FUJITSU Software
ServerView Resource Orchestrator
Cloud Edition V3.4.0

DR Option Instruction

Windows/Linux

Preface

Purpose of This Document

This manual explains the overview, setup, and operation of DR Option (*1), an optional product of FUJITSU Software ServerView Resource Orchestrator Cloud Edition (hereinafter Resource Orchestrator).

*1: DR is the abbreviation of Disaster Recovery.

This manual focuses on explaining how to set up DR Option and make it available for use on systems where FUJITSU Software ServerView Resource Orchestrator Cloud Edition will be installed.

Therefore, for content that is explained in FUJITSU Software ServerView Resource Orchestrator Cloud Edition manuals, only items are listed in this manual.

Intended Readers

This manual is written for system administrators who will use Resource Orchestrator to operate the infrastructure in private cloud or data center environments.

When using NS Option, it is assumed that readers have basic knowledge about FUJITSU Software ServerView Resource Orchestrator Cloud Edition.

Structure of This Document

This manual is composed as follows:

Chapter 1 Overview

Provides an overview of Resource Orchestrator.

Chapter 2 Design

Explains how to design a Resource Orchestrator installation.

Chapter 3 Installation

Explains the setup necessary for using DR Option.

Chapter 4 Operation

Explains how to operate this product.

Appendix A Settings for Software ID Prefixes

Explains settings for software ID prefixes.

Appendix B Commands

Provides an overview of the commands available in DR Option. Please refer to it when necessary.

Appendix C Message

Explains the messages that may be output when using Disaster Recovery.

Appendix D Output Logs when Switchover Occurs because of Disaster Recovery

Explains the logs output when switchover occurs due to Disaster Recovery.

Appendix E Using the [Templates] and [L-Platforms] Tabs when Resources Are Locked

Explains how to use the [Templates] tab and the [L-Platforms] tab when resources are locked.

Appendix F Target Files of Automatic Takeover of Configuration Files

Explains the files that are the targets of the configuration file automatic takeover function.

Web Site URLs

URLs provided as reference sources within the main text are correct as of March 2019.

Document Conventions

The notation in this manual conforms to the following conventions.

- When there is different information for the different versions of Resource Orchestrator, it is indicated as follows.

[All Editions]	Sections relevant for all editions
[Cloud Edition]	Sections related to Cloud Edition
[Virtual Edition]	Sections related to Virtual Edition

- When using Resource Orchestrator and the functions necessary differ due to the necessary basic software (OS), it is indicated as follows:

[Windows Manager]

Sections related to Windows manager

[Linux Manager]

Sections related to Linux manager

[Windows]

Sections related to Windows

[Linux]

Sections related to Linux

[Red Hat Enterprise Linux]

Sections related to Red Hat Enterprise Linux

[Solaris]

Sections related to Solaris

[VMware]

Sections related to VMware

[Horizon View]

Sections related to VMware Horizon View

[Hyper-V]

Sections related to Hyper-V

[Xen]

Sections related to RHEL5-Xen

[KVM]

Sections related to RHEL-KVM

[Solaris Zones]

Sections related to Solaris Zones (Solaris 10) and Solaris Zones (Solaris 11)

[Solaris Zones (Solaris 10)]

Sections related to Solaris Zones with Solaris 10 VM hosts

[Solaris Zones (Solaris 11)]

Sections related to Solaris Zones with Solaris 11 VM hosts

[OVM for x86]

Sections related to Oracle VM Server for x86 2.2 and Oracle VM Server for x86 3.x

[OVM for x86 2.2]

Sections related to Oracle VM Server for x86 2.2

[OVM for x86 3.x]

    Sections related to Oracle VM Server for x86 3.2 and Oracle VM Server for x86 3.3

[OVM for SPARC]

    Sections related to Oracle VM Server for SPARC

[Citrix Xen]

    Sections related to Citrix XenServer

[Physical Servers]

    Sections related to physical servers

[Trend Micro OfficeScan]

    Sections related to Trend Micro OfficeScan

[Symantec]

    Sections related to Symantec Endpoint Protection

[McAfee]

    Sections related to McAfee ePolicy Orchestrator

- Unless specified otherwise, the blade servers mentioned in this manual refer to PRIMERGY BX servers.

- Oracle Solaris may also be indicated as Solaris, Solaris Operating System, or Solaris OS.

- Oracle Solaris Zones may also be indicated as Solaris Containers or Solaris Container.

- Oracle VM Server for x86 may also be indicated as Oracle VM.

- In Resource Orchestrator, the following servers are referred to as SPARC Enterprise.

    - SPARC Enterprise M3000/M4000/M5000/M8000/M9000

    - SPARC Enterprise T5120/T5140/T5220/T5240/T5440

- In Resource Orchestrator, the following servers are referred to as SPARC M12.

    - SPARC M12-1/M12-2/M12-2S

- In Resource Orchestrator, the following servers are referred to as SPARC M10.

    - SPARC M10-1/M10-4/M10-4S

- Fujitsu SPARC M12 is the product name used for SPARC M12 when they are sold outside Japan.

- Fujitsu M10 is the product name used for SPARC M10 when they are sold outside Japan.

- In this manual, Fujitsu SPARC M12 is referred to as SPARC M12.

- In this manual, Fujitsu M10 is referred to as SPARC M10.

- In this manual, Fujitsu SPARC M12 and Fujitsu M10 are collectively referred to as SPARC M10/M12.

- In Resource Orchestrator, the following software is referred to as GLS.

    - PRIMECLUSTER GLS 4.4 or earlier

- In Resource Orchestrator, the following software is referred to as GDS.

    - PRIMECLUSTER GDS 4.4 or earlier

- References and character strings or values requiring emphasis are indicated using double quotes (").

- GUI items are shown enclosed by brackets ([ ]).

- The order of selecting menus is indicated using [ ]-[ ].

- Text to be entered by the user is indicated using bold text.

- Variables are indicated using italic text and underscores.

- The ellipses ("...") in menu names, indicating settings and operation window startup, are not shown.

- The ">" used in Windows is included in usage examples. When using Linux, read ">" as meaning "#".

- When using Resource Orchestrator on Windows 8 and Windows Server 2012, please note the following. When OS operations are explained in this manual, the examples assume OSs up to Windows 7 and Windows Server 2008. When using Resource Orchestrator on Windows 8 or Windows Server 2012, take explanations regarding the [Start] menu as indicating the [Apps] screen. The [Apps] screen can be displayed by right-clicking on the [Start] screen and then right-clicking [All apps].

- When using Resource Orchestrator on Windows 8.1 and Windows Server 2012 R2, please note the following. When OS operations are explained in this manual, the examples assume OSs up to Windows 7 and Windows Server 2008. When using Resource Orchestrator on Windows 8.1 or Windows Server 2012 R2, take explanations regarding the [Start] menu as indicating the [Apps] screen. The [Apps] screen can be displayed by swiping the [Start] screen from bottom to top, or clicking the downward facing arrow on the lower-left of the [Start] screen.

Menus in the ROR console

Operations on the ROR console can be performed using either the menu bar or pop-up menus.

By convention, procedures described in this manual only refer to pop-up menus.

Regarding Installation Folder Paths

The installation folder path may be given as C:\Fujitsu\ROR in this manual.

Replace it as shown below.

[Virtual Edition]

- When using Windows 64-bit (x64)

  C:\Program Files (x86)\Resource Orchestrator

- When using Windows 32-bit (x86)

  C:\Program Files\Resource Orchestrator

[Cloud Edition]

C:\Program Files (x86)\Resource Orchestrator

Command Examples

The paths used in command examples may be abbreviated. When using commands, execute them using the paths in the "Name" column in the "Reference Guide (Command) VE" and the "Reference Guide (Command/XML) CE".

Abbreviations

The following abbreviations are use in this manual.

Category

Abbreviation

- Products

Windows

Windows

- Microsoft(R) Windows Server(R) 2012 Standard

- Microsoft(R) Windows Server(R) 2012 Datacenter

- Microsoft(R) Windows Server(R) 2012 R2 Essentials

- Microsoft(R) Windows Server(R) 2012 R2 Standard

- Microsoft(R) Windows Server(R) 2012 R2 Datacenter

- Microsoft(R) Windows Server(R) 2016 Standard

- Microsoft(R) Windows Server(R) 2016 Datacenter

- Microsoft(R) Windows Server(R) 2019 Standard

- Microsoft(R) Windows Server(R) 2019 Datacenter

- Windows Vista(R) Business

- Windows Vista(R) Enterprise

- Windows Vista(R) Ultimate

- Windows(R) 7 Professional

- Windows(R) 7 Ultimate

- Windows(R) 8 Pro

- Windows(R) 8 Enterprise

- Windows(R) 8.1 Pro

- Windows(R) 8.1 Enterprise

- Windows(R) 10 Pro

- Windows(R) 10 Enterprise

Windows Server 2012

- Microsoft(R) Windows Server(R) 2012 Standard

- Microsoft(R) Windows Server(R) 2012 Datacenter

- Microsoft(R) Windows Server(R) 2012 R2 Essentials

- Microsoft(R) Windows Server(R) 2012 R2 Standard

- Microsoft(R) Windows Server(R) 2012 R2 Datacenter

Windows Server 2016

- Microsoft(R) Windows Server(R) 2016 Standard

- Microsoft(R) Windows Server(R) 2016 Datacenter

Windows Server 2019

- Microsoft(R) Windows Server(R) 2019 Standard

- Microsoft(R) Windows Server(R) 2019 Datacenter

Windows PE

- Microsoft(R) Windows(R) Preinstallation Environment

Windows Vista

- Windows Vista(R) Business

- Windows Vista(R) Enterprise

- Windows Vista(R) Ultimate

Windows 7

- Windows(R) 7 Professional

- Windows(R) 7 Ultimate

Windows 8

- Windows(R) 8 Pro

- Windows(R) 8 Enterprise

- Windows(R) 8.1 Pro

- Windows(R) 8.1 Enterprise

Windows 10

- Windows(R) 10 Pro

- Windows(R) 10 Enterprise

DOS

- Microsoft(R) MS-DOS(R) operating system, DR DOS(R)

MSFC

- Microsoft(R) Windows Server(R) 2012 Standard Failover Cluster

- Microsoft(R) Windows Server(R) 2012 Datacenter Failover Cluster

SCVMM

- Microsoft(R) System Center 2012 Virtual Machine Manager

- Microsoft(R) System Center 2012 R2 Virtual Machine Manager

- Microsoft(R) System Center 2016 Virtual Machine Manager

Linux

Linux

- Red Hat(R) Enterprise Linux(R) 6.0 (for x86)

- Red Hat(R) Enterprise Linux(R) 6.0 (for Intel64)

- Red Hat(R) Enterprise Linux(R) 6.1 (for x86)

- Red Hat(R) Enterprise Linux(R) 6.1 (for Intel64)

- Red Hat(R) Enterprise Linux(R) 6.2 (for x86)

- Red Hat(R) Enterprise Linux(R) 6.2 (for Intel64)

- Red Hat(R) Enterprise Linux(R) 6.3 (for x86)

- Red Hat(R) Enterprise Linux(R) 6.3 (for Intel64)

- Red Hat(R) Enterprise Linux(R) 6.4 (for x86)

- Red Hat(R) Enterprise Linux(R) 6.4 (for Intel64)

- Red Hat(R) Enterprise Linux(R) 6.5 (for x86)

- Red Hat(R) Enterprise Linux(R) 6.5 (for Intel64)

- Red Hat(R) Enterprise Linux(R) 6.6 (for x86)

- Red Hat(R) Enterprise Linux(R) 6.6 (for Intel64)

- Red Hat(R) Enterprise Linux(R) 6.7 (for x86)

- Red Hat(R) Enterprise Linux(R) 6.7 (for Intel64)

- Red Hat(R) Enterprise Linux(R) 6.8 (for x86)

- Red Hat(R) Enterprise Linux(R) 6.8 (for Intel64)

- Red Hat(R) Enterprise Linux(R) 6.9 (for x86)

- Red Hat(R) Enterprise Linux(R) 6.9 (for Intel64)

- Red Hat(R) Enterprise Linux(R) 6.10 (for x86)

- Red Hat(R) Enterprise Linux(R) 6.10 (for Intel64)

- Red Hat(R) Enterprise Linux(R) 7.0 (for Intel64)

- Red Hat(R) Enterprise Linux(R) 7.1 (for Intel64)

- Red Hat(R) Enterprise Linux(R) 7.2 (for Intel64)

- Red Hat(R) Enterprise Linux(R) 7.4 (for Intel64)

- Red Hat(R) Enterprise Linux(R) 7.5 (for Intel64)

- SUSE(R) Linux Enterprise Server 10 Service Pack 2 for x86

- SUSE(R) Linux Enterprise Server 10 Service Pack 2 for AMD64 & Intel64

- SUSE(R) Linux Enterprise Server 10 Service Pack 3 for x86

- SUSE(R) Linux Enterprise Server 10 Service Pack 3 for AMD64 & Intel64

- SUSE(R) Linux Enterprise Server 11 for x86

- SUSE(R) Linux Enterprise Server 11 for AMD64 & Intel64

- SUSE(R) Linux Enterprise Server 11 Service Pack 1 for x86

- SUSE(R) Linux Enterprise Server 11 Service Pack 1 for AMD64 & Intel64

- Oracle Enterprise Linux Release 6.7 for x86 (32-bit)

- Oracle Enterprise Linux Release 6.7 for x86_64 (64-bit)

- Oracle Enterprise Linux Release 7.2 for x86 (32-bit)

- Oracle Enterprise Linux Release 7.2 for x86_64 (64-bit)

Red Hat Enterprise Linux

- Red Hat(R) Enterprise Linux(R) 6.0 (for x86)

- Red Hat(R) Enterprise Linux(R) 6.0 (for Intel64)

- Red Hat(R) Enterprise Linux(R) 6.1 (for x86)

- Red Hat(R) Enterprise Linux(R) 6.1 (for Intel64)

- Red Hat(R) Enterprise Linux(R) 6.2 (for x86)

- Red Hat(R) Enterprise Linux(R) 6.2 (for Intel64)

- Red Hat(R) Enterprise Linux(R) 6.3 (for x86)

- Red Hat(R) Enterprise Linux(R) 6.3 (for Intel64)

- Red Hat(R) Enterprise Linux(R) 6.4 (for x86)

- Red Hat(R) Enterprise Linux(R) 6.4 (for Intel64)

- Red Hat(R) Enterprise Linux(R) 6.5 (for x86)

- Red Hat(R) Enterprise Linux(R) 6.5 (for Intel64)

- Red Hat(R) Enterprise Linux(R) 6.6 (for x86)

- Red Hat(R) Enterprise Linux(R) 6.6 (for Intel64)

- Red Hat(R) Enterprise Linux(R) 6.7 (for x86)

- Red Hat(R) Enterprise Linux(R) 6.7 (for Intel64)

- Red Hat(R) Enterprise Linux(R) 6.8 (for x86)

- Red Hat(R) Enterprise Linux(R) 6.8 (for Intel64)

- Red Hat(R) Enterprise Linux(R) 6.9 (for x86)

- Red Hat(R) Enterprise Linux(R) 6.9 (for Intel64)

- Red Hat(R) Enterprise Linux(R) 6.10 (for x86)

- Red Hat(R) Enterprise Linux(R) 6.10 (for Intel64)

- Red Hat(R) Enterprise Linux(R) 7.0 (for Intel64)

- Red Hat(R) Enterprise Linux(R) 7.1 (for Intel64)

- Red Hat(R) Enterprise Linux(R) 7.2 (for Intel64)

- Red Hat(R) Enterprise Linux(R) 7.4 (for Intel64)

- Red Hat(R) Enterprise Linux(R) 7.5 (for Intel64)

Red Hat Enterprise Linux 6

- Red Hat(R) Enterprise Linux(R) 6.0 (for x86)

- Red Hat(R) Enterprise Linux(R) 6.0 (for Intel64)

- Red Hat(R) Enterprise Linux(R) 6.1 (for x86)

- Red Hat(R) Enterprise Linux(R) 6.1 (for Intel64)

- Red Hat(R) Enterprise Linux(R) 6.2 (for x86)

- Red Hat(R) Enterprise Linux(R) 6.2 (for Intel64)

- Red Hat(R) Enterprise Linux(R) 6.3 (for x86)

- Red Hat(R) Enterprise Linux(R) 6.3 (for Intel64)

- Red Hat(R) Enterprise Linux(R) 6.4 (for x86)

- Red Hat(R) Enterprise Linux(R) 6.4 (for Intel64)

- Red Hat(R) Enterprise Linux(R) 6.5 (for x86)

- Red Hat(R) Enterprise Linux(R) 6.5 (for Intel64)

- Red Hat(R) Enterprise Linux(R) 6.6 (for x86)

- Red Hat(R) Enterprise Linux(R) 6.6 (for Intel64)

- Red Hat(R) Enterprise Linux(R) 6.7 (for x86)

- Red Hat(R) Enterprise Linux(R) 6.7 (for Intel64)

- Red Hat(R) Enterprise Linux(R) 6.8 (for x86)

- Red Hat(R) Enterprise Linux(R) 6.8 (for Intel64)

- Red Hat(R) Enterprise Linux(R) 6.9 (for x86)

- Red Hat(R) Enterprise Linux(R) 6.9 (for Intel64)

- Red Hat(R) Enterprise Linux(R) 6.10 (for x86)

- Red Hat(R) Enterprise Linux(R) 6.10 (for Intel64)

Red Hat Enterprise Linux 7

- Red Hat(R) Enterprise Linux(R) 7.0 (for Intel64)

- Red Hat(R) Enterprise Linux(R) 7.1 (for Intel64)

- Red Hat(R) Enterprise Linux(R) 7.2 (for Intel64)

- Red Hat(R) Enterprise Linux(R) 7.4 (for Intel64)

- Red Hat(R) Enterprise Linux(R) 7.5 (for Intel64)

SUSE Linux Enterprise Server

- SUSE(R) Linux Enterprise Server 10 Service Pack 2 for x86

- SUSE(R) Linux Enterprise Server 10 Service Pack 2 for AMD64 & Intel64

- SUSE(R) Linux Enterprise Server 10 Service Pack 3 for x86

- SUSE(R) Linux Enterprise Server 10 Service Pack 3 for AMD64 & Intel64

- SUSE(R) Linux Enterprise Server 11 for x86

- SUSE(R) Linux Enterprise Server 11 for AMD64 & Intel64

- SUSE(R) Linux Enterprise Server 11 Service Pack 1 for x86

- SUSE(R) Linux Enterprise Server 11 Service Pack 1 for AMD64 & Intel64

Oracle Enterprise Linux

- Oracle Enterprise Linux Release 6.7 for x86 (32-bit)

- Oracle Enterprise Linux Release 6.7 for x86_64 (64-bit)

- Oracle Enterprise Linux Release 7.2 for x86 (32-bit)

- Oracle Enterprise Linux Release 7.2 for x86_64 (64-bit)

KVM

RHEL-KVM

- Red Hat(R) Enterprise Linux(R) 6.1 (for x86) Virtual Machine Function

- Red Hat(R) Enterprise Linux(R) 6.1 (for Intel64) Virtual Machine Function

- Red Hat(R) Enterprise Linux(R) 6.2 (for x86) Virtual Machine Function

- Red Hat(R) Enterprise Linux(R) 6.2 (for Intel64) Virtual Machine Function

- Red Hat(R) Enterprise Linux(R) 6.3 (for x86) Virtual Machine Function

- Red Hat(R) Enterprise Linux(R) 6.3 (for Intel64) Virtual Machine Function

- Red Hat(R) Enterprise Linux(R) 6.4 (for x86) Virtual Machine Function

- Red Hat(R) Enterprise Linux(R) 6.4 (for Intel64) Virtual Machine Function

- Red Hat(R) Enterprise Linux(R) 6.5 (for x86) Virtual Machine Function

- Red Hat(R) Enterprise Linux(R) 6.5 (for Intel64) Virtual Machine Function

- Red Hat(R) Enterprise Linux(R) 6.6 (for x86) Virtual Machine Function

- Red Hat(R) Enterprise Linux(R) 6.6 (for Intel64) Virtual Machine Function

- Red Hat(R) Enterprise Linux(R) 6.7 (for x86) Virtual Machine Function

- Red Hat(R) Enterprise Linux(R) 6.7 (for Intel64) Virtual Machine Function

- Red Hat(R) Enterprise Linux(R) 6.8 (for x86) Virtual Machine Function

- Red Hat(R) Enterprise Linux(R) 6.8 (for Intel64) Virtual Machine Function

Xen

Xen

- Citrix XenServer(R) 5.5

- Citrix Essentials(TM) for XenServer 5.5, Enterprise Edition

- Citrix XenServer(R) 6.0

- Citrix Essentials(TM) for XenServer 6.0, Enterprise Edition

Citrix

Citrix XenServer

- Citrix XenServer(R) 6.0

- Citrix XenServer(R) 6.0.2

- Citrix XenServer(R) 6.1.0

- Citrix XenServer(R) 6.2.0

- Citrix XenServer(R) 7.1 LTSR

- Citrix XenServer(R) 7.2

- Citrix Hypervisor(R)

XenServer 6

- Citrix XenServer(R) 6.0

- Citrix Essentials(TM) for XenServer 6.0, Enterprise Edition

Citrix XenApp

- Citrix XenApp(R)

- Citrix Virtual Apps(R)

Citrix XenDesktop

- Citrix XenDesktop(R)

- Citrix Virtual Apps and Desktops(R)

Oracle Solaris

Solaris

- Oracle Solaris 10 05/09 (Update7)

- Oracle Solaris 11 11/11

- Oracle Solaris 11.1

- Oracle Solaris 11.2

- Oracle Solaris 11.3

Oracle VM

OVM for x86 2.2

- Oracle(R) VM Server for x86 2.2

OVM for x86 3.x

OVM for x86 3.2

- Oracle VM Server for x86 v3.2.x

OVM for x86 3.3

- Oracle VM Server for x86 v3.3.x

OVM for SPARC

- Oracle(R) VM Server for SPARC

Oracle VM Manager

- Oracle(R) VM Manager

EMC

Navisphere

- EMC Navisphere Manager

Solutions Enabler

- EMC Solutions Enabler

VMware

VMware vSphere or vSphere

- VMware vSphere(R) 4

- VMware vSphere(R) 4.1

- VMware vSphere(R) 5

- VMware vSphere(R) 5.1

- VMware vSphere(R) 5.5

- VMware vSphere(R) 6

- VMware vSphere(R) 6.5

- VMware vSphere(R) 6.7

VMware ESX

- VMware(R) ESX(R)

VMware ESX 4

- VMware(R) ESX(R) 4

VMware ESXi

- VMware(R) ESXi(TM)

VMware ESXi 5.0

- VMware(R) ESXi(TM) 5.0

VMware ESXi 5.1

- VMware(R) ESXi(TM) 5.1

VMware ESXi 5.5

- VMware(R) ESXi(TM) 5.5

VMware ESXi 6.0

- VMware(R) ESXi(TM) 6.0

VMware ESXi 6.5

- VMware(R) ESXi(TM) 6.5

VMware ESXi 6.7

- VMware(R) ESXi(TM) 6.7

VMware Infrastructure Client

- VMware(R) Infrastructure Client

VMware Tools

- VMware(R) Tools

VMware vSphere 4.0 or vSphere 4.0

- VMware vSphere(R) 4.0

VMware vSphere 4.1 or vSphere 4.1

- VMware vSphere(R) 4.1

VMware vSphere 5 or vSphere 5

- VMware vSphere(R) 5

VMware vSphere 5.1 or vSphere 5.1

- VMware vSphere(R) 5.1

VMware vSphere 5.5 or vSphere 5.5

- VMware vSphere(R) 5.5

VMware vSphere 6.0 or vSphere 6.0

- VMware vSphere(R) 6.0

VMware vSphere 6.5 or vSphere 6.5

- VMware vSphere(R) 6.5

VMware vSphere 6.7 or vSphere 6.7

- VMware vSphere(R) 6.7

VMware vSphere Client or vSphere Client

- VMware vSphere(R) Client

VMware vCenter Server or vCenter Server

- VMware(R) vCenter(TM) Server

VMware vCenter Server Appliance or vCenter Server Appliance

- VMware(R) vCenter(TM) Server Appliance(TM)

VMware vClient

- VMware(R) vClient(TM)

VMware FT

- VMware(R) Fault Tolerance

VMware DRS

- VMware(R) Distributed Resource Scheduler

VMware DPM

- VMware(R) Distributed Power Management

VMware Storage VMotion

- VMware(R) Storage VMotion

VMware vDS

- VMware(R) vNetwork Distributed Switch

VMware Horizon View

- VMware Horizon View 5.2.x

- VMware Horizon View 5.3.x

- VMware Horizon 6.0 (with View)

VMware VSAN or VSAN

- VMware(R) Virtual SAN(TM)

VMware vSphere Web Client or vSphere Web Client

- VMware vSphere(R) Web Client

VMware NSX

- VMware NSX(R)

- VMware NSX(R) for vSphere(R)

- VMware NSX(R) for vSphere(R) 6.3

VMware NSX Controller or NSX Controller

- VMware NSX(R) Controller(TM)

VMware NSX Edge or NSX Edge

- VMware NSX(R) Edge(TM)

VMware NSX Manager or NSX Manager

- VMware NSX(R) Manager(TM)

Excel

Excel

- Microsoft(R) Office Excel(R) 2007

- Microsoft(R) Office Excel(R) 2010

- Microsoft(R) Office Excel(R) 2013

Excel 2007

- Microsoft(R) Office Excel(R) 2007

Excel 2010

- Microsoft(R) Office Excel(R) 2010

Excel 2013

- Microsoft(R) Office Excel(R) 2013

Browsers

Internet Explorer

- Windows(R) Internet Explorer(R) 9

- Windows(R) Internet Explorer(R) 10

- Internet Explorer(R) 11

Firefox

- Firefox(R)

Antivirus Software

OfficeScan

- Trend Micro OfficeScan

McAfee ePolicy Orchestrator

- McAfee(R) ePolicy Orchestrator(R)

McAfee ePO

- McAfee(R) ePolicy Orchestrator(R)

McAfee Agent

- McAfee(R) Agent

McAfee Endpoint Security

- McAfee(R) Endpoint Security

Symantec Endpoint Protection

- Symantec(TM) Endpoint Protection

Symantec Endpoint Protection Manager

- Symantec(TM) Endpoint Protection Manager

BMC

BladeLogic

- BMC BladeLogic Server Automation

ETERNUS

ESC

- ETERNUS SF Storage Cruiser

ServerView

ServerView Agent

- ServerView SNMP Agents for MS Windows (32-bit and 64-bit)

- ServerView Agents Linux

- ServerView Agents VMware for VMware ESX Server

VIOM

- ServerView Virtual-IO Manager

ISM

- ServerView Infrastructure Manager

- Infrastructure Manager

SVOM

- ServerView Operations Manager

SVFAB

- ServerView Fabric Manager

RCVE

- ServerView Resource Coordinator VE

ROR

- FUJITSU Software ServerView Resource Orchestrator

ROR VE

- FUJITSU Software ServerView Resource Orchestrator Virtual Edition

ROR CE

- FUJITSU Software ServerView Resource Orchestrator Cloud Edition

Resource Coordinator

- Systemwalker Resource Coordinator

- Systemwalker Resource Coordinator Virtual server Edition

Resource Coordinator VE

- ServerView Resource Coordinator VE

- Systemwalker Resource Coordinator Virtual server Edition

Resource Orchestrator

- FUJITSU Software ServerView Resource Orchestrator

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Notices

Revision History

Month/Year Issued, Edition	Manual Code
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Contents

Chapter 1 Overview

This chapter provides an overview of this product.

This product provides the disaster recovery function which allows continuation of operations on a switchover destination site when a disaster strikes a cloud environment which is managed using FUJITSU Software ServerView Resource Orchestrator Cloud Edition.

This product provides simple and highly reliable Disaster Recovery, by exporting the following information that Resource Orchestrator Cloud Edition manager handles from the switchover source site and importing it to the switchover destination site.

- L-Platform Templates
    - Software information
    - Image information
    - Segment information
- L-Platform Configuration Information
- Resource Information
    - L-Servers
    - L-Server Templates
    - Tenants
    - Resource Folders
    - Image Resources
    - Users
    - User Groups
    - Roles
    - Network Resources
    - Address set resources
    - Resource Pools
    - Execution Information of Sample Scripts
- Accounting information
- Metering Logs
- Usage Charges

In order to recover the cloud environment on the switchover destination site, copy the switchover source site storage to the switchover destination site, using the replication functions of the storage units.

Overview of the Disaster Recovery Environment

The overview of the Disaster Recovery environment is as given below.

Figure 1.1 Overview of the Disaster Recovery Environment
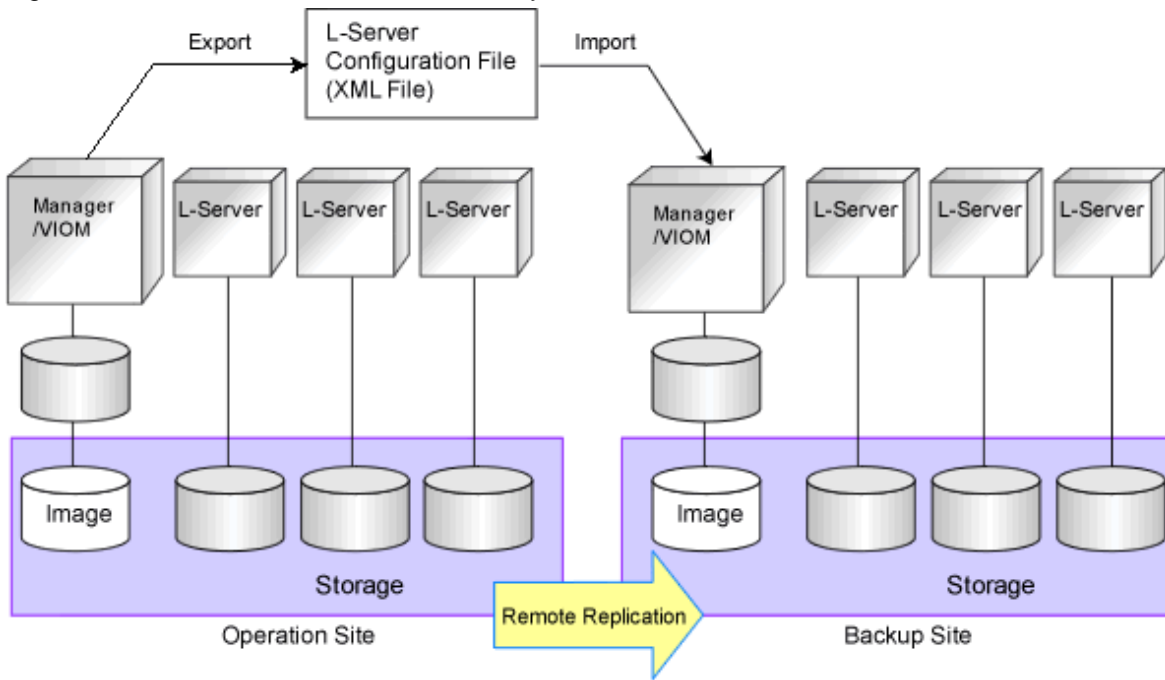
For details on the design of the Disaster Recovery environment, refer to "Chapter 2 Design".

