:DX8700/0x1
# DATE : 2008/06/25 15:10:00 - << EC Change >>

DX440/0x2:DX8700/0x2
# DATE : 2008/06/25 15:10:02 - << EC Change >>

  Succeeded : 2
  Failed    : 0
```

P Point

• •

The copy destination logical volumes with REC session can not be set volume protection.

If the REC session is not existence after restoration, you can set volume protection.

• •

Restore in stack mode or consistency mode

Execute restoration via REC using the following procedures.

1. 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, use A.4.2 acinhibit unset (Volume protection settings release command) [Excluding Linux 5 for Intel Itanium] to release the volume protection settings.

   This function is supported in Windows, Solaris, Linux 5 (for x86, for Intel64).

```
> acinhibit unset -v DX440/0x1
Successful completion
```

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

Execute A.3.1 acinq lv (Logical volume information display command) with the -l option added to check the volume protection status.

This function is supported in Windows, Solaris, Linux 5 (for x86, for Intel64).

```
> acinq lv -a DX440 -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 -                  - -
  :
```

3. 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 an REC session already.

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

    a. Check the transfer mode of the REC by using "A.8.2 acec query (Synchronous high-speed copy status display command)".

    If necessary, use "A.8.6 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

DX440/0x1:DX8700/0x1
# DATE : 2008/06/25 12:01:00 - << EC Change >>

DX440/0x2:DX8700/0x2
# 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

DX440/0x1:DX8700/0x1
# DATE : 2008/06/25 12:01:00 - << EC Change >>

DX440/0x2:DX8700/0x2
# DATE : 2008/06/25 12:01:02 - << EC Change >>

  Succeeded : 2
  Failed    : 0
```

    b. Reverse the REC direction by using "A.8.5 acec reverse (Synchronous high-speed copy reverse command)".

    [Execution example]

```
> acec reverse -g RecGroup

DX440/0x1:DX8700/0x1
# DATE : 2008/06/25 12:00:00 - << EC Change >>

DX440/0x2:DX8700/0x2
# 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 A.8.5 acec reverse (Synchronous high-speed copy reverse command) is executed (the command terminates normally).

```
> acec reverse -g RecEcGroup

DX440/0x1:DX8700/0x3
# DATE : 2008/06/24 16:28:00 - << EC Change >>
Warning:ccm7001 The target logical volume is write protected. target logical
volume=DX440/0x1

  Succeeded : 1
  Failed    : 0
```

Use A.4.2 acinhibit unset (Volume protection settings release command) [Excluding Linux 5 for Intel Itanium] to release the volume protection settings.

. . . .

c. Restart the REC by specifying the -r option for "A.8.4 acec resume (Synchronous high-speed copy restart command)".

[Execution example]

```
> acec resume -g RecGroup -r

DX440/0x1:DX8700/0x1
# DATE : 2008/06/25 12:02:00 - << EC Resumed >>

DX440/0x2:DX8700/0x2
# 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 specifying the -r option for "A.8.1 acec start (Synchronous high-speed copy start command)".

[In the case of stack mode]

[Execution example]

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

DX440/0x1:DX8700/0x1
# DATE : 2008/06/25 12:00:00 - << EC Started >>
#
From:BoxID=303045383030304d39232323232345383930533230412323234b4f34303730363339303033232323/
```

```
Olu=1/Adr_high=0/Adr_low=0/size_high=0/size_low=0
# To  :BoxID=303045343030304d333232323232323453435305332304123232234b44343033303633393030342323/
Olu=1/Adr_high=0/Adr_low=0

DX440/0x2:DX8700/0x2
# DATE : 2008/06/25 12:00:02 - << EC Started >>
#
From:BoxID=303045383030304d39232323232323453839305332304123232234b4f3430373036333393030332323/
Olu=2/Adr_high=0/Adr_low=0/size_high=0/size_low=0
# To  :BoxID=303045343030304d333232323232323453435305332304123232234b44343033303633393030342323/
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

DX440/0x1:DX8700/0x1
# DATE : 2008/06/25 12:00:00 - << EC Started >>
#
From:BoxID=303045383030304d39232323232323453839305332304123232234b4f3430373036333393030332323/
Olu=1/Adr_high=0/Adr_low=0/size_high=0/size_low=0
# To  :BoxID=303045343030304d333232323232323453435305332304123232234b44343033303633393030342323/
Olu=1/Adr_high=0/Adr_low=0

DX440/0x2:DX8700/0x2
# DATE : 2008/06/25 12:00:02 - << EC Started >>
#
From:BoxID=303045383030304d39232323232323453839305332304123232234b4f3430373036333393030332323/
Olu=2/Adr_high=0/Adr_low=0/size_high=0/size_low=0
# To  :BoxID=303045343030304d333232323232323453435305332304123232234b44343033303633393030342323/
Olu=2/Adr_high=0/Adr_low=0

  Succeeded : 2
  Failed    : 0
```

4. Check the status of all of the RECs in the copy group by specifying the -r option for "A.8.2 acec query (Synchronous high-speed copy status display command)".

In the case of stack mode

Check that the copied block count and the entire block count are the same.

[Execution example]

```
> acec query -g RecGroup -r

Copy Group Name        : RecGroup
Copy Group Type        : REC
Disk Array Name        : DX440 (00ETERNUSDXM##ET44S20A####HK000104######)
Remote Disk Array Name : DX8700 (00ETERNUSDXH##ET87S20A####NC4110699004##)


Source    <=> Target    SID(RSID)  EC Status      Copy Phase Copied Block Rcv  Split Xfer
--------- --- --------- ---------- -------------- ---------- ------------ ---- ----- -----
DX440/0x1 <== DX8700/0x1 0x49(0x10) "EC Executing" "Copying"      1048576 auto ----  stack
DX440/0x2 <== DX8700/0x2 0x4A(0x11) "EC Executing" "Copying"      1048576 auto ----  stack
```

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        : DX440 (00ETERNUSDXM##ET44S20A####HK000104######)
Remote Disk Array Name : DX8700 (00ETERNUSDXH##ET87S20A####NC4110699004##)

Source    <=> Target    SID(RSID) EC Status      Copy Phase Copied Block Rcv  Split Xfer
--------- --- --------- ---------- -------------- ---------- ------------ ---- -----
-------
DX440/0x1 <== DX8700/0x1 0x49(0x10) "EC Executing" "Paired"        1048576 auto ----
consist
DX440/0x2 <== DX8700/0x2 0x4A(0x11) "EC Executing" "Paired"        1048576 auto ----
consist
```

5. Forcibly and temporarily suspend the REC by specifying the "-force" option for "A.8.3 acec suspend (Synchronous high-speed copy temporary suspension command)".

[Execution example]

```
> acec suspend -g RecGroup -r -force

DX440/0x1:DX8700/0x1
# DATE : 2008/06/25 15:00:00 - << EC Suspended >>

DX440/0x2:DX8700/0x2
# DATE : 2008/06/25 15:00:02 - << EC Suspended >>

  Succeeded : 2
  Failed    : 0
```

6. Use "A.8.6 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

DX440/0x1:DX8700/0x1
# DATE : 2008/06/25 15:01:00 - << EC Change >>

DX440/0x2:DX8700/0x2
# DATE : 2008/06/25 15:01:02 - << EC Change >>

  Succeeded : 2
  Failed    : 0
```

7. Restart the REC by specifying the -r option for "A.8.4 acec resume (Synchronous high-speed copy restart command)".

[Execution example]

```
> acec resume -g RecGroup -r

DX440/0x1:DX8700/0x1
# DATE : 2008/06/25 15:02:00 - << EC Resumed >>
```

```
DX440/0x2:DX8700/0x2
# DATE : 2008/06/25 15:02:02 - << EC Resumed >>

  Succeeded : 2
  Failed    : 0
```

8. Specify the -r option for "A.8.2 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 -r

Copy Group Name        : RecGroup
Copy Group Type        : REC
Disk Array Name        : DX440 (00ETERNUSDXM##ET44S20A####HK000104######)
Remote Disk Array Name : DX8700 (00ETERNUSDXH##ET87S20A####NC4110699004##)

Source    <=> Target    SID(RSID) EC Status      Copy Phase Copied Block Rcv  Split Xfer
--------- --- --------- ---------- -------------- ---------- ------------ ---- ----- ----
DX440/0x1 <== DX8700/0x1 0x49(0x10) "EC Executing" "Paired"      1048576 auto ----
through
DX440/0x2 <== DX8700/0x2 0x4A(0x11) "EC Executing" "Paired"      1048576 auto ----
through
```

9. Temporarily suspend the REC by specifying the -r option for "A.8.3 acec suspend (Synchronous high-speed copy temporary suspension command)".

The restoration process is now complete.

[Execution example]

```
> acec suspend -g RecGroup -r

DX440/0x1:DX8700/0x1
# DATE : 2008/06/25 15:10:00 - << EC Suspended >>

DX440/0x2:DX8700/0x2
# DATE : 2008/06/25 15:10:02 - << EC Suspended >>

  Succeeded : 2
  Failed    : 0
```

10. Specify the -r option for "A.8.6 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.

In the case of stack mode

[Execution example]

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

DX440/0x1:DX8700/0x1
# DATE : 2008/06/25 15:20:00 - << EC Change >>

DX440/0x2:DX8700/0x2
# 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

DX440/0x1:DX8700/0x1
# DATE : 2008/06/25 15:20:00 - << EC Change >>

DX440/0x2:DX8700/0x2
# DATE : 2008/06/25 15:20:02 - << EC Change >>

  Succeeded : 2
  Failed   : 0
```

11. Reverse the REC copy direction by specifying the -r option for "A.8.5 acec reverse (Synchronous high-speed copy reverse command)".

[Execution example]

```
> acec reverse -g RecGroup -r

DX440/0x1:DX8700/0x1
# DATE : 2008/06/25 15:21:00 - << EC Change >>

DX440/0x2:DX8700/0x2
# DATE : 2008/06/25 15:21:02 - << EC Change >>

  Succeeded : 2
  Failed   : 0
```

Point

. . . .

The copy destination logical volumes with REC session can not be set volume protection.

If the REC session is not existence after restoration, you can set volume protection.

. . . .

3.1.2.5 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	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.
		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.
		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.
Asynchronous transfer methods	Stack	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.
		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.
	Consistency	This mode guarantees the sequence of transfers between copy sessions for the copy destination ETERNUS disk storage systems, and is suitable for operations, such as on databases, that perform mirroring using copies that consist of multiple areas.
		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.
	Through	This mode is for transferring data that has not been transferred when copies in stack mode or consistency mode are stopped or suspended.

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	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. 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.

3.1.2.6 Backup via REC using initial copy skip [Excluding Linux 5 for Intel Itanium]

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 the "A.8.1 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.

```
> acec start -g RecEcGroup -skip

E4000/0x1:E8000/0x1
# DATE : 2008/06/24 16:28:00 - << EC Started >>
#
From:BoxID=303045343030304d33323232323234534353053323041232323234b44343033303633393030342323/Olu=1/
Adr_high=0/Adr_lw=0/size_high=0/size_low=0
#
To  :BoxID=303045383030304d39323232323234538393053323041232323234b4f34303730363333933030332323/Olu=1/
Adr_high=0/Adr_low=0

E4000/0x2:E8000/0x2
# DATE : 2008/06/24 16:28:00 - << EC Started >>
#
From:BoxID=303045343030304d33323232323234534353053323041232323234b44343033303633393030342323/Olu=2/
Adr_high=0/Adr_low=0/size_high=0/size_low=0
#
To  :BoxID=303045383030304d39323232323234538393053323041232323234b4f34303730363333933030332323/Olu=2/
Adr_high=0/Adr_low=0

  Succeeded : 2
  Failed    : 0
```

Use "A.8.2 acec query (Synchronous high-speed copy status display command)" to check the status of all of the RECs in the copy group.

```
> acec query -g RecEcGroup

Copy Group Name        : RecEcGroup
Copy Group Type        : REC
Disk Array Name        : E4000 (00E4000M3#####E450S20A####KD4030639004##)
Remote Disk Array Name : E8000 (00E8000M9#####E890S20A####KO4070639003##)

Source    <=> Target   SID(RSID)  EC Status               Copy Phase Copied Block Rcv  Split Xfer
--------- --- --------- ---------- ----------------------- ---------- ------------ ---- ----- -------
E4000/0x1 ==> E8000/0x1 0x4B(0x12) "EC Suspend"            "Paired"        1048576 auto auto  through
E4000/0x2 ==> E8000/0x2 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 the "A.8.4 acec resume (Synchronous high-speed copy restart command)" with -remain option.

```
> acec resume -g RecEcGroup -remain

E4000/0x1:E8000/0x1
# DATE : 2008/06/24 16:28:00 - << EC Resumed >>

E4000/0x2:E8000/0x2
# DATE : 2008/06/24 16:28:00 - << EC Resumed >>

  Succeeded : 2
```

```
Failed   : 0
```

3.1.2.7 Restore on REC backup environment using initial copy skip [Excluding Linux 5 for Intel Itanium]

Refer to "3.1.2.4 Restore on REC backup environment", for the restoration procedure on REC backup environment using initial copy skip function.

3.1.2.8 Using Concurrent suspension function on EC/REC [Excluding Linux 5 for Intel Itanium]

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

To use the concurrent suspension function, execute the "A.8.3 acec suspend (Synchronous high-speed copy temporary suspension command)" with -concur option. For the operating methods, refer to "3.1.2.1 Backup via EC" or "3.1.2.3 Backup via REC".

📝 Note

- The concurrent suspension function of REC can be used, when the transfer mode is not Stack mode and an ETERNUS disk storage system that set the access path is copy-source box.

- 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 "A.5.2 acrecbuff stat (REC transfer buffer status display command) [Excluding Linux 5 for Intel Itanium]" with -disk option in "DiskRate".

Changing timeout value for concurrent suspension function

When there is many data or the network is not good condition, a timeout error will occur. When a timeout occurs, the following message is output.

```
> 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 suspension function.

📘 See

For the method of changing the timeout value for concurrent suspension function, refer to "3.4.7 Changing timeout value for concurrent suspension function [Excluding Linux 5 Intel Itanium]".

3.2 Backing Up to Tape

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

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

Figure 3.4 Overview of backup to tape library
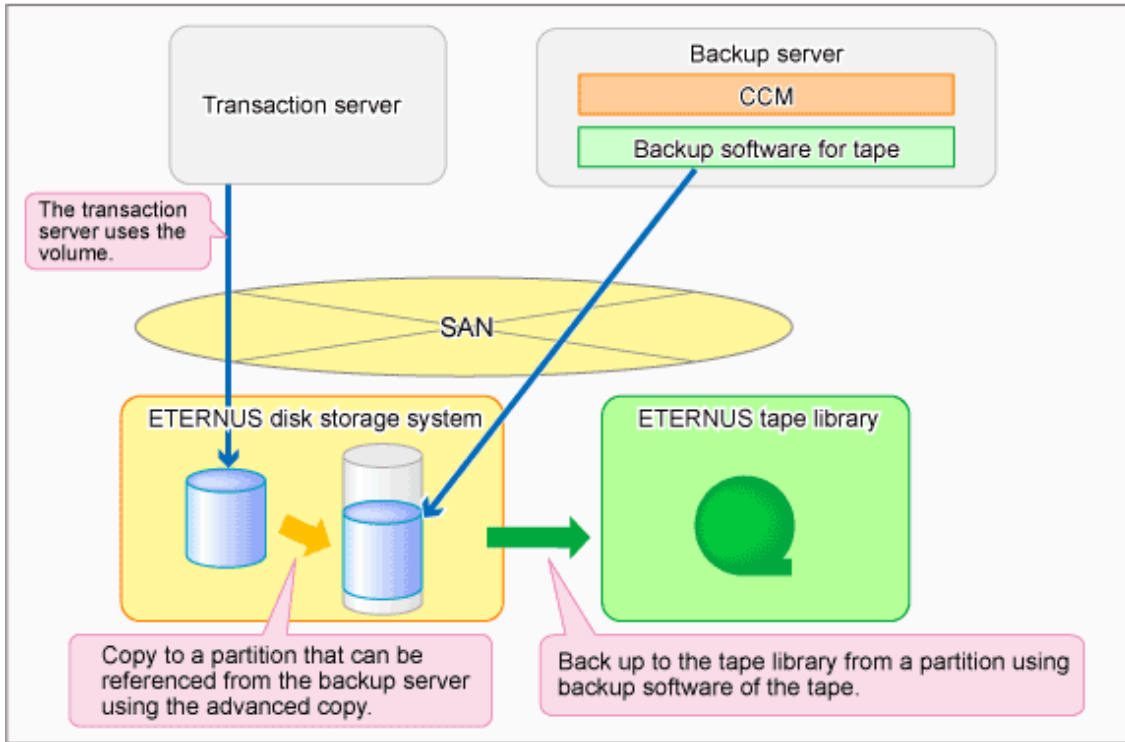
3.2.1 LU to Partition

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 is called the LU to Partition function.

Figure 3.5 Copying a volume to a partition

Note

....

This function is used for saving data to secondary media, such as backing up to tape. Do not use this function for copying from one disk to another disk.

....

Adding copy pairs

To use the LU to Partition function, 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 3.6 Copy pair format
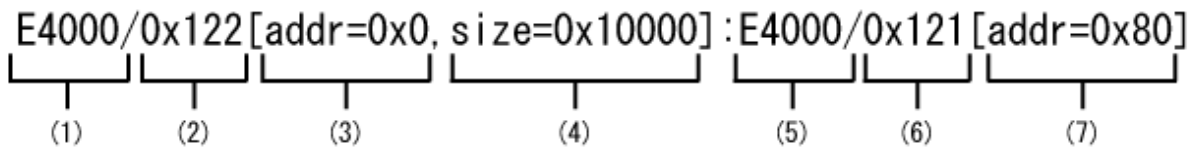
- (1) Copy source ETERNUS name

- (2) Copy source logical volume number

- (3) Extent start position at the copy source volume (block units)

- (4) Extent size at the copy source volume (number of blocks)

- (5) Copy destination ETERNUS name

- (6) Copy destination logical volume number

- (7) Extent start position at the copy destination volume (block units)

A character string starting with "0x" expresses a hexadecimal value.

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 "A.3.1 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 E4000

    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.
    Use the following formula to calculate the extent size (number of blocks):

    ```
    extent size (number of blocks) = logical volume size (MB) * 1024 * 1024/512
    ```

Information
. . . .
If the copy source logical volume number is not known

- [For Solaris, Linux, HP-UX, AIX]

    1. Execute the "A.9.2 acgetvolinfo (Logical volume information display command)" on the transaction server to check the copy source logical volume number (LV No) and the extent size (Size).

       [Execution example]

       [For Solaris]

       ```
       # acgetvolinfo /dev/rdsk/c4t0d10s2
       BOX-ID,LV No,Address,Size
       00E4000M3#####E450S20A####KD4030639004##,0x001,0x0,0x40000
       ```

       [For Linux]

       ```
       # acgetvolinfo /dev/sdo
       BOX-ID,LV No,Address,Size
       00E4000M3#####E450S20A####KD4030639004##,0x001,0x0,0x40000
       ```

       [For HP-UX]

       ```
       # acgetvolinfo /dev/rdsk/c1t0d20
       BOX-ID,LV No,Address,Size
       00E4000M3#####E450S20A####KD4030639004##,0x001,0x0,0x40000
       ```

       [For AIX]

       ```
       # acgetvolinfo /dev/hdisk10
       BOX-ID,LV No,Address,Size
       00E4000M3#####E450S20A####KD4030639004##,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. Use the following formula to calculate the logical volume size (in bytes or MB):

       ```
       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 "A.9.2 acgetvolinfo (Logical volume information display command)" in the transaction server.

       [Execution example]

       ```
       C:\> acgetvolinfo F:
       BOX-ID,LV No,Address,Size
       00E4000M3#####E450S20A####KD4030639004##,0x001,0x80,0x20000
       ```

    2. Check the logical volume size by executing A.3.1 acinq lv (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.

3. Checking the information on the copy destination logical volume

   Execute the "A.9.2 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.

   [Execution example]

   - [For Solaris]

   ```
   # acgetvolinfo /dev/dsk/c0t0d0s3
   BOX-ID,LV No,Address,Size
   00E4000M3#####E450S20A####KD4030639004##,0x008,0x0100000,0x140cc3
   ```

   - [For Linux]

   ```
   # acgetvolinfo /dev/sda1
   BOX-ID,LV No,Address,Size
   00E4000M3#####E450S20A####KD4030639004##,0x008,0x0100000,0x140cc3
   ```

   - [For Windows]

   ```
   C:\> acgetvolinfo X:
   BOX-ID,LV No,Address,Size
   00E4000M3#####E450S20A####KD4030639004##,0x008,0x0100000,0x140cc3
   ```

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

   [Execution example]

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

4. Adding copy pairs

   Using "A.6.5 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 the step 1

   - Values specified to the copy destination volume

     - Extent start position: Copy destination volume extent start position checked in the step 3

   The execution example below shows how to add copy groups.

   - For OPC, QuickOPC, EC, or REC

     Figure 3.7 Adding copy pairs (OPC, QuickOPC, EC, or REC)
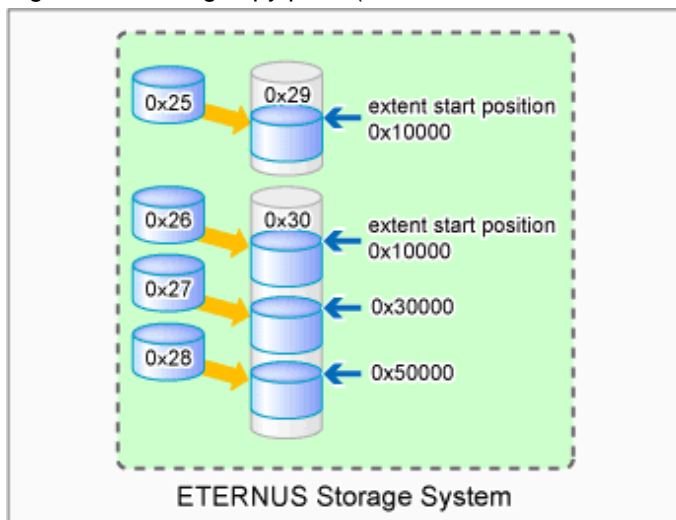
     [Execution example]

```
> acpair add -g GRP1 -p E4000/0x25[addr=0x0,size=0x5000]:E4000/0x29[addr=0x10000]
Successful completion.

> acpair add -g GRP1 -p E4000/0x26[addr=0x0,size=0x5000]:E4000/0x30[addr=0x10000]
Successful completion.

> acpair add -g GRP1 -p E4000/0x27[addr=0x0,size=0x5000]:E4000/0x30[addr=0x30000]
Successful completion.

> acpair add -g GRP1 -p E4000/0x28[addr=0x0,size=0x5000]:E4000/0x30[addr=0x50000]
Successful completion.
```

- For SnapOPCP [Excluding Linux 5 for Intel Itanium]

Figure 3.8 Adding copy pairs (For SnapOPCP)
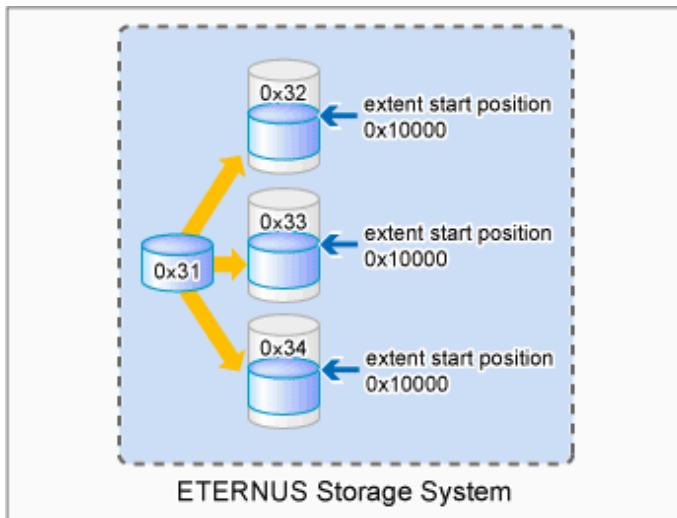
[Execution example]

```
> acpair add -g GRP2 -p E4000/0x31[addr=0x0,size=0x5000]:E4000/0x32[addr=0x10000]
Successful completion.

> acpair add -g GRP2 -p E4000/0x31[addr=0x0,size=0x5000]:E4000/0x33[addr=0x10000]
Successful completion.

> acpair add -g GRP2 -p E4000/0x31[addr=0x0,size=0x5000]:E4000/0x34[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
Use "A.6.3 acgroup detail (Copy group detail information display command)" to display the 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 : E4000 (00E4000M3#####E450S20A####KD4030639004##)

Pair
--------------------
E4000/0x25[addr=0x0,size=0x5000]:E4000/0x29[addr=0x10000]
E4000/0x26[addr=0x0,size=0x5000]:E4000/0x30[addr=0x10000]
E4000/0x27[addr=0x0,size=0x5000]:E4000/0x30[addr=0x30000]
E4000/0x28[addr=0x0,size=0x5000]:E4000/0x30[addr=0x50000]
```

3.2.2 Backup to tape

3.2.2.1 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 tape server. Then use the backup software to back up to the tape library.

Figure 3.9 Overview of tape backup
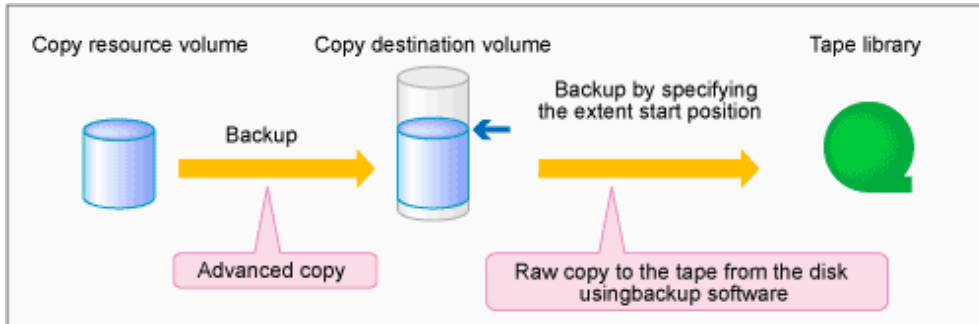
To manage the backup data on the tape library, the backup software with a function capable of performing RAW copy is required. Prepare ETERNUS SF TSM (the software that operates the ETERNUS tape library) or similar.
Refer to the manuals of the backup software and tape device that you are using for details on how to back up to tape.

3.2.2.2 Backup procedure

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

Figure 3.10 Backup to tape
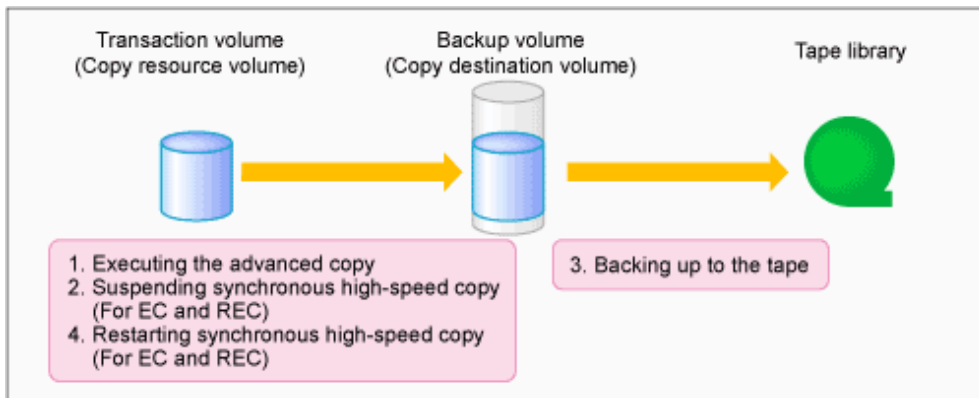
Follow the procedure below to back up transaction volume data to tape.

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 "3.1 Executing Advanced Copies" 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:

   - Use "A.8.3 acec suspend (Synchronous high-speed copy temporary suspension command)" to temporarily suspend synchronous high-speed copy.

   [Execution example]

```
> acec suspend -g group01

E4000/0x1[addr=0x0,size=0x5000]:E8000/0x3[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. Use "A.8.3 acec suspend (Synchronous high-speed copy temporary suspension command)" with the -force option specified to forcibly temporarily suspend REC.

    [Execution example]

    ```
    > acec suspend -g group01 -force

    E4000/0x1[addr=0x0,size=0x5000]:E8000/0x3[addr=0x10000]
    # DATE : 2008/06/25 00:00:00 - << EC Suspended >>

      Succeeded : 1
      Failed    : 0
    ```

    2. Use "A.8.6 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

    E4000/0x1[addr=0x0,size=0x5000]:E8000/0x3[addr=0x10000]
    # DATE : 2008/06/25 00:01:00 - << EC Change >>

      Succeeded : 1
      Failed    : 0
    ```

    3. Use "A.8.4 acec resume (Synchronous high-speed copy restart command)" to restart REC

    [Execution example]

    ```
    > acec resume -g group01

    E4000/0x1[addr=0x0,size=0x5000]:E8000/0x3[addr=0x10000]
    # DATE : 2008/06/25 00:02:00 - << EC Resumed >>

      Succeeded : 1
      Failed    : 0
    ```

    4. Use "A.8.2 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      : E4000 (00E4000M3#####E450S20A####KD4030639004##)
    Remote Disk Array Name : E8000 (00E8000M9#####E890S20A####KO4070639003##)

    Source                    <=> Target                SID(RSID) EC
    Status      Copy Phase Copied Block Rcv  Split Xfer
    ```

```
---------------------------- --- -------------------- ----------
-------------- ---------- ------------ ---- ----- -------
E4000/0x1[addr=0x0,size=0x5000] ==> E8000/0x3[addr=0x10000] 0x49(0x10) "EC
Executing" "Paired"          1048576 auto ----  through
```

5. Use "A.8.3 acec suspend (Synchronous high-speed copy temporary suspension command) " to temporarily suspend REC.

   [Execution example]

   ```
   > acec suspend -g group01

   E4000/0x1[addr=0x0,size=0x5000]:E8000/0x3[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:

     Use "A.8.4 acec resume (Synchronous high-speed copy restart command) " to restart synchronous high-speed copy.

     [Execution example]

     ```
     > acec resume -g group01

     E4000/0x1[addr=0x0,size=0x5000]:E4000/0x3[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:

     1. Use "A.8.6 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

        E4000/0x1[addr=0x0,size=0x5000]:E8000/0x3[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

        E4000/0x1[addr=0x0,size=0x5000]:E8000/0x3[addr=0x10000]
        # DATE : 2008/06/25 07:00:00 - << EC Change >>
        ```

```
  Succeeded : 1
  Failed    : 0
```

2. Use "A.8.4 acec resume (Synchronous high-speed copy restart command)" to restart synchronous high-speed copy.

   [Execution example]

```
> acec resume -g group01

E4000/0x1[addr=0x0,size=0x5000]:E8000/0x3[addr=0x10000]
# DATE : 2008/06/24 16:28:00 - << EC Resumed >>

  Succeeded : 1
  Failed    : 0
```

3.2.3 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".
For details, refer to "3.2.3.1 Restoring using backup volume".

Figure 3.11 Restoring from tape (Restore using backup volume)
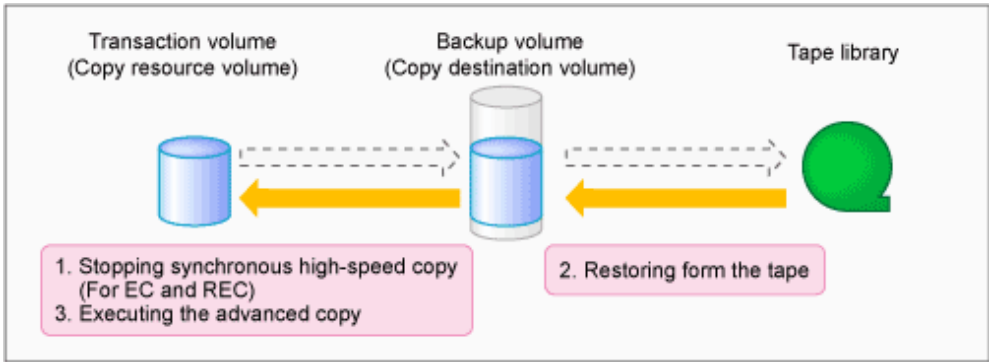
For SnapOPC+, follow the procedure below to restore transaction volume data from tape. This method is called "Restoring using a new volume".
In addition, if you do not use a backup volume that was used for backup regardless of copy type, follow the procedure below.
For details, refer to "3.2.3.2 Restoring using a new volume".

Figure 3.12 Restoring from tape (Restore using a new volume)
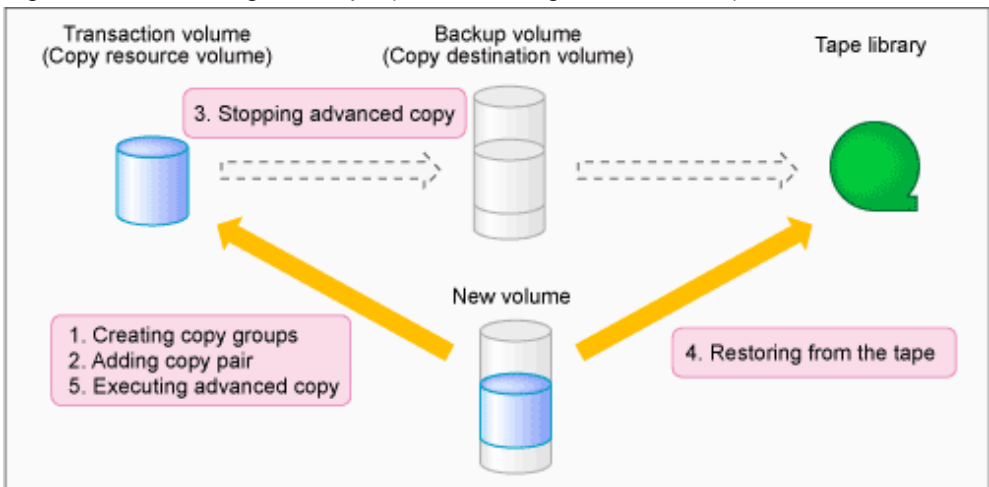
3.2.3.1 Restoring using backup volume

Follow the procedure below to restore using a backup volume.

> **Note**
>
> ....
>
> The backup volume contents are overwritten by the tape library contents.
> If you want to keep the backup volume data, perform restore the data using "Restoring using a new volume".
>
> ....

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

   Specify the -p and the -force options to "A.8.7 acec cancel (Synchronous high-speed copy stop command)" to stop synchronous high-speed copy.

   [Execution example]

   ```
   > acec cancel -g group01 -p E4000/0x1[addr=0x0,size=0x5000]:E4000/0x3[addr=0x10000] -force

   E4000/0x1[addr=0x0,size=0x5000]:E4000/0x3[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 "3.1 Executing Advanced Copies" for the execution procedure.

3.2.3.2 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.
   Refer to "A.6.1 acgroup create (Copy group creation command)" for the execution procedure.

   [Execution example]

   ```
   > acgroup create -g group02 -type OPC -a E4000
   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 pairs" for the execution procedure.

   [Execution example]

   ```
   > acpair add -g group02 -p E4000/0x25[addr=0x0,size=0x5000]:E4000/0x34[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

    Use "A.7.2 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, specify the -p option to "A.7.3 acopc cancel (OPC/QuickOPC copy stop command)" 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 : E4000 (00E4000M3#####E450S20A####KD4030639004##)

Source                          <=> Target                  SID  OPC Status      Copy Phase
Copied Block
------------------------------- --- ---------------------- ---- --------------- ----------
------------
E4000/0x1[addr=0x0,size=0x5000] ==> E4000/0x3[addr=0x10000] 0x21 "OPC Executing"
"Copying"           0

> acopc cancel -g group01 -p E4000/0x1[addr=0x0,size=0x5000]:E4000/0x3[addr=0x10000]

E4000/0x1:E4000/0x6
# 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+ [Excluding Linux 5 for Intel Itanium]

    Use "A.7.5 acsnap query (SnapOPC+ copy status display command) [Excluding Linux 5 for Intel Itanium]" to check the copy status.
    If the session has not been stopped, specify the -force option to "A.7.6 acsnap cancel (SnapOPC+ copy stop command) [Excluding Linux 5 for Intel Itanium]" to stop synchronous high-speed copying.

    [Execution example]

```
> acsnap query -g group01

Copy Group Name : group01
Copy Group Type : SnapOPCP
Disk Array Name : E4000 (00E4000M3#####E450S20A####KD4030639004##)

Source                     <=> Target                          SID  Snap Status
Gen Date     Copied Block
-------------------------- --- -------------------------------- ----
------------------------ ------------- ------------
E4000/0x31[addr=0x0,size=0x0] ==> E4000/0x34[addr=0x0,size=0x01000] 0x23 "Copy On
Write(Active)"    3   10minute      1048576
E4000/0x31[addr=0x0,size=0x0] ==> E4000/0x33[addr=0x0,size=0x01000] 0x22 "Copy On
Write(Inactive)" 2   3hour         1048576
E4000/0x31[addr=0x0,size=0x0] ==> E4000/0x32[addr=0x0,size=0x01000] 0x21 "Copy On
Write(Inactive)" 1   1day          1048576

> acsnap cancel -g group01 -force

E4000/0x31[addr=0x0,size=0x0]:E4000/0x32[addr=0x0,size=0x01000]
```

```
# DATE : 2008/06/24 16:28:00 - << SnapOPCP Disconnected >>

E4000/0x31[addr=0x0,size=0x0]:E4000/0x33[addr=0x0,size=0x01000]
# DATE : 2008/06/24 16:28:00 - << SnapOPCP Disconnected >>

E4000/0x31[addr=0x0,size=0x0]:E4000/0x34[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

  Specify the -p and the -force options to "A.8.7 acec cancel (Synchronous high-speed copy stop command) " to stop synchronous high-speed copy.

  [Execution example]

```
> acec cancel -g group01 -p E4000/0x1[addr=0x0,size=0x5000]:E4000/0x3[addr=0x10000] -force

E4000/0x1[addr=0x0,size=0x5000]:E4000/0x3[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 "3.1.1.2 Restore on OPC backup environment" for the execution procedure.

   [Execution example]

```
> acopc start -g group02 -p E4000/0x1[addr=0x0,size=0x5000]:E4000/0x3[addr=0x10000] -r

E4000/0x1[addr=0x0,size=0x5000]:E4000/0x3[addr=0x10000]
# DATE : 2008/06/25 12:00:00 - << OPC Started >>
#
From:BoxID=303045343030304d3332323232323234534353053323041232323234b4434303330363339303034232
3/Olu=3/Adr_high=0/Adr_low=0/size_high=0/size_low=0
#
To  :BoxID=303045343030304d3332323232323234534353053323041232323234b4434303330363339303034232
3/Olu=1/Adr_high=0/Adr_low=0

  Succeeded : 1
  Failed    : 0
```

> **Note**
>
> ....
>
> 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.
>
> ....

3.3 How to Back Up the 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.

3.3.1 Backing up environment settings files

This section explains how to back up environment settings files.
Copy the following files to a temporary directory.

For Windows

FIle name	Remarks
- $INS_DIR\etc\db\eternus.xml - All files under $INS_DIR\etc\db\cg directory	
- $INS_DIR\etc\prop\user.properties - $INS_DIR\etc\stxc.alias - $INS_DIR\etc\stxcvolinf	Please back up only when the file exists.
- $INS_DIR\var\micc\database\DeviceRegList.xml	

The "$INS_DIR" means the installation directory of AdvancedCopy Manager CCM.

For Solaris, Linux 5 (for x86, for Intel64)

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/stxcvolinf	Please back up only when the file exists.
- /var/opt/FJSVccm/micc/database/DeviceRegList.xml	

For Linux 5 for Intel Itanium

File name	Remarks
- /etc/opt/FJSVccm/db/eternus.xml - All files under /etc/opt/FJSVccm/db/cg directory - /var/opt/FJSVccm/micc/database/DeviceRegList.xml	

This completes the backup for environment settings files.

3.3.2 Restoring environment settings files

This section explains how to restore the environment settings files that were backed up in "3.3.1 Backing up environment settings files".

1. Delete the following files.

   - For Windows

File name	Remarks
- All files under $INS_DIR\etc\db\cg directory	
- $INS_DIR\etc\prop\user.properties - $INS_DIR\etc\stxc.alias - $INS_DIR\etc\stxcvolinf	Please delete only when the file exists.

   The "$INS_DIR" means the installation directory of AdvancedCopy Manager CCM.

   - For Solaris, Linux 5 (for x86, for Intel64)

File name	Remarks
- 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/stxcvolinf	Please delete only when the file exists.

   - For Linux 5 for Intel Itanium

File name	Remarks
- All files under /etc/opt/FJSVccm/db/cg directory	

2. Copy the files that were backed up in "3.3.1 Backing up environment settings files" to the following directory:

   - For Windows

File name	Remarks
- $INS_DIR\etc\db\eternus.xml - All files under $INS_DIR\etc\db\cg directory	
- $INS_DIR\etc\prop\user.properties - $INS_DIR\etc\stxc.alias - $INS_DIR\etc\stxcvolinf	Please restore only when the file was backed up.
- $INS_DIR\var\micc\database\DeviceRegList.xml	

   The "$INS_DIR" means the installation directory of AdvancedCopy Manager CCM.

   - For Solaris, Linux 5 (for x86, for Intel64)

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/stxcvolinf	Please restore only when the file was backed up.
- /var/opt/FJSVccm/micc/database/DeviceRegList.xml	

   - For Linux 5 for Intel Itanium

File name	Remarks
- /etc/opt/FJSVccm/db/eternus.xml	
- All files under /etc/opt/FJSVccm/db/cg directory	
- /var/opt/FJSVccm/micc/database/DeviceRegList.xml	

This completes the backup for environment settings files.

3.4 Changing the Configuration

This section explains the procedures for changing the configuration of AdvancedCopy Manager CCM.

3.4.1 Registering additional ETERNUS disk storage systems

Register additional information for ETERNUS disk storage systems with AdvancedCopy Manager CCM.

Register the ETERNUS disk storage systems by following the procedure in "2.2.6 Registering ETERNUS disk storage systems".

3.4.2 Changing the registration information for ETERNUS disk storage systems

This section explains how to change the registration information for ETERNUS disk storage systems that have been set up with AdvancedCopy Manager CCM.

The registration information for ETERNUS disk storage systems includes the following items:

- ETERNUS name
- Access path
- BOX ID
- IP address
- User
- Password

The registration information for remote ETERNUS disk storage systems includes the following items:

- ETERNUS name
- BOX ID

Changing ETERNUS names or access paths

Change ETERNUS names or access paths by referring to "A.2.2 acarray change (ETERNUS names and access paths for ETERNUS disk storage systems change command)".

Using the access path automatic setting function to change access paths

Refer to "A.2.5 acarray pathscan (Access path automatic setting command) [Excluding Linux 5 for Intel Itanium]" and change the access path.

Changing information other than ETERNUS names or access paths

Use the following procedure to change information other than ETERNUS names or access paths.

1. Delete the registration information

   Delete the registration information for the ETERNUS disk storage systems.

   Refer to "3.4.3 Deleting registration information for ETERNUS disk storage systems" for more information.

2. Reregister the ETERNUS disk storage systems

   Register the ETERNUS disk storage systems (whose registration information was deleted) again using the new information.

   Register the ETERNUS disk storage systems by following the procedure in "2.2.6 Registering ETERNUS disk storage systems".

3.4.3 Deleting registration information for ETERNUS disk storage systems

This section explains how to delete registration information for ETERNUS disk storage systems that have been set up with AdvancedCopy Manager CCM.
Use the following procedure to delete registration information for ETERNUS disk storage systems:

1. Delete copy groups

   Delete all of the copy groups that have been set up for the ETERNUS disk storage systems for which registration information is to be deleted.

   Delete the copy groups by referring to "3.4.6 Deleting copy groups ".

2. Delete the registration information for the ETERNUS disk storage systems

   Delete the registration information for the ETERNUS disk storage systems that has been set up with AdvancedCopy Manager CCM.

   Refer to "A.2.6 acarray remove (ETERNUS disk storage systems registration information deletion command)" for more information.

3.4.4 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 "2.2.7 Creating copy groups".

3.4.5 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 systems that have been set up with AdvancedCopy Manager CCM. Add copy pairs by referring to "2.2.8 Adding copy pairs".

Deleting copy pairs

Delete the copy pairs for the ETERNUS disk storage systems that have 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.

   - "A.7.3 acopc cancel (OPC/QuickOPC copy stop command)"

   - "A.7.6 acsnap cancel (SnapOPC+ copy stop command) [Excluding Linux 5 for Intel Itanium]"

   - "A.8.7 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.

- "A.7.2 acopc query (OPC/QuickOPC copy status display command)"

- "A.7.5 acsnap query (SnapOPC+ copy status display command) [Excluding Linux 5 for Intel Itanium]"

- "A.8.2 acec query (Synchronous high-speed copy status display command)"

3. Delete copy pairs

    Delete the copy pairs.

    Refer to "A.6.6 acpair remove (Copy pair deletion command)" for more information.

📖 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.

··

3.4.6 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.

    - "A.7.3 acopc cancel (OPC/QuickOPC copy stop command)"

    - "A.7.6 acsnap cancel (SnapOPC+ copy stop command) [Excluding Linux 5 for Intel Itanium]"

    - "A.8.7 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.

    - "A.7.2 acopc query (OPC/QuickOPC copy status display command)"

    - "A.7.5 acsnap query (SnapOPC+ copy status display command) [Excluding Linux 5 for Intel Itanium]"

    - "A.8.2 acec query (Synchronous high-speed copy status display command)"

3. Delete the copy group

    Delete the copy group from AdvancedCopy Manager CCM.

    Refer to "A.6.4 acgroup remove (Copy group deletion command)" for more information.

📖 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.

··

3.4.7 Changing timeout value for concurrent suspension function [Excluding Linux 5 Intel Itanium]

This section explains the method of setting or changing the timeout value for concurrent suspension function.

File name for setting

The timeout value must be defined in the following file.