For details on the installation of the Disaster Recovery environment, refer to "Chapter 3 Installation".

For details on the operation of the Disaster Recovery environment, refer to "Chapter 4 Operation".

Chapter 2 Design

This chapter explains how to design disaster recovery in Resource Orchestrator.

Table 2.1 Design Items of Disaster Recovery

Main Items	Reference
Switchover Methods	Refer to "2.1 Switchover Methods".
Switchover operations	Refer to "2.2 Switchover Operation".
Switchover levels	Refer to "2.3 Switchover Levels".
Limitation of switchover scope and additional recovery	Refer to "2.4 Limitation of switchover scope and additional recovery".
Configuration for blade chassis degradation	Refer to "2.5 Degrading Blade Chassis".
Configurations	Refer to "2.6 Configurations of the Switchover Source and Destination Sites".
Licenses	Refer to "2.7 Necessary Licenses".
Estimation of capacity of disks that will be replicated	Refer to "2.8 Estimation of Disk Capacity".
Estimation of capacity of disks that will not be replicated	
Advisory notes for Disaster Recovery environments	Refer to "2.9 Advisory Notes for Disaster Recovery Environments".
System configuration	Refer to "2.10 System configuration".

The combinations of switchover methods, switchover operations, and switchover units supported by DR Option are as follows:

Table 2.2 Combinations of Switchover Methods, Switchover Operations, and Switchover Units

Switchover Methods	Switchover operations	Switchover levels	Support Availability
"Physical L-Server switchover (physical OS)"	Active-Active Operation	Site switchover	No
		Tenant switchover	Yes
	Active-Standby Operation	Site switchover	Yes
		Tenant switchover	Yes
"Physical/virtual L-Server switchover (VM host/VM guest)"	Active-Active Operation	Site switchover	No
		Tenant switchover	No
	Active-Standby Operation	Site switchover	Yes
		Tenant switchover	No
"Virtual L-Server switchover (VM guest)"	Active-Active Operation	Site switchover	No
		Tenant switchover	Yes
	Active-Standby Operation	Site switchover	Yes
		Tenant switchover	Yes

The combinations of physical servers and the Disaster Recovery function supported by DR Option are as follows:

Table 2.3 Combinations of Physical Servers and the Disaster Recovery Function

Function		PRIMERGY blade servers	PRIMERGY rack mount servers	SPARC Server
Switchover Methods	Physical L-Server Switchover	Yes	Yes	No
	Physical/Virtual L-Server Switchover	Yes	Yes	No
	Virtual L-Server Switchover	Yes	Yes	Yes

Function		PRIMERGY blade servers	PRIMERGY rack mount servers	SPARC Server
Switchover operations	Active-Standby Operation	Yes	Yes	No
	Active-Active Operation	Yes	Yes	Yes
Switchover levels	Site switchover	Yes	Yes	No
	Tenant switchover	Yes	Yes	Yes
Limitation of switchover scope and additional recovery	Limitation of switchover scope	Yes	Yes	Yes
	Additional Recovery	Yes	Yes	Yes
Configuration for blade chassis degradation		Yes	-	-
Switchover target	Virtual L-Servers	Yes	Yes	Yes
	Virtual L-Servers linked with virtual servers	Yes	Yes	No
	Physical L-Servers	Yes	Yes	No
	Physical L-Servers linked with physical servers	No	No	No
	L-Servers with definitions only	No	No	No

Yes: Supported

No: Not supported

-: Not applicable

2.1 Switchover Methods

The following three switchover methods are supported:

Table 2.4 Switchover Methods

Content	Remarks	Reference
Physical L-Server Switchover (Physical OS)	-	Refer to "2.1.1 Physical L-Server Switchover (Physical OS)".
Physical/Virtual L-Server Switchover (VM Host/VM Guest)	This cannot be performed with virtual L-Server switchover (VM guest).	Refer to "2.1.2 Physical/Virtual L-Server Switchover (VM Host/VM Guest)".
Virtual L-Server Switchover (VM guest)	This cannot be performed with physical/virtual L-Server switchover (VM host/VM guest).	Refer to "2.1.3 Virtual L-Server Switchover (VM guest)".

The possibility of using a combination of these methods is shown below.

Switchover Methods	Physical L-Server Switchover (Physical OS)	Physical/Virtual L-Server Switchover (VM Host/VM Guest)	Virtual L-Server Switchover (VM guest)
Physical L-Server Switchover (Physical OS)	-	Yes	Yes
Physical/Virtual L-Server Switchover (VM Host/VM Guest)	Yes	-	No
Virtual L-Server Switchover (VM guest)	Yes	No	-

Yes: Use in combination is possible

No: Use in combination is not possible

-: Not applicable

A comparison of these methods is shown below.

Table 2.5 Comparison of Methods

		Physical L-Server Switchover (Physical OS)	Physical/Virtual L-Server Switchover (VM Host/VM Guest)	Virtual L-Server Switchover (VM Guest)
Switchover target	Physical OS	Yes	-	-
	VM host	-	Yes	-
	VM guest	-	Yes	Yes
Server type	PRIMERGY blade servers	Yes	Yes	Yes
	PRIMERGY rack mount servers	Yes (When using VIOM for the I/O virtualization method)	Yes (When using VIOM for the I/O virtualization method)	Yes
	SPARC M10/M12	No	No	Yes
Storage connections	FC	Yes	Yes	Yes
	iSCSI	No	No	Yes (only VMware)
	NAS	No	No	Yes (only VMware)
Server virtualization software	VMware	-	Yes	Yes (VMware ESXi 5.x)
	Hyper-V	-	Yes	No
	OVM for SPARC	-	No	Yes (Solaris 11/11 or later)
Configuration of a VM host on the switchover destination site in advance		-	Not necessary	Necessary
Recovery of a virtual L-Server linking with a configured virtual machine		-	No	Yes (L-Server useable for server/storage operations)

Yes: Supported

No: Not supported

-: Not applicable

2.1.1 Physical L-Server Switchover (Physical OS)

Switch over of a physical L-Server in which a physical OS is installed.

Figure 2.1 Physical L-Server Switchover (Physical OS)
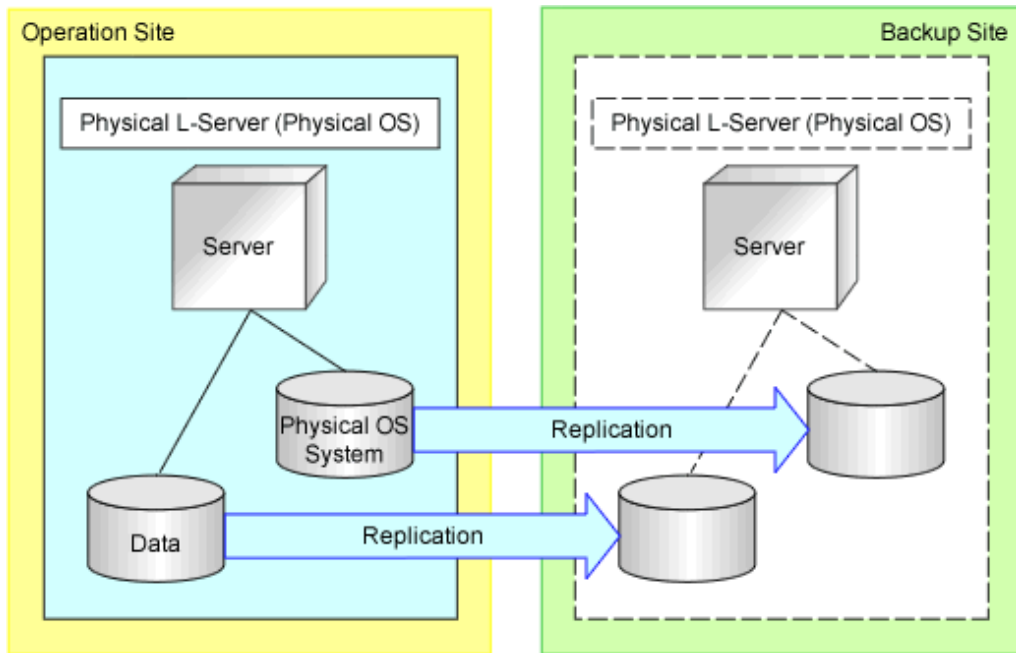
Table 2.6 Supported Configurations

Item	Content		Remarks
Managed server type	PRIMERGY blade servers		
	PRIMERGY rack mount/pedestal servers		Only available when using I/O virtualization with VIOM.
Storage connections	FC		
Physical L-Server disk allocation methods	LUNs created in advance, Dynamic LUN mirroring		
Managed switch blades	Connection Blade	Switch mode	IBP mode cannot be used.
		End host mode	
		Converged Fabric mode	

P Point

Physical L-Server switchover can be performed with physical/virtual L-Server switchover (VM host/VM guest), or virtual L-Server switchover (VM guest) at the same time.

Note

Physical OS System Disks or Disks Storing Data Used by Physical OSs

Use the FC connection disks as the replication targets.

2.1.2 Physical/Virtual L-Server Switchover (VM Host/VM Guest)

Switch over of a physical L-Server in which a VM host is installed, or a virtual L-Server (VM) that operates on a VM host.

Figure 2.2 Physical/Virtual L-Server Switchover (VM Host/VM Guest)
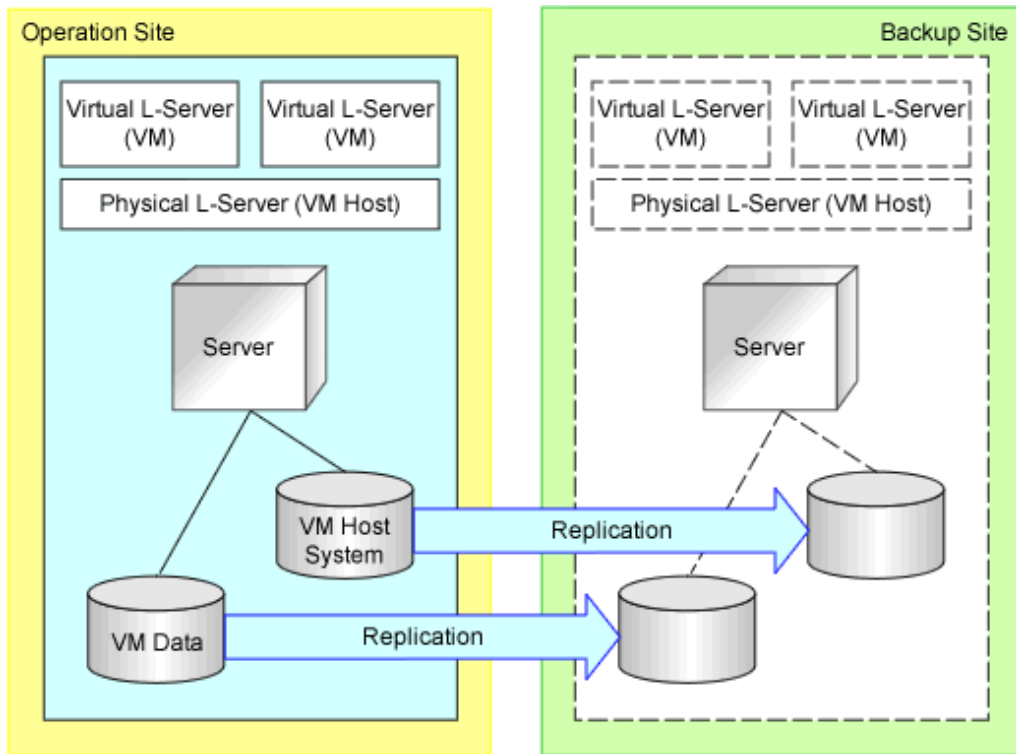
Table 2.7 Supported Configurations

Item	Content			Remarks
Managed server type	PRIMERGY blade servers			
	PRIMERGY rack mount/pedestal servers			Only available when using I/O virtualization with VIOM.
Storage connections	FC			
Physical L-Server disk allocation methods	LUNs created in advance, Dynamic LUN mirroring			
Managed switch blades	Connection Blade	Switch mode		IBP mode cannot be used.
		End host mode		
		Converged Fabric mode		
Server virtualization software/VM management software	VMware/VMware vCenter Server			Install VM management software on physical L-Servers, or on each site.
	Hyper-V/SCVMM			Install VM management software on physical L-Servers
				Supports only Windows managers.

Point

- Can be performed with physical L-Server switchover (physical OS).

- Cannot be performed with virtual L-Server switchover (VM guest).

- When using this method, tenant switchover cannot be performed. For details on the tenant switchover, refer to "Chapter 3 Installation".

Note

Regarding System Disks of VM Hosts, or Disks for Placing VM Data

Use the FC connection disks as the replication targets.

2.1.3 Virtual L-Server Switchover (VM guest)

Create the VM host for each site, and only switch over a virtual L-Server operating on the VM host.

Figure 2.3 Virtual L-Server Switchover (VM guest)
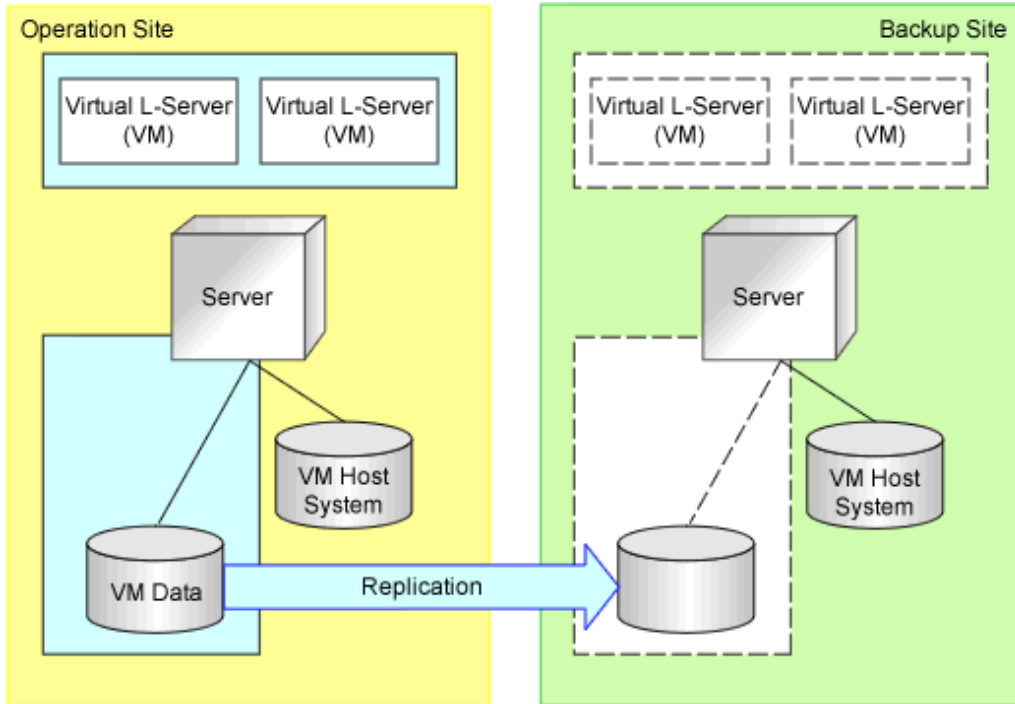
Table 2.8 Supported Configurations

Item	Content		Remarks
Managed server type	PRIMERGY blade servers		
	PRIMERGY rack mount/pedestal servers		
	SPARC M10/M12		
Storage connections	FC		
	iSCSI		Only VMware
	NAS		Only VMware
Managed switch blades	Connection Blade	Switch mode	IBP mode cannot be used.
		End host mode	
		Converged Fabric mode	
Server virtualization software/management software	VMware/VMware vCenter Server		Only VMware ESXi 5.x is supported
			Configure VM management software for each site
			Install the VMware vSphere Command-Line Interface (vCLI) on the servers which can communicate with VM management software (such as admin servers) for each site

Item	Content	Remarks
	OVM for SPARC/BMC BladeLogic Server Automation	Only ZFS and Solaris 11/11 or later are supported
		Only BMC BladeLogic Server Automation 8.3 is supported

🅿 Point

- It is possible to use a VM pool definition file to reduce the number of VM hosts on the switchover destination site. Refer to "Figure 2.4 Settings to Reduce the Number of VM Hosts on a Switchover Destination Site". For details on the VM pool definition file, refer to "4. Create a VM pool definition file [Virtual L-Server switchover (VM guest)]" in "3.6 Creating Files Used for Switchover".

- Can be performed with physical L-Server switchover (physical OS).

- Cannot be performed with physical/virtual L-Server switchover (VM host/VM guest).

- Disks storing storage areas of VM hosts are not regarded as replication targets. Therefore, it is possible to locate the system areas of VM hosts on any disks. (Example: local boot)

📙 Note

- It is necessary to install the VMware vSphere Command-Line Interface (vCLI) on the servers that can communicate with VMware vCenter Server (such as admin servers).

- Do not configure VM hosts on physical L-Servers.

- Disks containing VM data

Use FC, iSCSI, or NAS connection disks as replication targets.

Figure 2.4 Settings to Reduce the Number of VM Hosts on a Switchover Destination Site
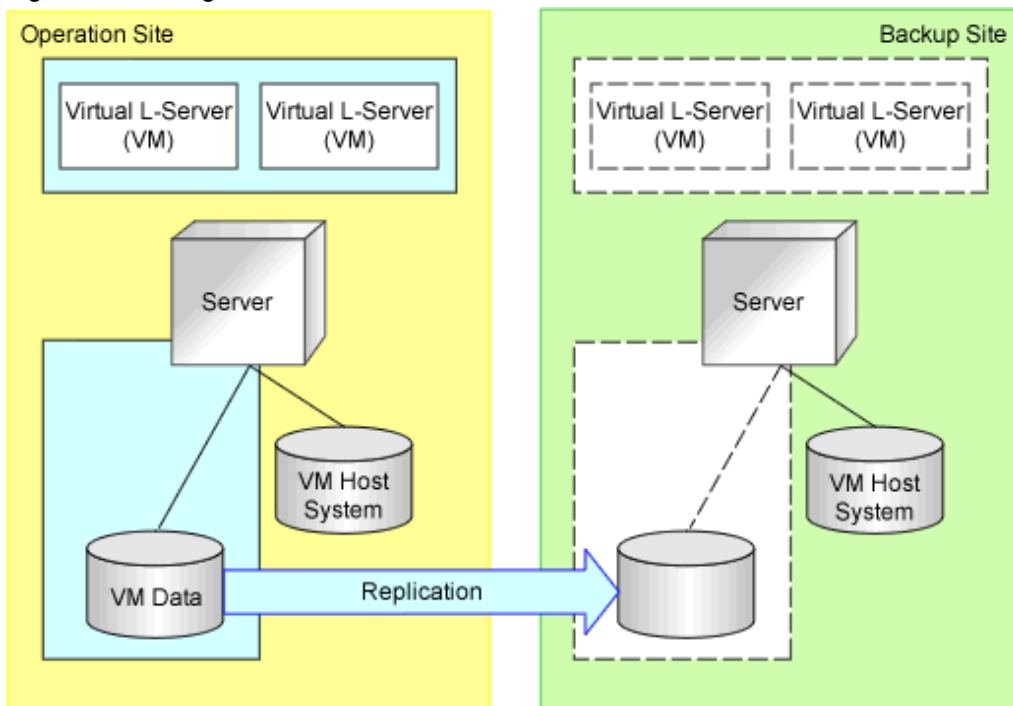
2.2 Switchover Operation

The following two switchover operations are supported:

Table 2.9 Switchover operations

Item	Content	Remarks
Switchover operations	Active-Standby Operation	
	Active-Active Operation	When the configuration is for performing physical/virtual L-Server switchover (VM host/VM guest), the Active-Active operation cannot be performed.

Differences between the operations are as follows:

Active-Standby Operation

An operation that cleans up the configuration of the switchover destination site in order to take over that of the switchover source before a switchover.

Select this operation when all resources in the switchover destination site are used for a switchover, such as in a disaster.

- The configuration of the switchover destination site is cleaned up before a switchover.

- Collecting the configuration information of the switchover destination site in advance enables the information to be restored after failback is performed.

Active-Standby Operation

Figure 2.5 Active-Standby Operation
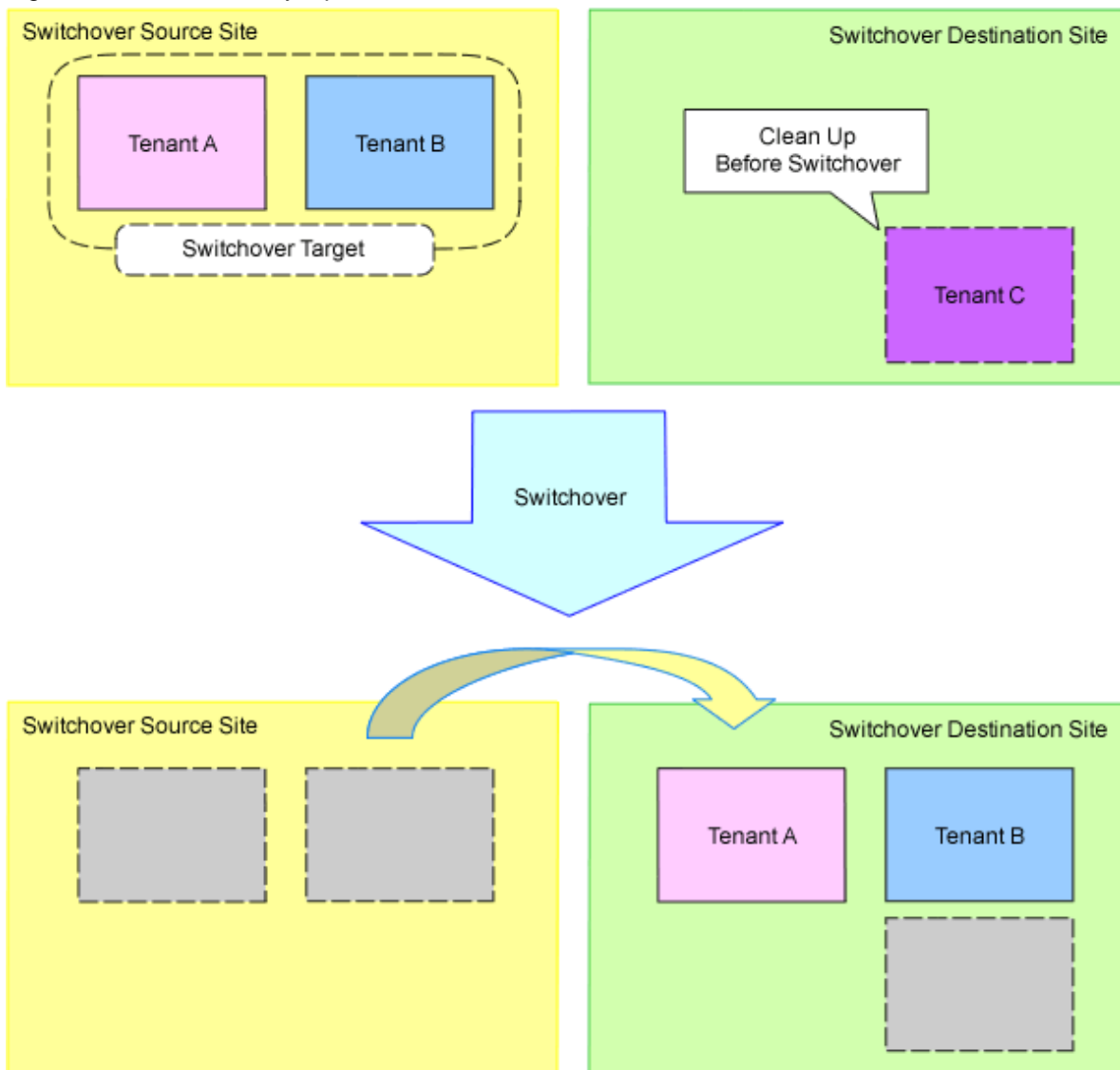
Active-Active Operation

An operation that maintains the configuration of the switchover destination site while taking over that of the switchover source during a switchover.

Select this operation when some resources in the switchover destination site are used for a switchover while services are continued.

- Physical servers and network devices required for importing the target configuration of the switchover source site must be prepared on the switchover destination site in advance.

When using the physical servers and network devices for other purposes until just before a switchover, those to be stopped for the switchover, and tenants, L-Platforms, and L-Servers which operate using those physical servers and network devices must be defined in advance.

It is necessary to delete the tenants, L-Platforms and L-Servers which were operating when switchover was performed. For details of the corrective actions, refer to "4.2.1 Stopping Services and Releasing Resources [Switchover Destination Site]".

It is possible to restore deleted tenants, L-Platforms and L-Servers after performing failback. For details, refer to "When Restoring the Switchover Destination Site after Failback" in "4.5 Operation after Failback".

- Estimate the number of resources to be used on the switchover destination site used for switchover based on the following conditions.

    - For the following resources, it is recommended that the same number of resources as on the switchover source site are provided on the switchover destination site.

        - VM hosts and physical servers in the VM pools and server pools used by the switchover target tenant

The reason this is recommended is because when all of the following conditions are met, there is a possibility that recovery of virtual L-Servers or physical L-Servers on the switchover destination site may fail due to a lack of resources.

- When the same number of VM hosts and physical servers as on the switchover source site are not provided at the switchover destination site

- When limitation of switchover scope is not performed

  - For the following resources, provide the same number of resources on the switchover source site as on the switchover destination site.

    - Network devices used by the switchover target tenant

When performing switchover or failback in phases, provide the network devices to be used for each phase of switchover.

For the resources provided on the switchover destination site, take appropriate actions according to the usage status of the resources, as follows:

- When not using the resources until switchover is performed

No action required.

- When using the resources for another purpose until switchover is performed

Identify the L-Platforms and L-Servers that use these resources using the CLI or the GUI in advance.

Then, stop the identified L-Platforms and L-Servers during the switchover procedure.

- The physical servers and network devices used for the switchover cannot be used for the original services of the switchover destination site until failback of the switched configuration is completed.

- Perform failover/failback by tenant. Neither failover nor failback are possible by site. For details on the switchover levels, refer to "2.3 Switchover Levels".

- There are some notes on the setting of resource names, etc. For details, refer to "2.6.3 Items to Be Different between the Switchover Source and Destination Sites".

- Editing of configuration files may be necessary. For details, refer to "2.6.5 Configuration Files for Matching Details between the Switchover Source and Destination Sites".

- There are specified settings for L-Platform templates. For details, refer to "Creation of Information on L-Platform Templates for Active-Active Operation" in "3.4 Configuring Managed Resources".

- There are some notes on operations after switchover. For details, refer to "When Switchover Was Performed Using the Active-Active Operation" in "4.3 Operation after Switchover".

- Different prefixes must be set for the software IDs of the switchover source and destination sites in advance.

When switchover is performed between sites with the same prefix set, the IDs of software information with the same software ID in the sites may be changed during import.

For details on how to set prefixes for software IDs, refer to "Appendix A Settings for Software ID Prefixes".