OS	File name
Windows	$INS_DIR\etc\prop\user.properties ($INS_DIR means "Program Directory" specified at the AdvancedCopy Manager CCM installation.)
Solaris Linux	/etc/opt/FJSVccm/prop/user.properties

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
```

···

Chapter 4 Uninstallation

This chapter explains how to uninstall AdvancedCopy Manager CCM.

4.1 Uninstall from the Windows Environment

Use the following procedure to uninstall AdvancedCopy Manager CCM.

1. Log in the system where AdvancedCopy Manager CCM is to be uninstalled.

   Log in as a user that has Administrator privileges on the terminal where AdvancedCopy Manager CCM is to be uninstalled.

2. Stop all 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.

   - "A.7.3 acopc cancel (OPC/QuickOPC copy stop command)"

   - "A.7.6 acsnap cancel (SnapOPC+ copy stop command) [Excluding Linux 5 for Intel Itanium]"

   - "A.8.7 acec cancel (Synchronous high-speed copy stop command)"

3. Remove AdvancedCopy Manager from the list of programs by following the procedure appropriate to the operating system being used.

   - For Windows Server 2003

     Double-click on the [Add or Remove Programs] icon in the Control Panel to display the following kind of window.

     Select [AdvancedCopy Manager Copy Control Module], and then click the [Change/Remove] button.
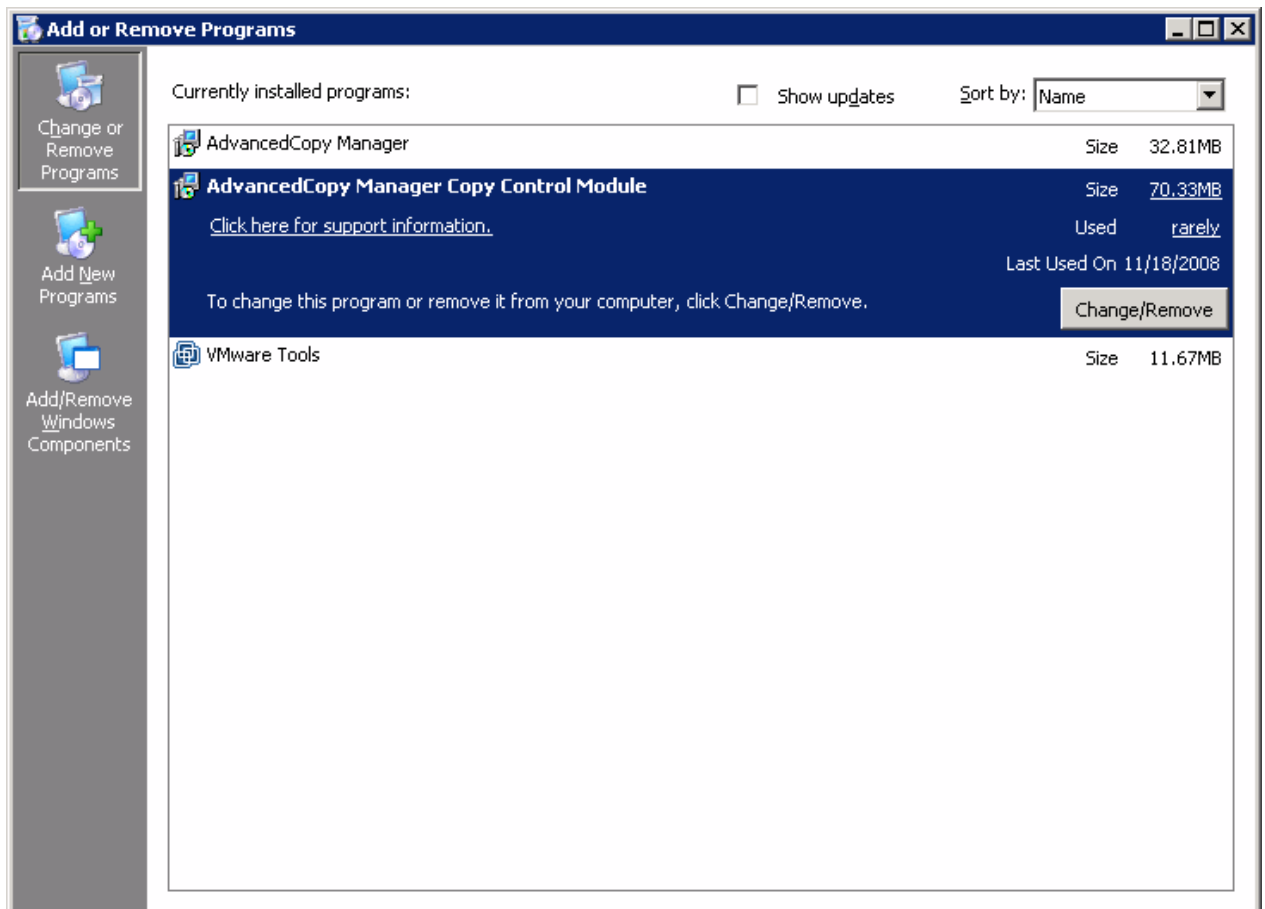
   - For Windows Server 2008 or Windows Server 2008 R2

     Double-click on the [Programs and Features] icon in the Control Panel to display the following kind of window.

Select [AdvancedCopy Manager Copy Control Module], and then click the [Uninstall] button.
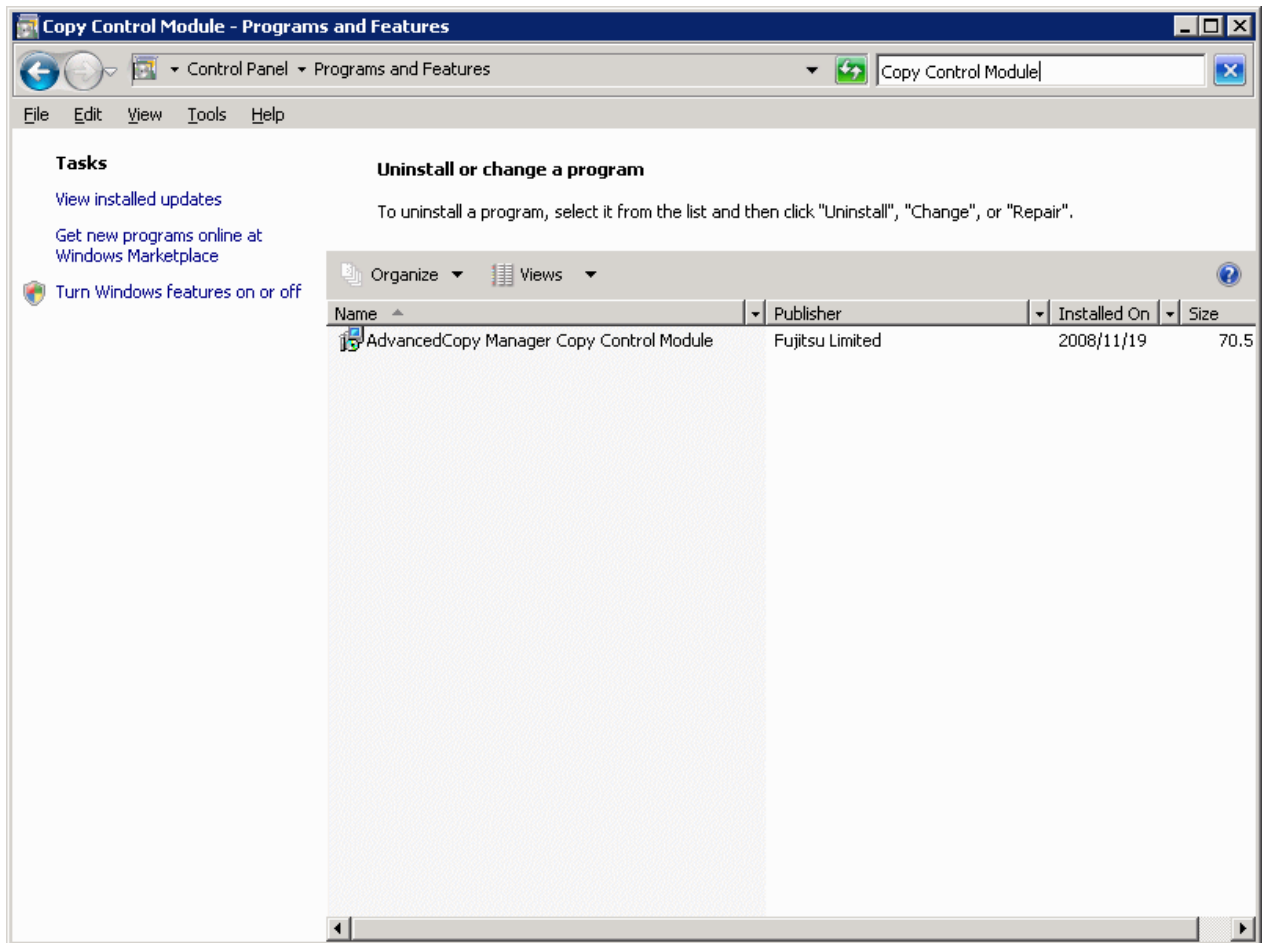

The following window will be displayed.
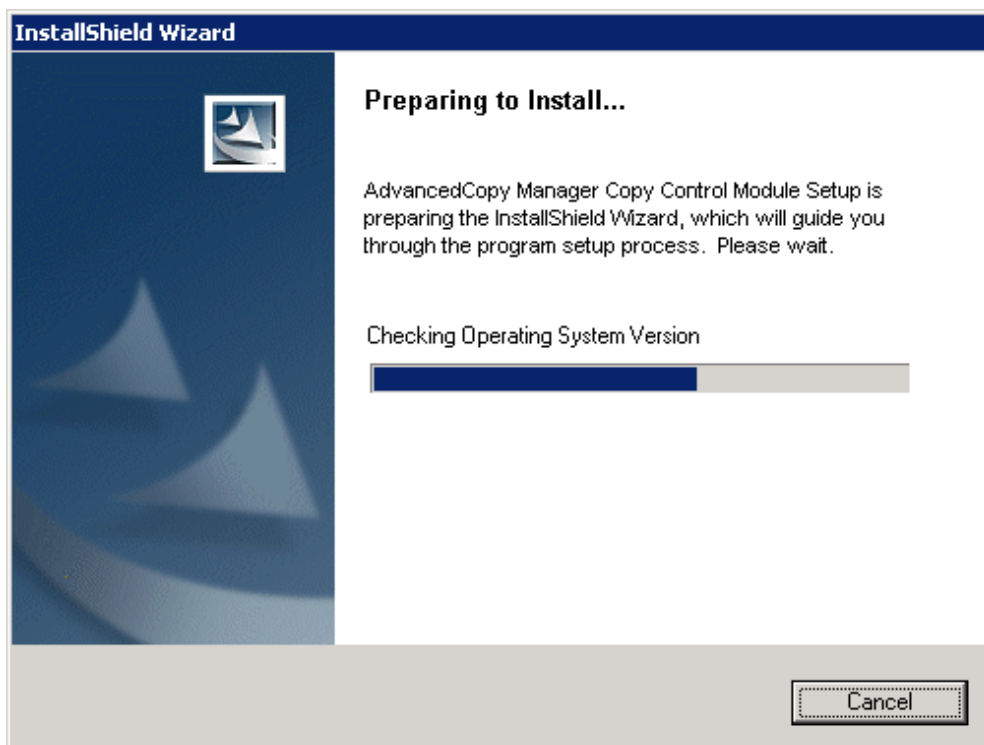
4. Click the [Yes] button in the following confirmation window.
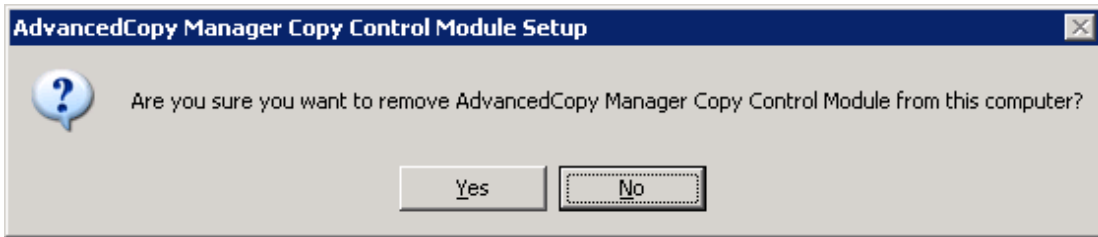
The uninstallation process for AdvancedCopy Manager CCM now starts.
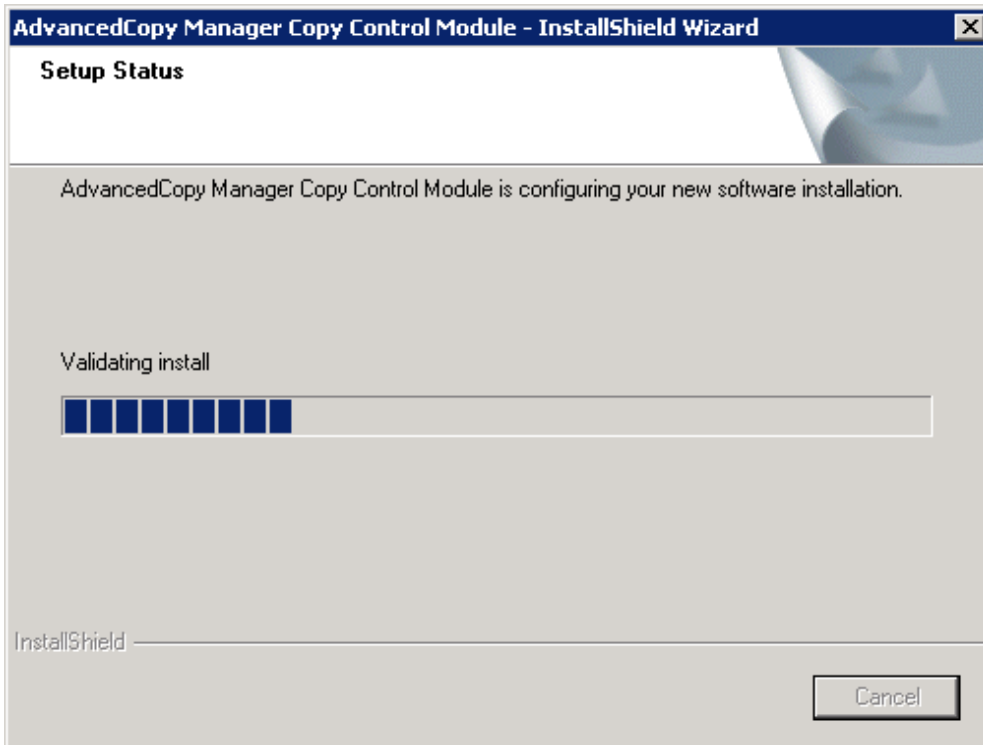
5. The uninstall of AdvancedCopy Manager CCM is complete when the following window is displayed.

   Click the [Finish] button to close the uninstaller.
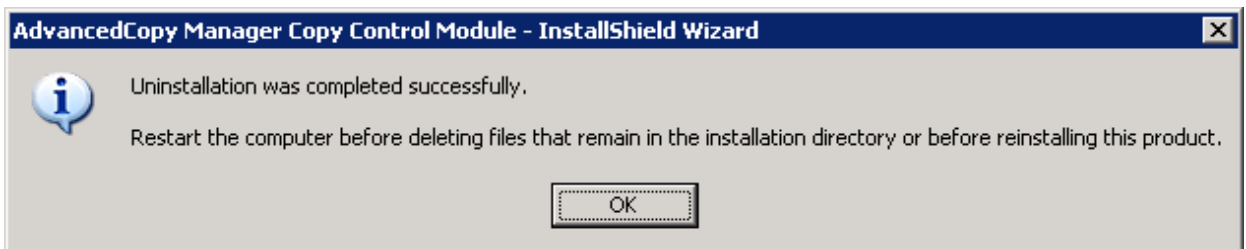
Even if uninstall is carried out, the package directory may not be removed. If the directory remains, delete as required.

6. Uninstall the ETERNUS SF License Manager.

   For the uninstallation procedure, refer to "Uninstallation of License Manager" in the "ETERNUS SF AdvancedCopy Manager Installation and Setup Guide".

4.2 Uninstall from the Solaris Environment

Use the following procedure to uninstall AdvancedCopy Manager CCM.

1. Uninstall work of AdvancedCopy Manager CCM must be carried out as a superuser. If a general user, use the su command to switch to superuser.

```
$ su
```

2. Stop advanced copies

   Use one of the commands below (depending on the type of advanced copy) to stop all executing advanced copies.

   - "A.7.3 acopc cancel (OPC/QuickOPC copy stop command)"

   - "A.7.6 acsnap cancel (SnapOPC+ copy stop command) [Excluding Linux 5 for Intel Itanium]"

   - "A.8.7 acec cancel (Synchronous high-speed copy stop command)"

3. Uninstall the AdvancedCopy Manager CCM package.

```
# pkgrm FJSVccm
```

   Even if uninstall is carried out, the package directory may not be removed. If the directory remains, remove as required.

4. Uninstall the ETERNUS SF License Manager.

   For the uninstallation procedure, refer to "Uninstallation of License Manager" in the "ETERNUS SF AdvancedCopy Manager Installation and Setup Guide".

4.3 Uninstall from the Linux Environment

Use the following procedure to uninstall AdvancedCopy Manager CCM.

1. Uninstall work of AdvancedCopy Manager CCM must be carried out as a superuser. If a general user, use the su command to switch to superuser.

```
$ su
```

2. Stop advanced copies

   Use one of the commands below (depending on the type of advanced copy) to stop all executing advanced copies.

   - "A.7.3 acopc cancel (OPC/QuickOPC copy stop command)"

   - "A.7.6 acsnap cancel (SnapOPC+ copy stop command) [Excluding Linux 5 for Intel Itanium]"

   - "A.8.7 acec cancel (Synchronous high-speed copy stop command)"

3. Uninstall the AdvancedCopy Manager CCM package.

```
# rpm -e FJSVccm
```

   Even if uninstall is carried out, the package directory may not be removed. If the directory remains, remove as required.

4. Uninstall the ETERNUS SF License Manager.

   For the uninstallation procedure, refer to "Uninstallation of License Manager" in the "ETERNUS SF AdvancedCopy Manager Installation and Setup Guide".

Chapter 5 Upgrades

This chapter describes how to upgrade from ETERNUS SF AdvancedCopy Manager Copy Control Module 13.4 or later editions.

Follow the procedures below to perform the upgrade. The command examples is for Windows operating system.

1. Backup environment settings files.

   Backup the environment settings file as described in the manual for the version currently being used.

   - Backing up the environment settings file

2. Backing up the license management database of License Manager

   Backup the license management database of ETERNUS SF License Manager by using "esflm backup" command. For details of "esflm backup" command, refer to the "ETERNUS SF Installation and Setup Guide" for the currently using version.

   - Example of executing "esflm backup" command

   ```
   > esflm backup Backup.dat
   Backup of license database was performed successfully
   ```

3. Uninstall the software.

   Uninstall the software as described in the manual for the version currently being used.

4. Install the new version of the software.

   For details, refer to "2.1.1 Installation on the Windows environment", "2.1.2 Installation on the Solaris environment" or "2.1.3 Installation on the Linux environment".

5. Restoring the license management database of License Manager

   Restore the license management database that has been backed up. For the restoration procedures, refer to "esflm restore (License management database restore command)" in the "ETERNUS SF AdvancedCopy Manager Installation and Setup Guide".

   - Example of executing "esflm restore" command

   ```
   > esflm restore Backup.dat
   Restoration of license database was performed successfully
   ```

6. Restore the environment settings files.

   For details on how to restore the files backed up in step 1, refer to "3.3.2 Restoring environment settings files".

7. Reconfigure the ETERNUS disk storage systems information. [Excluding Linux 5 for Intel Itanium]

   Reconfigure the ETERNUS disk storage systems information.

   For Windows, perform this procedure only when upgrading from ETERNUS SF AdvancedCopy Manager Copy Control Module 14.0 or earlier.

   1. Confirm the registered ETERNUS disk storage systems by using "A.2.3 acarray list (ETERNUS disk storage systems information display command)".

   ```
   C:\>acarray list

   Name  BOX-ID                                  IP Address
   ----- --------------------------------------- ------------
   E4000 00E4000M3#####E450S20A####KD4030639004## 10.124.6.251
   E8000 00E8000M9#####E890S20A####KO4070639003## 10.124.6.241
   ```

   2. Confirm the detail information of the registered ETERNUS disk storage systems by using "A.2.4 acarray detail (ETERNUS disk storage systems detail information display command)".

   ```
   C:\>acarray detail -a E4000

   Disk Array Name : E4000
   ```

```
BOX-ID        : 00E4000M3#####E450S20A####KD4030639004##
IP Address    : 10.124.6.251
Admin User    : root
Access Path   : X:


C:\>acarray detail -a E8000


Disk Array Name : E8000
BOX-ID        : 00E8000M9#####E890S20A####KO4070639003##
IP Address    : 10.124.6.241
Admin User    : root
Access Path   : Y:
```

3. Remove all of registered ETERNUS disk storage systems by using "A.2.6 acarray remove (ETERNUS disk storage systems registration information deletion command)".

```
C:\>acarray remove -a E4000
Successful completion.

C:\>acarray remove -a E8000
Successful completion.
```

4. Re-register all of ETERNUS disk storage systems that were removed in step 3 by using "A.2.1 acarray add (ETERNUS disk storage systems registration command)".

```
C:\>acarray add -a E4000 -ip 10.124.6.251 -user root -password root -path X:
Successful completion.

C:\>acarray add -a E8000 -ip 10.124.6.241 -user root -password root -path Y:
Successful completion.
```

Point

. . . .

When the ETERNUS disk storage systems were registered by specifying non existent drive letter or device name in the old AdvancedCopy Manager CCM editions, re-register their ETERNUS disk storage systems as a remote device. [Excluding Linux 5 for Intel Itanium]

. . . .

Appendix A Commands

This appendix explains the various commands that are used with AdvancedCopy Manager CCM.

For details on user accounts that can use commands, refer to "2.2.1 Configuring User Accounts".

Point

If using commands, refer to "2.2.2 PATH environment variables settings".

A.1 Command List

The commands can be classified as follows.

Environment definition commands

Table A.1 List of commands for controlling ETERNUS disk storage systems

Function	Command	Explanation
A.2.1 acarray add (ETERNUS disk storage systems registration command)	acarray add	Registers ETERNUS disk storage systems.
A.2.2 acarray change (ETERNUS names and access paths for ETERNUS disk storage systems change command)	acarray change	Changes the access paths and ETERNUS names for ETERNUS disk storage systems.
A.2.3 acarray list (ETERNUS disk storage systems information display command)	acarray list	Displays information about ETERNUS disk storage systems.
A.2.4 acarray detail (ETERNUS disk storage systems detail information display command)	acarray detail	Displays detailed information about ETERNUS disk storage systems.
A.2.5 acarray pathscan (Access path automatic setting command) [Excluding Linux 5 for Intel Itanium]	acarray pathscan	Sets access paths automatically to searches the ETERNUS disk storage system
A.2.6 acarray remove (ETERNUS disk storage systems registration information deletion command)	acarray remove	Removes registration information about ETERNUS disk storage systems.

Table A.2 List of commands for displaying information relating to ETERNUS disk storage systems

Function	Command	Explanation
A.3.1 acinq lv (Logical volume information display command)	acinq lv	Displays information about logical volumes.
A.3.2 acinq lunmap (LUN Mapping information display command)	acinq lunmap	Displays LUN mapping information.
A.3.3 acinq ag (Affinity group list display command)	acinq ag	Displays affinity groups for ETERNUS disk storage systems.
A.3.4 acinq hostag (Host affinity group list display command)	acinq hostag	Displays host affinity groups for ETERNUS disk storage systems.

Table A.3 List of commands for controlling logical volume

Function	Command	Explanation
A.4.1 acinhibit set (Volume protection settings command) [Excluding Linux 5 for Intel Itanium]	acinhibit set	Sets volume protection.
A.4.2 acinhibit unset (Volume protection settings release command) [Excluding Linux 5 for Intel Itanium]	acinhibit unset	Releases volume protection settings.

Table A.4 List of commands for controlling REC transfer buffers

Function	Command	Explanation
A.5.1 acrecbuff set (REC transfer buffer setting command) [Excluding Linux 5 for Intel Itanium]	acrecbuff set	Sets up REC transfer buffers.
A.5.2 acrecbuff stat (REC transfer buffer status display command) [Excluding Linux 5 for Intel Itanium]	acrecbuff stat	Displays REC transfer buffer information.

Table A.5 List of commands for setting up copy groups

Function	Command	Explanation
A.6.1 acgroup create (Copy group creation command)	acgroup create	Creates a copy group.
A.6.2 acgroup list (Copy group display command)	acgroup list	Displays the copy groups that have been set up.
A.6.3 acgroup detail (Copy group detail information display command)	acgroup detail	Displays the copy pairs that have been set up in copy groups.
A.6.4 acgroup remove (Copy group deletion command)	acgroup remove	Removes copy groups.
A.6.5 acpair add (Copy pair addition command)	acpair add	Adds copy pairs to copy groups.
A.6.6 acpair remove (Copy pair deletion command)	acpair remove	Removes copy pairs from copy groups.

Operation commands

Table A.6 List of commands for controlling snapshot type high-speed copying

Function	Command	Explanation
A.7.1 acopc start (OPC/QuickOPC copy start command)	acopc start	Starts the OPC or QuickOPC copying.
A.7.2 acopc query (OPC/QuickOPC copy status display command)	acopc query	Displays the status of OPC or QuickOPC copying.
A.7.3 acopc cancel (OPC/QuickOPC copy stop command)	acopc cancel	Stops the OPC or QuickOPC copying.
A.7.4 acsnap start (SnapOPC+ copy start command) [Excluding Linux 5 for Intel Itanium]	acsnap start	Starts the SnapOPC+ copying.
A.7.5 acsnap query (SnapOPC+ copy status display command) [Excluding Linux 5 for Intel Itanium]	acsnap query	Displays the status of SnapOPC copying.
A.7.6 acsnap cancel (SnapOPC+ copy stop command) [Excluding Linux 5 for Intel Itanium]	acsnap cancel	Stops the SnapOPC+ copying.

Table A.7 List of commands for controlling synchronous high-speed copying

Function	Command	Explanation
A.8.1 acec start (Synchronous high-speed copy start command)	acec start	Starts synchronous high-speed copying.
A.8.2 acec query (Synchronous high-speed copy status display command)	acec query	Displays the status of synchronous high-speed copying.
A.8.3 acec suspend (Synchronous high-speed copy temporary suspension command)	acec suspend	Temporarily suspends synchronous high-speed copying.
A.8.4 acec resume (Synchronous high-speed copy restart command)	acec resume	Restarts temporarily interrupted synchronous high-speed copying.
A.8.5 acec reverse (Synchronous high-speed copy reverse command)	acec reverse	Reverses the direction of synchronous high-speed copying.

Function	Command	Explanation
A.8.6 acec change (Synchronous high-speed copy mode change command)	acec change	Changes the mode of synchronous high-speed copying (for REC only).
A.8.7 acec cancel (Synchronous high-speed copy stop command)	acec cancel	Stops synchronous high-speed copying.

Utility commands

Table A.8 List of utility commands

Function	Command	Explanation
A.9.1 acutil devs (Logical volume information display command) [Excluding Linux 5 for Intel Itanium]	acutil devs	Displays information about logical volumes on Windows servers.
A.9.2 acgetvolinfo (Logical volume information display command)	acgetvolinfo	Displays information about logical volumes on UNIX servers.
A.9.3 acutil refresh (Partition table refresh command) [Windows version only]	acutil refresh	Refreshes the partition table for the disk.
A.9.4 acsdv init (Snap Data Volume initialization command) [Excluding Linux 5 for Intel Itanium]	acsdv init	Initializes Snap Data Volumes.
A.9.5 acsdv stat (Snap Data Volume status display command) [Excluding Linux 5 for Intel Itanium]	acsdv stat	Displays the status of a Snap Data Volume.
A.9.6 acsdv poolstat (Snap Data Pool status display command) [Excluding Linux 5 for Intel Itanium]	acsdv poolstat	Displays the status of a Snap Data Pool.

Troubleshooting data collection commands

Table A.9 List of troubleshooting data collection commands

Function	Command	Explanation
A.10.1 acmcapture (troubleshooting data collection command)	acmcapture	Collects data for use in investigating faults.

A.2 Control Commands for ETERNUS disk storage systems

This section explains the commands for ETERNUS disk storage systems.

A.2.1 acarray add (ETERNUS disk storage systems registration command)

NAME

acarray add - Registration of ETERNUS disk storage systems

SYNOPSIS

```
acarray add -a DISKARRAY-NAME -ip DISKARRAY-IP -user USER -password PASSWORD [-path ACCESSPATH] [-xml]
acarray add -a DISKARRAY-NAME -boxid BOX-ID -remote [-xml]
```

DESCRIPTION

This command registers ETERNUS disk storage systems.

OPTIONS

-a *DISKARRAY-NAME*

This option specifies the ETERNUS names that are used by AdvancedCopy Manager CCM.

Specify it in the alphanumeric character within 16 characters.

-ip *DISKARRAY-IP*

This option specifies the IP address of an ETERNUS disk storage system.
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.

-user *USER*

This option specifies a following user name.

- When using ETERNUS DX80 S2/DX90 S2, ETERNUS DX410 S2/DX440 S2:

    The user name with Software role for target storage device

- When using other ETERNUS disk storage systems:

    The user name with Administrator authorization for target storage device

Specify the user name using a string that is between 4 and 16 characters long. (NOTE)

Refer to the ETERNUS Web GUI manuals for more information about ETERNUS Web GUI.

NOTE: In the case of ETERNUS DX80 S2/DX90 S2, ETERNUS DX410 S2/DX440 S2, the user name with length between 1 and 32 can be registered. However, the user name used in AdvancedCopy Manager CCM must be between 4 and 16 characters long.

-password *PASSWORD*

This option specifies the password for the user name specified with -user option.

-path *ACCESSPATH*

This option specifies the access path in the logical volume within an ETERNUS disk storage system that was specified with the "-a" option.

[Windows version]

    Specify the drive letter (e.g. X:).

[Solaris version]

    Specify the RAW device name (e.g. /dev/rdsk/c4t0d10s2).

[Linux version]

    Specify the device name (e.g. /dev/sdo).

This option can be omitted in Windows, Solaris, Linux 5 (for x86, for Intel64).
The access path is automatically set if this option is omitted.

-box-id *BOX-ID*

This option specifies the BOX-ID of an 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.
This option can be specified in Windows, Solaris, Linux 5 (for x86, for Intel64).

-remote

This option specifies when registering the ETERNUS disk storage system which is in a remote site.
This option can be specified in Windows, Solaris, Linux 5 (for x86, for Intel64).

-xml

This option specifies when displaying the result of the command execution by the XML format.
This option can be specified in Windows, Solaris, Linux 5 (for x86, for Intel64).

EXIT STATUS

=0 : Completed successfully

>0 : Terminated abnormally

EXAMPLES

- Registering an ETERNUS disk storage system which is in a local site:

    The execution example on Windows operating system is as follows.

    ```
    > acarray add -a E4000 -ip 10.124.6.251 -user root -password root -path X:
    Successful completion.
    ```

- Registering an ETERNUS disk storage system which is in a remote site [Excluding Linux 5 for Intel Itanium]:

    ```
    > acarray add -a E4000 -boxid 00E4000M3#####E450S20A####KD4030639004## -remote
    Successful completion.
    ```

A.2.2 acarray change (ETERNUS names and access paths for ETERNUS disk storage systems change command)

NAME

acarray change - Change of ETERNUS names and access paths

SYNOPSIS

```
acarray change -a DISKARRAY-NAME {-path ACCESSPATH | -new NEW-DISKARRAY-NAME} [-xml]
acarray change -a DISKARRAY-NAME -new NEW-DISKARRAY-NAME -remote [-xml]
```

DESCRIPTION

This command changes the ETERNUS names and access paths for ETERNUS disk storage systems.

OPTIONS

-a *DISKARRAY-NAME*

   This option specifies the existing ETERNUS name for which the ETERNUS name or access path is to be changed.

-path *ACCESSPATH*

   This option specifies the new access path to be set in the ETERNUS disk storage system.

   [Windows version]

      Specify the drive letter (e.g. Y:).

   [Solaris version]

      Specify the RAW device name (e.g. /dev/rdsk/c4t0d10s2)

   [Linux version]

      Specify the device name (e.g. /dev/sdo)

-new *NEW-DISKARRAY-NAME*

   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.

    This option can be specified in Windows, Solaris, Linux 5 (for x86, for Intel64).

-xml

    This option specifies when displaying the result of the command execution by the XML format.

    This option can be specified in Windows, Solaris, Linux 5 (for x86, for Intel64).

EXIT STATUS

=0 : Completed successfully
>0 : Terminated abnormally

EXAMPLES

- Changing an ETERNUS disk storage system which is in a local site:

    The execution example on Windows operating system is as follows.

```
> acarray change -a E4000 -p path Y:
Successful completion.
```

- Changing an ETERNUS disk storage system which is in a remote site [Excluding Linux 5 for Intel Itanium]:

```
> acarray change -a E4000 -new E4000R -remote
Successful completion.
```

A.2.3 acarray list (ETERNUS disk storage systems information display command)

NAME

acarray list - Display of information on the ETERNUS disk storage systems

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 systems which are in a remote site.

    This option can be specified in Windows, Solaris, Linux 5 (for x86, for Intel64).

-xml

    This option specifies when displaying by the XML format.

    This option can be specified in Windows, Solaris, Linux 5 (for x86, for Intel64).

EXIT STATUS

=0 : Completed successfully

>0 : Terminated abnormally

EXAMPLES

- Displaying ETERNUS disk storage systems which are in a remote site:

```
> acarray list

Name  BOX-ID                                 IP Address
----- -------------------------------------- ------------
E4000 00E4000M3#####E450S20A####KD4030639004## 10.124.6.251
E8000 00E8000M9#####E890S20A####KO4070639003## 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 the ETERNUS disk storage system.
IP Address	Displays the IP address for the ETERNUS disk storage system.

- Displaying ETERNUS disk storage systems which are in a remote site [Excluding Linux 5 for Intel Itanium]:

```
> acarray list -remote

Name  BOX-ID
----- --------------------------------------
E4000 00E4000M3#####E450S20A####KD4030639004##
E8000 00E8000M9#####E890S20A####KO4070639003##
```

The following table shows the meanings of the information displayed.

Title	Explanation
Name	Displays the ETERNUS name.
BOX-ID	Displays the box ID for the ETERNUS disk storage system.

A.2.4 acarray detail (ETERNUS disk storage systems detail information display command)

NAME

acarray detail - Display the detail information on the ETERNUS disk storage systems

SYNOPSIS

```
acarray detail -a DISKARRAY-NAME [-xml]
```

DESCRIPTION

This command displays the detail information about the ETERNUS disk storage systems that have been registered.

OPTIONS

-a *DISKARRAY-NAME*

   This option specifies the ETERNUS name.

-xml

   This option specifies when displaying by the XML format.

   This option can be specified in Windows, Solaris, Linux 5 (for x86, for Intel64).

EXIT STATUS

=0 : Completed successfully

>0 : Terminated abnormally

EXAMPLES

   - Displaying an ETERNUS disk storage system which is in a local site:

   The execution example on Windows operating system is as follows.

```
> acarray detail -a E4000

Disk Array Name : E4000
BOX-ID          : 00E4000M3#####E450S20A####KD4030639004##
IP Address      : 10.124.6.251
Admin User      : root
Access Path     : 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 the ETERNUS disk storage system.
IP Address	Displays the IP address for the ETERNUS disk storage system. (**NOTE**)

Admin User	Displays the user name for ETERNUS Disk storage system. (**NOTE**)
	
	 - When using ETERNUS DX80 S2/DX90 S2, ETERNUS DX410 S2/DX440 S2:
	
	    The user name with Software role for target storage device
	
	 - When using other ETERNUS disk storage systems:
	
	    The user name with Administrator authorization for target storage device

Access Path	Displays the access path set up for the ETERNUS disk storage system. (**NOTE**)
	
	 - [For Windows]
	
	    Displays the device name of the physical drive.
	    If the access path is automatically set by "A.2.1 acarray add (ETERNUS disk storage systems registration command)" or "A.2.5 acarray pathscan (Access path automatic setting command) [Excluding Linux 5 for Intel Itanium]", 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]

Title	Explanation
	Displays the RAW device name. - [For Linux] Displays the device name.

NOTE: If the specified ETERNUS disk storage system exists on a remote site, a hyphen (-) is displayed.

A.2.5 acarray pathscan (Access path automatic setting command) [Excluding Linux 5 for Intel Itanium]

NAME

acarray pathscan - Automatic setting of access paths

SYNOPSIS

```
acarray pathscan -a DISKARRAY-NAME [-xml]
```

DESCRIPTION

This command searches the ETERNUS disk storage system and sets access paths automatically.

This option can be specified in Windows, Solaris, Linux 5 (for x86, for Intel64).

OPTIONS

-a *DISKARRAY-NAME*

This option specifies the ETERNUS name.

-xml

This option specifies that the access path be displayed in XML format.
This option can be specified in Windows, Solaris, Linux 5 (for x86, for Intel6).

EXIT STATUS

=0 :Completed successfully
>0 :Terminated abnormally

EXAMPLES

```
> acarray pathscan -a E4000
Successful completion.
```

NOTES

- This command is not available for ETERNUS disk storage systems registered as a remote device.

A.2.6 acarray remove (ETERNUS disk storage systems registration information deletion command)

NAME

acarray remove - Deletion of registered information of the ETERNUS disk storage systems

SYNOPSIS

```
acarray remove -a DISKARRAY-NAME [-xml]
```

DESCRIPTION

This command deletes registration information for ETERNUS disk storage systems.

OPTIONS

-a *DISKARRAY-NAME*

This option specifies the ETERNUS name.

-xml

This option specifies when displaying the result of the command execution by the XML format.

This option can be specified in Windows, Solaris, Linux 5 (for x86, for Intel64).

EXIT STATUS

=0 : Completed successfully
>0 : Terminated abnormally

EXAMPLES

```
> acarray remove -a E4000
Successful completion.
```

A.3 Commands for Displaying Information Related to ETERNUS disk storage systems

This section explains the commands for displaying information related to ETERNUS disk storage systems.

A.3.1 acinq lv (Logical volume information display command)

NAME

acinq lv - Display of information on logical volumes

SYNOPSIS

```
acinq lv -a DISKARRAY-NAME [-free] [-l] [-xml]
```

DESCRIPTION

This command displays a list of the logical volumes for ETERNUS disk storage systems, together with information about each logical volume.

This information can be displayed for the following types of logical volumes:

- Open

- SDV [Excluding Linux 5 for Intel Itanium]

- Thin Provisioning Volume

OPTIONS

-a *DISKARRAY-NAME*

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.

This option can be specified in Windows, Solaris, Linux 5 (for x86, for Intel64).

-xml

This option specifies when displaying by the XML format.

This option can be specified in Windows, Solaris, Linux 5 (for x86, for Intel64).

EXIT STATUS

=0 : Completed successfully
>0 : Terminated abnormally

EXAMPLES

- When you specify the -free option:

```
> acinq lv -a E4000 -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 E4000

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 [Excluding Linux 5 for Intel Itanium]:

```
> acinq lv -a DX440 -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 16 characters).
	(Only be displayed when used with an ETERNUS that supports logical volume alias name.)
LV Size	Displays the size of the logical volume in Megabytes.
LV Type	Displays the logical volume type.
	- Open: This refers to an "Open Volume", which means a normal 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.
RG No	Displays the RAID group number. The hyphen (-) is displayed, when "TPV" is displayed in "LV Type" field.
Encrypt	Displays the encryption status of the logical volume.
	- -: 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.
	- -: The volume is not protected.
	- Yes: The volume is protected.
	If the logical volume type is "SDV" or the device does not support the volume protection function, a hyphen (-) is displayed.

NOTES

- This command is not available for ETERNUS disk storage systems registered as a remote device. [Excluding Linux 5 for Intel Itanium]

- To display logical volume information of ETERNUS disk storage systems registered as a remote device, login to ETERNUS Web GUI, and confirm the information.

A.3.2   acinq lunmap (LUN Mapping information display command)

NAME

acinq lunmap - Display of LUN Mapping information

SYNOPSIS

```
acinq lunmap -a DISKARRAY-NAME -agno AFFINITY-GROUP-NO [-xml]
```

DESCRIPTION

This command displays LUN Mapping information for affinity groups.
This command cannot be used with the connected affinity group.

OPTIONS

-a *DISKARRAY-NAME*

This option specifies the ETERNUS name.

-agno *AFFINITY-GROUP-NO*

This option specifies an affinity group number.

-xml

This option specifies when displaying by the XML format.

This option can be specified in Windows, Solaris, Linux 5 (for x86, for Intel64).

EXIT STATUS

=0 : Completed successfully
>0 : Terminated abnormally

EXAMPLES

```
> acinq lunmap -a E4000 -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 16 characters).

Title	Explanation
	(Displayed only when used with an ETERNUS that supports logical volume alias name.)

NOTES

- This command is not available for ETERNUS disk storage systems registered as a remote device. [Excluding Linux 5 for Intel Itanium]

A.3.3   acinq ag (Affinity group list display command)

NAME

acinq ag - Display of list of affinity groups

SYNOPSIS

```
acinq ag -a DISKARRAY-NAME [-xml]
```

DESCRIPTION

This command displays a list of affinity groups for ETERNUS disk storage systems.

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 *DISKARRAY-NAME*

This option specifies the ETERNUS name.

-xml

This option specifies when displaying by the XML format.

This option can be specified in Windows, Solaris, Linux 5 (for x86, for Intel64).

EXIT STATUS

=0 : Completed successfully

>0 : Terminated abnormally

EXAMPLES

```
> acinq ag -a E4000

AG No AG Name
----- -------
0x000 win_78
0x001 x86_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 systems registered as a remote device. [Excluding Linux 5 for Intel Itanium]

A.3.4   acinq hostag (Host affinity group list display command)

NAME

- [For Windows, Solaris, Linux 5 (for x86, for Intel64)]

  acinq hostag - Display of list of host affinity groups

- [For Linux 5 for Intel Itanium]

  acinq hag - Display of list of host affinity groups

SYNOPSIS

- [For Windows, Solaris, Linux 5 (for x86, for Intel64)]

  ```
  acinq hostag -a DISKARRAY-NAME [-xml]
  ```

- [For Linux 5 for Intel Itanium]

  ```
  acinq hag -a DISKARRAY-NAME
  ```

DESCRIPTION

This command displays host affinity groups for ETERNUS disk storage systems.

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 *DISKARRAY-NAME*

   This option specifies the ETERNUS name.

-xml

   This option specifies when displaying by the XML format.

   This option can be specified in Windows, Solaris, Linux 5 (for x86, for Intel64).

EXIT STATUS

=0 : Completed successfully
>0 : Terminated abnormally

EXAMPLES

- [For Windows, Solaris, Linux 5 (for x86, for Intel64)]

```
> acinq hostag -a E4000

Host Name Port Type Address          AG No AG Name
--------- --------- ---------------- ----- -------
          FC        1000006069107A5A 0x002 win_78
          FC        100000AC340DA34F 0x003 win_78
          FC        10000045AA2C45GG 0x004 x86_76
```

- [For Linux 5 for Intel Itanium]

```
> acinq hag -a E4000

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 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. [Excluding Linux 5 for Intel Itanium]
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 systems registered as a remote device. [Excluding Linux 5 for Intel Itanium]

A.4 Logical Volume Control Commands

A.4.1 acinhibit set (Volume protection settings command) [Excluding Linux 5 for Intel Itanium]

NAME

acinhibit set - Settings for volume protection

SYNOPSIS

```
acinhibit set -v Volume-Name [-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.

This command is supported in Windows, Solaris, Linux 5 (for x86, for Intel64).

The following type of logical volume can be specified:

- Open (including Thin Provisioning Volume)

OPTIONS

-v *Volume-Name*

This option specifies the logical volume.
The format used to specify the logical volume is as follows:

- (1) ETERNUS name

- (2) Logical volume number

The extent start position and the extent size cannot be specified.

-xml

This option specifies that the logical volume be displayed in XML output format.

EXIT STATUS

=0 : Completed successfully
>0 : Terminated abnormally

EXAMPLES

```
> acinhibit set -v DX440/0x1
Successful completion
```

NOTES

The copy volume protection function cannot be used for the following volumes:

- Logical volumes in remote ETERNUS disk storage systems

- Copy destination logical volumes where a REC session exists

A.4.2　acinhibit unset (Volume protection settings release command) [Excluding Linux 5 for Intel Itanium]

NAME

acinhibit unset - Release of volume protection

SYNOPSIS

```
acinhibit unset -v Volume-Name [-xml]
```

DESCRIPTION

This command releases volume protection settings.

This command is supported in Windows, Solaris, Linux 5 (for x86, for Intel64).

The following type of logical volume can be specified:

- Open (including Thin Provisioning Volume)

OPTIONS

-v *Volume-Name*

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 that the access path be displayed in XML format.

EXIT STATUS

=0 : Completed successfully
>0 : Terminated abnormally

EXAMPLES

```
> acinhibit unset -v DX440/0x1
Successful completion
```

NOTES

The copy volume protection function cannot be used for the following volumes:

- Logical volumes in remote ETERNUS disk storage systems

A.5 Commands for REC transfer buffers

This section explains the commands for REC transfer buffers of the ETERNUS disk storage systems.

A.5.1 acrecbuff set (REC transfer buffer setting command) [Excluding Linux 5 for Intel Itanium]

NAME

acrecbuff set - Sets up REC transfer buffers

SYNOPSIS

```
acrecbuff set -a DISKARRAY-NAME -id BUFFER-ID -use {SEND|RECV} [-xml]
```

DESCRIPTION

The settings for transfer buffers used in the ETERNUS disk storage systems are changed.

To execute this command, it is required that the REC transfer buffers have been already set.

This command is supported in Windows, Solaris, Linux 5 (for x86, for Intel64).

OPTIONS

-a *DISKARRAY-NAME*

This option specifies the ETERNUS name.

-id *BUFFER-ID*

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

```
> acrecbuff set -a E4000 -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 systems registered as a remote device.

A.5.2 acrecbuff stat (REC transfer buffer status display command) [Excluding Linux 5 for Intel Itanium]

NAME

acrcsbuff stat - Displays REC transfer buffer information

SYNOPSIS

```
acrecbuff stat -a DISKARRAY-NAME [-disk] [-xml]
```

DESCRIPTION

The information for REC transfer buffers used in an ETERNUS disk storage system is displayed.

This command is supported in Windows, Solaris, Linux 5 (for x86, for Intel64).

OPTIONS

-a *DISKARRAY-NAME*

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:

```
> acrecbuff stat -a DX440 -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:

```
> acrecbuff stat -a E4000
ID  Use   Rate RemoteBoxID
--- ----  ---- --------------------------------------
1   SEND  12%  00E4000M3#####E450S20A####KD4030639004##
2   RECV   0%  00E4000M3#####E450S20A####KD4030639004##
```

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. - 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. - 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 systems.

DiskBuff	- Displays the REC Disk buffer status. This is displayed only if the -disk option is specified.
	
	- ---: Transfer buffer is for reception
	
	- active: REC Disk buffer is in the usable state
	
	- invalid: REC Disk buffer is not set
	
	- warnning(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:
	
	  - 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 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:
	
	  - 05: RAID 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	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.

Title	Description
	If the REC Disk buffer is not used, "0%" is displayed. In cases other than the above, "---" is displayed.

NOTES

- This command is not available for ETERNUS disk storage systems registered as a remote device.

A.6 Commands for Setting Up Copy Groups

This section explains the commands relating to copy groups and copy pairs.

A.6.1 acgroup create (Copy group creation command)

NAME

acgroup create - Creation of copy groups

SYNOPSIS

```
acgroup create -g COPY-GROUP -type { OPC | QuickOPC | SnapOPCP | EC } -a DISKARRAY-NAME [-xml]
acgroup create -g COPY-GROUP -type REC -a DISKARRAY-NAME -remote REMOTE-DISKARRAY-NAME [-xml]
```

DESCRIPTION

This command creates a copy group.

OPTIONS

-g *COPY-GROUP*

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.

Specify copy group names using up to 64 alphanumeric characters, hyphens (-), underscores (_), hashes (#) or periods (.). The first character must be an alphanumeric character.

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:

- OPC

- QuickOPC

- SnapOPCP [Excluding Linux 5 for Intel Itanium]

- EC

- REC

-a *DISKARRAY-NAME*

    This option specifies the ETERNUS name.

    For REC, the access path of the ETERNUS disk storage system specified here is used.

-remote *REMOTE-DISKARRAY-NAME*

    For REC, the ETERNUS name besides the specified ETERNUS disk storage system is specified by the -a option.

    The access path of the ETERNUS disk storage system specified by the -a option is used, instead of the access path of the ETERNUS disk storage system specified here.

-xml

    This option specifies when displaying the result of the command execution by the XML format.

    This option can be specified in Windows, Solaris, Linux 5 (for x86, for Intel64).

EXIT STATUS

=0 : Completed successfully
>0 : Terminated abnormally

EXAMPLES

```
> acgroup create -g group01 -type OPC -a E4000
Successful completion.
```


A.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.

    This option can be specified in Windows, Solaris, Linux 5 (for x86, for Intel64).

EXIT STATUS

=0 : Completed successfully
>0 : Terminated abnormally

```
CG Name
-------
Group01
Group02
```

The following table shows the meaning of the information displayed.

Title	Explanation
CG Name	Displays the copy group name.

A.6.3 acgroup detail (Copy group detail information display command)

NAME

acgroup detail - Display the detail information of copy groups

SYNOPSIS

```
acgroup detail -g COPY-GROUP [-xml]
```

DESCRIPTION

This command displays the copy pairs that have been set up in copy groups.

OPTIONS

-g *COPY-GROUP*

This option specifies the copy group name.

-xml

This option specifies when displaying by the XML format.

This option can be specified in Windows, Solaris, Linux 5 (for x86, for Intel64).

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 : E4000 (00E4000M3#####E450S20A####KD4030639004##)

Pair
------------------
E4000/0x1:E4000/0x6
```

```
E4000/0x2:E4000/0x7
E4000/0x3:E4000/0x8
```

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 the "-a" option of the "A.6.1 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        : E4000 (00E4000M3#####E450S20A####KD4030639004##)
Remote Disk Array Name : E8000 (00E8000M9#####E890S20A####KO4070639003##)

Pair
------------------
E4000/0x1:E8000/0x1
E4000/0x2:E8000/0x2
E4000/0x3:E8000/0x3
```

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 the "-a" option of the "A.6.1 acgroup create (Copy group creation command)".
Remote Disk Array Name	Displays the Box ID and ETERNUS name that was specified with the "-remote" option of the "A.6.1 acgroup create (Copy group creation command)".
Pair	Displays the copy pairs that have been set up.

A.6.4 acgroup remove (Copy group deletion command)

NAME

acgroup remove - Deletion of copy groups

SYNOPSIS

```
acgroup remove -g COPY-GROUP [-xml]
```

DESCRIPTION

This command removes copy groups.

OPTIONS

-g *COPY-GROUP*

This option specifies the copy group name.

-xml

This option specifies when displaying the result of the command execution by the XML format.

This option can be specified in Windows, Solaris, Linux 5 (for x86, for Intel64).

EXIT STATUS

=0 : Completed successfully

>0 : Terminated abnormally

EXAMPLES

```
> acgroup remove -g group01
Successful completion.
```

A.6.5   acpair add (Copy pair addition command)

NAME

acpair add - Addition of copy pairs

SYNOPSIS

```
acpair add -g COPY-GROUP -p PAIR [-xml]
```

DESCRIPTION

This command adds copy pairs to copy groups.

OPTIONS

-g *COPY-GROUP*

This option specifies the copy group name.

-p *PAIR*

This option specifies the copy pair to be added.

The following example shows the format for specifying copy pairs.

- (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.

E4000/0x122[addr=0x0, size=0x10000]:E4000/0x121[addr=0x80]
(1)   (2)   (3)   (4)   (5)   (6)   (7)
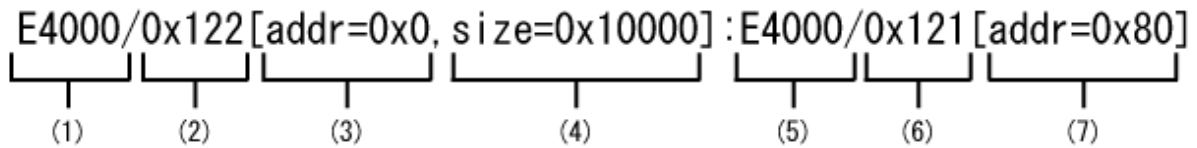
- (1) ETERNUS name for the copy source

- (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.

This option can be specified in Windows, Solaris, Linux 5 (for x86, for Intel64).

EXIT STATUS

=0 : Completed successfully
>0 : Terminated abnormally

EXAMPLES

```
> acpair add -g group01 -p E4000/0x1:E4000/0x6
Successful completion.
```

Example of adding a copy pair in LU to Partition format

```
> acpair add -g group01 -p E4000/0x122[addr=0x0,size=0x1]:E4000/0x121[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 the -a option for "A.6.1 acgroup create (Copy group creation command)".