Figure 2.6 Active-Active Operation
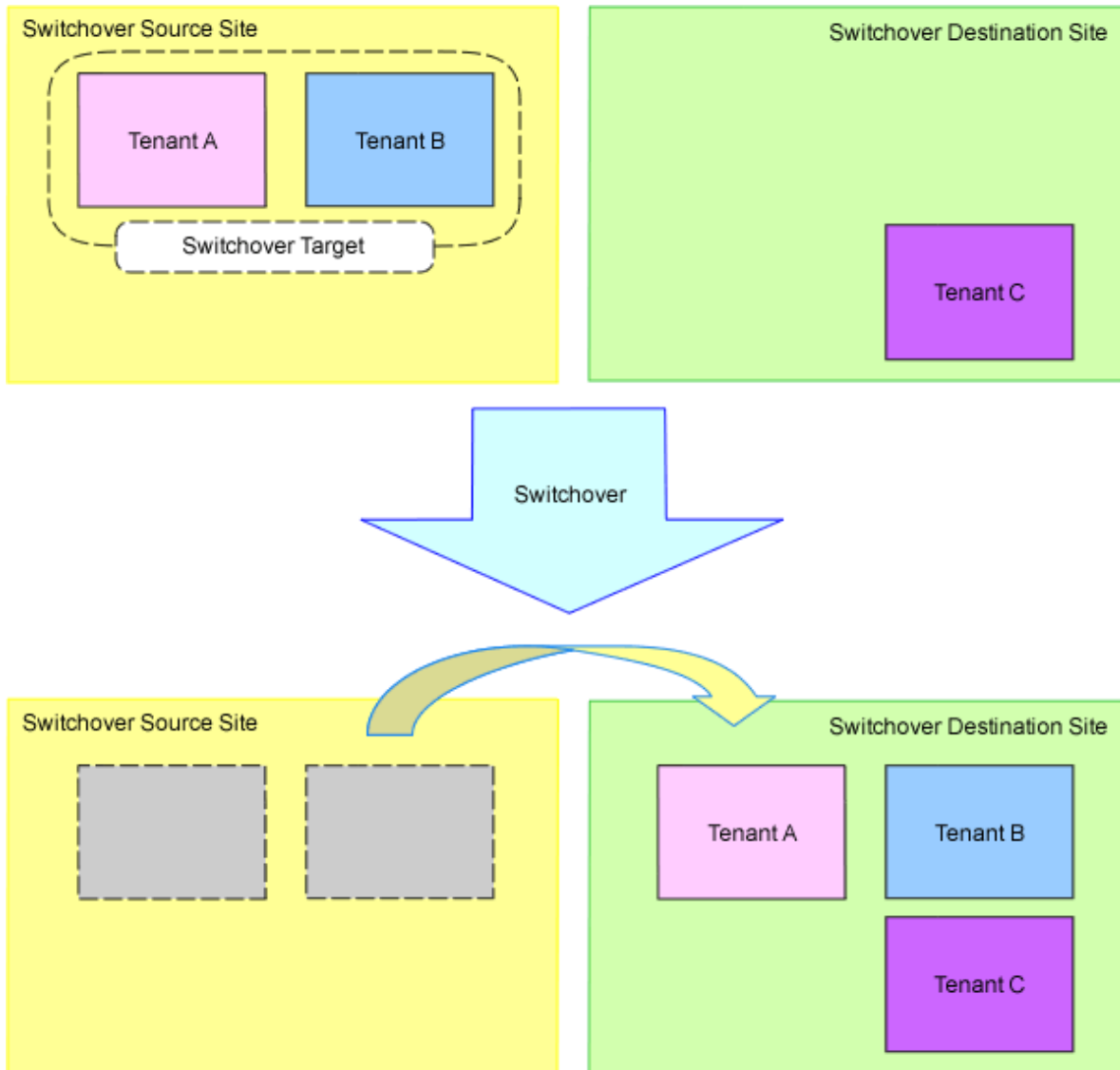
2.3 Switchover Levels

The following levels of switchover are supported:

Table 2.10 Switchover levels

Item	Content	Remarks
Switchover levels	Site switchover	This cannot be performed in Active-Active operation.
	Tenant switchover	When the configuration is for performing physical/virtual L-Server switchover (VM host/VM guest), tenant switchover cannot be performed.

Before performing tenant switchover, check the following advisory notes.

> **Note**
> ....
>
> - Advisory notes for using network devices are given below.
>
>   - For each item for which switchover will be performed, prepare the network devices for both the switchover source site and the switchover destination site.
>
>   - For the network devices prepared for switchover targets, use the same resource name when registering them in the network resource trees of both the switchover source site and the switchover destination site.

Do not use network devices prepared for switchover levels selecting from L-Platforms that belong to another switchover level.

- Perform design so as not to use the same virtual storage resources for tenants switched over separately.

- Configure the control item (copy group) for storage replication for each tenant being switched over simultaneously. Refer to "Configuring Copy Groups".

- There are specified locations for storing switchover target resources. For details, refer to "Storage Location of Switchover Target Resources for Tenant Switchover" in "3.4 Configuring Managed Resources".

- Address set resources cannot be shared among tenants. Register the address set resources in the local pool for each tenant.

- There are some notes on the setting of resource names, etc. For details, refer to "2.6.3 Items to Be Different between the Switchover Source and Destination Sites".

- Before tenant switchover, lock the resources used by the target tenants to be switched over in the switchover source site. Locking resources prevents the overlapping use of the resource in multiple sites. Refer to "Locking Resources". For details on how to lock and unlock resources, refer to "4.2 Switchover between Sites Using the Disaster Recovery Function".

Table 2.11 Operations Restricted by Locking Resources

Resource	Operations Restricted by Locking
Network Resources	- Deployment using the relevant resources - Migration to another pool - Release of registered resources - Deletion of resources - Creation of an L-Server for which only the configuration definition has been created, that uses the relevant resources - Registration of physical servers of relevant subnets in the server tree
Address set resources	- Deployment using the relevant resources - Migration to another pool - Release of registered resources - Deletion of resources - Creation of an L-Server, consisting of an L-Server definition for which only the configuration definition has been created, that uses the relevant resources
Disk resources	- Deployment using the relevant resources - Migration to another pool - Unregistration from pools
Virtual Storage Resources	- Deployment using the relevant resources - Migration to another pool - Unregistration from pools - Starting of an L-Server for which only the configuration definition has been created, that uses the relevant resources
Pool resources	- Deletion of a storage pool where disk resources have been locked
L-Servers	- Configuration changes using locked resources (addition of NICs and attachment of disks)

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Resource	Operations Restricted by Locking
	- Using virtual machines with locked resources as L-Servers

- The following template information used for the switchover target tenants should be created as tenant-specific templates.

    - Software information

    - Image information

    - Segment information

    - L-Platform Templates

    When created as global templates, they may also be used for tenants outside the switchover targets. In this case, the tenants cannot be deleted from the switchover source site after switchover, and information with the same IDs will be copied to the switchover destination site.

- When creating tenant-specific image information, use tenant-specific software information and cloning images in the local pool of the tenant.

    Cloning images in global pools may not be included in switchover targets. If no suitable resource exists, the template information cannot be used.

- When creating tenant-specific L-Platform templates, it is recommended to use tenant-specific information on images and segments.

    While the information on images and segments of global templates refers to resources in global pools, the resources may not be included in switchover targets. If no suitable resource exists, the template information cannot be used.

Figure 2.7 Configuring Copy Groups
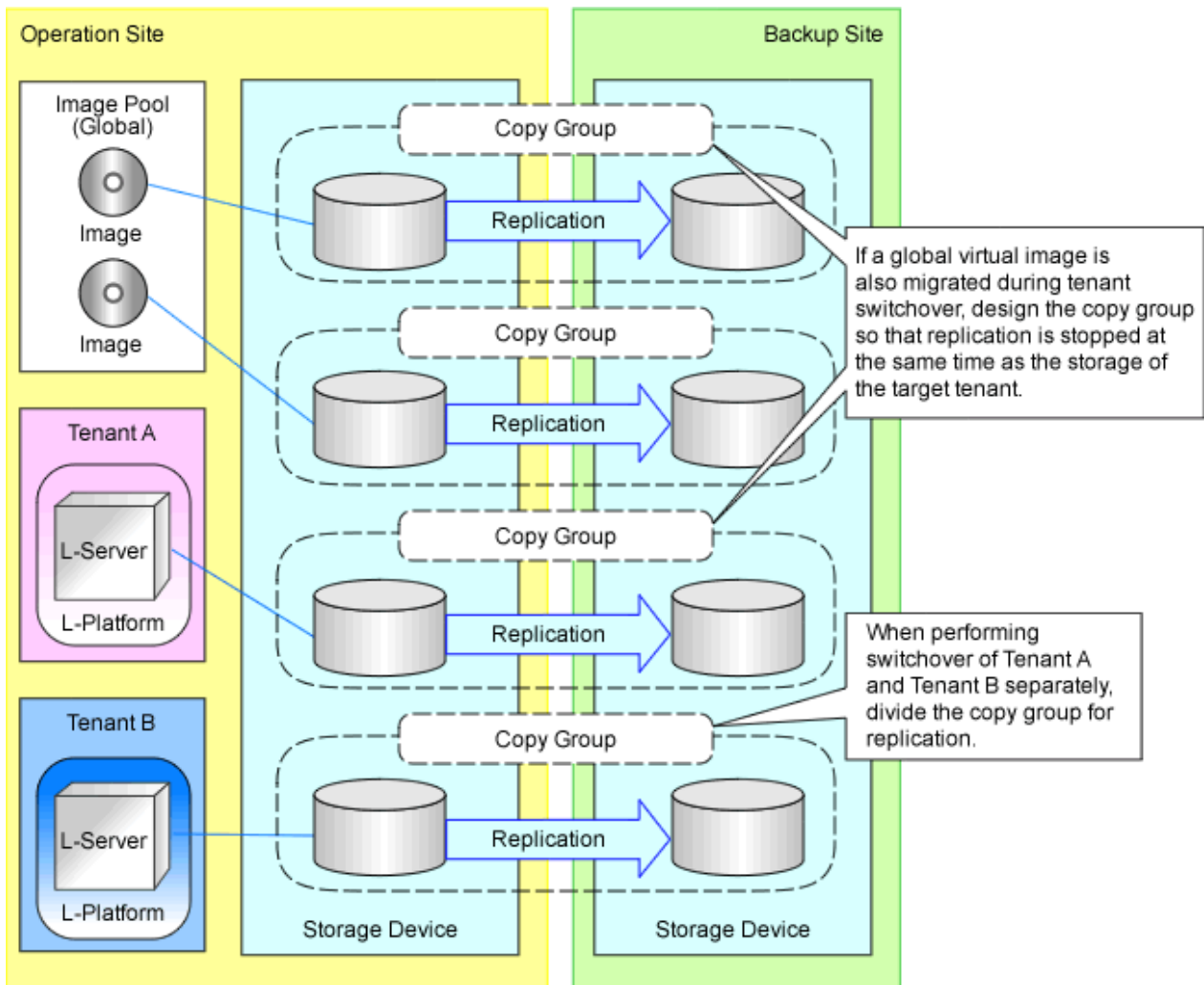
Figure 2.8 Locking Resources
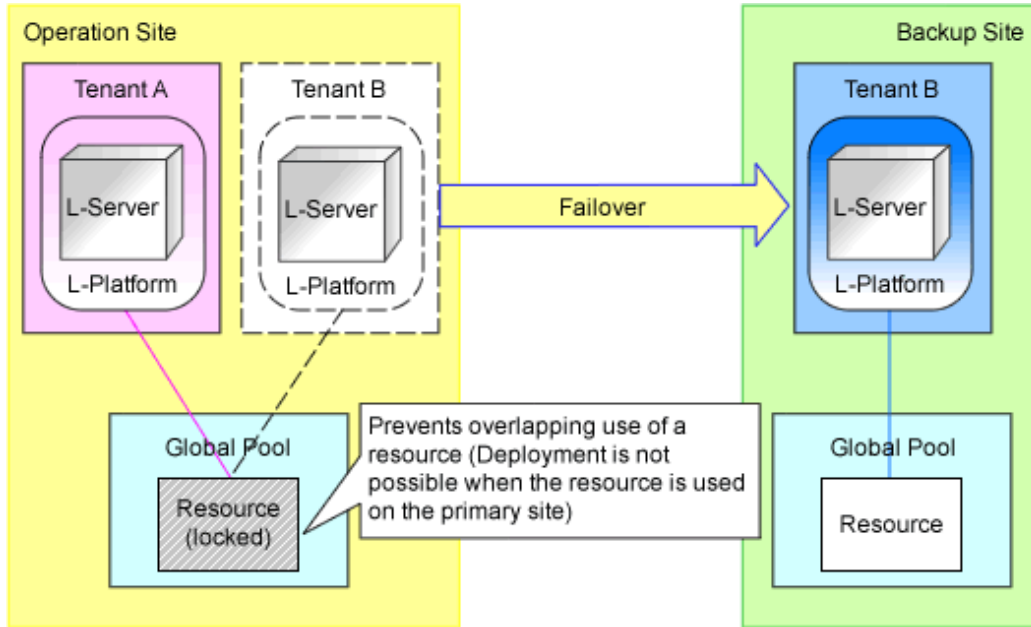
2.4 Limitation of switchover scope and additional recovery

Define whether switchover scopes are limited.

Table 2.12 Limitation of switchover scope

Item	Content	Remarks
Limitation of switchover scope	Limited	Not available when the configuration is for performing physical/virtual L-Server switchover (VM host/VM guest).
	Not limited	

Information

Regarding Limitation of Switchover Scopes

- The scope of configurations to be recovered on the switchover destination site can be limited by specifying either replication target storage pools or L-Servers outside the scope of switchover. For details on how to limit switchover scopes by specifying storage pools for replication, refer to "Figure 2.9 Limitation of switchover scope".

- When specifying the target storage pools to replicate, the following resources cannot be recovered to the switchover destination site.

    1. Disk resources or virtual storage resources registered in the storage pools which are not specified

    2. L-Servers using the storage in item 1

    3. Images using the storage in item 1

    4. L-Platforms which are only linked to the storage pools in item 1

    5. Tenants which are only linked to the storage pools in item 1

For details on how to specify storage pools, refer to "3.5 Configuring for Limiting Switchover Scope".

- For details on how to limit switchover scopes by specifying L-Servers outside the scope of switchover, refer to "3.5 Configuring for Limiting Switchover Scope".

Figure 2.9 Limitation of switchover scope
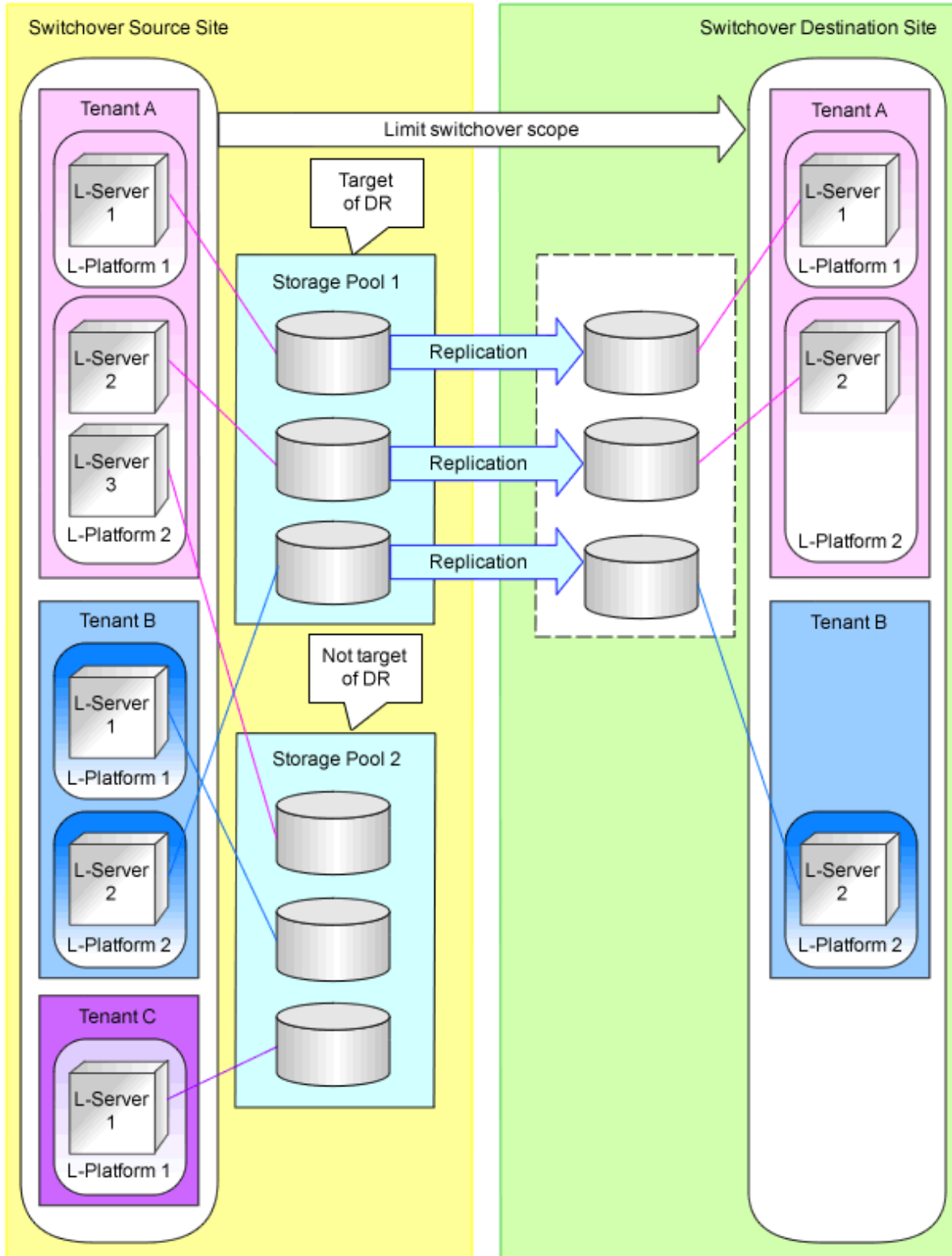
Resources degraded by the function for limiting switchover scope can be restored after failback. Refer to "Additional Recovery".

Table 2.13 Additional Recovery

Item	Content	Remarks
Additional Recovery	Limited	Not available when the configuration is for performing physical/virtual L-Server switchover (VM host/VM guest).

Item	Content	Remarks
	Not limited	

The following conditions must be met to perform additional recovery.

- For additional recovery by tenant, failback of tenants to be restored is completed, from the switchover destination site to the switchover source site.

- For additional recovery of an entire site, failback of all tenants and global resources is completed, from the switchover destination site to the switchover source site.

- Disks used by L-Servers, L-Platforms, tenants, and image resources which are to be restored have not been deleted or unmounted from VM hosts and physical servers in the switchover source site.

- Disks used by L-Servers, L-Platforms, tenants, and image resources which are to be restored have not been reused in the switchover source site.

- Switchover information used at switchover is being stored in the additional recovery information folder.

For details on how to specify additional recovery information folders, refer to "3.3 Manager Installation and Configuration".

When additional recovery is planned after failback, it is recommended to save the switchover information in the additional recovery folder in advance. In case that the switchover information is corrupted in the switchover source site, copy the information from the switchover destination site to the switchover source site.

Figure 2.10 Additional Recovery
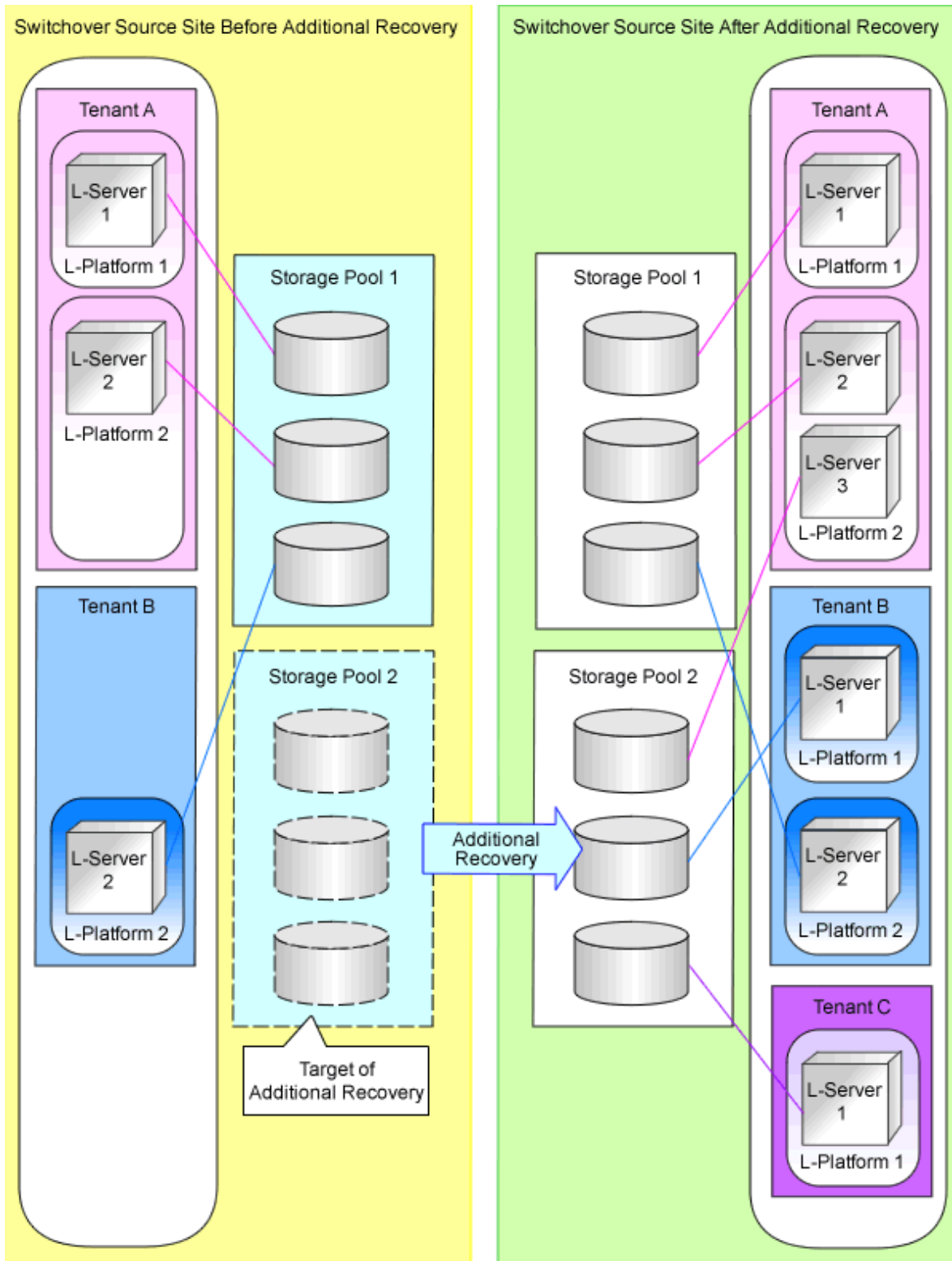
2.5 Degrading Blade Chassis

Degrading of blade chassis refers to failover or failback performed in the following configurations.

- The numbers of managed blade chassis differs between the switchover source site and the switchover destination site

- The numbers of LAN switch blades in chassis differs between the switchover source site and the switchover destination site

For details on configurations supporting blade chassis degradation, refer to "Table 2.14 Configurations Supporting Chassis Degrading" and "Configurations Supporting Chassis Degrading".

Table 2.14 Configurations Supporting Chassis Degrading

Switchover Methods	Numbers, Models, Names of LAN Switch Blades Mounted on Blade Chassis on which Switchover Target L-Servers Operate	
	Match between sites (*)	Do not match between sites
Physical L-Server Switchover (Physical OS)	Yes	No
Physical/Virtual L-Server Switchover (VM Host/VM Guest)	Yes	No
Virtual L-Server Switchover (VM guest)	Yes	Yes

Yes: Supported.

No: Not supported.

* Note: If no network resources that configure external connection ports exist, it is not necessary to match the names of LAN switch blades on the server tree between sites.

Figure 2.11 Configurations Supporting Chassis Degrading
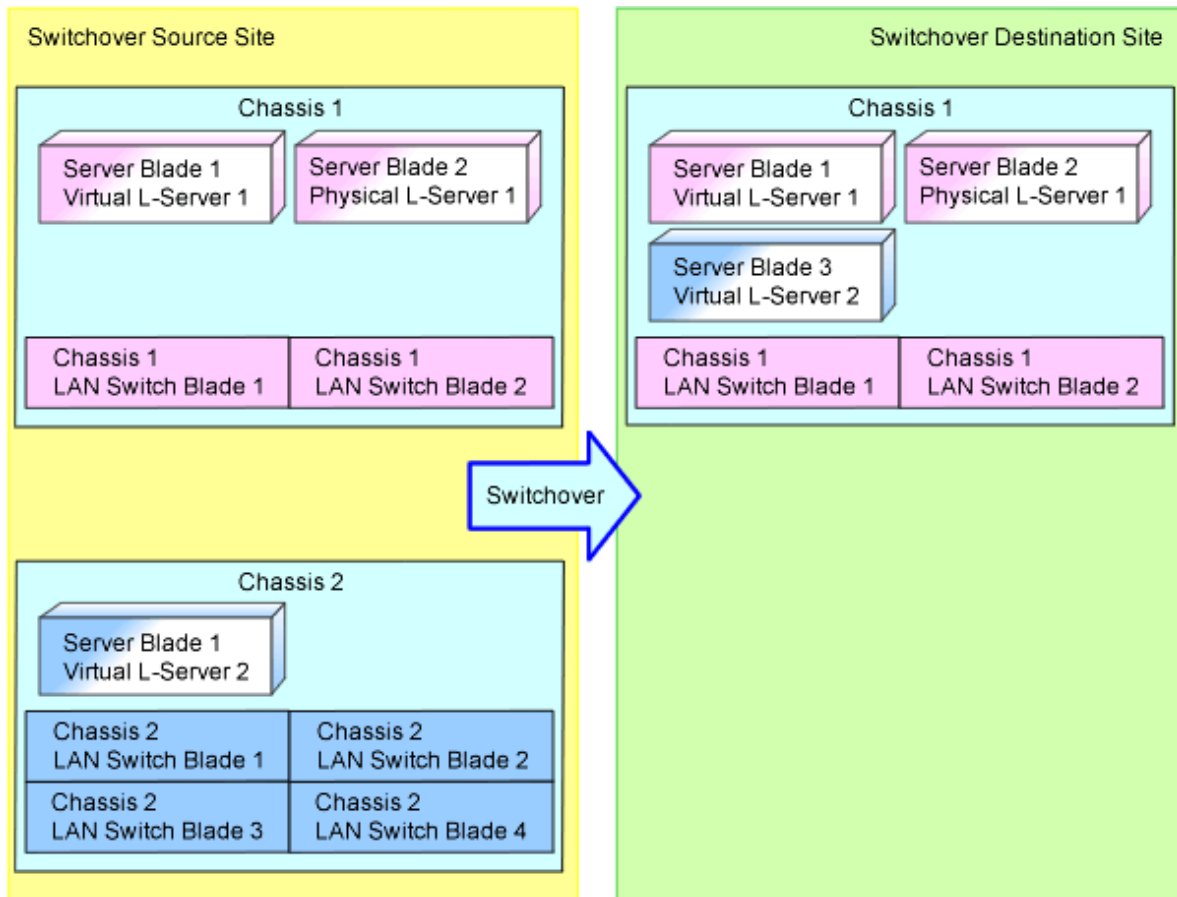
Point

- The network resources using ports of LAN switch blades to be degraded as external connection ports are created as an internal network of the switchover destination site. Refer to "Figure 2.12 Switchover by a Configuration that Reduces the Number of Blade Chassis and LAN Switch Blades in the Switchover Destination Site".

Internal network resources are the network resources without external connection ports set. Connect the internal network resources to the connection blades of Slot 1 and Slot 2.

After switchover, configure the external connection ports of network resources as necessary.

For details, refer to "4.3 Operation after Switchover" and "4.5 Operation after Failback".

- During failback, network resources are recovered in the switchover destination site according to the settings of network resources in the switchover source site. Refer to "Failback by a Configuration that Reduces the Number of Blade Chassis and LAN Switch Blades in the Switchover Destination Site".

After failback, restore the settings of the external connection ports of network resources as necessary. For details, refer to "4.3 Operation after Switchover" and "4.5 Operation after Failback".

Figure 2.12 Switchover by a Configuration that Reduces the Number of Blade Chassis and LAN Switch Blades in the Switchover Destination Site
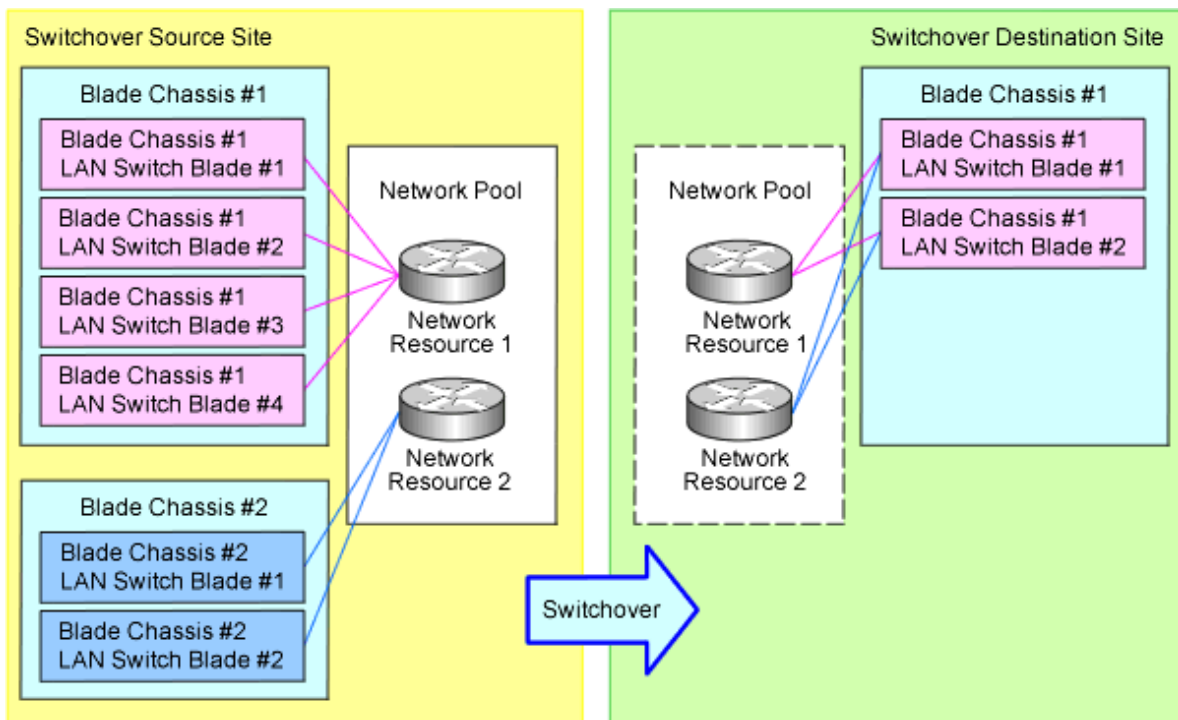
Figure 2.13 Failback by a Configuration that Reduces the Number of Blade Chassis and LAN Switch Blades in the Switchover Destination Site
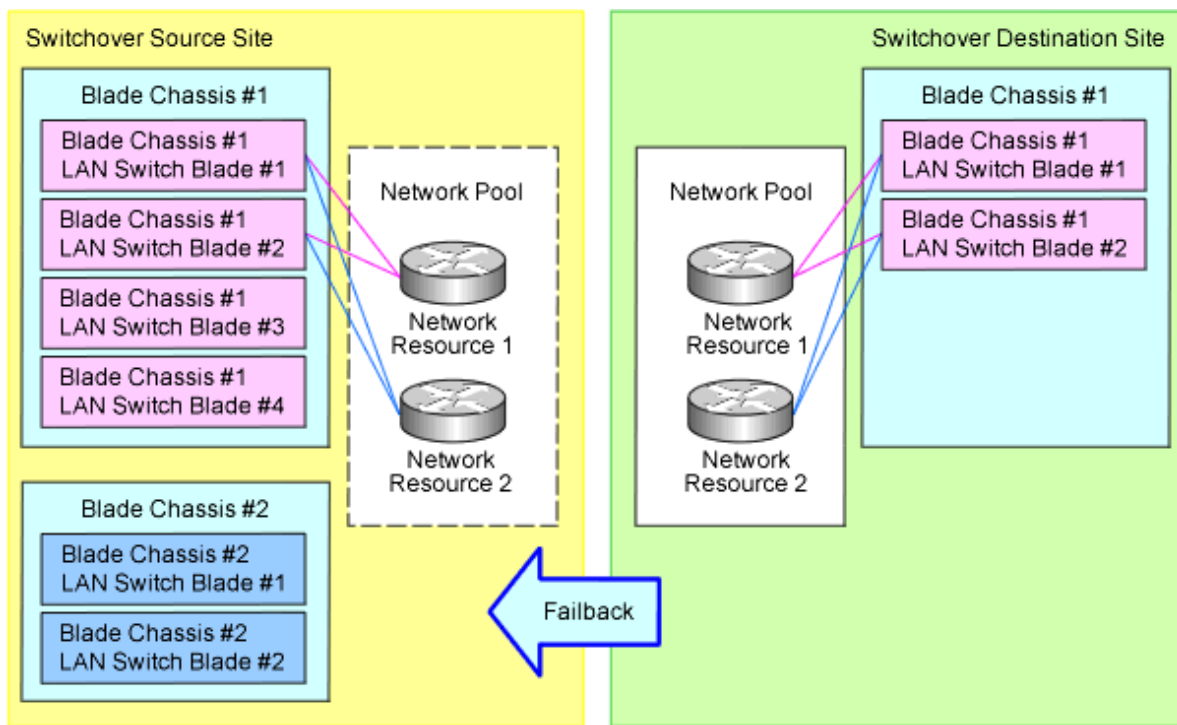
2.6 Configurations of the Switchover Source and Destination Sites

Define the configurations of the switchover source and destination sites.