- If the copy type is SnapOPCP

  - Specify the ETERNUS name that was specified with the -a option for "A.6.1 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 the -a or the -remote option for "A.6.1 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.

A.6.6 acpair remove (Copy pair deletion command)

NAME

acpair remove - Deletion of copy pairs

SYNOPSIS

```
acpair remove -g COPY-GROUP -p PAIR [-xml]
```

DESCRIPTION

This command deletes copy pairs from copy groups.

OPTIONS

-g *COPY-GROUP*

This option specifies the copy group name.

-p *PAIR*

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.

This option can be specified in Windows, Solaris, Linux 5 (for x86, for Intel64).

EXIT STATUS

=0 : Completed successfully
>0 : Terminated abnormally

EXAMPLES

```
> acpair remove -g group01 -p E4000/0x1:E4000/0x6
Successful completion.
```

Example of deleting a copy pair in LU to Partition format

```
> acpair remove -g group01 -p E4000/0x122[addr=0x0,size=0x1]:E4000/0x121[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 ETERNUSmgr, or add the copy pair again and then stop advanced copy.

A.7 Control Commands for Snapshot Type High-speed Copying

This section explains the commands for snapshot type high-speed copying.

A.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 COPY-GROUP [-p PAIR] [-r] [-xml]
  ```

- [For QuickOPC copy groups]

  ```
  acopc start -g COPY-GROUP [-p PAIR] [-diff|-r] [-xml]
  ```

DESCRIPTION

This command performs OPC or QuickOPC for the specified copy group or copy pair.

OPTIONS

-g *COPY-GROUP*

This option specifies the copy group name.

-p *PAIR*

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.

-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.

This option can be specified in Windows, Solaris, Linux 5 (for x86, for Intel64).

EXIT STATUS

=0 : Completed successfully

>0 : Terminated abnormally

EXAMPLES

```
> acopc start -g group01

E4000/0x1:E4000/0x6
# DATE : 2008/06/24 16:28:00 - << OPC Started >>
# From:BoxID=303045343030304d33232323232345343530533230412323234b44343033303633393030342323/Olu=1/
Adr_high=0/Adr_low=0/size_high=0/size_low=0
# To   :BoxID=303045343030304d33232323232345343530533230412323234b44343033303633393030342323/Olu=6/
Adr_high=0/Adr_low=0

E4000/0x2:E4000/0x7
# DATE : 2008/06/24 16:28:00 - << OPC Started >>
# From:BoxID=303045343030304d33232323232345343530533230412323234b44343033303633393030342323/Olu=2/
Adr_high=0/Adr_low=0/size_high=0/size_low=0
# To   :BoxID=303045343030304d33232323232345343530533230412323234b44343033303633393030342323/Olu=7/
Adr_high=0/Adr_low=0

E4000/0x3:E4000/0x8
# DATE : 2008/06/24 16:28:00 - << OPC Started >>
# From:BoxID=303045343030304d33232323232345343530533230412323234b44343033303633393030342323/Olu=3/
Adr_high=0/Adr_low=0/size_high=0/size_low=0
# To   :BoxID=303045343030304d33232323232345343530533230412323234b44343033303633393030342323/Olu=8/
Adr_high=0/Adr_low=0

  Succeeded : 3
  Failed    : 0
```

NOTES

- This command terminates abnormally if the copy destination logical volume of the specified copy group or pair is protected by "A.
  4.1 acinhibit set (Volume protection settings command) [Excluding Linux 5 for Intel Itanium]".

A.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 COPY-GROUP [-p PAIR] [-r] [-progress] [-xml]
```

DESCRIPTION

This command displays the copy status of the OPC or QuickOPC for the specified copy group or copy pair.

OPTIONS

-g *COPY-GROUP*

    This option specifies the copy group name.

-p *PAIR*

    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.

    This option can be specified in Windows, Solaris, Linux 5 (for x86, for Intel64).

-xml

    This option specifies when displaying by the XML format.

    This option can be specified in Windows, Solaris, Linux 5 (for x86, for Intel64).

EXIT STATUS

=0 : Completed successfully
>0 : Terminated abnormally

EXAMPLES

- For OPC

  - When the -progress option is not specified:

```
> acopc query -g Group01

Copy Group Name : Group01
Copy Group Type : OPC
Disk Array Name : E4000 (00E4000M3#####E450S20A####KD4030639004##)

Source    <=> Target    SID  OPC Status       Copy Phase Copied Block
--------- --- --------- ---- --------------- ---------- ------------
E4000/0x1 ==> E4000/0x3 0x21 "OPC Executing" "Copying"           0
E4000/0x2 ==> E4000/0x4 0x22 "OPC Executing" "Copying"     1048576
```

  - When the -progress option is specified [Excluding Linux 5 for Intel Itanium]:

```
> acopc query -g Group01 -progress

Copy Group Name : Group01
Copy Group Type : OPC
Disk Array Name : E4000 (00E4000M3#####E450S20A####KD4030639004##)

Source    <=> Target    Progress Copied Block Total Block
--------- --- --------- -------- ------------ -----------
E4000/0x1 ==> E4000/0x3      0%            0     1048576
E4000/0x2 ==> E4000/0x4     45%      1048576     2330168
```

- For QuickOPC

  - When the -progress option is not specified:

```
> acopc query -g Group01

Copy Group Name : Group01
```

```
Copy Group Type : QuickOPC
Disk Array Name : E4000 (00E4000M3#####E450S20A####KD4030639004##)


Source     <=> Target    SID  OPC Status      Copy Phase Copied Block
--------- --- --------- ---- --------------- ---------- ------------
E4000/0x1 ==> E4000/0x3 0x21 "OPC Executing" "Tracking"     1048576
E4000/0x2 ==> E4000/0x4 0x22 "OPC Executing" "Tracking"     1048576
```

- When the -progress option is specified [Excluding Linux 5 for Intel Itanium]:

```
> acopc query -g Group01 -progress

Copy Group Name : Group01
Copy Group Type : QuickOPC
Disk Array Name : E4000 (00E4000M3#####E450S20A####KD4030639004##)


Source     <=> Target    Progress Copied Block Total Block
--------- --- --------- -------- ------------ -----------
E4000/0x1 ==> E4000/0x3     0%              0     1048576
E4000/0x2 ==> E4000/0x4    45%         471859     1048576
```

The following table shows the meanings of the information displayed.

Table A.10 When the -progress 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 the "-a" option of the "A.6.1 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. - 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. - 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	Displays the number of blocks that have been copied.

Table A.11 When the -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 the "-a" option of the "A.6.1 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. 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 "???".

NOTES

- Information such as Copy direction data and SID data may display as "???".

  It is possible that the access path is incorrect. Therefore, check it using the "A.2.4 acarray detail (ETERNUS disk storage systems detail information display command)". For details on how to correctly set the access path, refer to "2.2.4 Access Path Settings".

A.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 COPY-GROUP [-p PAIR] [-r] [-xml]
  ```

- [For QuickOPC copy groups]

  ```
  acopc cancel -g COPY-GROUP [-p PAIR] [-r] [-force] [-xml]
  ```

DESCRIPTION

This command stops the OPC or QuickOPC copy for the specified copy group or copy pair.

OPTIONS

-g *COPY-GROUP*

This option specifies the copy group name.

-p *PAIR*

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.

-xml

This option specifies when displaying the result of the command execution by the XML format.

This option can be specified in Windows, Solaris, Linux 5 (for x86, for Intel64).

EXIT STATUS

=0 : Completed successfully
>0 : Terminated abnormally

EXAMPLES

```
> acopc cancel -g group01
E4000/0x1:E4000/0x6
# DATE : 2008/06/24 16:28:00 - << OPC Disconnected >>

E4000/0x2:E4000/0x7
# DATE : 2008/06/24 16:28:00 - << OPC Disconnected >>

E4000/0x3:E4000/0x8
# DATE : 2008/06/24 16:28:00 - << OPC Disconnected >>

  Succeeded : 3
  Failed    : 0
```

A.7.4 acsnap start (SnapOPC+ copy start command) [Excluding Linux 5 for Intel Itanium]

NAME

acsnap start - Start of SnapOPC+

SYNOPSIS

```
acsnap start -g COPY-GROUP [-p PAIR | -v VOLUME-NAME] [-r][-xml]
acsnap start -estimate -v VOLUME-NAME [-xml]
```

DESCRIPTION

The SnapOPC+ is executed onto a specified copy group or copy pair.
It is also possible to start to estimate the number of updated blocks generated for the copy source volume.

If the -p option is not specified, a copy destination is automatically selected and SnapOPC+ is started.If all copy destination volumes are generation-managed, the oldest snap generation is cancelled and selected as a copy destination.

If the -p option is specified, SnapOPC+ is started onto a specified copy destination.If a past snap generation (excluding the oldest snap generation) is specified as a copy destination, this command ends abnormally.

This command is supported in Windows, Solaris, Linux 5 (for x86, for Intel64).

OPTIONS

-g *COPY-GROUP*

This option specifies the copy group name.

-p *PAIR*

This option specifies a copy pair.

-r

This option performs a copy in the reverse direction to the direction that has been specified.
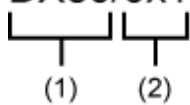The latest snap generation is selected as a copy source when the copy pair is not specified.

-v *VOLUME-NAME*

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.
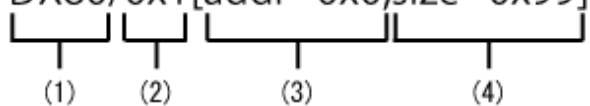
The following is an example of a format to specify a logical volume.

- (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.

EXIT STATUS

=0 : Completed successfully

>0 : Terminated abnormally

EXAMPLES

- Start the SnapOPC+

```
> acsnap start -g group01

E4000/0x1:E4000/0x6
# DATE : 2008/06/24 16:28:00 - << SnapOPCP Started >>

E4000/0x2:E4000/0x7
# DATE : 2008/06/24 16:28:00 - << SnapOPCP Started >>

E4000/0x3:E4000/0x8
# 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 E4000/0x1
Successful completion
```


NOTES

- This command is not available for ETERNUS disk storage systems 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 "A. 4.1 acinhibit set (Volume protection settings command) [Excluding Linux 5 for Intel Itanium]".

A.7.5 acsnap query (SnapOPC+ copy status display command) [Excluding Linux 5 for Intel Itanium]

NAME

acsnap query - Display the copy status of SnapOPC+

SYNOPSIS

```
acsnap query -g COPY-GROUP [-p PAIR] [-r][-xml]
acsnap query -estimate -v VOLUME-NAME [-xml]
```


DESCRIPTION

This command displays the copy status of the SnapOPC+ for the specified copy group or copy pair.

It is also possible to refer to the estimation of the amount of snap data volume updates for the copy-source volume.

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.)

This command is supported in Windows, Solaris, Linux 5 (for x86, for Intel64).

OPTIONS

-g *COPY-GROUP*

This option specifies the copy group name.

-p *PAIR*

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.

-estimate

This option displays the amount of snap data volume updates.

-v *VOLUME-NAME*

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.

DX80/0x1

- (1) ETERNUS name

- (2) Logical volume number

The extent start position and the extent size can be specified.

DX80/0x1[addr=0x0,size=0x99]

- (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.
This option is only supported in Windows version.

EXIT STATUS

=0 : Completed successfully
>0 : Terminated abnormally

EXAMPLES

- Displaying the SnapOPC+ copy status

```
> acsnap query -g group01


Copy Group Name : group01
Copy Group Type : SnapOPCP
Disk Array Name : E4000 (00E4000M3#####E450S20A####KD4030639004##)

Source     <=> Target     SID  Snap Status                Gen Date       Copied Block
---------  --- ---------  ---- -------------------------  ------------- ------------
E4000/0x1  ==> E4000/0x5  0x23 "Copy On Write(Active)"    3    10minute      1048576
E4000/0x1  ==> E4000/0x4  0x22 "Copy On Write(Inactive)"  2    3hour         1048576
E4000/0x1  ==> E4000/0x3  0x21 "Copy On Write(Inactive)"  1    1day          1048576
```

The following table shows the meanings of the information displayed.

Title	Explanation
Source	Displays a copy-source logical volume.
<=>	Displays a copy direction. The following information is displayed. - 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 the -r option is specified, no information is displayed. - 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(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 the -r option is specified. - 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. If the -r option is specified, no information is displayed. - No set: No copy process is executed. - Copying: Copy is in process.
Date	Displays the elapsed time of Snapshot type copy execution. If the -r option is specified, no information is displayed. The output format is as follows. - 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.

Title	Explanation
	- 24H or more: Displayed on a per day basis.
Gen	Displays snap generation numbers. If the -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. If no copy process is executed, it is displayed as "N/A".
Copied Block	Displays the number of copied blocks. If no copy process is executed, it is displayed as "N/A". If the number of copied blocks is unknown, it is displayed "???".

- Referring the estimation of the amount of snap data volume updates

```
> acsnap query -estimate -v E4000/0x1
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

- Information such as Copy direction data and SID data may display as "???". It is possible that the copy-source logical volume size and copy-destination logical volume size are different or the access path is incorrect.
  Check the size of their logical volumes. If it is different, register the copy pair that the copy-source logical volume size and copy-destination logical volume size are same.
  And, check the access path using the "A.2.4 acarray detail (ETERNUS disk storage systems detail information display command)". If the access path is incorrect, set the correct access path by referring the "2.2.4 Access Path Settings".

- This command is not available for ETERNUS disk storage systems registered as a remote device.

A.7.6 acsnap cancel (SnapOPC+ copy stop command) [Excluding Linux 5 for Intel Itanium]

NAME

acsnap cancel - Stops of SnapOPC+ copy

SYNOPSIS

```
acsnap cancel -g COPY-GROUP [-p PAIR | -v VOLUME-NAME] [-r | -force][-xml]
acsnap cancel -estimate -v VOLUME-NAME [-xml]
```

DESCRIPTION

The SnapOPC+ copy for a specified copy group or pair is cancelled.
It is also possible to cancel the estimation of the number of updated blocks generated for the copy-source volume.

This command is supported in Windows, Solaris, Linux 5 (for x86, for Intel64).

OPTIONS

-g *COPY-GROUP*

This option specifies the copy group name.

-p *PAIR*

This option specifies a copy pair.

- If neither a pair nor the -force option is specified, the copy process of the oldest snap generation is cancelled.

- If a pair is not specified but the -force option is specified, the copy process of the latest snap generation is cancelled.

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.

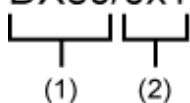This option is specifiable even if there is only one snap generation.

-v *VOLUME-NAME*

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.
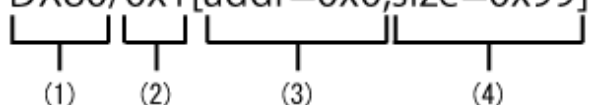
When cancelling the estimation of the amount of snap data volume updates, specify a copy-source logical volume.

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

E4000/0x1:E4000/0x6
# DATE : 2008/06/24 16:28:00 - << SnapOPCP Disconnected >>

E4000/0x2:E4000/0x7
# DATE : 2008/06/24 16:28:00 - << SnapOPCP Disconnected >>

E4000/0x3:E4000/0x8
# 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 E4000/0x1
Successful completion
```

NOTES

- This command is not available for ETERNUS disk storage systems registered as a remote device.

A.8 Control Commands for Synchronous High-Speed Copying

This section explains the commands for synchronous high-speed copying.

A.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 COPY-GROUP [-p PAIR] [-r] [-xml]
```

- [When the copy type set in the copy group is REC]

```
acec start -g COPY-GROUP [-p PAIR] [-r] [-transfer {sync [-split {auto|manual}]|through|consist|
stack}] [-recovery {auto|manual}] [-skip] [-xml]
```

DESCRIPTION

This command starts synchronous processing for the synchronous high-speed copy for the specified copy group or copy pair.

OPTIONS

-g *COPY-GROUP*

This option specifies the copy group name.

-p *PAIR*

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 "3.1.2.5 REC operating modes" for details on each mode.

- sync: Synchronous mode

    This option specifies the split mode when sync was specified with the "-transfer" option (Only for REC)

    -split

    The default mode is "auto".

    - auto: Automatic Split

    - manual: Manual Split

- through: Through mode

- 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 "3.1.2.5 REC operating modes" for details 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 intra-box is started.

This option can be specified in Windows, Solaris, Linux 5 (for x86, for Intel64).

-xml

This option specifies when displaying the result of the command execution by the XML format.

This option can be specified in Windows, Solaris, Linux 5 (for x86, for Intel64).

EXIT STATUS

=0 : Completed successfully

>0 : Terminated abnormally

EXAMPLES

```
> acec start -g group01

E4000/0x1:E4000/0x6
# DATE : 2008/06/24 16:28:00 - << EC Started >>
# From:BoxID=303045343030304d333232323232323435343530533230412323232323234b4434303330363333393030342323/Olu=1/
Adr_high=0/Adr_low=0/size_high=0/size_low=0
# To   :BoxID=303045343030304d333232323232323435343530533230412323232323234b4434303330363333393030342323/Olu=6/
Adr_high=0/Adr_low=0

E4000/0x2:E4000/0x7
# DATE : 2008/06/24 16:28:00 - << EC Started >>
# From:BoxID=303045343030304d333232323232323435343530533230412323232323234b4434303330363333393030342323/Olu=2/
Adr_high=0/Adr_low=0/size_high=0/size_low=0
# To   :BoxID=303045343030304d333232323232323435343530533230412323232323234b4434303330363333393030342323/Olu=7/
Adr_high=0/Adr_low=0

E4000/0x3:E4000/0x8
# DATE : 2008/06/24 16:28:00 - << EC Started >>
# From:BoxID=303045343030304d333232323232323435343530533230412323232323234b4434303330363333393030342323/Olu=3/
Adr_high=0/Adr_low=0/size_high=0/size_low=0
# To   :BoxID=303045343030304d333232323232323435343530533230412323232323234b4434303330363333393030342323/Olu=8/
Adr_high=0/Adr_low=0

  Succeeded : 3
  Failed    : 0
```

NOTES

- This command terminates abnormally if the copy destination logical volume of the specified copy group or pair is protected by "A. 4.1 acinhibit set (Volume protection settings command) [Excluding Linux 5 for Intel Itanium]".

A.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 COPY-GROUP [-p PAIR] [-r] [-progress] [-xml]
```

DESCRIPTION

This command displays the status of the synchronous high-speed copy for the specified copy group or copy pair.

OPTIONS

-g *COPY-GROUP*

This option specifies the copy group name.

-p *PAIR*

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.

This option can be specified in Windows, Solaris, Linux 5 (for x86, for Intel64).

-xml

This option specifies when displaying by the XML format.

This option can be specified in Windows, Solaris, Linux 5 (for x86, for Intel64).

EXIT STATUS

=0 : Completed successfully
>0 : Terminated abnormally

EXAMPLES

- For EC

  - When the -progress option is not specified:

```
> acec query -g ECGroup

Copy Group Name : ECGroup
Copy Group Type : EC
Disk Array Name : E8000 (00E8000M9#####E890S20A####KO4070639003##)

Source     <=> Target    SID  EC Status               Copy Phase Copied Block
--------- --- --------- ---- ---------------------- ---------- ------------
E8000/0x1 N/A E8000/0x3 N/A  "EC action not startup" "Not set"            0
E8000/0x2 ==> E8000/0x4 0x41 "EC Executing"          "Copying"      1048576
```

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 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 the "-a" option of the "A.6.1 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.
EC Status	Displays the execution status of the EC. - EC Starting: The EC is starting up.

Title	Explanation
	- 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. - Copying: Copy processing is executing. - Paired: The copy is in an 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.

- When the -progress option is specified [Excluding Linux 5 for Intel Itanium]:

```
> acec query -g ECGroup -progress

Copy Group Name : ECGroup
Copy Group Type : EC
Disk Array Name : E8000 (00E8000M9#####E890S20A####KO4070639003##)

Source     <=> Target     Progress Copied Block Total Block
---------- --- ---------- -------- ------------ -----------
E8000/0x1 N/A E8000/0x3    N/A          N/A          N/A
E8000/0x2 ==> E8000/0x4    45%       471859      1048576
```

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 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 the "-a" option of the "A.6.1 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. 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 "???".

- For REC

    - When the -progress option is not specified:

```
> acec query -g RECGroup

Copy Group Name       : RECGroup
Copy Group Type       : REC
Disk Array Name       : E4000 (00E4000M3#####E450S20A####KD4030639004##)
Remote Disk Array Name : E8000 (00E8000M9#####E890S20A####KO4070639003##)

Source    <=> Target    SID(RSID) EC Status              Copy Phase Copied Block Rcv  Split Xfer
--------- --- --------- ---------- ---------------------- ---------- ------------ ---- -----
-------
E4000/0x1 N/A E8000/0x6 N/A        "EC action not startup" "Not set"           0 ---- ---- ----
E4000/0x2 ==> E8000/0x7 0x4A(0x11) "EC Executing"          "Copying"           0 auto ----
through
E4000/0x3 ==> E8000/0x8 0x4C(0x13) "EC Suspend"            "Paired"      1048576 auto ----
through
```

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 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 the "-a" option of the "A.6.1 acgroup create (Copy group creation command)".
Remote Disk Array Name	Displays the Box ID and ETERNUS name that was specified with the "-remote" option of the "A.6.1 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(RSID)	Displays the Session ID of the ETERNUS disk storage system (i.e. the Disk Array Name) and the Session ID of the Remote ETERNUS disk storage system (i.e. the Remote Disk Array Name).
EC Status	Displays the execution status of the EC. - 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. - EC Hardware Suspend: The EC has paused because of a hardware error, such as a problem with the path between hardware devices. - The REC DISK buffer is in use because of a hardware error, such as a problem with the path between hardware devices.
Copy Phase	Displays the current phase.

Title	Explanation
	- Copying: Copy processing is executing.
	- Paired: The copy is in an 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.
	- 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.
	- 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.
	- 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".
	- ----: a REC copy is not being performed.

- When the -progress option is specified [Excluding Linux 5 for Intel Itanium]:

```
> acec query -g RECGroup -progress

Copy Group Name        : RECGroup
Copy Group Type        : REC
Disk Array Name        : E4000 (00E4000M3#####E450S20A####KD4030639004##)
Remote Disk Array Name : E8000 (00E8000M9#####E890S20A####KO4070639003##)

Source     <=> Target     Progress Copied Block Total Block
---------- --- ---------- -------- ------------ -----------
E4000/0x1 N/A E8000/0x6      N/A          N/A         N/A
E4000/0x2 ==> E8000/0x7     45%       471859     1048576
E4000/0x3 ==> E8000/0x8    100%      1048576     1048576
```

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 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 the "-a" option of the "A.6.1 acgroup create (Copy group creation command)".
Remote Disk Array Name	Displays the Box ID and ETERNUS name that was specified with the "-remote" option of the "A.6.1 acgroup create (Copy group creation command)".
Source	Displays the logical volume for the copy source.
<=>	Displays the copy direction.

Title	Explanation
	- 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 "???".

NOTES

- Information such as Copy direction data and SID data may display as "???".

  It is possible that the access path is incorrect. Therefore, check it using the "A.2.4 acarray detail (ETERNUS disk storage systems detail information display command)". For details on how to correctly set the access path, refer to "2.2.4 Access Path Settings".

A.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 COPY-GROUP [-p PAIR | -concur] [-r] [-xml]
  ```

- [For REC copy groups]

  ```
  acec suspend -g COPY-GROUP [-p PAIR] [-r] [-force] [-xml]
  acec suspend -g COPY-GROUP -concur [-r] [-xml]
  ```

DESCRIPTION

This command temporarily suspends the synchronous high-speed copy for the specified copy group or copy pair.

OPTIONS

-g *COPY-GROUP*

This option specifies the copy group.

-p *PAIR*

This option specifies a copy pair.

-concur

This option suspends synchronous high-speed copy using the Concurrent suspension 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 and an ETERNUS disk storage system that set the access path is copy-source box.

This option can be specified in Windows, Solaris, Linux 5 (for x86, for Intel64).

-r

This option temporarily suspends copying in the direction opposite to the specified one.

-force

This option forcibly and temporarily suspends the REC session.

-xml

This option specifies when displaying the result of the command execution by the XML format.

This option can be specified in Windows, Solaris, Linux 5 (for x86, for Intel64).

EXIT STATUS

=0 : Completed successfully
>0 : Terminated abnormally

EXAMPLES

- Suspending synchronous high-speed copy (no using the Concurrent suspension function)

```
> acec suspend -g group01

E4000/0x1:E4000/0x6
# DATE : 2008/06/24 16:28:00 - << EC Suspended >>

E4000/0x2:E4000/0x7
# DATE : 2008/06/24 16:28:00 - << EC Suspended >>

E4000/0x3:E4000/0x8
# DATE : 2008/06/24 16:28:00 - << EC Suspended >>

  Succeeded : 3
  Failed    : 0
```

- Suspending synchronous high-speed copy using the Concurrent suspension function [Excluding Linux 5 for Intel Itanium]

```
> acec suspend -g group01 -concur
Successful completion.
```

NOTES

- The following message 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@00E8000M9#####E890S20A####KO4070639003##).
```

Check that an ETERNUS disk storage system of the copy source is not registered as a remote device, if the above message is displayed. When an ETERNUS disk storage system of the copy source is not registered as a remote device, execute the command again after the re-registration the ETERNUS disk storage system of the copy source.

A.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 COPY-GROUP [-p PAIR] [-r] [-xml]
```

- [When the copy type set in the copy group is REC]

```
acec resume -g COPY-GROUP [-p PAIR] [-r] [-remain] [-xml]
```

DESCRIPTION

This command restarts the synchronous high-speed copy for the specified copy group or copy pair.

OPTIONS

-g *COPY-GROUP*

This option specifies the copy group name.

-p *PAIR*

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.

This option can be specified in Windows, Solaris, Linux 5 (for x86, for Intel64).

-xml

This option specifies when displaying the result of the command execution by the XML format.

This option can be specified in Windows, Solaris, Linux 5 (for x86, for Intel64).

EXIT STATUS

=0 : Completed successfully
>0 : Terminated abnormally

EXAMPLES

```
> acec resume -g group01

E4000/0x1:E4000/0x6
# DATE : 2008/06/24 16:28:00 - << EC Resumed >>

E4000/0x2:E4000/0x7
# DATE : 2008/06/24 16:28:00 - << EC Resumed >>
```

```
E4000/0x3:E4000/0x8
# DATE : 2008/06/24 16:28:00 - << EC Resumed >>

  Succeeded : 3
  Failed    : 0
```

NOTES

- This command terminates abnormally if the copy destination logical volume of the specified copy group or pair is protected by "A. 4.1 acinhibit set (Volume protection settings command) [Excluding Linux 5 for Intel Itanium]".

A.8.5 acec reverse (Synchronous high-speed copy reverse command)

NAME

acec reverse - Reversal of synchronous high-speed copying

SYNOPSIS

```
acec reverse -g COPY-GROUP [-p PAIR] [-r] [-xml]
```

DESCRIPTION

This command reverses the direction of the synchronous high-speed copy for the specified copy group or copy pair.

OPTIONS

-g *COPY-GROUP*

This option specifies the copy group name.

Only the following types of copy set in the copy group can be specified:

- EC

- REC

-p *PAIR*

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.

This option can be specified in Windows, Solaris, Linux 5 (for x86, for Intel64).

EXIT STATUS

=0 : Completed successfully
>0 : Terminated abnormally

EXAMPLES

```
> acec reverse -g group01

E4000/0x1:E4000/0x6
# DATE : 2008/06/24 16:28:00 - << EC Change >>

E4000/0x2:E4000/0x7
# DATE : 2008/06/24 16:28:00 - << EC Change >>

E4000/0x3:E4000/0x8
# DATE : 2008/06/24 16:28:00 - << EC Change >>

  Succeeded : 3
  Failed    : 0
```

A.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 COPY-GROUP [-p PAIR] [-r] [-transfer {sync [-split {auto|manual}]|through|consist|
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 *COPY-GROUP*

This option specifies the copy group.

-p *PAIR*

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 "3.1.2.5 REC operating modes" for details of 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 "3.1.2.5 REC operating modes" for details of each mode.

- auto: Automatic Recovery

- manual: Manual Recovery

-xml

This option specifies when displaying the result of the command execution by the XML format.

This option can be specified in Windows, Solaris, Linux 5 (for x86, for Intel64).

EXIT STATUS

=0 : Completed successfully
>0 : Terminated abnormally

EXAMPLES

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

E4000/0x1:E8000/0x1
# DATE : 2008/06/24 16:28:00 - << EC Change >>

E4000/0x2:E8000/0x2
# DATE : 2008/06/24 16:28:00 - << EC Change >>

E4000/0x3:E8000/0x3
# DATE : 2008/06/24 16:28:00 - << EC Change >>

  Succeeded : 3
  Failed    : 0
```

- Specify -force option for "A.8.3 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.

A.8.7 acec cancel (Synchronous high-speed copy stop command)

NAME

acec cancel - Stop of synchronous high-speed copying

SYNOPSIS

```
acec cancel -g COPY-GROUP [-p PAIR] [-r] [-force] [-xml]
```

DESCRIPTION

This command stops the synchronous high-speed copy for the specified copy group or copy pair.

OPTIONS

-g *COPY-GROUP*

This option specifies the copy group name.

-p *PAIR*

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.

This option can be specified in Windows, Solaris, Linux 5 (for x86, for Intel64).

EXIT STATUS

=0 : Completed successfully
>0 : Terminated abnormally

EXAMPLES

```
> acec cancel -g group01

E4000/0x1:E4000/0x6
# DATE : 2008/06/24 16:28:00 - << EC Disconnected >>

E4000/0x2:E4000/0x7
# DATE : 2008/06/24 16:28:00 - << EC Disconnected >>

E4000/0x3:E4000/0x8
# DATE : 2008/06/24 16:28:00 - << EC Disconnected >>

  Succeeded : 3
  Failed    : 0
```

NOTES

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 specifying -force option to "A.8.3 acec suspend (Synchronous high-speed copy temporary suspension command)".

2. Change the REC transfer mode to Through mode by executing "A.8.6 acec change (Synchronous high-speed copy mode change command)".

3. Stop the REC session by executing this command.
   Do not specify - force option.

A.9 Server Utility Commands

This section explains the utility commands that are used on each server.

A.9.1 acutil devs (Logical volume information display command) [Excluding Linux 5 for Intel Itanium]

NAME

acutil devs - Display the logical volume information

SYNOPSIS

```
acutil devs
```

DESCRIPTION

This command displays information about the logical volumes on ETERNUS disk storage systems for Windows servers.

This command is supported in Windows, Solaris, Linux 5 (for x86, for Intel64).

EXIT STATUS

=0 : Completed successfully
>0 : Terminated abnormally

EXAMPLES

- [For Windows]

```
> acutil devs

Device          BOX-ID                                    LV No Size
-------------- ----------------------------------------- ----- -------
PHYSICALDRIVE4 00E8000M9#####E890S20A####KO4070639003## 0x61  1048576
PHYSICALDRIVE5 00E8000M9#####E890S20A####KO4070639003## 0x62  1048576
PHYSICALDRIVE6 00E8000M9#####E890S20A####KO4070639003## 0x63  1048576
```

- [For Solaris]

```
>acutil devs

Device                   BOX-ID                                    LV No  Size
------------------------ ----------------------------------------- ------ -------
/dev/rdsk/c1t16d0s2      00E8000M9#####E890S20A####KO4070639003## 0x0208 8388608
/dev/FJSVmplb/rdsk/mplb1s2 00E8000M9#####E890S20A####KO4070639003## 0x0062 8388608
/dev/vx/rdmp/c2t16d0s2    00E8000M9#####E890S20A####KO4070639003## 0x0061 8388608
```

- [For Linux]

```
>acutil devs

Device                                                   BOX-ID                                  LV No  Size
-------------------------------------------------------- ---------------------------------------
------ --------
/dev/sdb                                                 00E8000M900###E890S20A####GG000327######
0x0084 12582912
/dev/disk/by-id/scsi-36000b5d0006a0000006a000200840000 00E8000M900###E890S20A####GG000327######
0x0084 12582912
/dev/disk/by-path/pci-0000:00:10.0-scsi-0:0:1:0          00E8000M900###E890S20A####GG000327######
0x0084 12582912
```

The following table shows the meanings of the information displayed.

Title	Explanation
Device	- [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 the 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.

A.9.2 acgetvolinfo (Logical volume information display command)

NAME

acgetvolinfo - Display the logical volume information

SYNOPSIS

```
acgetvolinfo DEVICE-NAME
```

DESCRIPTION

This command displays information about the logical volumes on ETERNUS disk storage systems.

This command is used on the backup source server.

This command can be used with the following operating systems:

- Windows Server 2003

- Windows Server 2008

- Solaris 10 Operating System

- Red Hat Enterprise Linux 5 (for x86)

- Red Hat Enterprise Linux 5 (for Intel64)

- Red Hat Enterprise Linux 5 (for Intel Itanium)

- AIX 5L V5.3

- HP-UX 11i v3

As a result of a backup source server OS error, 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 backup source server OS.

- [For Solaris/Linux]

  Install and use AdvancedCopy Manager CCM on the backup source server. Or, copy the utility file supported by the OS from the CCM server where AdvancedCopy Manager CCM is installed to the backup source server, and then use it.

- [For HP-UX/AIX]

  Copy the utility file supported by the OS from the CCM server where AdvancedCopy Manager CCM is installed to the backup source server, and then use it.

If installing AdvancedCopy Manager CCM on the backup source server and using it, refer to "2.1 Installation".

If copying the utility file to the backup source server and then using it, copy using the procedures below.

1. Copy the utility file to an arbitrary location on the backup source server.

   The utility file can be found in the following directory on the CCM server.

   - [For Windows]

Operating system	Utility file
Windows Server 2003 WIndows Server 2008	$INS_DIR\tools\server_utility_windows.zip
Solaris 10 Operating system	$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 5 (for Intel Itanium)	$INS_DIR\tools\server_utility_rhel5ia64.tar
AIX 5L V5.3	$INS_DIR\tools\server_utility_aix.tar
HP-UX 11i v3	$INS_DIR\tools\server_utility_hp-ux.tar

   NOTE: $INS_DIR means the "Program Directory" specified at the AdvancedCopy Manager CCM installation.

   - [For Solaris/Linux]

Operating system	Utility file
Windows Server 2003 WIndows Server 2008	/opt/FJSVccm/tools/server_utility_windows.zip
Solaris 10 Operating system	/opt/FJSVccm/tools/server_utility_solaris.tar
Red Hat Enterprise Linux 5 (for x86) Red Hat Enterprise Linux 5 (for Intel64)	/opt/FJSVccm/tools/server_utility_rhel5x86.tar
Red Hat Enterprise Linux 5 (for Intel Itanium)	/opt/FJSVccm/tools/server_utility_rhel5ia64.tar
AIX 5L V5.3	/opt/FJSVccm/tools/server_utility_aix.tar
HP-UX 11i v3	/opt/FJSVccm/tools/server_utility_hp-ux.tar

2. Decompress the utility file, and then change the active directory.

   - [For Solaris/Linux/HP-UX/AIX]

   ```
   # cd <Directory where the file was copied>
   # tar xvf <Utility file>
   # cd ./server_utility/bin
   ```

   - [For Windows]

   Decompress the zip file, and then change the active directory by using the Command prompt tool etc.
....

OPERANDS

- Install and use AdvancedCopy Manager CCM on the backup source server.

   DEVICE-NAME

   Specifies the device name.

   [For Solaris]

   Specifies the RAW device name (e.g. /dev/rdsk/c4t0d10s2).

   [For Linux]

   Specifies the device name (e.g. /dev/sdo).

   [For Windows]

   Specify the drive letter (e.g. X:).

- Copy utility file to the backup source server and use

   DEVICE-NAME

   Specifies the device name.

   [For Solaris]

   Specifies the RAW device name (e.g. /dev/rdsk/c4t0d10s2).

   [For Linux]

   Specifies the device name (e.g. /dev/sdo).

   [For Windows]

   Specify the drive letter (e.g. X:).

   [For HP-UX]

   Specifies the RAW device name (e.g. /dev/rdsk/c1t0d20).

   [For 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 backup source server.

   - [For Solaris]

   ```
   # acgetvolinfo /dev/rdsk/c4t0d10s2
   BOX-ID,LV No,Address,Size
   00E4000M3#####E450S20A####KD4030639004##,0x041,0x0,0x800000
   ```

   - [For Linux]

   ```
   # acgetvolinfo /dev/sdo
   BOX-ID,LV No,Address,Size
   00E4000M3#####E450S20A####KD4030639004##,0x042,0x0,0x800000
   ```

- [For Windows]

```
C:\> acgetvolinfo X:
BOX-ID,LV No,Address,Size
00E4000M3#####E450S20A####KD4030639004##,0x043,0x0,0x800000
```

The following table shows the meanings of the information displayed.

Title	Explanation
BOX-ID	Displays the box ID for the ETERNUS disk storage system.
LV No	Displays the logical volume numbers for the 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 backup source server and use

  - [For Solaris]

```
# ./acgetvolinfo /dev/rdsk/c4t0d10s2
BOX-ID,LV No,Address,Size
00E4000M3#####E450S20A####KD4030639004##,0x041,0x0,0x800000
```

  - [For Linux]

```
# ./acgetvolinfo /dev/sdo
BOX-ID,LV No,Address,Size
00E4000M3#####E450S20A####KD4030639004##,0x042,0x0,0x800000
```

  - [For Windows]

```
C:\> .\acgetvolinfo X:
BOX-ID,LV No,Address,Size
00E4000M3#####E450S20A####KD4030639004##,0x043,0x0,0x800000
```

  - [For HP-UX]

```
# ./acgetvolinfo /dev/rdsk/c1t0d20
BOX-ID,LV No,Address,Size
00E4000M3#####E450S20A####KD4030639004##,0x043,0x0,0x800000
```

  - [For AIX]

```
# ./acgetvolinfo /dev/hdisk10
BOX-ID,LV No,Address,Size
00E4000M3#####E450S20A####KD4030639004##,0x044,0x0,0x800000
```

The following table shows the meanings of the information displayed.

Title	Explanation
BOX-ID	Displays the box ID for the ETERNUS disk storage system.
LV No	Displays the logical volume numbers for the 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.

See

- For details on messages output by this command, refer to "B.2.1 Detailed Messages".

  For details on messages not listed in that section, refer to "Detail Error Messages of ETERNUS/GR Series" in the "ETERNUS SF AdvancedCopy Manager Message Guide".

A.9.3 acutil refresh (Partition table refresh command) [Windows version only]

NAME

acutil refresh - Refreshing of partition tables

SYNOPSIS

```
acutil refresh -d DEVICE-NAME
```

DESCRIPTION

This command refreshes the partition table to update partition information for the specified disk.

This command is only supported in Windows version.

OPTIONS

-d *DEVICE-NAME*

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.

EXIT STATUS

=0 : Completed successfully
>0 : Terminated abnormally

EXAMPLES

```
> acutil refresh -d PhysicalDrive2
Successful completion.
```

A.9.4 acsdv init (Snap Data Volume initialization command) [Excluding Linux 5 for Intel Itanium]

NAME

acsdv init - Initializes Snap Data Volumes

SYNOPSIS

```
acsdv init -v VOLUME-NAME [-xml]
```
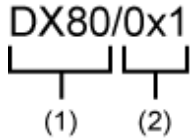
DESCRIPTION

This command initializes a Snap Data Volume.

This command is supported in Windows, Solaris, Linux 5 (for x86, for Intel64).

OPTIONS

-v *VOLUME-NAME*

Specify a Snap Data Volume to be initialized by the following format.

- (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 E4000/0x1
Successful completion
```

NOTES

- This command is not available for ETERNUS disk storage systems registered as a remote device.

A.9.5 acsdv stat (Snap Data Volume status display command) [Excluding Linux 5 for Intel Itanium]

NAME

acsdv stat - Displays the status of a Snap Data Volume

SYNOPSIS

```
acsdv stat -v VOLUME-NAME [-xml]
```

DESCRIPTION

This command displays the status of a Snap Data Volume.

This command is supported in Windows, Solaris, Linux 5 (for x86, for Intel64).

OPTIONS

-v *VOLUME-NAME*

Specify a Snap Data Volume to be displayed by the following format.

- (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 E4000/0x1

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.
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 and host usage.
Copy	Displays the copy usage out of Snap Data Volume used capacity in blocks.
Host	Displays the host usage 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.

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 systems registered as a remote device.

A.9.6 acsdv poolstat (Snap Data Pool status display command) [Excluding Linux 5 for Intel Itanium]

NAME

acsdv poolstat - Displays the status of a Snap Data Pool

SYNOPSIS

```
acsdv poolstat -a DISKARRAY-NAME [-xml]
```

DESCRIPTION

This command displays the status of a Snap Data Pool.

This command is supported in Windows, Solaris, Linux 5 (for x86, for Intel64).

OPTIONS

-a *DISKARRAY-NAME*

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 E4000

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 and host usage.
Copy	Displays the copy usage out of Snap Data Pool used capacity in blocks.
Host	Displays the host usage out of Snap Data Pool used capacity in blocks.
Free	Displays the capacity of Snap Data Pool unused area in blocks.

Copy usage: Usage of updates performed during SnapOPC+ execution.
Host usage: Usage of snap data volume updates performed when SnapOPC+ is not executed.

- This command is not available for ETERNUS disk storage systems registered as a remote device.

A.10 Troubleshooting data collection command

This section explains the command used to collect troubleshooting data when an AdvancedCopy Manager fault occurs.

A.10.1 acmcapture (troubleshooting data collection command)

NAME

acmcapture - Collection of AdvancedCopy Manager troubleshooting data

SYNOPSIS

Solaris and Linux versions

```
/opt/FJSVccm/bin/acmcapture dirname
```

Windows version

```
<AdvancedCopy Manager CCM program directory>\bin\acmcapture.bat dirname
```

DESCRIPTION

This command collects AdvancedCopy Manager troubleshooting data. Data is collected for all AdvancedCopy Manager components installed on the server where this command is executed.

[Format of the filename or directory name for the troubleshooting data]

- [For Solaris]

  The collected data is stored in a file with the "acmcapture_HOSTNAME_YYYYMMDD_ttmmss.tar.Z" format under the directory specified for "dirname".

- [For Linux]

  The collected data is stored in a file with the "acmcapture_HOSTNAME_YYYYMMDD_ttmmss.tar.gz" format under the directory specified for "dirname".

- [For Windows]

  The collected data is stored in a directory with the "acmcapture_HOSTNAME_YYYYMMDD_ttmmss" format under the directory specified for "dirname".

The name of the host where the command is executed is used for HOSTNAME. If characters other than alphanumeric and hyphens are used in the host name, then "NOHOSTNAME" is used as the host name. Values are truncated to 15 characters.

- For YYYYMMDD, YYYY is the year, MM is the month, and DD is the day.

- For ttmmss, tt is the hour, mm is minutes, and ss is seconds.

OPERANDS

dirname

Directory where the troubleshooting data is stored.

Specify a directory with plenty free space - 500MB or more is recommended. Regard 500MB as a rough guide, since the size of the troubleshooting data will vary depending on the system environment and conditions. If there is not enough free space, then this command will terminate abnormally without collecting troubleshooting data.

Specify an existing directory, otherwise this command will terminate abnormally without collecting troubleshooting data.

EXIT STATUS

=0 : Completed successfully
>0 : Terminated abnormally

EXAMPLES

- [For Solaris]

  Collect data to the /tmp directory.

  ```
  # acmcapture /tmp
  Executing.......................................
  Completed.
  OUTPUT=/tmp/acmcapture_srv01_20090323_094614.tar.Z
  ```

- [For Linux]

  Collect data to the /tmp directory.

  ```
  # acmcapture /tmp
  Executing.......................................
  Completed.
  OUTPUT=/tmp/acmcapture_srv01_20090323_094614.tar.gz
  ```

- [For Windows]

  Collect data to the C:\temp directory.