2.6.1 Configurations to Perform Site Switchover Transparently for ROR Console Users

In order to perform site switchover transparently for ROR console users, when connecting to the admin server from the ROR console, perform either one of the following operations for the IP address and the host name (FQDN) of the admin server used for connecting the ROR console with the admin server.

- Assign the same IP address for the ROR console connection network on the admin servers of the switchover source and destination sites, and make the FQDN of the admin servers the same

  In order to avoid overlap of IP addresses, do not connect the admin servers on the switchover source site and destination sites to the same network at the same time.

- Assign different IP addresses for the ROR console connection network on the admin servers of the switchover source and destination sites, and make the FQDN of the admin servers the same

  When using the same admin LAN IP address for the admin server between sites, use an IP address of the ROR console connection network other than one from the admin LAN.

For prerequisites for using the same admin LAN IP address for the admin server between sites, refer to "2.6.1 Configurations to Perform Site Switchover Transparently for ROR Console Users".

Configure the IP address of the ROR console connection network for the admin server on the switchover source site as the IP address to which the FQDN of the DNS server connects. Upon site switchover, modify the DNS server settings, and switch this IP address to that of the ROR console connection network for the admin server on the switchover destination site.

These operations can only be performed when switching over the sites.

When switching over the tenants, connect to the network by specifying the FQDN of the admin server.

2.6.2 Items to be Matched between the Switchover Source and Destination Sites

Match the following items between the switchover source and destination sites.

Common between Switchover Methods

Table 2.15 Items Common between Switchover Methods

Item	Remarks
Levels and versions of FUJITSU Software ServerView Resource Orchestrator Cloud Edition managers	If patches are applied to the manager on either of the sites, ensure the patch is applied on the other manager.
Installation folders of FUJITSU Software ServerView Resource Orchestrator Cloud Edition managers	
OS of the admin server	Use the same version and OS patches.
Managed server configuration	Assign identical names to the servers and chassis to be registered in the server trees on both sites. Use identical models and configurations for servers and chassis with the same names between sites. The server names on the server trees can be changed according to the site. Refer to "3.6 Creating Files Used for Switchover". For virtual L-Server switchover (VM guests), the number of servers of the VM hosts can be reduced by using VM pool definition files. For details on VM pool definition files, refer to "3.6 Creating Files Used for Switchover". The number of blade chassis, and the LAN switch blades on them, on the server tree in the switchover destination site can be reduced. For details, refer to "2.5 Degrading Blade Chassis".
Network devices connected with managed servers	Assign identical names to the network devices (L2 switches, firewalls, and Ethernet Fabric switches) to be registered in the network trees on both sites. Use identical models and configurations for the network devices with the same names between sites. For details on the network devices of the automatic configuration target (L2 switches, firewalls, Ethernet Fabric switches), configure the same settings of the network configuration information, and perform the same pre-configuration of the network devices. For details on how to configure network configuration information, refer to "9.4.8 When Managing Network Devices as Resources" in the "Design Guide CE". For details on the pre-configuration of network devices, refer to "9.2.3 Settings for Managed Network Devices" in the "Design Guide CE".

Item	Remarks
Configurations of network devices (blade configurations: CB, rack mount configurations: L2 switches)	Models, links, firmware, and account settings must be the same. For details on the L2 switches of automatic configuration targets, refer to "Network devices connected with managed servers" in "Items".
LAN switch blade configuration	Assign identical names to the LAN switch blade to be registered in the server trees on both sites. (*) Use identical models and configurations for the LAN switch blades with the same names between sites. Of all of the LAN switch blades to be registered in the server tree on the switchover source site, when there are LAN switch blades to be degraded, it is not necessary to register LAN switch blades with the same names in the server tree on the switchover destination site. For details, refer to "2.5 Degrading Blade Chassis".
Network settings (CB uplink/ downlink ports, or VLAN settings for external switch VLANs)	The settings must be the same when performing manual network settings (L2, L3) in advance. If it is not possible to match the settings of the sites in advance for reasons such as validation using the switchover destination site, match them during the switchover procedure.
SAN switch settings (zoning)	Configure physical servers to access corresponding LUNs (in a replication relationship) of both sites. - When the switchover method is either physical L-Server switchover (physical OS) or physical/ virtual L-Server switchover (VM host/VM guest), without ETERNUS storage Configure SAN switches of the switchover destination site using the WWPNs of HBA ports on the switchover source site and that of storage ports on the switchover destination site. - When the switchover method is either physical L-Server switchover (physical OS) or physical/ virtual L-Server switchover (VM host/VM guest), using ETERNUS SAN switches are automatically configured during switchover, and no settings are required.
The admin LAN IP address of the admin server	When only performing virtual L-Server switchover (VM guest) and when there are no network resources of the admin LAN, the IP addresses do not need to be the same.
Rights changes due to customization of roles	When roles with the same name exist on both sites, perform the same customization on both roles. For details on how to customize roles, refer to "5.1.3 Customizing Roles" in the "Design Guide CE".
The configuration of Active Directory when using the Single Sign-On function of ServerView Operations Manager	When operating Active Directory in a redundant configuration, use an Active Directory in a redundant configuration on both sites.
User password for the user name "svuser" (when using Single Sign-On authentication)	When using the directory service included in ServerView Operations Manager, make all user passwords for the user name "svuser" the same between sites.
Admin LAN Subnets	For admin LAN subnets linked to the switchover target network resources, register the same subnet name and scope on the switchover destination site in advance.

* Note: If no network resources that configure external connection ports exist, it is not necessary to match the names of LAN switch blades on the server tree between sites.

Physical/Virtual L-Server Switchover (VM Host/VM Guest)

Table 2.16 Items for Physical/Virtual L-Server Switchover (VM Host/VM Guest)

Item	Remarks
The name of VM management software on FUJITSU Software ServerView Resource Orchestrator Cloud Edition	Specify the same names when installing VM management software for each site (excluding switchover target physical L-Servers). When mapping definitions are created, different names can be used for each site.

Item	Remarks
	For details on mapping definitions, refer to "3.6 Creating Files Used for Switchover".

Virtual L-Server Switchover (VM guest)

Table 2.17 Items for Virtual L-Server Switchover (VM Guest) [VMware]

Item	Remarks
Port groups (names, VLAN settings)	The settings must be the same when performing manual network settings in advance. For details on how to manually configure the network settings, refer to "8.2.5 Manual Network Configuration" in the "Setup Guide CE".
The name of VM management software on FUJITSU Software ServerView Resource Orchestrator Cloud Edition	When mapping definitions are created, different names can be used for each site. For details on mapping definitions, refer to "3.6 Creating Files Used for Switchover".
Configurations of VM management software (cluster L-Server deployment policy)	Configure the same L-Server deployment policy settings (such as VMware HA is available) with the switchover source cluster for the cluster to which the VM host described in the VM pool definition file belongs. For details on VM pool definition files, refer to "3.6 Creating Files Used for Switchover". For details on the L-Server deployment policy settings, refer to "E.1.2 Preparations for Servers" in the "Design Guide CE". 📖 **Note** ･･ Do not configure the same vCenter instance IDs of VMware vCenter Server for each site. ･･

2.6.3 Items to Be Different between the Switchover Source and Destination Sites

For the following items, configure different values between the switchover source and destination sites.

Common between Switchover Methods

Table 2.18 Items Common between Switchover Methods

Item	Remarks
The computer name of the admin server	For the computer name of the admin server, configure different names on the switchover source and destination sites. When re-installing an admin server due to a disaster, computer names that have been used on the switchover source site or switchover destination site in the past cannot be used.
The IP addresses of storage units which are registered with the admin server	IP addresses of storage units are required for replication.
The following resource names: - Tenant names - Resource folder names - Pool names (global pools only) - L-Server template names - Virtual storage names - Network device names	For the Active-Active operation or tenant switchover, do not create resources with the same names in different sites. However, for resources that are created by DR switchover (import of configuration information) there is no problem with the same names being used between sites. Do not change the name of resources that were created during switchover. After switchover, which sites resources belong to should be defined, and it is recommended to add the site name to the beginning of the resource names.

Item	Remarks

- Network resource names
 	
- Names of address set resources
 	
- User group names
 	
- User names
 	
- Duplicated role names
	Resource names duplicated between sites can be checked using the DR configuration check tool. For details, refer to "Checking Using the DR Configuration Check Tool" in "4.1 Normal Operation".
	
	For network device names, ensure that the same names are not used for the network devices that are the target of switchover on the switchover source site and the network devices on the switchover destination site that will not be switched over.
	
	For details on resources automatically created when installing the manager, refer to the following points:
	
	  - For the following resources, their resource names can remain the same between sites and there is no need to change them:
	
	    - The "supervisor" user group
	
	    - Dual-role administrators whose access scope is "all"
	
	    - The virtual storage used with OVM for SPARC configuration "vm-disk-vstorage"
	
	  - For the following resources, delete the resource from one of the sites or change the resource names so that the resource names are not duplicated between the sites.
	
	    - The "monitor" user group
	
	    - L-Server templates (sample_large, sample_medium, sample_physical, sample_small)
	
	    - Global pools (VMHostPool, ServerPool, StoragePool, NetworkPool, AddressPool, ImagePool)

Registered information on network resources	For the Active-Active operation or tenant switchover, do not register a network resource with the same IP address or VLAN ID as that of a network resource registered on one site, on the other site. If the network resource with the duplicated settings on the switchover destination site will be deleted when cleaning up during the switchover, there is no problem with registering a network resource with duplicated settings.
Registered information on address set resources	For the Active-Active operation or tenant switchover, do not register the MAC addresses and WWNs that are already registered with one site on another.
Settings of host names for virtual servers	For the Active-Active operation, when using "prefix with serial number" style of "3" to set host names of virtual servers, specify different character strings for the prefixes of each site. For details on how to configure host names of virtual servers, refer to "9.4 Setting the Host Names for Virtual Servers" in the "Setup Guide CE".
Settings for Software ID Prefixes	For the Active-Active operation, change the prefix settings of the software IDs to use different prefixes between sites. For details on how to set prefixes for software IDs, refer to "Appendix A Settings for Software ID Prefixes".

Physical L-Server Switchover (Physical OS) or Physical/Virtual L-Server Switchover (VM Host/VM Guest)

Table 2.19 Items for Physical L-Server Switchover (Physical OS) or Physical/Virtual L-Server Switchover (VM Host/VM Guest)

Item	Remarks
The IP addresses of servers registered in the server tree	For the IP addresses configured in the servers registered in the server tree, the different IP addresses according to each site. Also, for the IP addresses to be specified when creating physical L-Servers, do not use IP addresses that have been set for servers during the server registration to the server tree.

2.6.4 Virtual Storage Resource Names and Disk Resource Names

- For either of the following cases, users can configure arbitrary virtual storage resource names and disk resource names.

- When using NetApp storage as the storage unit

- When a storage unit is Netapp storage, and the formats of the virtual storage resource name and the disk resource name are the same format as the RAID group name and the alias name of LUNs respectively managed by ESC

In the case above, for physical L-Server switchover (physical OS) or physical/virtual L-Server switchover (VM host/VM guest), configure a virtual storage resource name and a disk resource name that satisfies either of the following.

- For all replicated virtual storage resources and disk resources, use the same names between the sites

- Do not use the same resource name between sites

- Ensure that numbers are not used in virtual storage resource names. If there are the virtual storage resource names including numbers, import may fail.

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Addition of Numbers to Virtual Storage Resource Names

For the virtual storage resource names of FUJITSU Software ServerView Resource Orchestrator Cloud Edition, the datastore name, the Cluster Shared Volume name, or the RAID group name is used. If the names overlap, the overlap will be avoided by the addition of numbers to the end of resource names. Therefore, in order to prevent to the addition of numbers to the end of the virtual storage names, configure the datastore name, Cluster Shared Volume name, and the RAID group name not to overlap with the virtual storage resource names between sites.

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2.6.5 Configuration Files for Matching Details between the Switchover Source and Destination Sites

When changing the following files on the switchover source site, also change the files on the switchover destination site.

"*" in the table indicates arbitrary files in the folders.

The above changes are not necessary when no file exists in both the switchover source and destination sites.

Table 2.20 Configuration Files for Matching Details between the Switchover Source and Destination Sites [Windows Manager]

Folder	File Name
Installation_folder\SVROR\Manager\etc\conf\	dhcp_server.yml
Installation_folder\SVROR\Manager\etc\customize_data\	auto_replace.rcxprop
	cli_notlist_oc.rcxprop
	get_cpu_enabled_cores.rcxprop
	gui_always_home.rcxprop
	gui_config.rcxprop
	gui_enable_reverse_proxy.rcxprop
	image_admin_hyperv.rcxprop
	image_admin_hyperv_*User_Group_Name*.rcxprop
	iscsi.rcxprop
	iscsi_*User_Group_Name*.rcxprop
	kb978336_scvmm.rcxprop
	l_server.rcxprop
	ldap_attr.rcxprop
	library_share_deny.conf
	library_share_*User_Group_Name*_deny.conf
	manager.rcxprop

Folder	File Name
	multiple_ds.rcxprop
	mwgui_config.rcxprop
	network_list.rcxprop
	network_map.rcxprop
	network_viewer.rcxprop
	nic_index_map.rcxprop
	os_setting.rcxprop
	os_setting_*User_Group_Name*.rcxprop
	physical_l_server_modify.rcxprop
	pool.rcxprop
	power_timeout.rcxprop
	product_report.rcxprop
	rcxmgrctl_except_rba.rcxprop
	scsicontroller.rcxprop
	scvmm_mac_pool.rcxprop
	scvmm_mac_pool_*Tenant_Name*.rcxprop
	scw_nf_retry_define.rcxprop
	server_control.rcxprop
	server_snmp.rcxprop
	server_spec.rcxprop
	show_vds_vc.rcxprop
	sparc_vm.rcxprop
	svom_info.rcxprop
	use_image_data_disk
	vdipool_group_entitlement.rcxprop
	vm.rcxprop
	vm_console.rcxprop
	vmguest_uuid_output.rcxprop
	zpool_and_zone_recovery.rcxprop
Installation_folder\SVROR\Manager\etc\customize_data\alive_monitoring\	vm_Hyper-V.rcxprop
	vm_VMware.rcxprop
Installation_folder\SVROR\Manager\etc\customize_data\home_tab\	home_infra_mes.txt
	home_tenant_mes.txt
Installation_folder\SVROR\Manager\etc\customize_data\l_server\net\	*
Installation_folder\SVROR\Manager\etc\customize_data\net\	net_info.*Network_Resource_Name*.conf
	net_info.*L-Server_Name*.conf
Installation_folder\SVROR\Manager\etc\customize_data\setup_wizard\	enable_advanced_mode.rcxprop
	lplatform_console_setup_parameter_on
Installation_folder\SVROR\Manager\etc\customize_data\sysprep_guirunonce\	*
Installation_folder\SVROR\Manager\etc\customize_data\vm_prop	vm_*.rcxprop

Folder	File Name
Installation_folder\SVROR\Manager\etc\event_handler\	*
Installation_folder\SVROR\Manager\etc\l_platform\	enable_cloning
Installation_folder\SVROR\Manager\etc\l_server\	disable_check_num_of_cpu
	enable_cpu_per_socket
Installation_folder\SVROR\Manager\etc\vm\	delete_old_image
	online_cloning
	require_image_location
	single_storage_vc
	thin_provisioning
Installation_folder\SVROR\Manager\rails\config\rcx\	vm_guest_params.rb
Installation_folder\SVROR\Manager\sys\irmctool	*
Installation_folder\SVROR\Manager\sys\usm\etc\	emcpath.conf
	fspath.conf

Table 2.21 Configuration Files for Matching Details between the Switchover Source and Destination Sites [Linux Manager]

Directory	File Name
/etc/opt/FJSVrcvmr/conf/	dhcp_server.yml
/etc/opt/FJSVrcvmr/customize_data/	auto_replace.rcxprop
	cli_notlist_oc.rcxprop
	get_cpu_enabled_cores.rcxprop
	gui_always_home.rcxprop
	gui_config.rcxprop
	gui_enable_reverse_proxy.rcxprop
	image_admin_hyperv.rcxprop
	image_admin_hyperv_*User_Group_Name*.rcxprop
	iscsi.rcxprop
	iscsi_*User_Group_Name*.rcxprop
	kb978336_scvmm.rcxprop
	l_server.rcxprop
	ldap_attr.rcxprop
	library_share_deny.conf
	library_share_*User_Group_Name*_deny.conf
	manager.rcxprop
	multiple_ds.rcxprop
	mwgui_config.rcxprop
	network_list.rcxprop
	network_map.rcxprop
	network_viewer.rcxprop
	nic_index_map.rcxprop
	os_setting.rcxprop

Directory	File Name
	os_setting_*User_Group_Name*.rcxprop
	physical_l_server_modify.rcxprop
	pool.rcxprop
	power_timeout.rcxprop
	product_report.rcxprop
	rcxmgrctl_except_rba.rcxprop
	scsicontroller.rcxprop
	scvmm_mac_pool.rcxprop
	scvmm_mac_pool_*Tenant_Name*.rcxprop
	scw_nf_retry_define.rcxprop
	server_control.rcxprop
	server_snmp.rcxprop
	server_spec.rcxprop
	show_vds_vc.rcxprop
	sparc_vm.rcxprop
	svom_info.rcxprop
	use_image_data_disk
	vdipool_group_entitlement.rcxprop
	vm.rcxprop
	vm_console.rcxprop
	zpool_and_zone_recovery.rcxprop
/etc/opt/FJSVrcvmr/customize_data/alive_monitoring/	vm_Hyper-V.rcxprop
	vm_VMware.rcxprop
/etc/opt/FJSVrcvmr/customize_data/home_tab/	home_infra_mes.txt
	home_tenant_mes.txt
/etc/opt/FJSVrcvmr/customize_data/l_server/net/	*
/etc/opt/FJSVrcvmr/customize_data/net/	net_info.*Network_Resource_Name*.conf
	net_info.*L-Server_Name*.conf
/etc/opt/FJSVrcvmr/customize_data/setup_wizard/	enable_advanced_mode.rcxprop
	lplatform_console_setup_parameter_on
/etc/opt/FJSVrcvmr/customize_data/sysprep_guirunonce/	*
/etc/opt/FJSVrcvmr/customize_data/vm_prop/	vm_*.rcxprop
/etc/opt/FJSVrcvmr/event_handler/	*
/etc/opt/FJSVrcvmr/l_platform/	enable_cloning
/etc/opt/FJSVrcvmr/l_server/	disable_check_num_of_cpu
	enable_control
	enable_cpu_per_socket
/etc/opt/FJSVrcvmr/vm/	delete_old_image
	online_cloning
	require_image_location

Directory	File Name
	single_storage_vc
	thin_provisioning
/opt/FJSVrcvmr/rails/config/rcx/	vm_guest_params.rb
/opt/FJSVrcvmr/sys/irmctool	*
/opt/FJSVrcvmr/sys/usm/etc/	emcpath.conf
	fspath.conf

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When the rcxmgrexport command is executed, the above configuration files are output to the following switchover information storage folder:

[Windows Manager]

Switchover information storage folder\ManagerExport\CONFIG_FILE*Date Exported*

[Linux Manager]

Switchover information storage directory/ManagerExport/CONFIG_FILE*Date Exported*

Referring to the configuration file for the switchover source site, which is stored in the switchover information storage folder, during switchover, enables you to make the content of the configuration file for the switchover destination site the same as the one for the switchover source site.

For details on the switchover information storage folder, refer to "3.2 Creating Switchover Information Storage Folders".

For details on the rcxmgrexport command, refer to "B.1 rcxmgrexport".

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When the contents of configuration files shown below differ between sites at the switchover, matching them is not easy.

When editing configuration files on the switchover source site, manually merge the edited contents on the switchover destination site, before switchover. For details on how to edit configuration files, see the references listed below.

Table 2.22 References for Editing Procedures of Configuration Files

Overview	File Name	Reference
Definition file for alive monitoring	- Stored folder [Windows Manager] *Installation_folder*\SVROR\Manager\etc\customize_data\alive_monitoring [Linux Manager] /etc/opt/FJSVrcvmr/customize_data/alive_monitoring - File name vm_VMware.rcxprop vm_Hyper-V.rcxprop	Refer to "8.1.8 Definition File for Alive Monitoring" in the "Setup Guide CE".
Editing information in the Home window of the ROR console	- Stored folder [Windows Manager] *Installation_folder*\SVROR\Manager\etc\customize_data\home_tab [Linux Manager] /etc/opt/FJSVrcvmr/customize_data/home_tab - File name	Refer to "8.4 Editing Information in the Home Window" in the "Operation Guide CE".

Overview	File Name	Reference
	home_infra_mes.txt home_tenant_mes.txt	
When using driver-specific parameters such as GLS or Bonding for scripts for configuring networks	- Stored folder [Windows Manager] *Installation_folder*\SVROR\Manager\etc\customize_data\net [Linux Manager] /etc/opt/FJSVrcvmr/customize_data/net - File name net_info.network resource name.conf net_info.l_server name.conf	Refer to "7.8 Network Redundancy and VLAN Settings of L-Servers" in the "Setup Guide CE".
[Hyper-V] Configuration file for access limitation in the image storage location	- Stored folder [Windows Manager] *Installation_folder*\SVROR\Manager\etc\customize_data - File name library_share_deny.conf library_share_*User_Group_Name*_deny.conf	Refer to "8.3.8 Collecting and Deleting Cloning Images" in the "Setup Guide CE".
[Hyper-V] For specification of the VM guest administrator account when L-Servers are created by specifying an image	- Stored folder [Windows Manager] *Installation_folder*\SVROR\Manager\etc\customize_data - File name image_admin_hyperv.rcxprop image_admin_hyperv.*User_Group_Name*.rcxprop	Refer to "8.3.10 [OS] Tab Configuration" in the "Setup Guide CE".
When creating virtual L-Servers using VMware ESXi on other companies' servers	- Stored folder [Windows Manager] *Installation_folder*\SVROR\Manager\etc\customize_data [Linux Manager] /etc/opt/FJSVrcvmr/customize_data - File name server_control.rcxprop	Refer to "8.1.5 Definition Files when Creating a Virtual L-Server Using VMware ESXi on Another Vendor's Servers or when Creating Virtual L-Servers without Using ServerView ESXi CIM Provider on VMware ESXi on Fujitsu Rack Mount Servers" in the "Setup Guide CE".
- vm.rcxprop When modifying behaviors of server virtualization software - vm_console.rcxprop When configuring using console connections from public LANs	- Stored folder [Windows Manager] *Installation_folder*\SVROR\Manager\etc\customize_data [Linux Manager] /etc/opt/FJSVrcvmr/customize_data - File name vm.rcxprop vm_console.rcxprop	Refer to "8.2.1 Creating Definition Files" in the "Setup Guide CE".

Overview	File Name	Reference
When creating L-Servers connected with NICs using System Center 2012 Virtual Machine Manager or later	- Stored folder [Windows Manager] *Installation_folder*\SVROR\Manager\etc\customize_data - File name scvmm_mac_pool.rcxprop scvmm_mac_pool_*Tenant_Name*.rcxprop	Refer to "8.3.5 Manual Network Configuration" in the "Setup Guide CE".
When using distributed virtual switches	- Stored folder [Windows Manager] *Installation_folder*\SVROR\Manager\etc\vm [Linux Manager] /etc/opt/FJSVrcvmr/vm - File name vds_vc	Refer to "E.1.4 Network Preparations" in the "Design Guide CE".
iSCSI network definition file	- Stored folder [Windows Manager] *Installation_folder*\SVROR\Manager\etc\customize_data\ [Linux Manager] /etc/opt/FJSVrcvmr/customize_data/ - File name iscsi_*User_Group_Name*.rcxprop iscsi.rcxprop	Refer to "7.1.10 Definition File for iSCSI Network" in the "Setup Guide CE".
Configuration for ordering display of resources on trees	- Stored folder [Windows Manager] *Installation_folder*\SVROR\Manager\etc\customize_data\ [Linux Manager] /etc/opt/FJSVrcvmr/customize_data/ - File name gui_config.rcxprop	Refer to "2.3.1.3 Sorting the Resource List in the Tree" in the "Release Notes".
Definition file for ZFS storage pool information	- Stored folder [Windows Manager] *Installation_folder*\SVROR\Manager\etc\customize_data [Linux Manager] /etc/opt/FJSVrcvmr/customize_data/ - File name zpool_and_zone_recovery.rcxprop	Refer to "18.5.1 ZFS Storage Pool Definition Files [Solaris] [Solaris Zones]" in the "User's Guide VE".
Definition file for the monitoring timeout value for physical server power operations	- Stored folder [Windows Manager] *Installation_folder*\SVROR\Manager\etc\customize_data [Linux Manager]	Refer to "Appendix A Notes on Operating ServerView Resource Orchestrator" in the "Operation Guide CE".

Overview	File Name	Reference
	/etc/opt/FJSVrcvmr/customize_data - File name power_timeout.rcxprop	
Definition file for when creating a virtual L-Server using a server which cannot use ServerView Agents	- Stored folder [Windows Manager] *Installation_folder*\SVROR\Manager\etc\customize_data [Linux Manager] /etc/opt/FJSVrcvmr/customize_data - File name server_spec.rcxprop	Refer to "8.1.4 Definition Files when Creating a Virtual L-Server Using a Server which cannot Use ServerView Agents" in the "Setup Guide CE".
SCSI controller definition file	- Stored folder [Windows Manager] *Installation_folder*\SVROR\Manager\etc\customize_data [Linux Manager] /etc/opt/FJSVrcvmr/customize_data - File name scsicontroller.rcxprop	Refer to "8.2.1 Creating Definition Files" in the "Setup Guide CE".

If the following configuration files exist, contact Fujitsu technical staff.