  ```
  C:¥> acmcapture.bat C:\temp
  Executing.......................................
  Completed.
  OUTPUT=C:\temp\acmcapture_srv01_20090323_094614
  ```

NOTES

- For systems with a cluster configuration, please mount the shared disk by either of node. to gather information on the shared disk.

  And execute this command. at both nodes.

- Execute this command when other AdvancedCopy Manager commands are in the stopped state. Data collection may not be performed correctly if other AdvancedCopy Manager commands are running.

Appendix B Messages for AdvancedCopy Manager CCM

This appendix explains the messages that are issued by AdvancedCopy Manager CCM and its commands.

B.1 Message Format

Messages consist of a message ID and message text.

Each message is explained according to the sections described in the following table.

Table B.1 Format of message explanations

Section	Content
Message text	This section shows the message that is output.
Description	This section explains the reason why the message is output or the situations where the message is output.
Parameters	This section explains the meanings of the parameters in the message text.
System response	This section explains the processing that the system performs when the message is output.
System administrator response	This section explains the actions that the system administrator should take in response to the message.

B.2 Message Explanations

ccm1001

An invalid argument was specified.

Description

An invalid argument has been specified.

System response

Interrupts the processing.

System administrator response

Check the valid values for the argument, and then execute the command again

ccm1002

An invalid option was specified. option=[*OPTION*]

Description

An invalid option has been specified.

Parameters

OPTION : The specified option

System response

Interrupts the processing.

System administrator response

Check the valid values for the option, and then execute the command again

ccm1003

An invalid parameter was specified. option=[*OPTION*], parameter=[*PARAM*]

Description

An invalid parameter has been specified.

Parameters

OPTION : The specified option
PARAM : The specified parameter

System response

Interrupts the processing.

System administrator response

Check the valid values for the parameter, and then execute the command again

ccm1004

An invalid option was specified for the copy type. copy group=[*GROUP*], copy type=[*TYPE*], option=[*OPTION*]

Description

An invalid option has been specified for a copy group.

Parameters

GROUP : Copy group
TYPE : Copy type
OPTION : The specified option

System response

Interrupts the processing.

System administrator response

Check the valid values for the copy type, and then execute the command again.

ccm2001

This command requires operating system's administrative privileges.

Description

This command can only be executed with Administrator privileges.

System response

Interrupts the processing.

System administrator response

Execute the command as a user with Administrator privileges.

ccm2002

The license is not registered.

Description

The license has not been registered yet.

System response

Interrupts the processing.

System administrator response

Register the license, and then execute the command again.

---

ccm3001

The specified disk array is already registered. disk array=[*DISKARRAY*]

Description

Information for the specified ETERNUS disk storage systems has already been registered.

Parameters

DISKARRAY : ETERNUS name or ETERNUS disk storage systems IP address

System response

Interrupts the processing.

System administrator response

Confirm the existing ETERNUS disk storage systems information (ETERNUS name, Box ID and IP address of ETERNUS disk storage systems) by executing the "A.2.3 acarray list (ETERNUS disk storage systems information display command)".

---

ccm3002

The specified copy group is already registered. copy group=[*GROUP*]

Description

The copy group has already been registered.

Parameters

GROUP : Copy group name

System response

Interrupts the processing.

System administrator response

Execute the command again, specifying a copy group name that has not been registered yet.

---

ccm3003

The specified copy pair already registered. copy group=[*GROUP*], pair=[*PAIR*]

Description

The copy pair has already been registered.

Parameters

GROUP : Copy group name
PAIR : Copy pair name

System response

Interrupts the processing.

System administrator response

Execute the command again, specifying a copy pair name that has not been registered yet.

---

ccm3004

An invalid copy pair was specified. pair=[*PAIR*], detail=[*DETAIL*]

Description

An invalid copy pair has been specified.

Parameters

PAIR : Copy pair name
DETAIL : Detailed information about the cause of the error

The *DETAIL* is will be one of the following strings:

Strings indicated in *DETAIL*	Cause of error
invalid format	The format of the copy pair is incorrect.
invalid disk array	The specified ETERNUS disk storage systems have not been set up for the copy group.
same disk array	The same ETERNUS disk storage systems have been specified for both the copy source and the copy destination.
invalid copy direction	The copy direction is not the same as the other copy pairs that have already been added to the copy group.
invalid Snap Data Volume	The copy-destination logical volume of the specified copy pair is not Snap Data Volume.

System response

Interrupts the processing.

System administrator response

The action required depends on the DETAIL string, as described below:

Strings indicated in *DETAIL*	Appropriate action
invalid format	Execute the command again, specifying a correct format for the copy pair.
invalid disk array	Execute the command again, specifying the ETERNUS disk storage systems that has been set up for the copy group.
same disk array	Execute the command again, specifying different ETERNUS disk storage systems for the copy source and the copy destination.
invalid copy direction	Execute the command again, using the same copy direction as for the other copy pairs that have already been added to the copy group.
invalid Snap Data Volume	Execute the command again, specifying the Snap Data Volume for the copy-destination logical volume.
old disk array info	Execute the command again, after the re-registration of ETERNUS disk storage system.

---

ccm3005

An invalid volume is specified. volume=[*VOLUME*], detail=[*DETAIL*]

Description

An invalid logical volume is specified.

Parameters

VOLUME : Logical volume name
DETAIL : Detailed information about the cause of the error

The *DETAIL* is will be one of the following strings:

Strings indicated in *DETAIL*	Cause of error
invalid format	The format of the logical volume is incorrect.

System response

Interrupts the processing.

System administrator response

The action required depends on the *DETAIL* string, as described below:

Strings indicated in *DETAIL*	Appropriate action
invalid format	Confirm the format of logical volume. And then execute the command again, specifying a correct format.

ccm3006

The number of generation is exceeded the registerable number. Maximum Number of Generation=[*NUMBER*]

Description

The number of generation that can be registered is exceeded.

Parameters

NUMBER : Maximum number of generation that can be registered

System response

Interrupts the processing.

System administrator response

Check whether the number of copy pairs that have the same copy-source logical volume is exceeded the maximum number or not.

ccm3007

The REC buffer could not be found. ID=[*ID*]

Description

The specified buffer ID does not exist.

Parameters

ID : ID of the REC transfer buffer

System response

Interrupts the processing.

System administrator response

Execute the command again, specifying the correct ID.

ccm3008

An invalid access path is specified. access path=[*PATH*], detail=[*DETAIL*]

Description

An invalid access path is specified.

Parameters

PATH : Access path
DETAIL : Detailed information about the cause of the error

The *DETAIL* is will be one of the following strings:

Strings indicated in *DETAIL*	Cause of error
invalid access path	The access path is incorrect.

System response

Interrupts the processing.

System administrator response

The action required depends on the *DETAIL* string, as described below:

Strings indicated in *DETAIL*	Appropriate action
invalid access path	Execute the command again, specifying the access path of the specifying ETERNUS disk storage systems.

ccm3009

The remote ETERNUS disk storage system is defined in the specified copygroup. remote disk storage system= [*DISKARRAY*]

Description

The remote ETERNUS disk storage systems is defined for the specified copy group.

Parameters

DISKARRAY : The name of ETERNUS disk storage systems

System response

Interrupts the processing.

System administrator response

Check that the specified ETERNUS disk storage systems is not remote ETERNUS disk storage systems.
To display the list of remote ETERNUS disk storage systems, execute the acarray list command with -remote option. For detail of acarray list command, refer to "A.2.3 acarray list (ETERNUS disk storage systems information display command)".

ccm4001

The specified disk array does not exist. disk array=[*DISKARRAY*]

Description

There is no information for the specified ETERNUS disk storage systems.

Parameters

DISKARRAY : ETERNUS name

System response

Interrupts the processing.

System administrator response

Use "A.2.3 acarray list (ETERNUS disk storage systems information display command)" to check whether the specified ETERNUS name is correct.

ccm4002

The specified disk array does not exist. disk array=[*BOXID*]

Description

There is no information for the specified ETERNUS disk storage systems.

Parameters

BOXID : The box ID of ETERNUS disk storage systems

System response

Interrupts the processing.

System administrator response

The information for the ETERNUS disk storage systems specified by the *BOXID* has been deleted.

Register the same box ID information for the specified ETERNUS disk storage systems again, and then execute the command again.

---

ccm4003

The specified copy group was not found. copy group=[*GROUP*]

Description

The specified copy group has not been set up.

Parameters

GROUP : Copy group name

System response

Interrupts the processing.

System administrator response

Use "A.6.2 acgroup list (Copy group display command)" to check whether the specified copy group name is correct.

---

ccm4004

No copy pair was found for the specified copy group. copy group=[*GROUP*]

Description

The copy pair has not been set up for the specified copy group.

Parameters

GROUP : Copy group name

System response

Interrupts the processing.

System administrator response

Set up the copy pair for the specified copy group, and then execute the command again.

---

ccm4005

The specified copy pair was not found. copy group=[*GROUP*], pair=[*PAIR*]

Description

The specified copy pair has not been set up for the copy group.

Parameters

GROUP : Copy group name
PAIR : Copy pair name

System response

Interrupts the processing.

System administrator response

Set up the specified copy pair for the copy group, and then execute the command again.

---

ccm4006

The specified logical volume was not found. logical volume=[*VOLUME*]

Description

The specified logical volume does not exist.

Parameters

VOLUME : Logical volume name

System response

Interrupts the processing.

System administrator response

Execute the command again, specifying an existing logical volume.

---

ccm4007

An invalid copy group was specified. copy group=[*GROUP*], copy type=[*TYPE*]

Description

The operation that the user is trying to execute cannot be performed on the specified copy group.

Parameters

GROUP : The specified copy group
TYPE : The copy type set in the copy group

System response

Interrupts the processing.

System administrator response

Check the copy type that has been set up for the specified copy group.

---

ccm4008

The logical volume is not found. copy group=[*GROUP*], logical volume=[*VOLUME*]

Description

The specified logical volume does not exist.

Parameters

GROUP : The specified copy group
VOLUME : Logical volume name

System response

Interrupts the processing.

System administrator response

Execute the command again, specifying an existing copy source logical volume in the specified copy group.

ccm4009

Remote ETERNUS Disk storage system cannot be specified. disk array=[*DISKARRAY*]

Description

The remote ETERNUS disk storage systems cannot be specified.

Parameters

DISKARRAY : The name of ETERNUS disk storage systems

System response

Interrupts the processing.

System administrator response

Check that the specified ETERNUS disk storage systems is not remote ETERNUS disk storage systems.
To display the list of remote ETERNUS disk storage systems, execute the acarray list command with -remote option. For detail of acarray list command, refer to "A.2.3 acarray list (ETERNUS disk storage systems information display command)".

ccm4010

An access path could not be found. disk storage system=[*DISKARRAY*]

Description

An access path could not be found.

Parameters

DISKARRAY : ETERNUS NAME

System response

Interrupts the processing.

System administrator response

Confirm that the specified ETERNUS disk storage system has a valid access path.

ccm4011

The directory could not be found. directory=[*DIRECTORY NAME*]

Description

The specified directory is not found.

Parameters

DIRECTORY NAME : Directory name

System response

Interrupts the processing.

System administrator response

Confirm that the directory actually exists, or check whether the directory name is correct, and then execute the command again.

ccm5001

Operation aborted. The configuration file is in use.

Description

Processing was interrupted because an AdvancedCopy Manager CCM configuration file was being updated by one of the commands listed below:

- acarray add

- acarray change

- acarray remove

- acgroup create

- acgroup remove

- acpair add

- acpair remove

System response

Interrupts the processing.

System administrator response

Wait for the conflicting command to finish, and then execute the command again.

ccm5002

Operation failed. function=[*FUNC*], message=[*MSG*]

Description

The process has failed.

Parameters

FUNC : Process name
MSG : Message

System response

Interrupts the processing.

System administrator response

Take the appropriate action according to the error message.

ccm5003

Operation failed. function=[*FUNC*], message=[*MSG*]

Description

The process has failed.

Parameters

FUNC : Process name
MSG : Message

System response

Interrupts the processing.

System administrator response

Take the appropriate action indicated by the "B.2.1 Detailed Messages" section displayed in the *MSG* section.

ccm5004

Operation failed. function=[*FUNC*], message=[*MSG*]

Description

The process has failed.

Parameters

FUNC : Process name
MSG : Message

System response

Interrupts the processing.

System administrator response

Take the appropriate action indicated by the "B.2.1 Detailed Messages" section displayed in the *MSG* section.

If a message not listed in "B.2.1 Detailed Messages" is displayed, then please refer to "Detailed Error Messages for the ETERNUS/ GR Series" in the "ETERNUS SF AdvancedCopy Manager Message Guide".

---

ccm5005

An invalid mount point was specified. mount point=[*MNTP*]

Description

An invalid mount point or drive letter has been specified.

Parameters

MNTP : The mount point or drive letter

System response

Interrupts the processing.

System administrator response

Check the mount point or drive letter, and then execute the command again. For details on how to check mount points and drive letters, refer to "A.9.2 acgetvolinfo (Logical volume information display command)".

---

ccm5006

An invalid device was specified. device=[*DEVICE*]

Description

An invalid device has been specified.

Parameters

DEVICE : Device

System response

Interrupts the processing.

System administrator response

Devices must be specified using the following format: "PhysicalDrive [*device number*]". Execute the command again, specifying a valid format for the device.

---

ccm5007

The target logical volume is write protected. target logical volume=[*VOLUME*]

Description

The copy destination logical volume is protected.

Parameters

VOLUME : Copy destination logical volume

System response

Interrupts the processing.

System administrator response

Release the copy destination logical volume protection settings, and then execute the command again.

---

ccm7001

The target logical volume is write protected. target logical volume=[*VOLUME*]

Description

The copy destination logical volume is protected.

Parameters

VOLUME : Copy destination logical volume

System response

Continues the processing.

System administrator response

No response is required.

---

ccm8001

A general system function failed. function=[*FUNC*], error=[*ERROR*]

Description

The execution of a system function has failed.

Parameters

FUNC : System function
ERROR : Error content

System response

Interrupts the processing.

System administrator response

Gather the information needed to resolve the problem as described in "C.1 How to Collect Data", and then contact a Fujitsu system engineer.

---

ccm8002

Could not open the registry. registry key=[*KEY*]

Description

Opening a registry has failed.

Parameters

KEY : Name of the registry key

System response

Interrupts the processing.

System administrator response

Gather the information needed to resolve the problem as described in "C.1 How to Collect Data", and then contact a Fujitsu system engineer.

ccm8003

Could not open the file. file=[*FILE*]

Description

Opening a file has failed.

Parameters

FILE : File name

System response

Interrupts the processing.

System administrator response

Check the status of the file system.

If the file system is normal, then gather the information needed to resolve the problem as described in "C.1 How to Collect Data", and then contact a Fujitsu system engineer.

---

ccm8004

Could not write the file. file=[*FILE*]

Description

Writing to a file has failed.

Parameters

FILE : File name

System response

Interrupts the processing.

System administrator response

Check the status of the file system.

If the file system is normal, then gather the information needed to resolve the problem as described in "C.1 How to Collect Data", and then contact a Fujitsu system engineer.

---

ccm8005

Could not delete the file. file=[*FILE*]

Description

Deleting a file has failed.

Parameters

FILE : File name

System response

Interrupts the processing.

System administrator response

Check the status of the file system.

If the file system is normal, then gather the information needed to resolve the problem as described in "C.1 How to Collect Data", and then contact a Fujitsu system engineer.

ccm8006

Could not start Java VM.

Description

Starting the Java VM has failed.

System response

Interrupts the processing.

System administrator response

Gather the information needed to resolve the problem as described in "C.1 How to Collect Data", and then contact a Fujitsu system engineer.

ccm8007

A memory allocation failed.

Description

Allocating a memory area has failed.

System response

Interrupts the processing.

System administrator response

Check the memory usage status.

- If there is not enough memory, then increase it.

- If there is enough memory, then gather the information needed to resolve the problem as described in "C.1 How to Collect Data", and then contact a Fujitsu system engineer.

ccm8008

Could not read the file. file=[*FILE*]

Description

Reading a file has failed.

Parameters

FILE : File name

System response

Interrupts the processing.

System administrator response

Check the status of the file system.

If the file system is normal, then gather the information needed to resolve the problem as described in "C.1 How to Collect Data", and then contact a Fujitsu system engineer.

ccm8009

License Manager is not installed.

Description

The License Manager has not been installed.

System response

Interrupts the processing.

System administrator response

Install the License Manager and register the license. And then execute the command again.

---

ccm9001

The configuration file has an invalid format. file=[*FILE*]

Description

The content of the configuration file is invalid.

Parameters

FILE : File name

System response

Interrupts the processing.

System administrator response

Gather the information needed to resolve the problem as described in "C.1 How to Collect Data", and then contact a Fujitsu system engineer.

---

ccm9002

An error occurred in accessing the Java property file. property=[*PROPERTY*]

Description

A Java property could not be looked up.

Parameters

PROPERTY : Property name

System response

Interrupts the processing.

System administrator response

Gather the information needed to resolve the problem as described in "C.1 How to Collect Data", and then contact a Fujitsu system engineer.

---

ccm9003

An unexpected error occurred.

Description

A system error has occurred.

System response

Interrupts the processing.

System administrator response

Gather the information needed to resolve the problem as described in "C.1 How to Collect Data", and then contact a Fujitsu system engineer.

B.2.1 Detailed Messages

no such session.

Description

There is no session for the specified copy pair.

System response

Interrupts the processing.

System administrator response

Operations cannot be executed on copy pairs for which there is no copy session.

Check the session status using either "A.7.2 acopc query (OPC/QuickOPC copy status display command)" or "A.8.2 acec query (Synchronous high-speed copy status display command)".

invalid logical volume name.

Description

Either the access path specified at ETERNUS disk storage systems registration time or the device name specified using a command is invalid.

System response

Interrupts the processing.

System administrator response

Check that the specified device name is correct.

Or, The access path may have been disabled.
Check the drive letter and device name specified in the access path, and set a valid access path.
"A.2.5 acarray pathscan (Access path automatic setting command) [Excluding Linux 5 for Intel Itanium]" can be used to set the access path automatically.

STXC0100 ERROR Specified command parameter is incorrect. Parameter=(*PARAM*)

Description

The specified parameter is not correct.

Parameters

PARAM : Parameter

System administrator response

Correct the parameter and try again.
If "No parameter" is displayed in *PARAM*, specify a parameter for the command and try again.

STXC0101 ERROR REC buffer identifier does not exist.

Description

A REC transfer buffer with the specified ID does not exist.

System administrator response

Check the REC transfer buffer definition status and check the ID, and then execute the command again.

STXC1000 ERROR Insufficient Snap Data Pool. Required capacity=(*CAPACITY*).

Description

Snap Data Pool area is insufficient and command cannot be executed.

Parameters

CAPACITY : Capacity

System administrator response

Secure free Snap Data Pool capacity that is larger than the capacity notified by the message and try again.

STXC1002 ERROR Invalid logical volume name. Volume name=(*VOLNAME*).

Description

The specified logical volume name is not valid.

Parameters

VOLNAME : Logical volume name

System administrator response

Check the logical volume name specified by the parameter and try again.

STXC1003 ERROR Logical volume is already defined in another copy operation.

Description

The specified logical volume has already been defined as the copy source or copy destination for another copy session.

System administrator response

Review the specification for the logical volume of the copy source or copy destination and try again.

STXC1004 ERROR Maximum session reached.

Description

Copying cannot start because the number of sessions simultaneously operatable on the ETERNUS disk storage system has already reached maximum.

System administrator response

Check the sessions, delete the unneeded ones among them, and try again.

STXC1005 ERROR Another copy has already started.

Description

For the specified logical volume, a copy operation of another type is already running.

System administrator response

Review the specification for the logical volume name.

STXC1006 ERROR Target volume is already defined in another copy operation.

Description

The specified copy destination logical volume has already been defined as the copy destination for another copy session.

System administrator response

Review the specification for the copy destination logical volume name.

STXC1007 ERROR Logical volume is already reserved.

Description

The logical volume has already been reserved by another user.

STXC1009 ERROR Logical volume is busy.

Description

The logical volume is being used by another user.

System administrator response

Wait for a few seconds and try again.

STXC1010 ERROR Specified option is invalid.

Description

The specified option is invalid.

System administrator response

Correct the processing option setting and try again.

STXC1011 ERROR Invalid parameter. Parameter=(*PARAM*).

Description

The parameter is incorrect.

Parameters

PARAM : Parameter

System administrator response

The parameter value is incorrect. Correct the parameter and try again.

STXC1013 ERROR Target volume size mismatch.

Description

Copying cannot execute because the size of the copy destination logical volume is inappropriate.

System administrator response

For the copy destination, specify a logical volume that is equal in size to the copy source logical volume.

STXC1014 ERROR Target volume overlap source volume.

Description

Copy destination logical volume and copy source logical volume area are overlapped.

System administrator response

Change the copy destination or copy source logical volume setting.

STXC1016 ERROR The group file of the form not permitted was specified.

Description

Operation cannot be performed because the specified format of the group file is not permitted.

System administrator response

One of the cases indicated below can be assumed. Re-specify the group file, and try again.

- A group file which describes copy pairs may have been specified in a logical volume operation.

- A group file which describes logical volumes may have been specified in a copy pair operation.

STXC1017 ERROR The option that cannot be used for copy session is specified.

Description

An option that cannot be operate a copy session is specified.

System administrator response

One of the cases indicated below can be assumed. Re-specify the option.

- The transfer mode specified at the copy operation start is not the same as the transfer mode specified at copy restart (recovery).

STXC1018 ERROR The copy protection cannot be set to Snap Data Volume.

Description

The copy destination volume protection function cannot be set for a Snap Data Volume.

System administrator response

Confirm that the specified logical volume is correct, and then execute the command again.

STXC1019 ERROR The copy session other than EC or REC was specified.

Description

A copy session other than EC or REC was specified.

System administrator response

Check the copy pair specified in the parameters and the group file contents, and then execute the command again.

STXC1100 ERROR Session does not exist.

Description

No session exists between the specified logical volumes.

System administrator response

Check that the logical volume specification is correct and try again.

STXC1102 ERROR Invalid Snap Data Volume.

Description

The specification for Snap Data Volume is invalid.

System administrator response

One of the cases indicated below can be assumed. Review the specification for the logical volume and try again.

- The copy destination logical volume specified when starting SnapOPC+ copying is not Snap Data Volume.

- The copy source logical volume specified when starting SnapOPC+ copying is Snap Data Volume.

- Either the copy source logical volume name specified when starting EC/OPC/QuickOPC copying or the copy destination volume is Snap Data Volume.

STXC1104 ERROR Operation sequence error.

Description

The current status cannot execute the specified operation.

System administrator response

Check the copy status for any of the following cases:

- Suspend was executed for the session that is not in equivalence status.

- Stop was executed for the session in Error Suspend status or Halt status.

- Initialization was executed for the Snap Data Volume for which a SnapOPC+ session was running.

- Start of SnapOPC+ was executed for the Snap Data Volume being initialized.

- Suspend was executed for the session in Suspend status.

- Copy stop, copy resume, or copy direction reversal was executed for the session that is not in Suspend status.

- Session start/resume was executed for a copy destination logical volume for which the copy destination volume protection function is set.

STXC1106 ERROR Insufficient memory.

Description

Memory shortage occurred.

System administrator response

Execute the following and try again.

- Shut down unnecessary programs.

STXC1107 ERROR Alias is not defined.

Description

The ETERNUS disk storage system alias that is specified as the copy source or copy destination has not been defined.

System administrator response

Check that the ETERNUS disk storage system alias has been registered. If the alias is not registered, register the routing information and try again.

STXC1108 ERROR The specification of physical information is incorrect.

Description

The specified physical information is incorrect.

System administrator response

One of the cases indicated below can be assumed. Correct the physical information description.

- A start location or copy size that exceeds 2TB was specified for a copy operation to an ETERNUS disk storage system which does not support copy operations over 2TB.

- Other than "0" is specified for the start location, but "0" is specified for the copy size.

- A size that is larger than actual capacity is specified for the copy size.

STXC1109 ERROR ETERNUS cannot be recognized.

Description

The ETERNUS disk storage system specified by alias name cannot be recognized.

System administrator response

One of the cases indicated below can be assumed. Correct the physical information description.

- Disk information was reconfigured after the routing information was set.

  In this case, retry after setting the routing information.

- Connection path between ETERNUS disk storage systems is not established (for REC).

STXC1110 ERROR Alias specified for the copy source is not defined.

Description

The ETERNUS disk storage system alias name specified as the copy source is not defined.

System administrator response

Confirm that the ETERNUS disk storage system alias name specified as the copy source has been registered. If it is not registered, register the routing information, and then execute the command again.

STXC1111 ERROR Logical volume state is not able to be set to the copy protection.

Description

Copy destination volume protection cannot be set when the logical volume is in its current state.

System administrator response

The error might be caused by the following. Revise the session status.

- The specified logical volume has Stack mode as the transfer mode or REC as the Consistency mode, and its status is "Active".

STXC1200 ERROR Unexpected error.

Description

An unexpected error occurred.

System administrator response

Gather the information needed to resolve the problem as described in "C.1 How to Collect Data", and then contact a Fujitsu system engineer (SE).

STXC1201 ERROR Internal inconsistency.

Description

Internal inconsistency occurred.

System administrator response

Gather the information needed to resolve the problem as described in "C.1 How to Collect Data", and then contact a Fujitsu system engineer (SE).

STXC1202 ERROR Unsupported function.

Description

An unsupported function was called.

System administrator response

Check the version of the ETERNUS disk storage system firmware.

STXC1203 ERROR The operation is not permitted.

Description

User does not posses required root privilege to perform copy operation.

System administrator response

Perform copy operations with root previlege.

STXC1204 ERROR SCSI error detected. Error=(*ERROR*).

Description

An error was detected through the SCSI command.

Parameters

ERROR : Error information

System administrator response

Check the connection status of the device and try again. If this error persists, contact Fujitsu technical staff (CE).

STXC1208 ERROR Specified logical volume is not ETERNUS.

Description

The specified logical volume is not an ETERNUS disk storage system.

System administrator response

Specify an ETERNUS disk storage system logical volume and try again.

STXC1209 ERROR Insufficient resource in ETERNUS.

Description

Not executable due to ETERNUS disk storage system resource shortage.

System administrator response

Take any of the following measures:

- Check/set the Advanced Copy option license.

- Check/set the device resources for such errors as "Table size not set" and "Table size not enough".

STXC1212 ERROR Disk drive off by the ECO mode.

Description

The disk drive is stopped due to the Eco-mode.

System administrator response

Try again when the disk drive is activated.

STXC1213 ERROR Invalid file system.

Description

The file system is invalid.

System administrator response

The file system is unsupported. Check the file configuration and try again.

STXC1214 ERROR Preconditions for copy operation are not satisfied.

Description

The predconditions for the copy operation are not satisfied.

System administrator response

Check for the following causes, and check the copy status.

- Tried to start SnapOPC+ session for a copy pair for which a SnapOPC+ session already exists.

- Tried to restore SnapOPC+ session that does not exist for the copy pair.

- Tried to suspend EC session for a copy pair for which no EC exists.

- Tried to suspend EC session without waiting.

- A group configuration that cannot be simultaneously operated is specified.

- Retried to suspend a copy session without resolving the error.

STXC1220 ERROR Change mode operation failed because of communication error. Cause=(*DETAIL*).

Description

Communication or ETERNUS disk storage system error occurs and changing session mode failed.

Parameters

DETAIL : Detailed information

System administrator response

- When *DETAIL* is "NOT_CHANGED"
  Check the device connection status and try again.

- When *DETAIL* is "CROSS"
  Check the device connection status and try again. If this error occurs again, contact Fujitsu technical engineer (CE).

STXC1222 ERROR ETERNUS unit inconsistency.

Description

The copy source and copy destination ETERNUS disk storage systems setting do not match and remote copy cannot be executed.

System administrator response

Check that the bitmap ratio of the ETERNUS disk storage system advanced copy table size for the copy source and copy destination are not the same.

STXC1223 ERROR The copy operation with ETERNUS is incorrect.

Description

The copy operation with ETERNUS disk storage system is not correct.

System administrator response

Take any of the following measures:

- Check ETERNUS disk storage system firmware version between cabinets.
  Contact Fujitsu system engineer (SE) when ETERNUS disk storage system firmware version cannot be confirmed.

- Check whether the size of the copy source volume and the copy destination volume is the same.

- Check the server connects it with the ETERNUS disk storage system of the copy source volume at the suspend processing by the Concurrent suspend mode operation. Moreover, check the route guidance information setting is executed to the ETERNUS disk storage system of the copy source volume.

STXC1224 ERROR Communication error occurred.

Description

Communication error occurred between the ETERNUS disk storage systems and remote copy operation cannot be performed.

System administrator response

Check the device connection status and try again.

STXC1225 ERROR MPHD environment is incorrect.

Description

The mutlipath driver environment is incorrect.

System administrator response

Correct the multipath driver settings.

STXC1226 ERROR GDS environment is incorrect.

Description

The GDS environement is incorrect.

System administrator response

Correct the GDS environment settings.

STXC1250 ERROR Specified LUN_V Number is invalid.

Description

The specified LUN_V number is incorrect.

System administrator response

One of the cases indicated below can be assumed. Check the parameter settings and the status of the ETERNUS disk storage system, and try again.

- A LUN_V number that does not exisit or cannot be accessed is specified.

- Tried to start copy between an encrypted volume and non-encrypted volume.

- Specify the volume which contains bad sector.

STXC1252 ERROR Operation is not supported.

Description

Operation cannot be performed as operation is not supported.

System administrator response

One of the cases indicated below can be assumed. Correct the parameter settings, and try again.

- Tried to execute a copy operation of a size that exceeds 2TB. (For Linux)

STXC1300 ERROR Time out detected.

Description

Timeout was detected while Suspend was being executed.

System administrator response

Try executing the command again.
Or, correct any mistakes with the timeout monitoring frequency and interval specified in the parameters.

STXC1301 WARNING The operation was accepted.

Description

The copy operation was accepted, but the process is not completed.

System administrator response

Check the copy status to confirm whether the copy operation is completed.
If this message appears when the copy operation is suspended, correct any mistakes with the timeout monitoring frequency and interval specified in the parameters.

STXC1400 ERROR File open error. File name=(*FILE*). Cause=(*CAUSE*).

Description

Failed to open the file.

Parameters

FILE : File name
CAUSE : Cause code

System administrator response

Check file status by referring to the cause code and the file name sent by the message.

STXC1401 ERROR The file name of ACCC can not be acquired. Cause=(*CAUSE*).

Description

Files required for operation of ACCC cannot be obtained.

Parameters

CAUSE : Cause code

System administrator response

The ACCC operating environment may be corrupted. Check that the following files exist in the sub directory (etc) of the install directory.

- stxc.ini

- trcdef.ini

- stxcvolinf (for Solaris/Linux)

- stxc.alias (for Solairs/Linux)

STXC1402 ERROR ACCC parameter name is not defined. Parameter=(*PARAM*).

Description

Invalid parameter name is set in the ACCC predefinition file.

Parameters

PARAM : Parameter name

System administrator response

Correct the ACCC predefinition file and try again.

STXC1403 ERROR ACCC parameter value is not allowed. Parameter=(*PARAM*).

Description

Invalid parameter value is set in the ACCC predefinition file.

Parameters

PARAM : Parameter name

System administrator response

Correct the ACCC predefinition file and try again.

STXC1404 ERROR ACCC parameter value is out of range. Parameter=(*PARAM*).

Description

A parameter value that is out of the range is set in the ACCC predefinition file.

Parameters

PARAM : Parameter name

System administrator response

Specify a parameter value in the ACCC predefinition file that is within the definable range.

STXC1405 ERROR The combination of ACCC parameters is incorrect.

Description

The parameter combination defined in the ACCC predefinition file is incorrect.

System administrator response

Correct the ACCC predefinition file and try again.

STXC1406 ERROR Waiting time cannot be set.

Description

The monitoring time for suspendable status cannot be set.

System administrator response

The following may have occurred. Check and correct parameters or the predefinition file.

- Accumulated monitoring interval and monitoring count values exceed their respective permissible values.

- The monitoring count is specified but the monitoring interval is not set (or set to 0).

STXC1407 ERROR ACCC parameter is not defined. Parameter=(*PARAM*).

Description

Parameters necessary for ACCC operation are not set in the ACCC predefinition file.

Parameters

PARAM : Parameter name

System administrator response

Set the parameters displayed in the message in the ACCC predefinition file.

STXC1409 ERROR ACCC (*PARAM*) parameter is already defined.

Description

Defined parameter has been defined twice in the ACCC predefinition file.

Parameters

PARAM : Parameter name

System administrator response

Correct the ACCC predefinition file and try again.

STXC1410 ERROR Alias number reached the maximum.

Description

The ETERNUS disk storage system alias reached the maximum number that can be managed by ACCC and routing information cannot be set.

System administrator response

Check alias definition status and if there are unnecessary alias names, delete them.

STXC1411 ERROR Alias is already defined.

Description

The ETERNUS disk storage system alias has already been registered.

System administrator response

Specify another alias and try again.

STXC1412 ERROR Alias identifier does not exist.

Description

An ETERNUS disk storage system alias with the specified ID does not exist.

System administrator response

Check the alias definition status and ID, and try again.

STXC1500 ERROR Error occurred recognition of ETERNUS management file. Cause=(*CAUSE*).

Description

The ETERNUS disk storage system management file cannot be obtained.

Parameters

CAUSE : Cause code

System administrator response

The following may be causes. Take an action based on the *CAUSE* (cause code).

- When the *CAUSE* is -1 or -2:
  MICC is not installed or registry is rewritten.

- When the *CAUSE* is -3:
  The file used for setting ETERNUS disk storage system registration information is corrupted or deleted.

-

STXC1600 ERROR ETERNUS is not registered on ETERNUS management file.

Description

The ETERNUS disk storage system has not been registered in the management file.

System administrator response

Register the ETERNUS disk storage system and try again.

STXC1700 ERROR Alias management file access error. Cause=(*CAUSE*).

Description

An error occurred when the ETERNUS disk storage system alias management file was accessed.

Parameters

CAUSE : Cause code

System administrator response

The following may be causes. Take an action based on the *CAUSE* (cause code).

- Registry key acquisition, reference

- File read/write

- File cannot be created

STXC1801 ERROR Group_file does not exist.

Description

The group file does not exist.

System administrator response

Check the group file name specified in the parameter, and try again.

STXC1802 ERROR Syntax error was detected in Group File.line=(*LINE*).

Description

There is a syntax error in the group file description.

Parameters

LINE : Line number of the line in which the syntax error was detected

System administrator response

Check the contents of the group file specified in the parameter, and try again.

STXC1803 ERROR There is no volume name in Copy Group File.

Description

The copy information is not registered in the group file.

System administrator response

Check the contents of the group file specified in the parameter, and try again.

STXC1804 ERROR Error occurred with copy operation described in group file. *VOLINFO.* Error message=(*MSG*).

Description

An error occurred with the copy operation described in the group file.

Parameters

VOLINFO : Name of the logical volume in which the error occurred. "Source=(copy source logical volume name).Target=(copy destination logical volume name)" is for copy pairs. "Volume=(Logical volume name)" is for logical volumes.
MSG : Message text

System administrator response

Deal with the error according to the *MSG*.

STXC1805 ERROR The number of the copy pairs or logical volumes described in the group file exceeds the maximum number.

Description

The copy operation cannot be performed, as the number of copy pairs or logical volumes described in the group file exceeds the maximum number possible.

System administrator response

Take any of the following measures:

- Divide the group

- Change the max_grouping_ses parameter value in the predefinition file.

STXS1027 ERROR The specified parameter is invalid. [parameter name=[*NAME*], parameter value=[*VALUE*]]

Description

An incorrect affinity group number has been specified.

Parameters

NAME : Parameter name
VALUE : Parameter value

System response

Interrupts the processing.

System administrator response

Use "A.3.3 acinq ag (Affinity group list display command)" to check the specified affinity group number.

STXS2001 ERROR The specified user name and password have not been registered in the device. [user=[*USER*]]

Description

The user name and password have not been registered on the ETERNUS disk storage systems.

Parameters

USER : User name

System response

Interrupts the processing.

System administrator response

Check whether the user name and password are correct.

STXS2002 ERROR The specified user does not have privileges greater than that of an administrator. [user=[*USER*]]

Description

The user does not have Administrator privileges.

Parameters

USER : User name

System response

Interrupts the processing.

System administrator response

Use ETERNUS Web GUI to check the user privileges.

STXS2008 ERROR The registered user and password are not registered in the current device. [IP address=[*IPADDR*], user=[*USER*]]

Description

The user name and password have not been registered on the ETERNUS disk storage systems.

Parameters

IPADDR : IP address
USER : User name

System response

Interrupts the processing.

System administrator response

The ETERNUS Web GUI user account has either been changed or deleted.

Change the registration information for the ETERNUS disk storage systems by referring to "3.4 Changing the Configuration".

STXS2009 ERROR The operation cannot be performed with the user privileges when registering the device. [IP address=[*IPADDR*], user=[*USER*]]

Description

The user does not have Administrator privileges.

Parameters

IPADDR : IP address
USER : User name

System response

Interrupts the processing.

System administrator response

The user account privileges for ETERNUS Web GUI have been changed.

Use ETERNUS Web GUI to check the user privileges.

STXS2012 ERROR Failed to authenticate the user. [IP address=[*IPADDR*], user=[*USER*]]

Description

The ETERNUS disk storage system could not be logged into for one of the following reasons:

- The maximum number of connections to the ETERNUS disk storage system has been reached.

- The specified user information is invalid or does not match the user information that is registered in the ETERNUS disk storage system.

- The specified user information registered in Copy Control Module is invalid or does not match the user information in the ETERNUS disk storage system.

Parameters

IPADDR : IP address
USER : User name

System response

Interrupts the processing.

System administrator response

- When the maximum number of connections to the ETERNUS disk storage system has been reached:

    Wait for a while, and then try again.

- When the user information does not match:

    - Check the user name, password, privileges, or role registered in the ETERNUS disk storage system by using ETERNUS Web GUI and try again.

    - The user information of the ETERNUS disk storage system may have been changed, disabled, or deleted. Check the user information registered in the ETERNUS disk storage system.

        - When it has been changed:

            Delete the user information that was registered before the change by using "Deleting the Devices" in Copy Control Module, and then register the user information after the change by performing "Adding the Devices".

- When it has been disabled:

    Use ETERNUS Web GUI to enable the user information that is registered in Copy Control Module.

- When it has been deleted:

    Use ETERNUS Web GUI to re-register the user information that is registered in Copy Control Module.

STXS2013 ERROR The specified user does not have the "Software" role. [user=[*USER*]]

Description

The specified user does not have the "Software" role.

Parameters

USER : User name

System response

Interrupts the processing.

System administrator response

Create a user account with "Software" role by using ETERNUS Web GUI or ETERNUS CLI, and then specify this user.

STXS4002 ERROR The device is not supported. [IP address=[*IPADDR*], model=[*MODEL*], type=[*TYPE*]]

Description

The specified ETERNUS disk storage system is not supported.

Parameters

IPADDR : IP address
MODEL : ETERNUS disk storage systems model
TYPE : ETERNUS disk storage systems type

System response

Interrupts the processing.

System administrator response

Check that the ETERNUS disk storage systems meets the "1.4.1 Hardware requirements".

STXS4046 ERROR The specified affinity group has not been registered. [affinity group number=[*GROUP*]]

Description

The specified affinity group has not been registered.

Parameters

GROUP : Affinity group number

System response

Interrupts the processing.

System administrator response

Use A.3.3 acinq ag (Affinity group list display command) to check the specified affinity group number.

STXS4047 ERROR The specified affinity group has been concatenated. [affinity group number=[*GROUP*]]

Description

A concatenated affinity group has been specified.

Parameters

GROUP : Affinity group number

System response

Interrupts the processing.

System administrator response

Concatenated affinity groups cannot be specified.

STXS5002 ERROR Failed to access the device. [code=[*CODE*], result=[*RESULT*]]

Description

Command access to ETERNUS disk storage system failed.

Parameters

CODE : Command code
RESULT : Command execution result

System response

Interrupts the processing.

System administrator response

The following are possible causes:

- The status of ETERNUS disk storage system is abnormal.

- The component of ETERNUS disk storage system failed.

- Network environment is invalid.

- LAN connection status is invalid.

- Number of disks used exceeds the number of disks that can be installed.

- The setting command is executed again before the setting process is complete in the ETERNUS disk storage system.

After checking the causes listed above, wait for a while, then try again. If this fails to solve the problem, gather the information needed to resolve the problem as described in "C.1 How to Collect Data", and then contact a Fujitsu system engineer (SE).

STXS7004 ERROR Failed to communicate with the device. [IP address=[*IPADDR*]]

Description

Communications with the ETERNUS disk storage systems have failed.

Parameters

IPADDR : IP address

System response

Interrupts the processing.

System administrator response

It is not possible to communicate with the ETERNUS disk storage systems.

Refer to "2.2.3 Configuring the Network Environment" to check the status of the network, and then execute the command again.

STXS8020 ERROR An internal error occurred. [parameter name=[*PARAM*], parameter value=[*VALUE*]]

Description

An internal error occurred.

Parameters

PARAM : Parameter name
VALUE : Parameter value

System response

Interrupts the processing.

System administrator response

Gather the information needed to resolve the problem as described in "C.1 How to Collect Data", and then contact a Fujitsu system engineer (SE).

STXS8098 ERROR Cannot be used because of the Slave CM. [parameter name=[*PARAM*], parameter value=[*VALUE*]]

Description

Try again using the Master CM.

Parameters

PARAM : Parameter name
VALUE : Parameter value

System response

Interrupts the processing.

System administrator response

Use the Master CM and try again.

STXS8101 ERROR Insufficient memory. [parameter name=[*PARAM*], parameter value=[*VALUE*]]

Description

There is not enough memory.

Parameters

PARAM : Parameter name
VALUE : Parameter value

System response

Interrupts the processing.

System administrator response

Secure sufficient memory and try again.

STXS8151 ERROR Shutdown or startup is currently being performed. [parameter name=[*PARAM*], parameter value=[*VALUE*]]

Description

Shutdown or startup is currently being performed.

Parameters

PARAM : Parameter name
VALUE : Parameter value

Interrupts the processing.

Wait for shutdown or startup to complete and then try again.

B.3 Error Messages on Troubleshooting Data Collection Command

This appendix explains the error messages output when the troubleshooting data collection command is executed.

Table B.2 Error Messages on Troubleshooting Data Collection Command

Item number	Error Message	Explanation	Action
1	An invalid argument was specified.	An invalid argument was specified.	Check the specification method of the argument specified in the option. Specify the correct argument and re-execute.
2	The specified directory does not exist.	The specified directory does not exist.	Specify an existing directory and re-execute.
3	The operation was interrupted.	The operation was interrupted for one of the following reasons: 1) A user without permission executed the command. 2) There is insufficient disk space (capacity).	1) Check the permissions of the user who executed the command and re-execute. 2) Secure sufficient disk space (capacity), then re-execute.

Appendix C Troubleshooting

This appendix explains how to resolve problems that may occur with AdvancedCopy Manager CCM.

C.1 How to Collect Data

Log into the CCM server, and execute acmcapture (troubleshooting data collection command) to collect data for investigating the problem - for details, refer to "A.10.1 acmcapture (troubleshooting data collection command)").

Send the collected data to a Fujitsu SE.

C.2 Resolving Hardware Error

If, as a result of a hardware error, the advanced copy cannot continue, the ETERNUS disk storage systems will automatically suspend it.

If a problem occurs, check the copy status and error code, and take action.

- Procedure for checking copy status

  Use either A.7.2 acopc query (OPC/QuickOPC copy status display command) or A.8.2 acec query (Synchronous high-speed copy status display command).

  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) [Excluding Linux 5 for Intel Itanium]

  - Snap Error Suspend [Excluding Linux 5 for Intel Itanium]

- 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 the "Error Code" column for the relevant copy process.

This section explains how to resolve problems.

Table C.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] 1. Use A.7.3 acopc cancel (OPC/QuickOPC 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.

Advanced copy status	Error code	Cause / Action
		- Recovery method 1 If the area can be recovered from the parent software (for example, the file system or DBMS), then recover it. - Recovery method 2 Use a dedicated tool (for example, UNIX dd 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. - Recovery method 3 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).
	Other than 0xBA	[Cause] An error other than 0xBA occurred. For error details, confirm with a Fujitsu SE. [Action] 1. Use A.7.3 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 A.6.6 acpair remove (Copy pair deletion command) to remove the copy pair. 3. Use A.6.5 acpair add (Copy pair addition command) to add a new copy pair.
EC Error Suspend	0xBA	[Cause] EC/REC is in suspend status (copy establishment status) and a bad sector has occurred in the logical volume of the copy source. [Action] 1. Use A.8.7 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. - Recovery method 1 If the area can be recovered from the parent software (for example, the file system or DBMS), then recover it. - Recovery method 2 Use a dedicated tool (for example, UNIX dd 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. - Recovery method 3 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).
	Other than 0xBA	[Cause] An error other than 0xBA occurred. For error details, confirm with a Fujitsu SE.

Advanced copy status	Error code	Cause / Action
		[Action] 1. Use A.8.7 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 A.6.6 acpair remove (Copy pair deletion command) to remove the copy pair. 3. Use A.6.5 acpair add (Copy pair addition command) to add a new copy pair.

EC Hardware Suspend	---	[Cause]
		
		An all path halt occurred.
		
		[Action]
		
		The REC resume procedure varies according to the REC Recovery mode.
		
		- [In Automatic Recovery mode]
		
		  1. Remove the cause of the all path halt.
		
		  2. The ETERNUS disk storage systems automatically resume REC.
		
		- [In Manual Recovery mode]
		
		  1. Remove the cause of the all path halt.
		
		  2. Forcibly and temporarily suspend the REC by specifying the "-force" option for A.8.3 acec suspend (Synchronous high-speed copy temporary suspension command).
		
		  3. Resume the REC using A.8.4 acec resume (Synchronous high-speed copy restart command)

EC Hardware Suspend (Use REC DISK)	---	**[Cause]**
		
		An all path halt occurred while transfer data was in the saved state in the REC Disk buffer.
		
		[Action]
		
		The method for REC restart (resume) depends on the REC recovery mode.
		
		- [For Automatic Recovery mode]
		
		  1. Remove the cause of the all path halt.
		
		  2. REC is automatically restarted (resumed) by the ETERNUS disk storage system.
		
		- [For Manual Recovery mode]
		
		  1. Remove the cause of the all path halt.
		
		  2. Use "A.8.3 acec suspend (Synchronous high-speed copy temporary suspension command)" with the -force options specified to forcibly suspend REC.
		
		  3. Use "A.8.4 acec resume (Synchronous high-speed copy restart command)" to restart (resume) REC.

Snap Error Suspend	0xBB	**[Cause]** A capacity shortage occurred for a Snap Data Volume or a Snap Data Pool. **[Action 1 (Snap Data Volume capacity shortage recovery method)]** Use "A.7.6 acsnap cancel (SnapOPC+ copy stop command) [Excluding Linux 5 for Intel Itanium]" 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.

Advanced copy status	Error code	Cause / Action
		The following are possible causes of a Snap Data Volume capacity shortage:
		a. The estimate for the physical capacity of the Snap Data Volume is not suitable.
		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.
		Use "A.9.5 acsdv stat (Snap Data Volume status display command) [Excluding Linux 5 for Intel Itanium]" to check the Snap Data Volume usage state.
		In the case of a, above, re-estimate the Snap Data Volume physical capacity and create the Snap Data Volume again. In the case of b. above, use the ETERNUS Web GUI or "A.9.4 acsdv init (Snap Data Volume initialization command) [Excluding Linux 5 for Intel Itanium]" to initialize the Snap Data Volume. Note that, after a Snap Data Volume is re-created and initialized, partitions (slices) must be created again.
		[Action 2 (Snap Data Pool capacity shortage recovery method)]
		Use "A.7.6 acsnap cancel (SnapOPC+ copy stop command) [Excluding Linux 5 for Intel Itanium]" 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.
		The following are possible causes of a Snap Data Pool capacity shortage:
		a. The estimate for the capacity of the Snap Data Pool is not suitable.
		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.
		Use "A.9.6 acsdv poolstat (Snap Data Pool status display command) [Excluding Linux 5 for Intel Itanium]" to check the Snap Data Pool usage state.
		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. In the case of b. above, use the ETERNUS Web GUI or "A.9.4 acsdv init (Snap Data Volume initialization command) [Excluding Linux 5 for Intel Itanium]" to initialize the Snap Data Volume.
		Note that, after a Snap Data Volume is re-created and initialized, partitions (slices) must be created again.

Appendix D Notes on Operations

This appendix explains the notes for AdvancedCopy Manager CCM operation.

Calculate the physical capacity for the Snap Data Volume [Excluding Linux 5 for Intel Itanium]

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/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 pseudo session on the copy source volume.

```
> acsnap start -estimate -v E4000/0x1
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.

```
> acsnap query -estimate -v E4000/0x1
Update
------
   10M
```

4. After the estimation is completed, cancel the pseudo session.

```
> acsnap cancel -estimate -v E4000/0x1
```

See

For detail of commands, refer to the following sections.

- "A.7.4 acsnap start (SnapOPC+ copy start command) [Excluding Linux 5 for Intel Itanium]"

- "A.7.5 acsnap query (SnapOPC+ copy status display command) [Excluding Linux 5 for Intel Itanium]"

- "A.7.6 acsnap cancel (SnapOPC+ copy stop command) [Excluding Linux 5 for Intel Itanium]"

Appendix E XML Format Output Function

This appendix explains the XML format output function.

This command is supported in Windows, Solaris, Linux 5 (for x86, for Intel64).

E.1   List of commands support the XML format output function

The following commands support the XML format output function.

Table E.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

Command name	Command type	
	Display type	Execution type
acec reverse	-	YES
acec change	-	YES
acec cancel	-	YES
acrecbuff set	-	YES
acrecbuff stat	YES	-
acinhibit set	-	YES
acinhibit unset	-	YES
acutil devs	YES	-
acutil refresh	-	YES

See
. . . .

The XML format between display type command and execution type command is different. Refer to "E.2.1 XML format of display type command" or "E.2.2 XML format of execution type command" for the each XML format.
. . . .

E.2 XML format

E.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 E4000

Disk Array Name : E4000
BOX-ID          : 00E4000M3#####E450S20A####KD4030639004##
IP Address      : 10.124.6.251
Admin User      : root
Access Path     : X:
```

With -xml option

```
> acarray detail -a E4000 -xml
<?xml version="1.0" encoding="UTF-8"?>
<Response>
  <ReturnCode>0</ReturnCode>
  <Message></Message>
  <List>
    <Data id="Disk Array Name">E4000</Data>
    <Data id="BOX-ID">00E4000M3#####E450S20A####KD4030639004##</Data>
```

```
      <Data id="IP Address">10.124.6.251</Data>
      <Data id="Admin User">root</Data>
      <Data id="Access Path">X:</Data>
    </List>
</Response>
```

Display example of table part only

Without -xml option

```
> acarray list

Name  BOX-ID                                 IP Address
----- -------------------------------------- ------------
E4000 00E4000M3#####E450S20A####KD4030639004## 10.124.6.251
E8000 00E8000M9#####E890S20A####KO4070639003## 10.124.6.241
```

With -xml option

```
> acarray list -xml
<?xml version="1.0" encoding="UTF-8"?>
<Response>
  <ReturnCode>0</ReturnCode>
  <Message></Message>
  <Table>
    <Row>
      <Data id="Name">E4000</Data>
      <Data id="BOX-ID">00E4000M3#####E450S20A####KD4030639004##</Data>
      <Data id="IP Address">10.124.6.251</Data>
    </Row>
    <Row>
      <Data id="Name">E8000</Data>
      <Data id="BOX-ID">00E8000M9#####E890S20A####KO4070639003##</Data>
      <Data id="IP Address">10.124.6.241</Data>
    </Row>
  </Table>
</Response>
```

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 : E8000 (00E8000M9#####E890S20A####KO4070639003##)

Source    <=> Target    SID  EC Status               Copy Phase Copied Block
--------- --- --------- ---- ----------------------- ---------- ------------
E8000/0x1 N/A E8000/0x3 N/A  "EC action not startup" "Not set"           N/A
E8000/0x2 ==> E8000/0x4 0x41 "EC Executing"          "Copying"      1048576
```

With -xml option

```
> acec query -g ECGroup -xml
<?xml version="1.0" encoding="UTF-8"?>
<Response>
  <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">E8000 (00E8000M9#####E890S20A####KO4070639003##)</Data>
```

```
      </List>
      <Table>
        <Row>
          <Data id="Source">E8000/0x1</Data>
          <Data id="&lt;=&gt;">N/A</Data>
          <Data id="Target">E8000/0x3</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">E8000/0x2</Data>
          <Data id="&lt;=&gt;">==&gt;</Data>
          <Data id="Target">E8000/0x4</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>
```

📘 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 E4000
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 E4000 -xml
<?xml version="1.0" encoding="UTF-8"?>
<Response>
  <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>
```

. . . .

E.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 E4000
Successful completion.
```

With -xml option

```
> acgroup create -g group01 -type OPC -a E4000 -xml
<?xml version="1.0" encoding="UTF-8"?>
<Response>
  <ReturnCode>0</ReturnCode>
  <Message>Successful completion.</Message>
</Response>
```

Display example of execution result including the detail information

Without -xml option

```
>acec start -g ECGroup

E4000/0x1:E4000/0x6
# DATE : 2008/06/24 16:28:00 - << EC Started >>
# From:BoxID=303045343030304d33323232323234534353053323041232323234b44343033303633393030342323/
Olu=1/Adr_high=0/Adr_low=0/size_high=0/size_low=0
# To  :BoxID=303045343030304d33323232323234534353053323041232323234b44343033303633393030342323/
Olu=6/Adr_high=0/Adr_low=0

E4000/0x2:E4000/0x7
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>
  <ReturnCode>6</ReturnCode>
  <Message></Message>
  <ResultList>
    <Result>
      <Object>E4000/0x1:E4000/0x6</Object>
      <Status>Succeeded</Status>
      <Message></Message>
      <Detail>DATE : 2008/06/24 16:28:00 - &lt;&lt; EC Started &gt;&gt; &#13;
From:BoxID=303045343030304d33323232323234534353053323041232323234b44343033303633393030342323/
Olu=1/Adr_high=0/Adr_low=0/size_high=0/size_low=0&#13;
To  :BoxID=303045343030304d33323232323234534353053323041232323234b44343033303633393030342323/
Olu=6/Adr_high=0/Adr_low=0</Detail>
    </Result>
    <Result>
      <Object>E4000/0x2:E4000/0x7</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>
  <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

DX440/0x1:DX440/0x6
# DATE : 2008/06/24 16:28:00 - << EC Change >>
Warning:ccm7001 The target logical volume is write protected. target logical volume=DX440/0x1

DX440/0x2:DX440/0x7
# 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>
    <ReturnCode>0</ReturnCode>
    <Message>Successful completion.</Message>
    <ResultList>
        <Result>
            <Object>DX440/0x1:DX440/0x6</Object>
            <Status>Succeeded</Status>
            <Message>Warning:ccm7001 The target logical volume is write protected. target logical
volume=DX440/0x1</Message>
            <Detail>DATE : 2008/06/24 16:28:00 - &lt;&lt; EC Change &gt;&gt;</Detail>
        </Result>
        <Result>
            <Object>DX440/0x2:DX440/0x7</Object>
            <Status>Succeeded</Status>
            <Message></Message>
            <Detail>DATE : 2008/06/24 16:28:00 - &lt;&lt; EC Change &gt;&gt;</Detail>
        </Result>
    </ResultList>
</Response>
```

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