[Windows Manager]

- *Installation_folder*\SVROR\Manager\etc\customize_data\mwgui_config.rcxprop

- *Installation_folder*\SVROR\Manager\etc\vm\single_storage_vc

- *Installation_folder*\SVROR\Manager\etc\vm\delete_old_image

- *Installation_folder*\SVROR\Manager\etc\vm\online_cloning

- *Installation_folder*\SVROR\Manager\etc\customize_data\use_image_data_disk

- *Installation_folder*\SVROR\Manager\etc\l_server\disable_check_num_of_cpu

- *Installation_folder*\SVROR\Manager\etc\l_server\enable_cpu_per_socket

- *Installation_folder*\SVROR\Manager\etc\customize_data\gui_always_home.rcxprop

- *Installation_folder*\SVROR\Manager\etc\customize_data\gui_enable_reverse_proxy.rcxprop

- *Installation_folder*\SVROR\Manager\etc\customize_data\network_map.rcxprop

- *Installation_folder*\SVROR\Manager\etc\customize_data\network_viewer.rcxprop

- *Installation_folder*\SVROR\Manager\etc\customize_data\show_vds_vc.rcxprop

- *Installation_folder*\SVROR\Manager\etc\customize_data\setup_wizard\enable_advanced_mode.rcxprop

- *Installation_folder*\SVROR\Manager\etc\customize_data\setup_wizard\lplatform_console_setup_parameter_on

- *Installation_folder*\SVROR\Manager\etc\l_platform\enable_cloning

- *Installation_folder*\SVROR\Manager\etc\vm\require_image_location

- *Installation_folder*\SVROR\Manager\sys\irmctool*

- *Installation_folder*\SVROR\Manager\etc\customize_data\svom_info.rcxprop

- *Installation_folder*\SVROR\Manager\etc\customize_data\nic_index_map.rcxprop

- *Installation_folder*\SVROR\Manager\etc\customize_data\server_snmp.rcxprop

- *Installation_folder*\SVROR\Manager\etc\conf\dhcp_server.yml

[Linux Manager]

- /etc/opt/FJSVrcvmr/customize_data/mwgui_config.rcxprop
- /etc/opt/FJSVrcvmr/vm/single_storage_vc
- /etc/opt/FJSVrcvmr/vm/delete_old_image
- /etc/opt/FJSVrcvmr/vm/online_cloning
- /etc/opt/FJSVrcvmr/l_server/enable_control
- /etc/opt/FJSVrcvmr/customize_data/use_image_data_disk
- /etc/opt/FJSVrcvmr/l_server/disable_check_num_of_cpu
- /etc/opt/FJSVrcvmr/l_server/enable_cpu_per_socket
- /etc/opt/FJSVrcvmr/customize_data/gui_always_home.rcxprop
- /etc/opt/FJSVrcvmr/customize_data/gui_enable_reverse_proxy.rcxprop
- /etc/opt/FJSVrcvmr/customize_data/network_map.rcxprop
- /etc/opt/FJSVrcvmr/customize_data/network_viewer.rcxprop
- /etc/opt/FJSVrcvmr/customize_data/show_vds_vc.rcxprop
- /etc/opt/FJSVrcvmr/customize_data/setup_wizard/enable_advanced_mode.rcxprop
- /etc/opt/FJSVrcvmr/customize_data/setup_wizard/lplatform_console_setup_parameter_on
- /etc/opt/FJSVrcvmr/l_platform/enable_cloning
- /etc/opt/FJSVrcvmr/vm/require_image_location
- /opt/FJSVrcvmr/sys/irmctool/*
- /etc/opt/FJSVrcvmr/customize_data/svom_info.rcxprop
- /etc/opt/FJSVrcvmr/customize_data/nic_index_map.rcxprop
- /etc/opt/FJSVrcvmr/customize_data/server_snmp.rcxprop
- /etc/opt/FJSVrcvmr/conf/dhcp_server.yml

2.6.6 Customized Settings on the Switchover Source Site

For Active-Standby operation, the following customizations on the switchover source site, which are performed according to "Chapter 9 Post-Installation Procedures" in the "Setup Guide CE", need to be reflected on the switchover destination site before switchover. Perform configuration when configuring the environment, or reflect the settings during switchover.

- "9.1 Settings for Sending Email"
- "9.2.2 Setting Application Process Settings"
- "9.2.3 Setting Application Process to be Used"
- "9.3 Customizing the Dashboard"
- "9.4 Setting the Host Names for Virtual Servers"
- "9.5 Setting the Method for Setting Resource Names"
- "9.6 Settings for the Overcommit Function"
- "9.7 Editing the Environment Setup File for the L-Platform API"
- "9.9 System Disk Settings for Physical L-Servers"
- "9.12 Editing the License Agreement"
- "9.13 Editing the User Agreement when Registering a User"

After a Disaster Recovery environment has been configured, if the settings of the switchover source site are changed according to "Chapter 8 Changing Settings" in the "Operation Guide CE", reflect the changes made to the following items on the switchover destination site.

- "8.2 Settings for Sending Email"

- "8.4 Editing Information in the Home Window"

- "8.5.1 Settings for Permissions to Change L-Platform Templates"

- "8.5.2 Subnet Settings at Segment Editing"

- "8.5.3 Settings for the Simplified Reconfiguration Function"

- "8.5.4 Distribution Ratio Settings"

- "8.5.5 Application Process Settings"

- "8.5.7 Editing the License Agreement"

- "8.5.9 Default Password Setting for Sent Emails"

- "8.5.10 Settings for the Maximum Number of Connections for the L-Platform Template"

- "8.6.1 Settings for Tenant Management and Account Management"

- "8.6.2 Editing the User Agreement when Registering a User"

- "8.7 Accounting Settings"

- "8.8 System Condition Server List Settings"

- "8.9 Settings for Event Log Output for CMDB Agent"

The following configuration files are edited based on the above settings.

[Windows Manager]

- *Installation_folder*\RCXCFMG\config\command_config.xml

- *Installation_folder*\RCXCFMG\config\mail_config.xml

- *Installation_folder*\RCXCFMG\config\vsys_config.xml

- *Installation_folder*\RCXCTMG\Charging\conf\accounting.properties

- *Installation_folder*\RCXCTMG\Charging\conf\metering_log.properties

- *Installation_folder*\RCXCTMG\MyPortal\config\application_process.properties

- *Installation_folder*\RCXCTMG\MyPortal\config\custom_config.xml

- *Installation_folder*\RCXCTMG\MyPortal\config\managerview_config.xml

- *Installation_folder*\RCXCTMG\SecurityManagement\conf\portal.properties

- *Installation_folder*\CMDB\FJSVcmdbm\axis2\WEB-INF\services\mdr_cfmg\cmdb.properties

- *Installation_folder*\CMDB\FJSVcmdbm\axis2\WEB-INF\services\mdr_ror\cmdb.properties

- *Installation_folder*\CMDB\FJSVcmdbm\CMDBConsole\WEB-INF\classes\viewlist_en.xml

- *Installation_folder*\RCXCTMG\MyPortal\config\license\create\default

- *Installation_folder*\RCXCTMG\MyPortal\config\license\reconfigure\default

- *Installation_folder*\RCXCTMG\MyPortal\config\license\return\default

- *Installation_folder*\IAPS\ahs\servers\RCXCT-ext\htdocs\sopdocs\pub\html\en\cRegApply_agreement.forUse_en.html

[Linux Manager]

- /etc/opt/FJSVcfmg/config/command_config.xml

- /etc/opt/FJSVcfmg/config/mail_config.xml

- /etc/opt/FJSVcfmg/config/vsys_config.xml

- /etc/opt/FJSVctchg/conf/accounting.properties

- /etc/opt/FJSVctchg/conf/metering_log.properties

- /etc/opt/FJSVctmyp/config/application_process.properties

- /etc/opt/FJSVctmyp/config/custom_config.xml

- /etc/opt/FJSVctmyp/config/managerview_config.xml

- /etc/opt/FJSVctsec/conf/portal.properties

- /opt/FJSVctdsb-cmdb/CMDB/FJSVcmdbm/axis2/WEB-INF/services/mdr_cfmg/cmdb.properties

- /opt/FJSVctdsb-cmdb/CMDB/FJSVcmdbm/axis2/WEB-INF/services/mdr_ror/cmdb.properties

- /opt/FJSVctdsb-cmdb/CMDB/FJSVcmdbm/CMDBConsole/WEB-INF/classes/viewlist_en.xml

- /etc/opt/FJSVctmyp/config/license/create/default

- /etc/opt/FJSVctmyp/config/license/reconfigure/default

- /etc/opt/FJSVctmyp/config/license/return/default

- /var/opt/FJSVctmg-isas/ahs/servers/RCXCT-ext/htdocs/sopdocs/pub/html/en/cRegApply_agreement.forUse_en.html

These configuration files are collected by performing "a. Export the Required Information" in "1. Export the Required Information from the Switchover Source Site" in "4.1 Normal Operation". Referring to the configuration file for the switchover source site, which is stored in the switchover information storage folder, during switchover, enables you to make the content of the configuration file for the switchover destination site the same as the one for the switchover source site.

🖼 Example
. . . .

Example of Storage Locations of Collected Configuration Files

[Windows Manager]

E:\Export\ManagerExport\CONFIG_FILE*Date exported*

[Linux Manager]

/DRImport/ManagerExport/CONFIG_FILE*Date exported*
. . . .

For details on the switchover information storage folder, refer to "3.2 Creating Switchover Information Storage Folders".

For the Active-Active operation, configurations of the following should be different between sites.

- "9.4 Setting the Host Names for Virtual Servers" in the "Setup Guide CE"

When using "prefix with serial number" style of "3" for configuration, specify different character strings for the prefixes of each site.

- "Appendix A Settings for Software ID Prefixes"

Configure using different prefixes on each site.

For configurations other than the above, use identical configurations between sites as with the Active-Standby operation.

2.7 Necessary Licenses

The same number of DR Option licenses as physical servers on which the switchover target L-Servers are operating are required for either the switchover source site (in the Active-Standby operation), or both the switchover source and destination sites (in the Active-Active operation).

In both the Active-Standby operation and the Active-Active operation, use the same licenses (as many DR option licenses as you purchased) for admin servers of switchover source and destination sites.

2.8 Estimation of Disk Capacity

In order to recover the FUJITSU Software ServerView Resource Orchestrator Cloud Edition environment of the switchover source site on the switchover destination site using DR Option, it is necessary to replicate the disks storing the following information from the switchover source site to the switchover destination site.

- Switchover information storage folder

This folder contains the following information:

1. The image file storage folders of physical servers

2. The output of the rcxmgrexport command

3. The output of the rcxstorage command

4. User scripts and definition files

Estimate that at least 5 GB of disk space is necessary for storing the information from steps 2 to 4. In addition, add 23 MB for each network device managed by Resource Orchestrator to the estimate.

- Virtual storage resources and disk resources registered in the replication target storage pools

The disk resources used by the managed servers or images of the switchover target.

- When manually copying the switchover information storage folder, it is not necessary to replicate the disk on which the switchover information storage folder is stored.

For the operation performed with the manually copied switchover information storage folder, refer to "8. Transfer the Switchover Information Storage Folder" in "4.1 Normal Operation".

Considering the descriptions above, estimate the replication target disk capacity. For details on the switchover information storage folder and the target areas of replication, refer to "3.1 Pre-setup Preparations".

Secure 200 MB on the manager of each site as the disk space for storing information necessary for the DR configuration check tool. For details, refer to "B.6 rcxdrcheck".

2.9 Advisory Notes for Disaster Recovery Environments

Manager OSs

Windows and Linux managers are supported.

Specify the same OS for the managers used for the switchover source site and the switchover destination site.

For details on Windows managers and Linux managers, refer to "Chapter 2 Overview" in the "Design Guide CE".

Managed Servers

Managed servers of physical OSs (Windows, Linux), VMware, Hyper-V, and OVM for SPARC are supported.

Managed servers for physical OSs (Solaris), Solaris Zones, OVM for x86, KVM, Xen, Citrix Xen, and are not supported.

L-Servers which Cannot Be Recovered

The following L-Servers cannot be recovered by Disaster Recovery.

- L-Servers for which only the configuration definitions have been created

- L-Servers linked with configured physical servers

Advisory Notes for Configurations Including OVM for SPARC

Note the following advisory notes:

- Configuration is only supported when automatic saving of VM guest configuration information is enabled.

For details on automatic saving of VM guest configuration information, refer to "Definition File of Whether to Save the Configuration Information" in "8.8.1 Creating Definition Files" in the "Setup Guide CE".

- Switchover of cloning images (system packages) is not possible.

After completion of switchover, create the cloning images on the switchover destination site, using the same name as the ones on the switchover source site, and then register them in the image pool migrated from the switchover source site.

  - Switchover of the installation server is not possible.

Set up the installation server in advance on both the switchover source and destination sites. If the installation server has been configured as an L-Server, limit the switchover scope so that the L-Server is out of switchover scope.

  - After switchover, configuration of the network settings may be necessary.

The MAC addresses of NICs before and after switchover may be different values. In that case, the recognition order of NICs in the guest OS may be affected.

Check if the same communications with the IP addresses from before switchover can also be performed after switchover. When communications cannot be performed, modify the settings of NICs on the guest OS and NICs on the VM management software.

  - After switchover, it is necessary to import the ZFS storage pool to the data disk.

When the data disk is connected to the switchover target, and ZFS is used on the guest OS, ZFS storage pools other than the root will be exported after switchover.

After starting the guest OS, if necessary, import the ZFS storage pool. When there are services affected by the state in which the ZFS storage pool is temporarily exported, restart the services.

For details on how to import the ZFS storage pool, refer to the manuals of Solaris OS.

Server Load Balancers (SLB)

L-Platform switchover including server load balancers (SLB) is not supported. When creating, editing, or copying an L-Platform template, do not place SLBs in the L-Platform template. Instruct the tenant administrator not to create or release L-Platform templates including SLBs by accident.

VM Guests with VMware Fault Tolerance Enabled

VM guest switchover with VMware Fault Tolerance enabled is not supported. Do not use VMware Fault Tolerance.

VDI Coordination

Switchover of virtual L-Servers that use the VDI coordination function is not supported. Do not use VDI coordination when creating virtual L-Servers.

Global IP Addresses

Switchover of global IP addresses is not supported. Do not register global IP addresses in address pools.

Regarding The Automatic Quarantining Function

Environments in which the automatic quarantining function is used are excluded from the targets of recovery using Disaster Recovery.

2.10 System configuration

An example of a Disaster Recovery environment system configuration is given below.

Example Disaster Recovery Environment System Configuration Containing both Physical L-Server Switchover (Physical OS) and Physical/Virtual L-Server Switchover (VM Host/VM Guest)

An example of a Disaster Recovery environment system configuration that contains both physical L-Server switchover (physical OS) and physical/virtual L-Server switchover (VM host/VM guest) is shown below:

Figure 2.14 Example Disaster Recovery Environment Containing both Physical L-Server Switchover (Physical OS) and Physical/Virtual L-Server Switchover (VM Host/VM Guest)
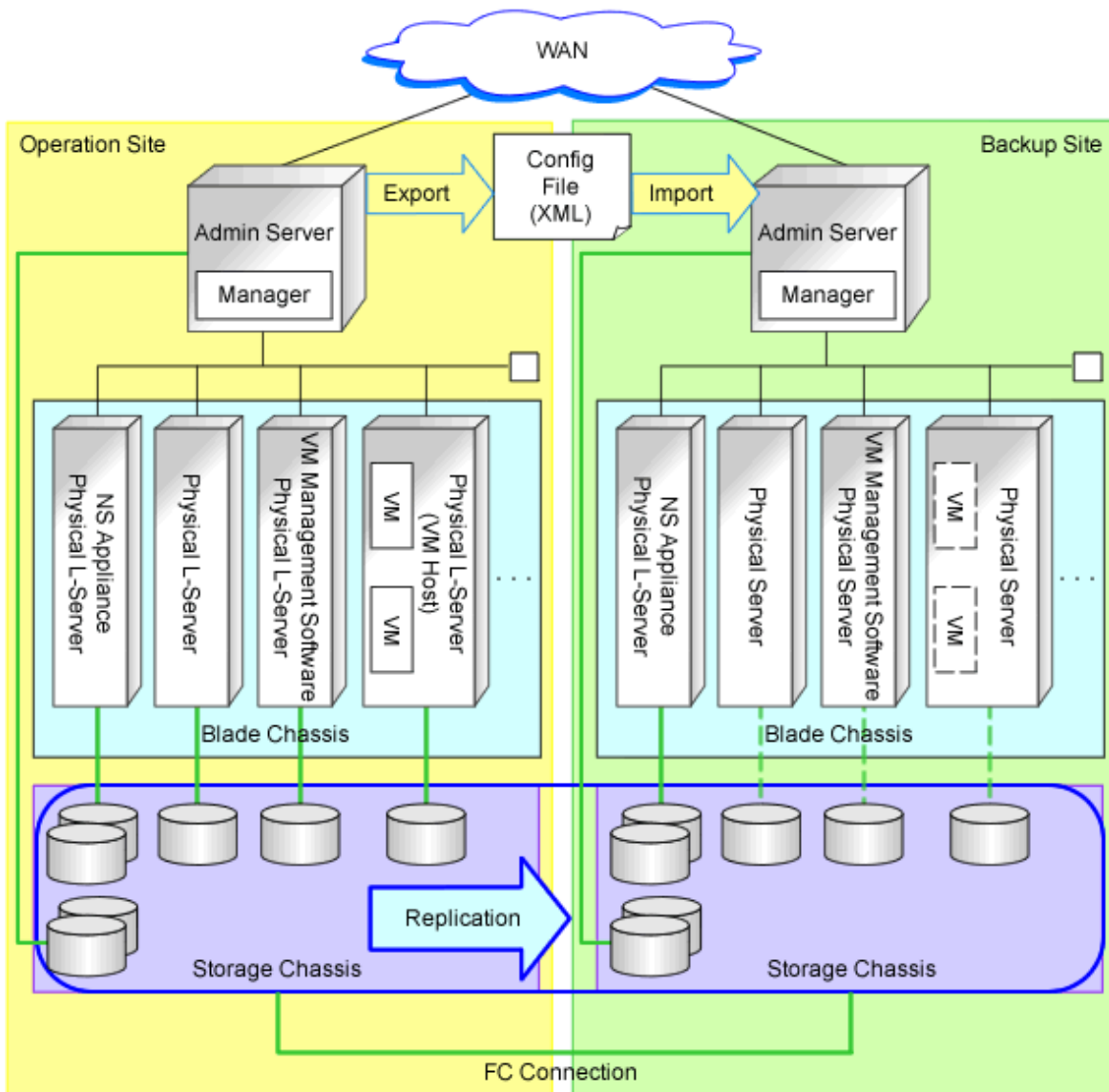
Example of System Configuration Installing VM Management Software on the Admin Server

An example system configuration with VM management software installed on the admin server is shown below:

Figure 2.15 Example of VM Management Software Installation on the Admin Server in a Disaster Recovery Environment which Contains both Physical L-Server Switchover (Physical OS) and Physical/Virtual L-Server Switchover (VM Host/VM Guest)
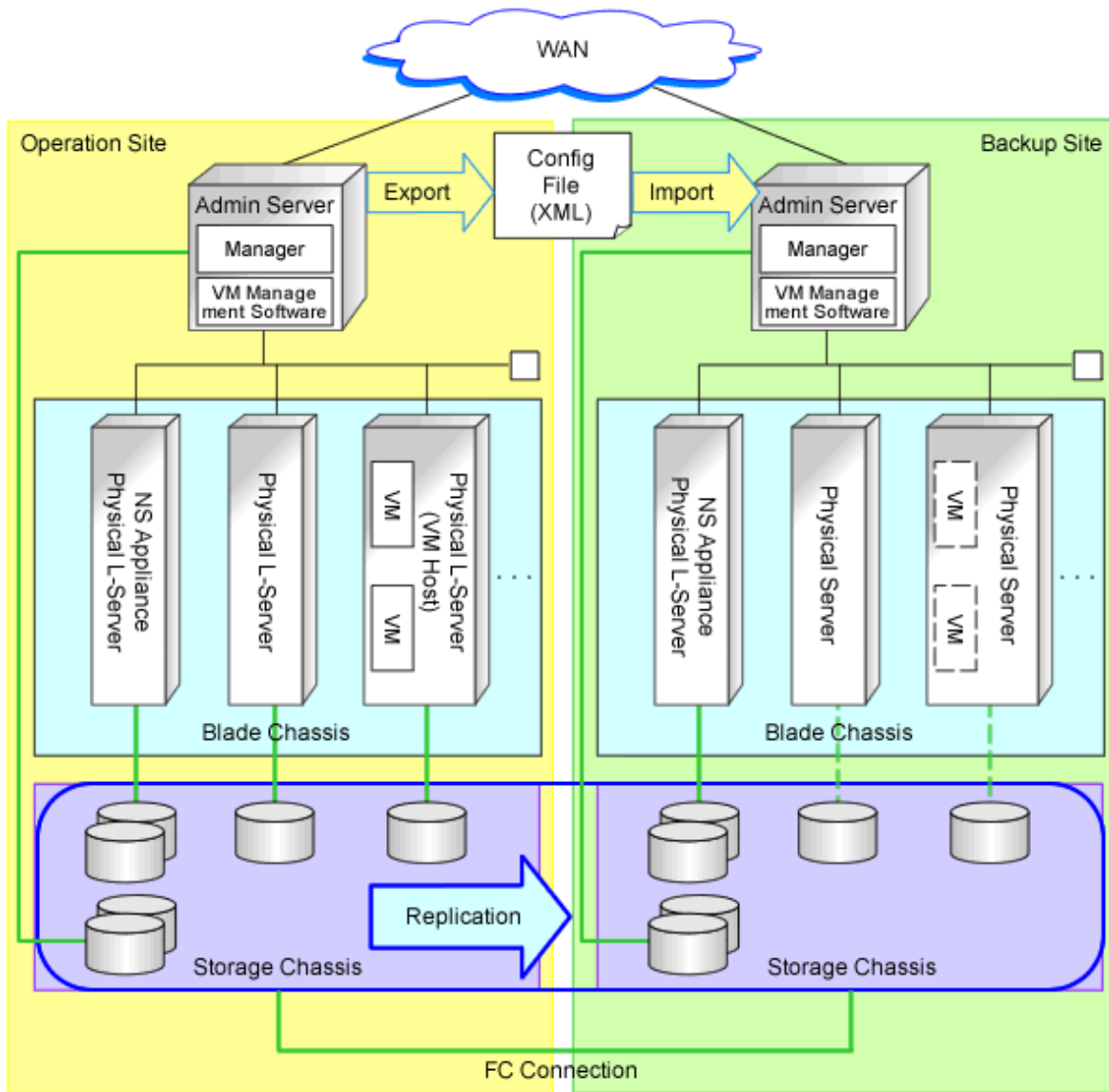
Example Disaster Recovery Environment System Configuration which Contains both Physical L-Server Switchover (Physical OS) and Virtual L-Server Switchover (VM Guest)

An example of a Disaster Recovery environment system configuration that contains both physical L-Server switchover (physical OS) and virtual L-Server switchover (VM guest) is shown below:

Figure 2.16 Example Disaster Recovery Environment which Contains both Physical L-Server Switchover (Physical OS) and Virtual L-Server Switchover (VM Guest)
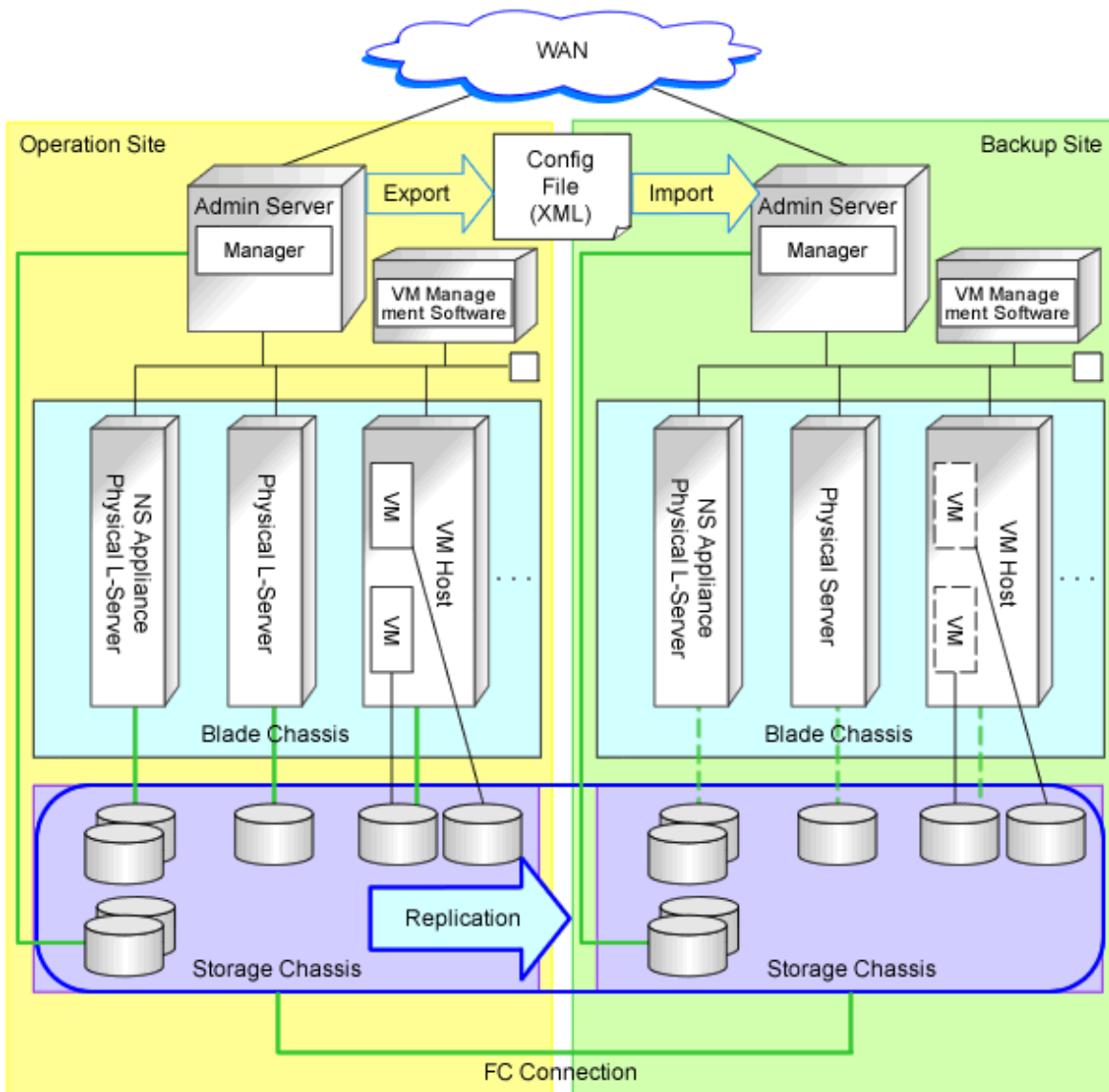
Chapter 3 Installation

This chapter explains how to configure a Disaster Recovery environment.

Configure a Disaster Recovery environment using the following flow.

3.1 Pre-setup Preparations

Perform pre-setup preparations for the switchover source and destination sites.

- Replication of Storage Units

  Replicate the switchover source site information on the switchover destination site using the storage unit replication function.

  The replication targets are the LUNs storing the following information. Refer to "Table 3.1 Replication of Storage Units".

Table 3.1 Replication of Storage Units

Replication Target Information	Type of LUNs to Store Information	Number of LUNs		Remarks
Switchover information storage folder (*1)	LUNs with FC, iSCSI, or NAS connections (*2)	Switchover source site	2 (*3)	Refer to "3.2 Creating Switchover Information Storage Folders".
		Switchover destination site	2 (*4)	Perform interactive copy from the switchover source site to the switchover destination site, and from the switchover destination site to the switchover source site. Configure the replication control item (copy group) for each site.
Disk resources and virtual storage resources stored in the storage pools of the replication targets (*5)	LUNs with FC, iSCSI, or NAS connections (*6, *7)	Switchover source site	Number of LUNs used by the disk resources and the virtual storage resources stored in the storage pools of the replication targets	Configure the control unit (copy group) of the replication targets for each unit to perform switchover.
		Switchover destination site	Same number as the switchover source site (*8)	

*1: For the operation with manually copied switchover information storage folders, it is not necessary to replicate the disk on which the switchover information storage folder is stored. For the operation performed with the manually copied switchover information storage folder, refer to "8. Transfer the Switchover Information Storage Folder" in "Chapter 4 Operation".

* 2: FOR Windows managers set to collect switchover information automatically (refer to "3.7 Configuring Automatic Collection of Switchover Information"), LUNs with NAS connections cannot be used. This is because the automatic collection of switchover information is performed using "local system account", and services executed using the account have limited reference for network drives due to the nature of Windows OSs.

* 3: The following LUNs are necessary:

   - LUNs for the switchover information storage folder of the switchover source site

   - LUNs for the replication destination used for the switchover information storage folders of the switchover destination site

* 4: The following LUNs are necessary:

   - LUNs for the switchover information storage folder of the switchover destination site

   - LUNs for the replication destination used for the switchover information storage folders of the switchover source site

*5: The tenants, L-Platforms, L-Servers for the infrastructure administrator, and images using the disk resources or virtual storage resources in the storage pool are the switchover targets on the switchover destination site. Refer to "2.4 Limitation of switchover scope and additional recovery".

*6: LUNs with iSCSI or NAS connections are only supported when used for virtual L-Server switchover (VM guests).

*7: For the LUNs used in the virtual L-Server switchover (VM guest) method, before starting replication, check that the replication destination LUNs are not regarded as the datastore on the switchover destination VM management software.

When the LUNs are regarded as the datastore, perform the following operations, and ensure that the LUNs are not regarded as the datastore.

   - For the VMFS datastore

Delete the corresponding datastore on the arbitrary VM host.

Also, on the VM host which the datastore is shared, check that deletion of the datastore was detected. Example: Rescan the datastore on each VM host

   - For the NFS datastore

Unmount the corresponding datastore from each host.

For details of the operation, refer to the VMware manuals.

*8: Number of LUNs of the replication targets used by the disk resources and the virtual storage resources stored in the storage pools of the switchover source site replication targets.

Figure 3.1 Replication of Storage Units
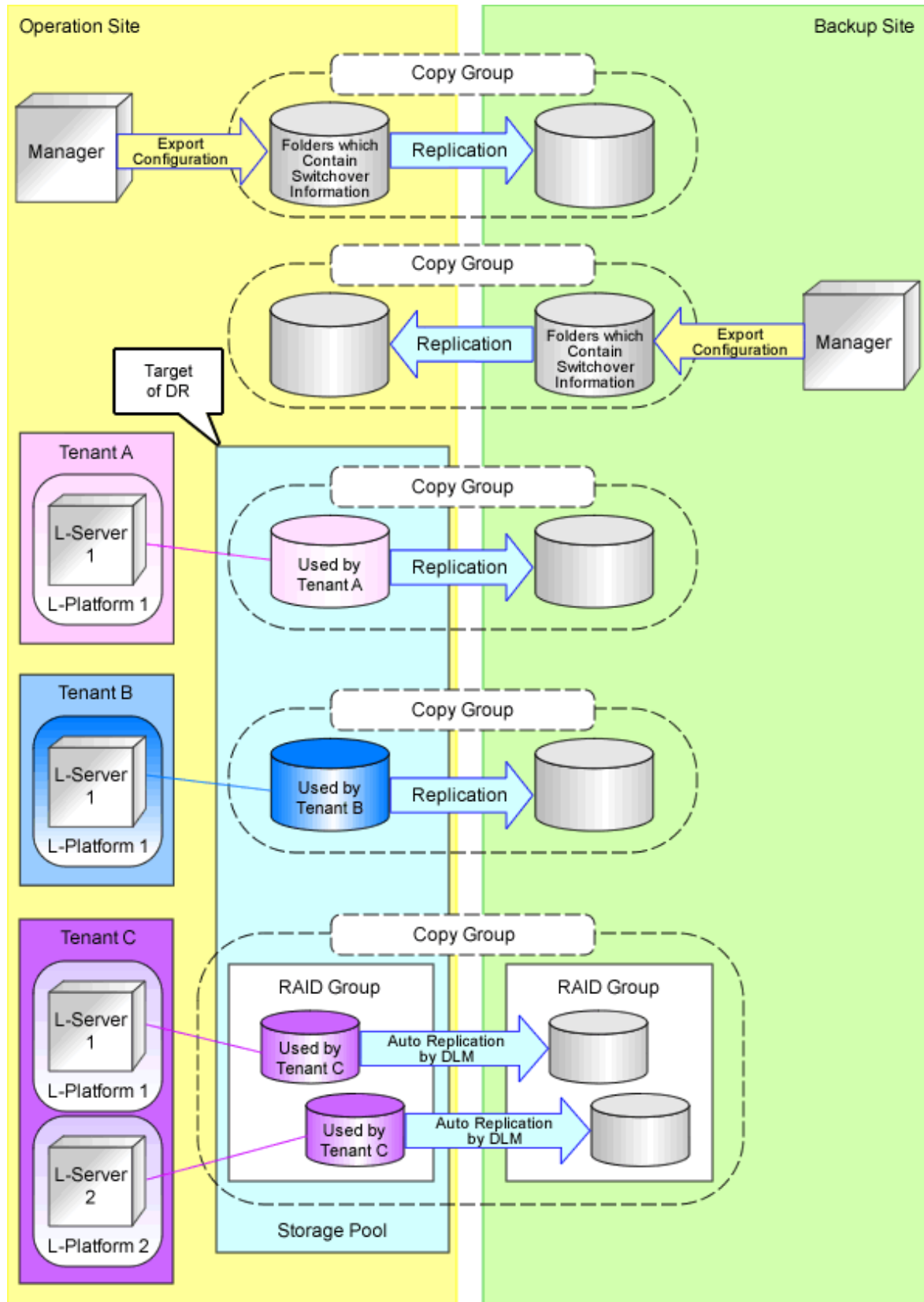
For details on storage replication, refer to "18.1.3 High Availability for Storage Chassis" in the "Operation Guide CE".

Disaster Recovery can be operated on LUNs created beforehand or on dynamic LUN mirroring (DLM) storage of ETERNUS. For details on prerequisites for storage replication, refer to "7.2 Storage Chassis High Availability Design" in the "Design Guide CE".

> 📒 **Note**
>
> ....
>
> LUNs created by ETERNUS dynamic LUN mirroring (DLM) are handled as LUNs created beforehand once they are switched from the switchover source site to the switchover destination site. Depending on the failback method, LUNs may be handled as LUNs created by dynamic LUN mirroring (DLM). For details, refer to "4.4 Failback after Recovery of the Switchover Source Site".
>
> Replication settings for LUNs created beforehand must be performed before the next switchover operation because automatic replication setting is not available for such LUNs.
>
> For details about LUNs created by dynamic LUN mirroring (DLM) and LUNs created beforehand, refer to "D.3 Storage Preparations" in the "Design Guide CE".
>
> ....

For switchover source sites, it is not necessary for the disk resources for the switchover destination site to have been detected. Therefore, it is not necessary to connect storage units for the switchover destination site to the server for the switchover source site.

- Path Configuration for Replication Software

  Configuration is required when performing "3.7 Configuring Automatic Collection of Switchover Information".

  When the replication software being used is ACM-CCM or SnapMirror, this procedure is not required.

  [Windows Manager]

  1. Add the following path to the PATH environment variables depending on the replication software that will be used. Perform this operation on the server on which the replication software is installed.

     - navisphere

       <Navisphere CLI Installation Path>

       > 📝 **Example**
       >
       > ....
       >
       > C:\Program Files (x86)\EMC\Navisphere CLI
       >
       > ....

     - Solutions Enabler

       <SYMCLI Installation Path>\bin

       > 📝 **Example**
       >
       > ....
       >
       > C:\Program Files (x86)\EMC\SYMCLI\bin
       >
       > ....

  2. Restart the OS to enable the environment variables by the SYSTEM user.

  [Linux Manager]

  1. Add the following path to the end of the "/etc/profile" file depending on the type of replication software that will be used. Perform this operation on the server on which the Resource Orchestrator manager and the replication software are installed.

     - NaviSphere

       PATH=$PATH:/opt/Navisphere/bin

     - SolutionsEnabler

       PATH=$PATH:/usr/symcli/bin

  2. Execute the following command from the console.

     ```
     source /etc/profile
     ```

- When creating physical L-Servers

  Refer to "Appendix D Preparations for Creating a Physical L-Server" in the "Design Guide CE".

- When creating virtual L-Servers using server virtualization software

Refer to "Appendix E Preparations for Creating a Virtual L-Server" in the "Design Guide CE". Installation of VM management software on the switchover destination site is not necessary when it is installed on physical L-Servers on the switchover source site.

- When using VMware virtual L-Servers for physical/virtual L-Server switchover (VM host/VM guest)

Enter the following commands for the VM host and disable detection of the copied LUNs.

```
>esxcfg-advcfg -s 0 /LVM/DisallowSnapshotLUN <RETURN>
```

📒 Note
....
When performing switchover of VMware virtual L-Servers (VM guest), do not disable detection of copied LUNs.
....

📘 Information
....
- On VM hosts of VMware on which detection of copied LUNs is disabled, the function for detecting replicated datastores as snapshot LUNs is disabled. Consequently, replicated datastores can be mounted automatically on VM hosts without re-signing for datastores (UUID modification) by users.

- To enable detection of copied LUNs on a VM host of VMware with that function disabled, execute the following command on that VM host:

```
>esxcfg-advcfg -s 1 /LVM/DisallowSnapshotLUN <RETURN>
```

For details, refer to the VMware documentation.
....

- When using Hyper-V virtual L-Servers for physical/virtual L-Server switchover (VM host/VM guest)

It is necessary to also configure the remote management authentication settings on the admin server of the switchover destination site.

For details, refer to "E.2.5 Pre-setup Preparations in Hyper-V Environments" in the "Design Guide CE".

- When using OVM for SPARC virtual L-Servers for virtual L-Server switchover (VM guest)

  - Install BMC BladeLogic Server Automation on both the switchover source and destination sites.

  - Configure the virtual disk service for the disk used for the switchover target guest domain and its replicated disk, and then register the disk resources.

    - Configure the same value for *VDS service name* + *Volume name* (attribute of the disk resource) on the switchover source and destination sites

  - For all VM hosts not to be deleted from the switchover target VM pool (the VM hosts specified in the VM pool definition file), it is necessary to configure the following network settings on both sites in advance:

    - The name (case sensitive) of the virtual switch (vsw) connected to the NIC and its VLAN information

    - VLAN information of the network devices connected to the NIC

  If the network settings are not same on both sites, network communication to and from the guest domain may not be possible on the switchover destination site.

3.2 Creating Switchover Information Storage Folders

Create the switchover information storage folders in the admin servers of the switchover source and destination sites. In the LUNs for switchover information storage folders, create the folders in the following configurations:

[Windows Manager]

Switchover information storage folder

Switchover information storage folder\Image - Folder to contain physical server image files

Switchover information storage folder\ManagerExport - Output directory of the rcxmgrexport command

---

Switchover information storage folder\MAP - Folder to contain mapping definition files of physical server names or VM management software names

Switchover information storage folder\OtherBackupFiles - Folder to contain definition files and user scripts

Switchover information storage folder\vmmgr_file.txt - Definition files of VM management software [physical/virtual L-Server switchover (VM host/VM guest)]

Switchover information storage folder\vm_pool.csv - VM pool definition files [virtual L-Server switchover (VM guest)]

[Linux Manager]

Switchover information storage folder

Switchover information storage folder\Image - Folder to contain physical server image files

Switchover information storage folder\ManagerExport - Output directory of the rcxmgrexport command

Switchover information storage folder\MAP - Folder to contain mapping definition files of physical server names or VM management software names

Switchover information storage folder\OtherBackupFiles - Folder to contain definition files and user scripts

Switchover information storage folder/vmmgr_file.txt - Definition files of VM management software [physical/virtual L-Server switchover (VM host/VM guest)]

Switchover information storage folder\vm_pool.csv - VM pool definition files [virtual L-Server switchover (VM guest)]

Note

Configure the switchover information storage folders so their paths do not contain multibyte characters.

Information

For details of the content of vmmgr_file.txt and vm_pool.csv, refer to "3.6 Creating Files Used for Switchover".

Example

[Windows Manager]

D:\Export\

D:\Export\Image

D:\Export\ManagerExport

D:\Export\MAP

D:\Export\OtherBackupFiles

D:\Export\vmmgr_file.txt

D:\Export\vm_pool.csv

[Linux Manager]

/DRExport/Export

/DRExport/Export/Image

/DRExport/Export/ManagerExport

/DRExport/Export/MAP

/DRExport/Export/OtherBackupFiles

/DRExport/Export/vmmgr_file.txt

```
/DRExport/Export/vm_pool.csv
```

• •

Make the LUNs that contain the switchover information storage folders the targets of replication.

The information stored in each folder within the switchover information storage folder is as below.

- *Switchover information storage folder*

  Parent folder. The following folders must be created. Any folder name can be used.

- *Switchover information storage folder*\Image

  Stores physical server images. Create the folder when migrating physical server images between sites.

- *Switchover information storage folder*\ManagerExport

  Folder to store the configuration information of the Resource Orchestrator manager. The following folders must be created.

- *Switchover information storage folder*\MAP

  Folder to store the mapping information of physical server names and VM management software names. Create the folder, when the physical server or VM management software names are different between sites.

- *Switchover information storage folder*\OtherBackupFiles

  Store files other than those described above. The following folders must be created.

3.3 Manager Installation and Configuration

Install the Resource Orchestrator manager on the admin servers of the switchover source and destination sites.

For details, refer to the following:

- "Chapter 2 Installation" in the "Setup Guide CE"

- "Chapter 3 SSL Communication Environment Settings for the ROR Console" in the "Setup Guide CE"

- "Chapter 2 Login and Logout" in the "User's Guide for Infrastructure Administrators CE"

- "Chapter 4 License Setup and Confirmation" in the "Setup Guide CE"

- "Chapter 5 Importing a Certificate to a Browser" in the "Setup Guide CE"

For Disaster Recovery environments, configure as follows.

- For details on the items to match or to be different, between the switchover source and destination sites, refer to "Chapter 2 Design".

- When the environment is configured so that disaster recovery is transparent to ROR console users, SVOM and VIOM need to be installed on the admin server of the switchover destination site under either of the following conditions. Once installation is complete, the conditions do not apply.

  - The admin server of the switchover source site must be stopped

  - The network connecting to the switchover source site must be disconnected

- When performing VMware virtual L-Server switchover (VM guest), install the VMware vSphere Command-Line Interface (vCLI) corresponding to the VMware vCenter Server version on the servers (such as admin servers) which can communicate with VMware vCenter Server.

  When there are VMware vCenter Server 6 and VMware ESXi 6, it is necessary to configure the authentication settings, after installing the VMware vSphere Command-Line Interface (vCLI).

  For details, refer to the following URL:

  URL: http://kb.vmware.com/kb/2108416

  For the authentication settings, take one of the following corrective actions described in the reference:

  - Downloading and Installing the vCenter Server Certificate

  - Using the Credential Store

- Certificate files in the following folder on both the switchover source and destination sites must be the same files. When installing a manager on the switchover destination site, copy the files from the switchover source site. Perform this operation after stopping the manager.

  When configuring a single switchover destination site to inherit multiple switchover source sites, copy the following files of the manager on the switchover source site that is first created to the managers on the other switchover source sites.

  [Windows Manager]

  - *Installation_folder*\SVROR\Manager\etc\opt\FJSVssmgr\current\certificate\

  - *Installation_folder*\SVROR\Manager\sys\apache\conf\ssl.crt\

  - *Installation_folder*\SVROR\Manager\sys\apache\conf\ssl.key\

  [Linux Manager]

  - /etc/opt/FJSVrcvmr/opt/FJSVssmgr/current/certificate/

  - /etc/opt/FJSVrcvmr/sys/apache/conf/ssl.crt/

  - /etc/opt/FJSVrcvmr/sys/apache/conf/ssl.key/

  - After installing the manager, set up SSL if necessary.

  For details, refer to "Chapter 2 Installation" and "Chapter 3 SSL Communication Environment Settings for the ROR Console" in the "Setup Guide CE".

📎 Note

The site certificate that was issued by the CA should be used for the Disaster Recovery environment.

When test certificates are used, certificates on the switchover destination site also need to be imported to the browser during installation or after switchover.

For details, refer to "Chapter 5 Importing a Certificate to a Browser" in the "Setup Guide CE".

- When using Disaster Recovery, a license for the "DR option" is necessary.

  After installing Resource Orchestrator, register the license for the "DR option" on the switchover source and destination sites.

  For details on how to register the license, refer to "Chapter 4 License Setup and Confirmation" in the "Setup Guide CE".

  [OVM for SPARC]

  To use an OVM for SPARC managed server as the server for DR, it is necessary to install the FUJITSU Software ServerView Resource Orchestrator DR Option Media Pack.

  For details on installation, refer to "1.1.9 Overview of Functions Provided in the FUJITSU Software ServerView Resource Orchestrator DR Option for Solaris" in the "Release Notes".

- For the image storage location folders of physical servers, specify the image folders created in "3.2 Creating Switchover Information Storage Folders". For details on how to change the storage folders of image files, refer to "5.9 rcxadm imagemgr" in the "Reference Guide (Command/XML) CE".

- For Active-Active operation, set prefixes of software IDs according to "Appendix A Settings for Software ID Prefixes".

- Specify the information of the *switchover information storage folders* in the following definition files of the switchover source and destination sites.

[Windows Manager]

Installation_folder\SVROR\Manager\etc\customize_data\fa_dr.rcxprop

[Linux Manager]

/etc/opt/FJSVrcvmr/customize_data/fa_dr.rcxprop

Lines other than the following that begin with sharp signs ("#") are comments in this definition file.

- #rcxrepdef_define
- #rcxstorage_define

- #rcxmgrexport_define

- #rcxrecovery_define

- #dr_storagepool

- #exclude_lserver

- #salvage_define

- #DR Operation Method

- #Config File Switchover

Blank lines in this definition file are regarded as meaningless and skipped.

🔲 Example
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[Windows Manager]

Enter the following descriptions, when using the folder configurations described as examples in "3.2 Creating Switchover Information Storage Folders", and when mounting the switchover information storage folders replicated to the switchover destination site on the E drive during switchover.

- For #rcxstorage_define, enter the path for the "switchover information storage folder".

- For #rcxmgrexport_define, enter the path for "switchover information storage folder\ManagerExport".

- For #rcxrecovery_define, enter the path on which the "Chapter 4 Operation" replicated from the switchover source site after the procedure in "Mounting the Switchover Information Storage Folder [Switchover Destination Site]" will be mounted.

```
#rcxstorage_define
D:\Export
#rcxmgrexport_define
D:\Export\ManagerExport
#rcxrecovery_define
E:\Export
```

[Linux Manager]

Enter the following descriptions, when using the folder configurations described as examples in "3.2 Creating Switchover Information Storage Folders", and when mounting the switchover information storage folders replicated to the switchover destination site on /DRImport during switchover.

- For #rcxstorage_define, enter the path for the "switchover information storage folder".

- For #rcxmgrexport_define, enter the path for "switchover information storage folder/ManagerExport".

- For #rcxrecovery_define, enter the path on which the "4.2.5 Mounting the Switchover Information Storage Folder [Switchover Destination Site]" replicated from the switchover source site after the procedure in "Mounting the Switchover Information Storage Folder [Switchover Destination Site]" will be mounted.

```
#rcxstorage_define
/DRExport/Export
#rcxmgrexport_define
/DRExport/Export/ManagerExport
#rcxrecovery_define
/DRImport/Export
```
・・

Information

Create the DR definition file "fa_dr.rcxprop" using the following sample files.

[Windows Manager]

Installation_folder\SVROR\Manager\etc\customize_data\fa_dr.rcxprop.sample

[Linux Manager]

/etc/opt/FJSVrcvmr/customize_data/fa_dr.rcxprop.sample

- When performing additional recovery after switchover operations, specify the information of the additional recovery information folder for the following definition files in the switchover source site.

[Windows Manager]

Installation_folder\SVROR\Manager\etc\customize_data\fa_dr.rcxprop

[Linux Manager]

/etc/opt/FJSVrcvmr/customize_data/fa_dr.rcxprop

Example

[Windows Manager]

When using "C:\Users\Administrator\work\DRsalvage\Export" for the additional recovery information folder, describe it as follows:

```
#salvage_define
C:\Users\Administrator\work\DRsalvage\Export
```

[Linux Manager]

When using "/root/work/DRsalvage/Export" for the additional recovery information folder, describe it as follows:

```
#salvage_define
/root/work/DRsalvage/Export
```

Information

When the contents of the switchover information storage folder will be kept as they are after a switchover operation and will not be modified until additional recovery after failback, the switchover information storage folder can be specified as the additional recovery information folder.

[Windows Manager]

When "D:\Export\ManagerExport" is set for "#rcxmgrexport_define" in fa_dr.rcxprop, describe the following lines in the same file:

```
#salvage_define
D:\Export
```

[Linux Manager]

When "/DRExport/Export/ManagerExport" is set for "#rcxmgrexport_define" in fa_dr.rcxprop, describe the following lines in the same file:

```
#salvage_define
/DRExport/Export
```

Before starting an additional recovery operation, ensure that the switchover information storage folder has not been updated by switchover information collection (through the rcxmgrexport command) after failback.

Then perform the additional recovery.

. . . .

- When enabling automatic takeover of configuration files, modify the following configuration file on the switchover source site:

[Windows Manager]

Installation_folder\SVROR\Manager\etc\customize_data\fa_dr.rcxprop

[Linux Manager]

/etc/opt/FJSVrcvmr/customize_data/fa_dr.rcxprop

Example

. . . .

When the DR operation method is Active-Active, enter the following content:

```
#DR Operation Method
DR_operation_method=1
#Config File Switchover
config_file_switchover=true
```

When the DR operation method is Active-Standby, enter the following content:

```
#DR Operation Method
DR_operation_method=2
#Config File Switchover
config_file_switchover=true
```

. . . .

Information

. . . .

For the files that are taken over by automatic takeover of configuration files, refer to "Appendix F Target Files of Automatic Takeover of Configuration Files".

Even when whether to enable or disable automatic takeover of configuration files is specified in the DR definition file (fa_dr.rcxprop), the value specified using the -config_file_switchover option of the batch recovery command (the rcxrecovery command), which is executed on the switchover destination site, is given priority.

For details on the rcxrecovery command, refer to "B.2 rcxrecovery".

. . . .

3.4 Configuring Managed Resources

Configure the settings of managed servers and network devices for the switchover source and destination sites.

For details, refer to the following:

- Registering Infrastructure Administrators

  Refer to "3.1 Registering User Accounts" in the "User's Guide for Infrastructure Administrators (Resource Management) CE".

- Creating Definition Files

  Refer to "Appendix G Definition Files" in the "Setup Guide CE".

- Registering Resources with Resource Orchestrator

  Refer to "Chapter 5 Registering Resources" in the "User's Guide for Infrastructure Administrators (Resource Management) CE".

- Installing Software and Registering Agents on VM Hosts

Refer to "8.2 Installing Software and Registering Agents on VM Hosts" in the "User's Guide for Infrastructure Administrators (Resource Management) CE".

- Registering Resources to the Global Pool

  Refer to "Chapter 14 Registering Resources in Resource Pools" in the "User's Guide for Infrastructure Administrators (Resource Management) CE".

- Creating L-Server Templates

  Refer to "15.1.2 Creating" in the "User's Guide for Infrastructure Administrators (Resource Management) CE".

- Creating an L-Server for an Infrastructure Administrator

  Refer to "L-Servers for Infrastructure Administrators" in "1.2.2 Configuring Resources" in the "Setup Guide CE".

- Collecting and Registering Cloning Images

  Refer to "17.5 Cloning Image Operations" in the "User's Guide for Infrastructure Administrators (Resource Management) CE".

- Creating L-Platform Templates

  Refer to "Chapter 8 Templates" in the "User's Guide for Infrastructure Administrators (Resource Management) CE".

For Disaster Recovery environments, configure as follows.

Common Configurations

- For details on the items to match or to be different, between the switchover source and destination sites, refer to "Chapter 2 Design".

- Register servers on the server tree in advance on the switchover destination site as well as on the switchover source site. It is also necessary to configure the BIOS settings on the registered server in advance. For details, refer to "8.2.7 Configuring BIOS Settings of Managed Servers" in the "Design Guide CE".

- Configuration when physical L-Servers are switchover targets

  This procedure is required for all switchover target physical L-Servers on which agents of Resource Orchestrator are installed.

  - Installation of the first managed server on the switchover source site

    1. Install the agent of Resource Orchestrator on a managed server.

    2. Register the managed server to the resource tree on the admin server.

    3. Collect the following file from the managed server.

       [Windows]

       Installation_folder\Agent\StorageRM\Agent\etc\certificate\agent_keystore

       [Linux]

       /etc/opt/FJSVssagt/certificate/agent_keystore

  - Installation of the second managed server on the switchover source site or the first and subsequent managed server on the switchover destination site

    1. Install the agent of Resource Orchestrator on a managed server.

    2. After the agent installation, overwrite "agent_keystore" with the data collected when the first managed server was installed on the switchover source site.

    3. Register the managed server to the resource tree on the admin server.

  This procedure is not necessary for physical L-Servers created using images collected after the procedure above which contain the "agent_keystore" of the collection source.

  When no managed server with an agent of Resource Orchestrator installed is registered on the switchover destination site, copy the files in the following folder again from the manager of the switchover source site to that of the switchover destination site after installing the first managed server on the switchover source site.

  [Windows Manager]

  Installation_folder\SVROR\Manager\etc\opt\FJSVssmgr\current\certificate\

[Linux Manager]

/etc/opt/FJSVrcvmr/opt/FJSVssmgr/current/certificate/

- Regarding the following configurations, use the information that fits the environment on the switchover source and switchover destination site respectively.

[Windows Manager]

- Under *Installation_folder*\SVROR\Manager\etc\storage\emc

- *Installation_folder*\SVROR\Manager\etc\customize_data\storage_portset.rcxprop

- Under *Installation_folder*\SVROR\Manager\etc\customize_data\fc_connection_pattern

[Linux Manager]

- Under /etc/opt/FJSVrcvmr/storage/emc

- /etc/opt/FJSVrcvmr/customize_data/storage_portset.rcxprop

- Under /etc/opt/FJSVrcvmr/customize_data/fc_connection_pattern

Information

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Regarding the files to be stored in fc_connection_pattern

Specify the same file name in each site.

Describe the same definition for NUM_OF_FC and BOOT_FC_PORT in the files for each site.

Describe definitions for STORAGE_X of each file suitable for the storage units in each site.

For details on files to be stored in fc_connection_pattern, refer to "7.1.7 Setting the Number of FCs Fitted and their Position for Each Physical Server" in the "Setup Guide CE".

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- For network devices registered on the network tree, prepare identical devices and register them in advance on the switchover destination site.

- When using the auto-configuration function for network devices

Copy the files and folders below to the switchover destination site.

[Windows Manager]

- *Installation_folder*\SVROR\Manager\etc\customize_data\network_device_model.xml

- *Installation_folder*\SVROR\Manager\etc\scripts\

[Linux Manager]

- /etc/opt/FJSVrcvmr/customize_data/network_device_model.xml

- /etc/opt/FJSVrcvmr/scripts/

- When using a NIC other than one in the default configurations of network auto-configuration, create a server NIC definition, and reflect it on the manager.

Create the same server NIC definition for the switchover destination site as the one for the switchover source site in advance, and reflect it on the manager.

Execute the rcxadm nicdefctl commit command, and reflect the created server NIC definition on the manager.

For details on server NIC definitions, refer to "15.13 Server NIC Definition" in the "Reference Guide (Command/XML) CE".

For details on the rcxadm nicdefctl commit command, refer to "5.15 rcxadm nicdefctl" in the "Reference Guide (Command/XML) CE".

- For admin LAN subnets linked to the switchover target network resources, register the same subnet name and scope on the switchover destination site in advance.

For details on how to register admin LAN subnets, refer to "5.11 Registering Admin LAN Subnets" in the "User's Guide for Infrastructure Administrators (Resource Management) CE".

- For the Active-Standby operation, proceed with the switchover destination site installation before registering resources in the resource pool. When using the backup site for tasks with lower priority, proceed with the switchover destination site installation before performing switchover.

For the Active-Active operation, install both the switchover source site and switchover destination site.

- The following customizations on the switchover source site, which are performed according to "Chapter 9 Post-Installation Procedures" in the "Setup Guide CE", need to be reflected on the switchover destination site before switchover.

Perform configuration when configuring the environment, or reflect the settings during switchover.

  - "9.1 Settings for Sending Email"

  - "9.2.2 Setting Application Process Settings"

  - "9.2.3 Setting Application Process to be Used"

  - "9.3 Customizing the Dashboard"

  - "9.4 Setting the Host Names for Virtual Servers"

  - "9.5 Setting the Method for Setting Resource Names"

  - "9.6 Settings for the Overcommit Function"

  - "9.7 Editing the Environment Setup File for the L-Platform API"

  - "9.9 System Disk Settings for Physical L-Servers"

  - "9.12 Editing the License Agreement"

  - "9.13 Editing the User Agreement when Registering a User"

Back up the following files if they have been modified.

[Windows Manager]

  - *Installation_folder*\RCXCFMG\config\command_config.xml

  - *Installation_folder*\RCXCFMG\config\mail_config.xml

  - *Installation_folder*\RCXCFMG\config\vsys_config.xml

  - *Installation_folder*\RCXCTMG\Charging\conf\accounting.properties

  - *Installation_folder*\RCXCTMG\MyPortal\config\application_process.properties

  - *Installation_folder*\RCXCTMG\MyPortal\config\custom_config.xml

  - *Installation_folder*\RCXCTMG\MyPortal\config\managerview_config.xml

  - *Installation_folder*\RCXCTMG\MyPortal\config\license\create\default

  - *Installation_folder*\RCXCTMG\MyPortal\config\license\reconfigure\default

  - *Installation_folder*\RCXCTMG\MyPortal\config\license\return\default

  - *Installation_folder*\RCXCTMG\SecurityManagement\conf\portal.properties

  - *Installation_folder*\IAPS\F3FMihs\servers\FJapache\htdocs\sopdocs\pub\html\en\cRegApply_agreement.forUse_en.html

[Linux Manager]

  - /etc/opt/FJSVcfmg/config/command_config.xml

  - /etc/opt/FJSVcfmg/config/mail_config.xml

  - /etc/opt/FJSVcfmg/config/vsys_config.xml

  - /etc/opt/FJSVctchg/conf/accounting.properties

  - /etc/opt/FJSVctmyp/config/application_process.properties

  - /etc/opt/FJSVctmyp/config/custom_config.xml

  - /etc/opt/FJSVctmyp/config/managerview_config.xml

  - /etc/opt/FJSVctmyp/config/license/create/default

- /etc/opt/FJSVctmyp/config/license/reconfigure/default

- /etc/opt/FJSVctmyp/config/license/return/default

- /etc/opt/FJSVctsec/conf/portal.properties

- /var/opt/FJSVihs/servers/FJapache/htdocs/sopdocs/pub/html/en/cRegApply_agreement.forUse_en.html

Storage Location of Switchover Target Resources for Tenant Switchover

- Store the following switchover target resources in the tenant:

  - Address set resources

  - L-Servers for infrastructure administrators

- It is recommended to store the following switchover target resources in the tenant:

  - Cloning images

    When performing tenant switchover with the images stored in the global pool, images which never been deployed are not switched over.

  - Network Resources

    When performing tenant switchover with the resources stored in the global pool, those resources are locked. Consequently, deployment using the network resources in other tenants cannot be performed in the switchover source site.

Creation of Information on L-Platform Templates for Active-Active Operation

Configure attributes of information on L-Platform templates as follows.

Table 3.2 Attributes to Configure for L-Platform Template Information

L-Platform Template Information	Attributes Shown As "Tenant"
Software information	Tenant information
Image information	Tenant information
Segment information	Tenant information
L-Platform template information	Tenant information

For details of information on L-Platform templates, refer to "7.4 Items to Set for Each Type of L-Platform Template Information" in the "User's Guide for Tenant Administrators CE".

Configurations when an L-Server Linked with a Configured Virtual Machine (VMware) Is the Switchover Target

When L-Servers linked with configured virtual machines (VMware) are switchover targets, it is necessary to modify the configurations regarding the UUIDs of VM guests before performing switchover. Modify configurations following the descriptions in the VMware section in "Configuration Requirements for VM Guest Switchovers" in "9.2.1 Configuration Requirements" in the "Design Guide VE".

Configuration when Performing Virtual L-Server Switchover (VM Guest)

The advisory notes regarding performing virtual L-Server switchover (VM guest) are given below.

- Set up the VM host on both the switchover source and destination sites.

- Do not configure VM hosts on physical L-Servers.

- Before performing switchover, perform the following preparations for the switchover destination site in order to be able to mount the replicated LUNs on the correct VM hosts. It is necessary to mount the replicated LUNs on the VM host connected with the images stored in each VM host registered in the VM pool used by L-Servers in the LUNs, or in VM hosts connected with the images stored in the LUNs.

  - When using FC or iSCSI connection disks

    Configure the zoning and mapping settings so that the replicated LUNs can be referred to from the VM hosts.

  - When using NAS connection disks

    - Operate the network links or the storage software so that the replicated LUNs can be mounted on the VM hosts.

- Prepare the NFS connection information files that describe the information (NFS server addresses and NFS paths) for mounting each replicated LUN (datastore) in the following format. Use this file during the switchover procedure. For details, refer to "Chapter 4 Operation".

```
Datastore name, IP address or FQDN, NFS path
```

📘 Example
....
```
storage_X,192.168.3.230,/nfs/data
```
....

- [VMware]

  - Do not use multibyte characters for datastore names.

  - When using distributed virtual switches, the connections between the virtual machines and the port group of the distributed virtual switches in the switchover destination site cannot be restored. After switchover, configure the settings again.

  - When editing the destination VM files of the virtual machines through direct operation of VM management software, edit all VM files to deploy on the datastore in which the system disks or data disks of the virtual machines are located.

  - When editing the destination VM file through direct operation of VM management software, edit the VM file for a template (cloning image) to deploy in the datastore.

  - Only a datastore used by the switchover target L-Servers or cloning images can be mounted in the VM host, during the switchover procedure. When mounting a replicated datastore other than the above, manually mount it after switchover.

  - Once disks are deleted from a virtual machine in the switchover source site, any snapshots of the virtual machine taken before deletion of disks cannot be used on the switchover destination site. Therefore, you should delete old snapshots and take new ones after deleting disks from a virtual machine.

    If snapshots taken before deletion of disks are not deleted, there will be the following effects on the switchover destination site:

    - Unavailable snapshots consume disk resources.

    - If the usage charge calculation function is enabled in the accounting settings, the usage charges for unavailable snapshots are calculated in the same way as available snapshots.

- [OVM for SPARC]

  - Use the following procedure to register the disks of the replication destination as disk resources with the manager of the switchover destination site in advance.

    1. Mount the volume on a SPARC server for which replication is not being performed.

    2. Register disk resources according to the procedure in "2. Register Disk Resources" in "8.8.3 Registering Resources in Resource Pools" in the "Setup Guide CE".

    3. After registering disk resources, unregister the relevant disk resources from the storage pool.

    4. Unmount the disk from the SPARC server.

    5. Start replication again.

  - When there is an L-Server of an OVM for SPARC domain other than the guest domain, limit the switchover scope to make it out of the switchover scope.

  - Switchover of cloning images (system packages) is not possible.

    After completion of switchover, create a cloning image with the same name as the cloning image on the switchover source on the switchover destination site. Then register it in the image pool migrated from the switchover source site.

    The respective servers in the switchover source and destination sites are used as the installation servers.

3.5 Configuring for Limiting Switchover Scope

- Switchover scope can be limited either by specifying switchover target storage pools or by specifying L-Servers outside the switchover. These methods can be used in combination.

- When specifying switchover target storage pools

  Enter replication target storage pools in the following file of the switchover source site.

  [Windows Manager]

  Installation_folder\SVROR\Manager\etc\customize_data\fa_dr.rcxprop

  [Linux Manager]

  /etc/opt/FJSVrcvmr/customize_data/fa_dr.rcxprop

  ## 📋 Example
  ....

  Enter the following descriptions when specifying the global pool StoragePool1 and the local pool StoragePool2 of tenantA as the storage pools that are the targets of replication. Specify the storage pool name using the full path (the path must start with "/"). When specifying multiple storage pools as the targets of replication, enter multiple lines of descriptions.

  ```
  #dr_storagepool
  storage_pool=/StoragePool1
  storage_pool=/tenantA/StoragePool2
  ```
  ....

  ## 📌 Note
  ....

  - When switchover scope is not limited by specifying replication target storage pools, all resources on the sites become the targets of switchover, as all storage pools are regarded as the targets of replication.

    Perform replication of all disk resources and virtual storage resources.

  - Virtual L-Servers linked with virtual servers are switchover targets regardless of whether storage pools are specified. If necessary, specify them as out of the switchover scope.
  ....

- When specifying L-Servers outside the switchover scope

  Enter L-Servers outside the switchover in the following file of the switchover source site.

  [Windows Manager]

  Installation_folder\SVROR\Manager\etc\customize_data\fa_dr.rcxprop

  [Linux Manager]

  /etc/opt/FJSVrcvmr/customize_data/fa_dr.rcxprop

  ## 📋 Example
  ....

  Enter the following descriptions when specifying the global L-Server1 and L-Server2 of L-platformX of tenantA as L-Servers outside the switchover.

  Specify the L-Server names using the full path (the path must start with "/"). When specifying multiple L-Servers outside the switchover, enter multiple lines of descriptions.

  ```
  #exclude_lserver
  /L-Server1
  /tenantA/L-platformX/L-Server2
  ```
  ....

  ## 📌 Note
  ....

  - For physical/virtual L-Server switchover (VM host/VM guest), switchover scope cannot be limited.

  - Virtual L-Servers linked with virtual servers are switchover targets regardless of whether storage pools are specified. If necessary, specify them as out of the switchover scope.
  ....

- When limiting switchover scope, use the disk resources or the virtual storage resources registered in the storage pools of the switchover targets for the tenants, L-Servers for the infrastructure administrator, and images.

3.6 Creating Files Used for Switchover

Create the following files on the switchover source site.

When performing failback, it is also necessary to create the following files on the switchover destination site.

1. Create the mapping definitions of physical servers [Physical L-Server switchover (physical OS), Physical/Virtual L-Server switchover (VM host/VM guest)]

   When names of physical servers registered on the server tree of Resource Orchestrator are different between the switchover source site and the switchover destination site, creating mapping definitions enables defining of the relationships of corresponding servers between sites.

   This file must be located in the MAP folder under the switchover information storage folder and be a csv file that includes the following content.

   - Any file name can be used.

   - Comments cannot be set in this definition file.

   - Blank lines in this definition file are regarded as meaningless and skipped.

   - Enter the physical server mapping definitions in a single file.

   - When defining physical server mapping, enter "#PhysicalServer" in a single line in this definition file. Enter the mapping definitions for physical servers after this line.

     Each physical server mapping definition should be stated in a single line, separating two corresponding physical server names using a comma (",").

     ```
     #PhysicalServer
     Server1-1,Server2-1
     Server1-2,Server2-2
     ```

   Server1-1 and *Server1-2* are the server names on the switchover source site.

   Server2-1, Server2-2 are the server names on the switchover destination site.

   For details on the physical server mapping definitions, refer to "B.2 rcxrecovery".

   📖 Information
   ....

   Mapping definitions of physical servers and VM management software can be described in the MAP folder using either one of the following file configurations.

   - Enter descriptions in a single file

   - Enter descriptions in (two) different files

   When including both the definition of physical server mapping and the definition of VM management software in the same file, do not give the descriptions as follows:

   - Describing the physical server mapping definitions after the line including "#VMManagementSoftware", and before the line including "#PhysicalServer"

   - Describing the VM management software mapping definitions after the line including "#PhysicalServer", and before the line including "#VMManagementSoftware"
   ....

2. Create the mapping definitions of VM management software [Physical/virtual L-Server switchover (VM host/VM guest), virtual L-Server switchover (VM guest)]

   When names of VM management software registered on the VM management tree of Resource Orchestrator are different between the switchover source site and the switchover destination site, creating the mapping definitions enables defining of the relationship of corresponding VM management software between sites.

This file must be located in the MAP folder under the switchover information storage folder and be a csv file that includes the following content.

- Any file name can be used.

- Comments cannot be set in this definition file.

- Blank lines in this definition file are regarded as meaningless and skipped.

- Enter mapping definitions for VM management software in a single file.

- When defining VM management software mapping, enter "#VMManagementSoftware" in a single line in this definition file. Enter the mapping definitions for VM management software after this line.

  Each VM management software mapping definition should be stated in a single line, separating two corresponding VM management software names using a comma (",").

```
#VMManagementSoftware
VMM1-1,VMM2-1 VMM1-2,VMM2-2
```

VMM1-1 and *VMM1-2* are the VM management software names on the switchover source site.

VMM2-1 and *VMM2-2* are the VM management software names on the switchover destination site.

For details on the mapping definitions of VM management software, refer to "B.2 rcxrecovery".

Information

Mapping definitions of physical servers and VM management software can be described in the MAP folder using either one of the following file configurations.

- Enter descriptions in a single file

- Enter descriptions in (two) different files

When including both the definition of physical server mapping and the definition of VM management software in the same file, do not give the descriptions as follows:

- Describing the physical server mapping definitions after the line including "#VMManagementSoftware", and before the line including "#PhysicalServer"

- Describing the VM management software mapping definitions after the line including "#PhysicalServer", and before the line including "#VMManagementSoftware"

3. Create a definition file of VM management software [Physical/virtual L-Server switchover (VM host/VM guest)]

   Create the information in the switchover information storage folder in order to register VM management software of Resource Orchestrator on the switchover destination site.

   - Specify the file name as vmmgr_file.txt.

   - Lines beginning with sharp signs ("#") are comments in this definition file.

   - Blank lines in this definition file are regarded as meaningless and skipped.

   - The format of this definition file is shown below.

     For details on the VM management software definition file, refer to "B.2 rcxrecovery".

```
#name soft name ip user name password physical-lserver
vcenter, vmware-vc, 192.168.1.24, admin, admin, no
scvmm, ms-scvmm, 192.168.100.77, root, root, yes
```

After performing failback, when restoring the switchover destination site to the state that it was in before switchover, create this definition file on the switchover destination site, in addition to the definition file for failback. In addition, include the information of the switchover destination site in the definition file.

The definition file created for VM management software is used when performing "4.2.1 Stopping Services and Releasing Resources [Switchover Destination Site]".

> **Note**
> ....
> When using virtual L-Server switchover (VM guest), do not create this file.
> ....

4. Create a VM pool definition file [Virtual L-Server switchover (VM guest)]

   Create the file defining VM hosts on which the switchover target virtual L-Server is operating under the switchover information storage folder as follows.

   - Specify the file name as vm_pool.csv.

   - Lines beginning with sharp signs ("#") are comments in this definition file.

   - Blank lines in this definition file are regarded as meaningless and skipped.

   - The format of this definition file is shown below.

     For details on the VM pool definition files, refer to "B.2 rcxrecovery".

     ```
     #vmpool_name,vmhost_name,vmhost_type
     /VMHostPool,192.168.2.1,VMware
     /VMHostPool,192.168.2.2,OVM-SPARC
     /tenant1/TenantVMHostPool,vmhost1.example.org,VMware
     /tenant1/TenantVMHostPool,vmhost2.example.org,OVM-SPARC
     /tenant2/TenantVMHostPool,192.168.10.15
     ```

   - Specify the VM pool name of the switchover source site for vmpool_name.

   - Specify the VM host name (displayed on the server tree of the ROR console in the switchover destination site) of the switchover destination site to be registered in the vmpool_name in the switchover destination site for vmhost_name.

   - Specify the VM host type for vmhost_type.

     "VMware" and "OVM-SPARC" can be specified for vmhost_type. If this option is omitted, "VMware" is set.

   - When registering multiple VM hosts in a VM pool, enter multiple lines.

   After performing failback, when restoring the switchover destination site to the state that it was in before switchover, create this definition file on the switchover destination site, in addition to the definition file for failback. In addition, include the information of the switchover destination site in the definition file.

   The definition file created is used when performing "4.2.1 Stopping Services and Releasing Resources [Switchover Destination Site]".

> **Note**
> ....
> When performing physical/virtual L-Server switchover (VM host/VM guest), do not create this file.
> ....

> **Information**
> ....
> By configuring the number of VM pools specified in the VM pool in the file above as one smaller than that of the switchover source site, the number of VM hosts can be reduced on the switchover destination site.
> ....

3.7 Configuring Automatic Collection of Switchover Information

Configure automatic switchover information collection settings on the switchover source and destination sites.

The portion of switchover information that is modified through operations by tenant users or tenant administrators, other than firewall setting information, can be collected automatically.

When configuring automatic failover information collection settings, select either of the following operations, and configure the selected settings.

- Operation collecting the information periodically

  To start operations for switchover at regular intervals, perform the following operation:

  - When performing virtual L-Server switchover (VM guest), and not performing physical L-Server switchover (physical OS)

    [Windows Manager]

    ```
    >Installation_folder\SVROR\Manager\bin\rcxmgrexport -interval minutes -base <RETURN>
    ```

    [Linux Manager]

    ```
    # /opt/FJSVrcvmr/bin/rcxmgrexport -interval minutes -base <RETURN>
    ```

    For details on the rcxmgrexport command, refer to "B.1 rcxmgrexport".

  - In other cases

    [Windows Manager]

    ```
    >Installation_folder\SVROR\Manager\bin\rcxmgrexport -interval minutes <RETURN>
    ```

    [Linux Manager]

    1. Execute the following command:

       ```
       # /opt/FJSVrcvmr/bin/rcxmgrexport -interval minutes <RETURN>
       ```

       When the replication software being used is ACM-CCM or SnapMirror, the procedure after this point is not required.

    2. When the Resource Orchestrator manager and the replication software are installed on the same server

       Add the following path to the start of the "/etc/cron.d/SVROR_rcxmgrexportwrapper" file depending on the type of replication software that will be used.

       - NaviSphere

       PATH=/bin:/usr/bin:/opt/Navisphere/bin

       - Solutions Enabler

       PATH=/bin:/usr/bin:/usr/symcli/bin

       After adding the paths, it is not necessary to restart the OS or cron services.

       It is necessary to add the paths described above every time the rcxmgrexport -interval command is executed.

       For details on the rcxmgrexport command, refer to "B.1 rcxmgrexport".

- Operation collecting the configuration definition information after changes are made

  Configuration definition information will be collected automatically upon the occurrence of events causing a change of switchover information. Perform the operations described below.

  For details on the timing of automatic collection of switchover information, refer to "B.1 rcxmgrexport".

  - When performing virtual L-Server switchover (VM guest), and not performing physical L-Server switchover (physical OS)

    [Windows Manager]

    ```
    Installation_folder\SVROR\Manager\bin\rcxmgrexport -event on -base <RETURN>
    ```

    [Linux Manager]

    ```
    # /opt/FJSVrcvmr/bin/rcxmgrexport -event on -base <RETURN>
    ```

    For details on the rcxmgrexport command, refer to "B.1 rcxmgrexport".

  - In other cases

    [Windows Manager]

    ```
    Installation_folder\SVROR\Manager\bin\rcxmgrexport -event on <RETURN>
    ```

    [Linux Manager]

```
# /opt/FJSVrcvmr/bin/rcxmgrexport -event on <RETURN>
```

For details on the rcxmgrexport command, refer to "B.1 rcxmgrexport".

📝 Note

. . . .

- When collecting the switchover information using Disaster Recovery, the information for the entire system is collected. When collecting the information in environments with a high frequency of update, or with short time intervals configured, normal operations may be affected. Review the operation method, considering the impact on business.

- There is information which is not collected by the automatic collection performed by "3.7 Configuring Automatic Collection of Switchover Information", but is necessary for disaster recovery failover. Perform the operation described in "Chapter 4 Operation" to manually collect this failover information.

- Even when performing physical L-Server switchover (physical OSs), for configurations that do not replicate LUNs that are connected with the L-Servers, use the rcxmgrexport -event on -base command.

  (Configuration example: The LUN connected with an L-Server is copied to another LUN using One Point Copy to be replicated)

- Switchover information is not collected automatically at the timing when setting operations for collecting information regularly or for collecting in case the configuration definition information is changed is enabled. To collect information at the timing when the setting is enabled, execute the rcxmgrexport command manually.

. . . .

3.8 Configuring the DR Configuration Check Tool

Before executing the DR configuration check tool, configure the DR configuration check tool manually using the following procedure.

1. When performing VMware L-Server switchover (VM guest), configure VMware vSphere CLI (vCLI) using the procedure in "3.3 Manager Installation and Configuration".

   If these configuration operations are not performed, or if vCLI was installed on a server other than the admin server, the following error message is displayed in the execution result for check number 1 of the DR configuration check tool (Presence of LUN replication in the switch scope).

   ```
   Item 01: Correctness of Storage Replication
   Result: ERROR
   Details:
   ERROR: Replication check of vmware datastores cannot be performed. Detail: vCLI is not installed
   or path of vCLI has not been set to environment variable.
   ```

   If vCLI was installed on a server other than the admin server, ignore this message.

📖 Information

. . . .

Even if the path to vCLI is not added to the PATH environment variable on a Windows manager, the DR configuration check tool can be executed using the vCLI command prompt.

. . . .

📝 Note

. . . .

- When the switchover target is OVM for SPARC, these settings are not necessary.

- The replication settings for the OVM for SPARC disk that is the switchover target are not checked by the DR settings tool. Therefore, check the replication settings of the OVM for SPARC disk using storage management software.

. . . .

2. When using ETERNUS storage units, set the replication configuration information on the switchover source site.

   [Windows Manager]

   Installation_folder\SVROR\Manager\etc\customize_data\fa_dr.rcxprop

   [Linux Manager]

/etc/opt/FJSVrcvmr/customize_data/fa_dr.rcxprop

📄 Example

....

```
#rcxrepdef_define
ccm, ,192.168.0.205, 192.168.0.206
```

For details, refer to "Required Option Setting Information for the rcxrepdef Command" in "B.1 rcxmgrexport".

....

📝 Note

....

The check for the use of replication by the DR configuration check tool can be executed only when CCM has been installed on the manager of Resource Orchestrator.

When the replication configuration information has not been set, the check for the use of replication is not executed.

....

3. If necessary, set the definition file for the DR configuration check tool in the switchover source site and the switchover destination site.

   - Lines beginning with sharp signs ("#") are comments in this definition file.

   - Blank lines in this definition file are regarded as meaningless and skipped.

   [Windows Manager]

   Installation_folder\SVROR\Manager\etc\customize_data\drcheck.rcxprop

   [Linux Manager]

   /etc/opt/FJSVrcvmr/customize_data/drcheck.rcxprop

   It is necessary to specify the -config_dir option when all of the following conditions are met:

   - "rcxdrcheck_prepare_define" is not specified in the definition file

   - The command is executed with "prepare" specified for the "-mode" option

   When all of the following conditions are met, it is necessary to specify the -config_dir option.

   - "rcxdrcheck_check_define" is not specified in the definition file

   - The command is executed with "check" specified for the "-mode" option

   It is necessary to specify the -dir option when all of the following conditions are met:

   - "#rcxmgrexport_define" is not specified in the DR definition file (fa_dr.rcxprop)

   - The command is executed with "check" specified for the "-mode" option

   For details, refer to "B.6 rcxdrcheck".

📄 Example

....

```
#Please select the DR switchover method.
#1:Physical L-Server switchover
#2:Physical/Virtual L-Server switchover
#3:Virtual L-Server switchover
#4:both Physical L-Server switchover and Physical/Virtual L-Server switchover
#5:both Physical L-Server switchover and Virtual L-Server switchover
#ex) DR_switchover_method=1

DR_switchover_method=1
#Please select the type of DR operation method.
#1.Active-Active
#2.Active-Standby
#ex) DR_operation_method=1
```

```
DR_operation_method=1
# Please select which check items will be excluded.
# All items will be checked if nothing is specified.
#1. Correctness of Storage Replication
#2. Confliction of Storage Names
#3. Integrality of Rcxrecovery Input Files
#4. Consistency of rcxmgrexport output
#5. Location of Physical Image Folder
#6. Confliction of Resource Name
#7. Confliction of Network Resource
#8. Confliction of AddressSet Resource
#9. Consistency of Server Resource
#10. Consistency of Network Device
#11. Consistency of ROR Manager Version
#12. Consistency of ROR manager Installation Folder
#13. Consistency of Admin Lan IP Address
#14. Confliction of Storage Units' IP Addresses
#15. Confliction of Servers' IP Addresses
#16. Use of Global AddressSet and Network
#17. Confliction of Software ID
#18. Correctness of definition file configuration
#19. Consistency of Resource Name
# ex) excluded_check_items =1,2,11,13
excluded_check_items =1,2,11,13
#Specify the rcxdrcheck prepare folder.
#For Windows Manager:
#ex) rcxdrcheck_prepare_define=D:\Export\drcheck_prepare_dir
#For Linux Manager:
# ex) rcxdrcheck_prepare_define=/DRExport/Export/drcheck_prepare_dir
rcxdrcheck_prepare_define=D:\Export\drcheck_prepare_dir
#Specify the rcxdrcheck check folder.
#For Windows Manager:
# ex) rcxdrcheck_check_define=D:\Export\drcheck_check_dir
#For Linux Manager:
# ex) rcxdrcheck_check_define=/DRExport/Export/drcheck_check_dir
rcxdrcheck_check_define=D:\Export\drcheck_check_dir
```

For details on setting items, refer to "B.6 rcxdrcheck".

Information

Create definition files for the DR configuration check tool using the following sample files.

[Windows Manager]

Installation_folder\SVROR\Manager\etc\customize_data\drcheck.rcxprop.sample

[Linux Manager]

/etc/opt/FJSVrcvmr/customize_data/drcheck.rcxprop.sample

Chapter 4 Operation

This chapter explains operation of a Disaster Recovery environment using Resource Orchestrator.

4.1 Normal Operation

This section explains operations that need to be performed in order to be able to perform disaster recovery switchover.

Notes on Setting of Resources

When creating resources, there are restrictions on the setting of resource names, etc.

For details, refer to the following:

- "2.6.3 Items to Be Different between the Switchover Source and Destination Sites"

- "Storage Location of Switchover Target Resources for Tenant Switchover" and "Creation of Information on L-Platform Templates for Active-Active Operation" in "3.4 Configuring Managed Resources".

Advisory Notes when Modifying System Configurations

When performing the operations described in the following table, update the definition information by checking the references.

When not limiting switchover scope, all resources on the site are the targets of switchover.

Table 4.1 Operations Requiring Definition Information Update

Operation	Reference
- Creating and deleting L-Platforms - Creating and deleting L-Servers	- "3.5 Configuring for Limiting Switchover Scope"
- Creating and deleting tenants	- "3.5 Configuring for Limiting Switchover Scope" - "4. Create a VM pool definition file [Virtual L-Server switchover (VM guest)]" in "3.6 Creating Files Used for Switchover".
- Creating, deleting, and migrating VM pools - Modifying VM pool names	- "4. Create a VM pool definition file [Virtual L-Server switchover (VM guest)]" in "3.6 Creating Files Used for Switchover".
- Adding and deleting VM hosts If the switchover destination site is one on which VM hosts have been added or deleted, it is necessary to update the definition information on the switchover source site when performing virtual L-Server switchover (VM guest).	- "4. Create a VM pool definition file [Virtual L-Server switchover (VM guest)]" in "1. Create the mapping definitions of physical servers [Physical L-Server switchover (physical OS), Physical/ Virtual L-Server switchover (VM host/VM guest)]" in "3.6 Creating Files Used for Switchover".
- Creating, deleting, and migrating storage pools - Modifying storage pool names	- "3.5 Configuring for Limiting Switchover Scope"
- Updating the management information of VM management software Modifying IP addresses or login passwords, etc.	- "3. Create a definition file of VM management software [Physical/ virtual L-Server switchover (VM host/VM guest)]" in "3.6 Creating Files Used for Switchover"
- Modifying DR switchover targets (L-Servers, storage) - Modifying replication target LUNs	- "3.5 Configuring for Limiting Switchover Scope"
- Modifying the replication configuration Modification of IP addresses of the storage used or the replication software, etc.	- "Required Option Setting Information for the rcxrepdef Command" in "B.1 rcxmgrexport"

Collecting Switchover Information

If updating is performed, such as resource configuration information to do with an L-Platform deployment, or patches are applied to ROR managers, perform the following to collect the information for Disaster Recovery switchover. Collect information either automatically or periodically to ensure the latest configuration information is available.

1. Export the Required Information from the Switchover Source Site

   a. Export the Required Information

   As a backup in case of failure of the switchover source site, and where an environment that can be used for recovery has been constructed, export the information as explained below. The information can be automatically collected by configuring the settings. For how to configure the automatic collection settings, refer to "3.7 Configuring Automatic Collection of Switchover Information".

   - L-Platform Templates

   - L-Platform Configuration Information

   - Resource Information

   - Role Information

   - Execution Information of Sample Scripts

   - Accounting information

   - Metering Logs

   - Usage Charges

   - Configuration File Information

   One of the following operations is recommended.

   - When changing the configurations of managed servers, export the information first, and maintain the latest system information

   - Export regularly, and update the data

   Execute the command shown below to collect the information.

   [Windows Manager]

   ```
   >Installation_folder\SVROR\Manager\bin\rcxmgrexport<RETURN>
   ```

   [Linux Manager]

   ```
   # /opt/FJSVrcvmr/bin/rcxmgrexport <RETURN>
   ```

   ### Information

   The following configuration files are collected by executing the rcxmgrexport command. These configuration files can be referred to when making the content of the configuration file for the switchover destination file the same as the one for the switchover source site, during switchover.

   - "2.6.5 Configuration Files for Matching Details between the Switchover Source and Destination Sites"

   - "Appendix F Target Files of Automatic Takeover of Configuration Files"

   - "2.6.6 Customized Settings on the Switchover Source Site"

   These configuration files are output to the following switchover information storage folder:

   [Windows Manager]

   Switchover information storage folder\ManagerExport\CONFIG_FILEDate Exported

   [Linux Manager]

   Switchover information storage directory/ManagerExport/CONFIG_FILEDate Exported

   For details on the switchover information storage folder, refer to "3.2 Creating Switchover Information Storage Folders".

For details on the rcxmgrexport command, refer to "B.1 rcxmgrexport".

b. Export Network Configuration Information

When you change the target network device configuration, keep the latest system configuration by exporting the information.

Execute the command shown below to collect the information.

[Windows Manager]

```
>Installation_folder\SVROR\Manager\bin\rcxadm netconfig export -file switchover_information_storage_folder
\OtherBackupfiles\networkconfiginfo.xml <RETURN>
```

[Linux Manager]

```
# /opt/FJSVrcvmr/bin/rcxadm netconfig export -file Switchover_installation_folder/OtherBackupfiles/
networkconfiginfo.xml <RETURN>
```

Specify the XML file of the output destination used as the -file option argument so that it will be stored in *switchover_information_storage_folder*\OtherBackupFiles.

For details on the rcxadm netconfig command, refer to "3.7 rcxadm netconfig" in the "Reference Guide (Command/XML) CE".

📒 Note

- Operations such as L-Platform deployment, cancellation, or configuration modifications that change various information must not be performed during the export of information.

- If the accounting setting is on, it is recommended to export switchover information every day.

This ensures the exported information of the switchover source site will be updated with the newest information.

- When using VMware as the server virtualization software, note the following regarding execution of rcxmgrexport:

  - Do not execute rcxmgrexport immediately after performing any operations that move the files of the virtual machines (e.g. VM migration involving changes of datastores, storage vMotion). Be sure to execute rcxmgrexport after the information is reflected on ROR by a regular update.

  - When a virtual machine is moving a VM host (e.g. vMotion), do not execute rcxmgrexport. Execute rcxmgrexport after such operations are completed.

2. Confirm Switchover Scope

Perform this procedure when configuring the limitations of switchover scopes.

After executing rcxmgrexport, execute the following commands to confirm that the switchover scope is correct.

```
rcxmgrexport -drlist : Displays the list of the resources that are switchover targets.

rcxmgrexport -drlist -error : Displays the list of resources which use both targeted storage and non-targeted storage for Disaster Recovery, and therefore cannot be switched over.
```

📘 Example

```
> rcxmgrexport -drlist
TYPE NAME
---- ----
L-Server /tenant_1/l-server_1
Image /image_1
Image /image_2
> rcxmgrexport -drlist -error
TYPE NAME
---- ----
L-Server /tenant_1/l-server_1
```

For details on the rcxmgrexport command refer to "B.1 rcxmgrexport".

If the displayed switchover targets are not appropriate, check if the limitation of switchover scope is correctly configured. For details on how to configure limitation of switchover scope, refer to "3.5 Configuring for Limiting Switchover Scope".

3. Obtain the Storage Replication Information

   Create a replication definition file describing the relationship of LUNs in the switchover source and destination sites when replicating storage units.

   When "3.7 Configuring Automatic Collection of Switchover Information" is performed, this operation is not necessary, because the information is collected automatically.

   Create a replication definition file that describes LUN relations.

   When using dynamic LUN mirroring storage of ETERNUS, as the target LUNs to be replicated are changed by the deployment or cancellation of L-Platforms, and the addition or removal of disks, create the replication definition file using the rcxrepdef command.

   When using a LUN that was created in advance, if the replication definition is created, modified, or deleted by the storage management software, create a replication definition file using the rcxrepdef command.

   For configurations where LUNs connected with L-Servers are not replicated (Configuration example: The LUN connected with an L-Server is copied to another LUN using One Point Copy for replication), the rcxrepdef command cannot be used. Create replication definition files manually.

   For details on replication definition files, refer to "Replication Definition Files" in "18.1.3 High Availability for Storage Chassis" in the "Operation Guide CE".

   ### 🖼 Example
   ....

   [Windows Manager]

   > *Installation_folder*\SVROR\Manager\bin\rcxrepdef ccm -local 192.168.0.X -remote 192.168.0.Y -file file1 <RETURN>

   [Linux Manager]

   # /opt/FJSVrcvmr/bin/rcxrepdef ccm -local 192.168.0.X -remote 192.168.0.Y -file file1 <RETURN>

   ....

   After creating the replication definition file, specify it and create the file to perform mapping of LUNs in the switchover destination site resources from the relation lists during import.

   To create this file, execute the rcxstorage command with the -recovery, -mode, and -outfile options specified. Specify "prepare" for the -mode option, and *switchover_information_storage_folder*\storage_file for the -outfile option.

   For details on the *switchover information storage folder*, refer to "3.2 Creating Switchover Information Storage Folders".

   ### 🖼 Example
   ....

   [Windows Manager]

   > *Installation_folder*\SVROR\Manager\bin\rcxstorage -recovery -mode prepare -file file1 -outfile D:\Export\storage_file <RETURN>

   [Linux Manager]

   # /opt/FJSVrcvmr/bin/rcxstorage -recovery -mode prepare -file file1 -outfile /DRExport/Export/storage_file <RETURN>

   ....

   For details on replication definition files, refer to "Replication Definition Files" in "18.1.3 High Availability for Storage Chassis" in the "Operation Guide CE".

   For details on the rcxrepdef command, refer to "5.22 rcxrepdef" in the "Reference Guide (Command/XML) CE".

   For details on the rcxstorage command, refer to "5.23 rcxstorage" in the "Reference Guide (Command/XML) CE".

4. Back Up Directory Service Information (When Using Single Sign-On Authentication)

When using Single Sign-On authentication, back up the directory service information. Back up the information, after performing operations such as registration, modification, or deletion of a user. For the backup procedure, refer to the manual for the directory service product being used.

5. Back Up VM Management Software Information

When not configuring VM management software on a physical L-Server using the physical/virtual L-Server switchover (VM host/VM guest) method, it is necessary to restore the VM management software information during switchover. Therefore, back up the VM management software information as well. For details on how to back up and restore VM management software information, refer to the manual of each VM management software. It is necessary to collect the VM management software information when registering, modifying, or deleting an L-Platform on which a virtual L-Server is deployed.

6. Back Up Firewall Configurations

When configuring a firewall automatically using the auto-configuration function for network devices, it is recommended to use the network device configuration backup command or the management software configuration backup function, and operate as follows:

    a. After configuring auto-configuration of the firewall, back up the configuration automatically and collect the newest configuration.

    To enable this function, refer to "9.4.8.2 When Using the Network Device File Management Function" in the "Design Guide CE" for required settings.

    For details on auto-configuration function of the network devices, refer to "2.2.7.4 Network Device Automatic Configuration" in the "Design Guide CE".

    b. Back up firewall configurations regularly.

    When backing up a firewall configuration regularly, the -event option of the rcxmgrexport command must be disabled.

    Collect the firewall configuration immediately after executing the rcxmgrexport command, which exports configuration information of Resource Orchestrator, to synchronize the timing of backup of network device configuration files.

    Use the rcxadm netdevice cfbackup command for the backup of network device configuration files.

    For details on the rcxadm netdevice command, refer to "3.8 rcxadm netdevice" in the "Reference Guide (Command/XML) CE".

    When not using the auto-configuration function of network devices, it is recommended to perform the operation in step b.

7. Customize Roles

Do not create a role using the same name as that of a role copied from the basic role, on different sites.

If the basic role or a role restored by DR switchover is modified on one site, perform the same modification on the other site as well.

For details on how to customize roles, refer to "5.1.3 Customizing Roles" in the "Design Guide CE".

8. Transfer the Switchover Information Storage Folder

When manually copying the switchover information storage folder, transfer the switchover information storage folder to the Resource Orchestrator manager on the switchover destination site.

Transfer the folder regularly, or when the configuration is changed.

The transfer destination is the folder specified in #rcxrecovery_define in the DR definition file (fa_dr.rcxprop) in "3.3 Manager Installation and Configuration".

📝 Example
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[Windows Manager]

Transfer the folder in D:\Export of the Resource Orchestrator manager on the switchover source site to the E:\Export folder of the Resource Orchestrator manager on the switchover destination site.

[Linux Manager]

Transfer the directory in /DRExport/Export of the Resource Orchestrator manager on the switchover source site to the /DRImport/Export directory of the Resource Orchestrator manager on the switchover destination site.
∙∙∙

Checking Using the DR Configuration Check Tool

Check whether the settings of the created Disaster Recovery environment are complete using the DR configuration check tool through the procedure below.

📘 Information

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After setting up the DR environment or when the resource configuration is changed for reasons such as addition of network resources or L-Platform deployment, execute the DR configuration check tool again.

•••

1. Execute the following commands on the switchover destination site to collect information for the DR configuration check tool of the switchover destination site.

   [Windows Manager]

   > *Installation_folder*\SVROR\Manager\bin\rcxdrcheck -mode prepare <RETURN>

   [Linux Manager]

   # /opt/FJSVrcvmr/bin/rcxdrcheck -mode prepare <RETURN>

   The command execution results are stored in the folder specified using "rcxdrcheck_prepare_define" in the DR configuration check tool definition file.

   For details, refer to "B.6 rcxdrcheck".

⚠️ Note

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Check that the folder specified using "rcxdrcheck_prepare_define" in the DR configuration check tool definition file is empty before executing the command for collecting information for the DR configuration check tool.

•••

2. Copy the collected information for the DR configuration check tool on the switchover destination site to the switchover source site. Store the copy in the folder specified using "rcxdrcheck_check_define" in the DR configuration check tool definition file.

   For details, refer to "B.6 rcxdrcheck".

3. Execute the following commands on the switchover source site to run the DR configuration check tool.

   - For Site Switchover

     [Windows Manager]

     > *Installation_folder*\SVROR\Manager\bin\rcxdrcheck -mode check <RETURN>

     [Linux Manager]

     # /opt/FJSVrcvmr/bin/rcxdrcheck -mode check <RETURN>

   - For Tenant Switchover (tenant1, tenant2)

     [Windows Manager]

     > *Installation_folder*\SVROR\Manager\bin\rcxdrcheck -mode check -tenant tenant1,tenant2 <RETURN>

     [Linux Manager]

     # /opt/FJSVrcvmr/bin/rcxdrcheck -mode check -tenant tenant1,tenant2 <RETURN>

   For details, refer to "B.6 rcxdrcheck".

   When DR_switchover_method has not been set in the definition file for the DR configuration check tool, the following message is displayed.

   Please select the DR switchover method.

   <DR Switchover Method>

```
1:Physical L-Server switchover

2:Physical/Virtual L-Server switchover

3:Virtual L-Server switchover

4:both Physical L-Server switchover and Physical/Virtual L-Server switchover

5:both Physical L-Server switchover and Virtual L-Server switchover

=>
```

Enter the number of the desired switchover method to continue the command.

When DR_operation_method has not been set in the definition file for the DR configuration check tool, the following message is displayed.

```
Please select the type of DR operation method.

<DR Operation Method>

1:Active-Active

2:Active-Standby

=>
```

Enter the number of the desired DR switchover operation method to continue the command.

4. After execution of the DR configuration check tool is completed, the result is output as follows.

   [Windows Manager]

   Stored in the %temp%drcheckresult-YYYY-MM-DD-hhmmss.txt file. YYYY-MM-DD-hhmmss indicates the check completion time.

   Check results are automatically displayed using a text editor.

   [Linux Manager]

5. Check results are written to the standard output.

     - Confirm that the check results are neither "WARNING" nor "ERROR".

   If an item determined to be an "ERROR" exists, remove the cause of the error. Then execute the DR configuration check tool again to confirm the item does not appear again. Repeat these steps until all "ERROR" items no longer appear.

   If an item determined to be a "WARNING" exists, check the content and remove the cause of the "WARNING" as necessary.

   For details, refer to "C.3 Error Messages Regarding rcxdrcheck".

Collecting Additional Recovery Information

When additional recovery is planned, copy all information in the switchover information storage folder into the additional recovery information storage folder. However, it is not necessary to copy the Image folder under the switchover information storage folder or the images of physical servers stored in the Image folder.

For the VM pool definition file (vm_pool.csv) and the mapping definition file of the physical server name or the VM management software name in the MAP folder, modify the section in which the switchover destination site information is described to the information of the switchover source site.

Place the configuration information that includes resources that will be recovered through additional recovery (i.e. resources removed by the function of switchover scope limitation) in the additional recovery information folder.

For details on the switchover information storage folder, refer to "3.2 Creating Switchover Information Storage Folders".

For additional recovery, refer to "2.4 Limitation of switchover scope and additional recovery".

For details on how to specify additional recovery information folders, refer to "3.3 Manager Installation and Configuration".

4.2 Switchover between Sites Using the Disaster Recovery Function

This section explains the procedure for disaster recovery switchover between sites.

The Flow of the Switchover Procedure

The flow of the switchover procedure is as follows.

Table 4.2 The Flow of the Switchover Procedure

Number	Target Site	Item	Remarks
1	Switchover destination site	4.2.1 Stopping Services and Releasing Resources [Switchover Destination Site]	
2	Switchover source site	4.2.2 Locking the Resources and Exporting the Configuration Information [Switchover Source Site]	Perform when the switchover source site is operating
3		4.2.3 Stopping the Resources that Are Targets of Switchover [Switchover Source Site]	Perform when the switchover source site is operating
4	Switchover source site or the site for which the replication definitions have been created	4.2.4 Stopping Storage Replication [Switchover Source Site or the Site for Which Replication Definitions Have Been Created]	Not necessary when a site is stopped due to a disaster
5	Switchover destination site	4.2.5 Mounting the Switchover Information Storage Folder [Switchover Destination Site]	
6		4.2.6 Copying the Physical L-Server Images [Switchover Destination Site]	Perform when physical L-Servers are included in the targets of switchover
7		4.2.7 Restoring the Network Device Configuration of the Switchover Source Site [Switchover Destination Site]	Perform when firewalls are included in the targets of switchover
8		4.2.8 Restoring the Configuration Files of the Switchover Source Site [Switchover Destination Site]	Perform when the configuration files do not match
9		4.2.9 Reflecting the Changes to the Settings of the Switchover Source Site [Switchover Destination Site]	
10		4.2.10 Reflecting Customization of Roles [Switchover Destination Site]	
11		4.2.11 Mounting the Datastore to a VM Host [Switchover Destination Site]	Perform for virtual L-Server switchover (VM guest)
12		4.2.12 Switchover Using the Batch Command [Switchover Destination Site]	
13		4.2.13 Restoring Directory Service Information [Switchover Destination Site]	Perform when using Single Sign-On authentication
14		4.2.14 Checking Imported L-Platforms [Switchover Destination Site]	
15		4.2.15 Recovery of Usage Charges [Switchover Destination Site]	
16		4.2.16 Exporting Configuration Information and Resuming Automatic Collection of Switchover Information [Switchover Destination Site]	
17	Switchover source site	4.2.17 Cleaning Up the Switchover Source Site	Perform when the switchover source site is operating

4.2.1 Stopping Services and Releasing Resources [Switchover Destination Site]

1. Save Configuration Information

   When restoration of the switchover source site is planned after a failback operation, save the following information in a location other than the switchover information storage folder on the switchover destination site specified in the DR definition file.

   For the settings of the DR definition file, refer to "3.3 Manager Installation and Configuration".

   - Configuration Information of the Switchover Destination Site

   Execute the rcxmgrexport command to save the configuration information of the switchover destination site.

   Execution of the rcxrepdef command and the rcxstorage command are not necessary.

   ### Example
   ....

   [Windows Manager]

   >*Installation_folder***SVROR\Manager\bin\rcxmgrexport -dir C:\Users\Administrator\work\backup\Export** <RETURN>

   [Linux Manager]

   # **/opt/FJSVrcvmr/bin/rcxmgrexport -dir /root/work/backup/Export** <RETURN>

   For details on the rcxmgrexport command, refer to "B.1 rcxmgrexport".
   ....

   - For physical/virtual L-Server switchover (VM host/VM guest), the definition file containing the information of the VM management software on the switchover site which was created when performing "3.6 Creating Files Used for Switchover"

   - For virtual L-Server switchover (VM guest), the VM pool definition file containing the information of the VM host on the switchover site which was created when performing "3.6 Creating Files Used for Switchover"

   The saved information is used during "4.5 Operation after Failback".

2. Release Resources

   For Active-Active operation

   Physical servers used for switchover need to be released from the operation of the switchover destination site using one of the following methods.

   - When manually releasing servers used for switchover from pools

     a. Stop services operating on the physical servers used for switchover.

        When the physical OS is operating, shutdown the physical servers.

        However, do not shut down physical servers to be used as VM hosts during switchover.

        For L-Servers operating on the VM hosts, delete or migrate the servers to VM hosts other than those used for switchover.

        For details on deletion, refer to "8.3.16 Reconfiguration Page" in the "User's Guide for Tenant Administrators CE".

        For details on migration, refer to "17.7 Migration between VM Hosts" in the "User's Guide for Infrastructure Administrators (Resource Management) CE".

     b. Release the physical servers which were stopped in step a from the physical L-Server. Or delete the physical L-Servers. However, physical servers to be used as VM hosts during switchover are not the target of this operation.

        For details on how to release the physical servers from the physical L-Servers, refer to "17.8 Allocating and Releasing Resources to L-Servers" in the "User's Guide for Infrastructure Administrators (Resource Management) CE".

     c. Unregister the physical servers stopped in step a or VM hosts from the resource pool.

     d. When a physical server used for switchover is configured as a spare server, cancel the spare server setting.

   - When releasing servers used for switchover by deleting tenants

a. Identify the physical servers used for L-Platforms/L-Servers in the tenants to be deleted or VM hosts, using the GUI or the CLI.

b. When the physical OS is operating on the physical servers identified in step a, shutdown the physical servers. When being operated as VM hosts, do not shut them down.

c. Clean up the tenants to be deleted.

Execute the rcxadm config cleanup -tenant command to clean up the tenants to be deleted on the switchover destination site.

When executing the cleanup command (rcxadm config cleanup), add the -predr option and the -deluser option.

Table 4.3 Conditions for -predr Option Addition

Virtual L-Server Switchover (VM guest)	-predr Option
Switched over	Added
Not switched over	Not added

Table 4.4 Conditions for the -deluser Option (When Using Single Sign-On Authentication)

Directory Service Information	-deluser Option
Shared among sites	Not added
Not shared among sites	Added

Information

When the -predr option is added to the cleanup command (rcxadm config cleanup), it unregisters the virtual L-Server resources deleted from managers and VM guest information linked to the resources from the VM management software.

This operation is necessary for synchronization of information on VM management software and Resource Orchestrator, when using the VMware virtual L-Server switchover (VM guest) method.

When the -deluser option is added to the cleanup command (rcxadm config cleanup), it deletes the user resources deleted from managers and user information linked to the resources from directory services.

When directory services are shared between sites, deleting user information from directory services disables recovery of the deleted user information, so ensure users are not deleted.

Note

When tenants are deleted using the rcxadm config cleanup command, VMware cloning images used for L-Server deployment in the tenants will be unregistered from resource pools. To continue using the cloning images, register them to resource pools again.

Execute the following procedure, when using servers that have not been used as physical L-Servers in the switchover destination site as physical L-Servers for switchover.

1. Execute the rcxadm server list command.

   [Windows Manager]

   >*Installation_folder***SVROR****Manager****bin****rcxadm server list** <RETURN>

   [Linux Manager]

   # **/opt/FJSVrcvmr/bin/rcxadm server list** <RETURN>

   For details on the rcxadm server list command, refer to "3.11 rcxadm server" in the "Reference Guide (Command/XML) CE".

2. Execute the following procedure for any servers for which a value is given in the SERVER item of the rcxadm server list execution results, within the servers used for physical L-Server switchover.

   a. Delete the target server from the ROR console server tree.

   b. Register the target server in the ROR console server tree.

In this case, do not register the agent.

3. **For Active-Standby operation**

In either of the following cases, execute the following procedure from steps 1 to 3.

- When performing site switchover

- When performing tenant switchover for the first time

1. Stop all operations of the switchover destination site.

   When performing site switchover and either of the following conditions are satisfied, it is not necessary to perform steps 2 and 3.

   - There are no physical L-Servers that are switchover targets on the switchover source site

   - None of the physical servers that are switchover targets are already used as physical L-Servers on the switchover destination site

2. Execute the following command to clean up the configuration information of the entire switchover destination site.

   When executing the cleanup command (rcxadm config cleanup), add the -predr option and the -deluser option on the same conditions as in "When releasing servers used for switchover by deleting tenants".

   When using internal authentication, do not add the -deluser option.

   ### 📑 Example
   ∙∙∙

   - When performing physical/virtual L-Server switchover (VM host/VM guest), and the directory service information is not shared among sites

     [Windows Manager]

     >*Installation_folder***SVROR\Manager\bin\rcxadm config cleanup -deluser** <RETURN>

     [Linux Manager]

     # **/opt/FJSVrcvmr/bin/rcxadm config cleanup -deluser** <RETURN>

   - When performing virtual L-Server switchover (VM guest), and the directory service information is shared between sites using Active Directory

     [Windows Manager]

     >*Installation_folder***SVROR\Manager\bin\rcxadm config cleanup -predr** <RETURN>

     [Linux Manager]

     # **/opt/FJSVrcvmr/bin/rcxadm config cleanup -predr** <RETURN>
   ∙∙∙

   ### 📑 Point
   ∙∙∙

   - When the cleanup target L-Servers are in Unknown status, only the management information of managers is cleaned up. As the entities of the VM guest inventory are not deleted, manually delete the VM guest inventory from the VM management software, after the managed servers are recovered.

   - When the automatic collection of switchover information is enabled, performing cleanup disables the setting.

     Refer to "4.2.16 Exporting Configuration Information and Resuming Automatic Collection of Switchover Information [Switchover Destination Site]" to enable the setting when necessary.
   ∙∙∙

3. Execute the following procedure when using servers that have not been used as physical L-Servers in the switchover destination site as physical L-Servers for switchover.

   1. Execute the rcxadm server list command.

      [Windows Manager]

```
>Installation_folder\SVROR\Manager\bin\rcxadm server list <RETURN>
```

[Linux Manager]

```
# /opt/FJSVrcvmr/bin/rcxadm server list <RETURN>
```

For details on the rcxadm server list command, refer to "3.11 rcxadm server" in the "Reference Guide (Command/XML) CE".

2. Execute the following procedure for any servers for which a value is given in the SERVER item of the rcxadm server list execution results, within the servers used for physical L-Server switchover.

    1. Delete the target server from the ROR console server tree.

    2. Register the target server in the ROR console server tree.

In this case, do not register the agent.

Information

Executing the rcxadm config cleanup command either deletes the following resources or unregisters them from the resource pool.

- When the -tenant option is specified

Table 4.5 List of Resources to Be Cleaned Up (with the -tenant Option Specified)

	Resources Belonging to the Specified Tenant	Global Resources Used by the Specified Tenant	Other Resources
User	-	-	-
User Group	-	-	-
L-Servers	Yes	-	-
L-Server Templates	-	-	-
Image	Yes	Yes	-
AddressSet	Yes	Yes (*)	-
Network	Yes	Yes (*)	-
Pool	Yes	Yes (*)	-
Folder	-	-	-
VMHost	No	No (*)	-
Server	No	No (*)	-
Virtual_Storage	No	No (*)	-
Disk	No	No (*)	-
Network_device	No	No (*)	-
Customized role	-	-	-

Yes: Deletion of resources

No: Unregistration from the resource pool

-: Not applicable

* Note: When the user who executed the command is the last user of the specified tenant, the resources will be processed.

- When the -tenant option is not specified (when cleaning up an entire site)

Table 4.6 List of Resources to Be Cleaned Up (without the -tenant Option Specified)

	Resources Belonging to Tenants	Global Resources Used by Tenants	Other Resources
User	-	-	Yes (*1)
User Group	-	-	Yes (*2)

	Resources Belonging to Tenants	Global Resources Used by Tenants	Other Resources
L-Servers	Yes	-	Yes
L-Server Templates	-	-	Yes
Image	Yes	Yes	Yes
AddressSet	Yes	Yes	Yes
Network	Yes	Yes	Yes
Pool	Yes	Yes	Yes
Folder	-	-	Yes
VMHost	No	No	No
Server	No	No	No
Virtual_Storage	No	No	No
Disk	No	No	No
Network_device	No	No	No
Customized role	-	-	Yes

Yes: Deletion of resources

No: Unregistration from the resource pool

-: Not applicable

*1: Infrastructure administrators and dual-role administrators whose access scope is "all" are excluded.

*2: The user groups with "supervisor" users are excluded.

For details on the rcxadm config cleanup command, refer to "B.3 rcxadm config".

4.2.2 Locking the Resources and Exporting the Configuration Information [Switchover Source Site]

When performing tenant switchover and the switchover source site is operating, lock the resources being used by the tenants. For details, refer to "3.14 rcxadm tenant" in the "Reference Guide (Command/XML) CE". When the global resources for the tenants are also used for other tenants, lock all the tenants.

- For Tenant Switchover (tenant1)

[Windows Manager]

```
>Installation_folder\SVROR\Manager\bin\rcxadm tenant lockrsc -name tenant1 <RETURN>
```

[Linux Manager]

```
# /opt/FJSVrcvmr/bin/rcxadm tenant lockrsc -name tenant1 <RETURN>
```

- For Tenant Switchover (tenant2, tenant3)

[Windows Manager]

```
>Installation_folder\SVROR\Manager\bin\rcxadm tenant lockrsc -name tenant2 <RETURN>
Installation_folder\SVROR\Manager\bin\rcxadm tenant lockrsc -name tenant3 <RETURN>
```

[Linux Manager]

```
# /opt/FJSVrcvmr/bin/rcxadm tenant lockrsc -name tenant2 <RETURN>
# /opt/FJSVrcvmr/bin/rcxadm tenant lockrsc -name tenant3 <RETURN>
```

Example

Whether resources are locked can be checked by checking if "locked(DR)" is displayed for ATTRIBUTES when executing the following command:

[Windows Manager]

```
>Installation_folder\SVROR\Manager\bin\rcxadm network list -extend lock <RETURN>
>Installation_folder\SVROR\Manager\bin\rcxadm {disk| vstorage} list -verbose -extend lock <RETURN>
>Installation_folder\SVROR\Manager\bin\rcxadm {network| disk| vstorage} show -name name-extend lock
<RETURN>
```

[Linux Manager]

```
# /opt/FJSVrcvmr/bin/rcxadm network list -extend lock <RETURN>
# /opt/FJSVrcvmr/bin/rcxadm {disk| vstorage} list -verbose -extend lock <RETURN>
# /opt/FJSVrcvmr/bin/rcxadm {network| disk| vstorage} show -name name -extend lock <RETURN>
```

For details, refer to the following:

- "3.3 rcxadm disk" in the "Reference Guide (Command/XML) CE"

- "3.9 rcxadm network" in the "Reference Guide (Command/XML) CE"

- "3.15 rcxadm vstorage" in the "Reference Guide (Command/XML) CE"

Whether resources are locked can also be checked on the [Resources] tab of the ROR console.

Resources that are locked are displayed as follows:

- "Locked(DR)" is displayed in the orchestration tree

- "Locked(DR)" is displayed in the [Attributes] column on the resource list

Figure 4.1 Locking Resources

When the switchover source site is operating, execute the rcxmgrexport command to export the configuration information.

This export operation should be performed regardless of whether site switchover or tenant switchover is being performed.

For the specific procedures, refer to "a. Export the Required Information" in "1. Export the Required Information from the Switchover Source Site" in "4.1 Normal Operation".

When additional recovery is planned, copy all information in the switchover information storage folder into the additional recovery information storage folder. However, it is not necessary to copy the Image folder under the switchover information storage folder or the images of physical servers stored in the Image folder.

For the VM pool definition file (vm_pool.csv) and the mapping definition file of the physical server name or the VM management software name in the MAP folder, modify the section in which the switchover destination site information is described to the information of the switchover source site.

Place the configuration information that includes resources that will be recovered through additional recovery (i.e. resources removed by the function of switchover scope limitation) in the additional recovery information folder.

For details on the switchover information storage folder, refer to "3.2 Creating Switchover Information Storage Folders".

For additional recovery, refer to "2.4 Limitation of switchover scope and additional recovery".

For details on how to specify additional recovery information folders, refer to "3.3 Manager Installation and Configuration".

4.2.3 Stopping the Resources that Are Targets of Switchover [Switchover Source Site]

When the switchover source site is operating, stop the resources that are targets of switchover on that site.

- For Site Switchover

  Stop all L-Servers operating on the switchover source site.

- For Tenant Switchover

  Stop all L-Servers belonging to the switchover target tenants.

4.2.4 Stopping Storage Replication [Switchover Source Site or the Site for Which Replication Definitions Have Been Created]

Stop the replication from the switchover source site to the switchover destination site.

This operation is not necessary when a site is stopped due to a disaster.

When using the replication function of a storage unit to replicate the LUN on which the switchover information storage folder exists between sites, stop the replication operation of the disk containing the switchover information storage folder.

- For Site Switchover

  Also stop all replication processes of any other disks.

- For Tenant Switchover

  Stop the replication of the replication control item (copy group) for each tenant that is the target of switchover.

4.2.5 Mounting the Switchover Information Storage Folder [Switchover Destination Site]

When using the replication function of a storage unit to replicate the LUN on which the switchover information storage folder exists between sites, mount the disk containing the switchover information storage folder that has been replicated from the switchover source site, on the switchover destination site.

Example

Example for the "switchover information storage folder" to be mounted

[Windows Manager]

E drive

[Linux Manager]

/DRImport

4.2.6 Copying the Physical L-Server Images [Switchover Destination Site]

On the switchover destination site, add the images of the physical L-Servers from the replicated switchover source site to the image file storage folder on the switchover destination site.

1. Stop the manager.

2. Copy the images that were used on the switchover source site to the image file storage folder.

📋 Example

Example for image file storage folders

[Windows Manager]

D:\Export\Image

[Linux Manager]

/DRExport/Export/Image

The images which were used on the switchover source site are stored in the Image folder in the "switchover information storage folder" on the replicated switchover source site.

📋 Example

Example for Image folders in the "switchover information storage folder"

[Windows Manager]

E:\Export\Image

[Linux Manager]

/DRImport/Export/Image

3. Start the manager.

4.2.7 Restoring the Network Device Configuration of the Switchover Source Site [Switchover Destination Site]

When using the firewall auto-configuration function for network devices on the switchover destination site, copy the newest configuration from the source site to the firewall of the destination site.

However, after the switchover operation, to restore the switchover destination site to its previous state, backup the configurations of the firewall on the switchover destination site before copying the configurations of the switchover source site. The backed up configurations are used during "4.5 Operation after Failback".

When CB uplink/downlink ports or external switches are set manually on the switchover source site, and if it was not possible to match the settings among sites in advance for reasons such as a validation of the switchover destination site, make the settings the same.

4.2.8 Restoring the Configuration Files of the Switchover Source Site [Switchover Destination Site]

The contents of the configuration files on the switchover source and destination sites should be as similar as possible. If there are differences, make the files the same.

For the configuration files that must be the same on the switchover source and destination sites, refer to "2.6.5 Configuration Files for Matching Details between the Switchover Source and Destination Sites".

In this case, check the content collected in "a. Export the Required Information" in "1. Export the Required Information from the Switchover Source Site" in "4.1 Normal Operation", and configure the manager again manually if necessary.

💡 Example
. . . .

Example of Storage Locations of Collected Configuration Files

[Windows Manager]

E:\Export\ManagerExport\CONFIG_FILE*Date exported*

[Linux Manager]

/DRImport/ManagerExport/CONFIG_FILE*Date exported*
. . . .

📋 Note
. . . .

For the Active-Active operation, when contents of definition files are not merged in "2.6.5 Configuration Files for Matching Details between the Switchover Source and Destination Sites" manually merge the changes on the switchover destination site.
. . . .

4.2.9 Reflecting the Changes to the Settings of the Switchover Source Site [Switchover Destination Site]

For the Active-Active operation, reflect the following customization settings of the switchover source site, which are performed according to "Chapter 9 Post-Installation Procedures" in the "Setup Guide CE", on the switchover destination site.

- "9.1 Settings for Sending Email"

- "9.2.2 Setting Application Process Settings"

- "9.2.3 Setting Application Process to be Used"

- "9.3 Customizing the Dashboard"

- "9.4 Setting the Host Names for Virtual Servers"

- "9.5 Setting the Method for Setting Resource Names"

- "9.6 Settings for the Overcommit Function"

- "9.7 Editing the Environment Setup File for the L-Platform API"

- "9.9 System Disk Settings for Physical L-Servers"

- "9.12 Editing the License Agreement"

- "9.13 Editing the User Agreement when Registering a User"

After a Disaster Recovery environment is configured, if the settings of the switchover source site are changed according to "Chapter 8 Changing Settings" in the "Operation Guide CE", reflect the changes of the following settings on the switchover destination site.

- "8.2 Settings for Sending Email"

- "8.4 Editing Information in the Home Window"

- "8.5.1 Settings for Permissions to Change L-Platform Templates"

- "8.5.2 Subnet Settings at Segment Editing"

- "8.5.3 Settings for the Simplified Reconfiguration Function"

- "8.5.4 Distribution Ratio Settings"

- "8.5.5 Application Process Settings"

- "8.5.7 Editing the License Agreement"

- "8.5.9 Default Password Setting for Sent Emails"

- "8.5.10 Settings for the Maximum Number of Connections for the L-Platform Template"

- "8.6.1 Settings for Tenant Management and Account Management"

- "8.6.2 Editing the User Agreement when Registering a User"

- "8.7 Accounting Settings"

- "8.8 System Condition Server List Settings"

- "8.9 Settings for Event Log Output for CMDB Agent"

These configuration files are collected by performing "a. Export the Required Information" in "1. Export the Required Information from the Switchover Source Site" in "4.1 Normal Operation". Referring to the configuration file for the switchover source site, which is stored in the switchover information storage folder, enables you to make the content of the configuration file for the switchover destination site the same as the one for the switchover source site.

📋 Example
・・

Example of Storage Locations of Collected Configuration Files

[Windows Manager]

E:\Export\ManagerExport\CONFIG_FILE*Date exported*

[Linux Manager]

/DRImport/ManagerExport/CONFIG_FILE*Date exported*
・・

For the Active-Active operation, configurations of the following should be different between sites.

- "9.4 Setting the Host Names for Virtual Servers" in the "Setup Guide CE"

When using "prefix with serial number" style of "3" for configuration, specify different character strings for the prefixes of each site.

- "Appendix A Settings for Software ID Prefixes"

Configure using different prefixes on each site.

For configurations other than the above, use identical configurations between sites as with the Active-Standby operation.

Check the details of the network device information (*switchover_information_storage_folder*\OtherBackupfiles*networkconfiginfo*.xml) collected in "1. Export the Required Information from the Switchover Source Site" in "4.1 Normal Operation". In this case, if the type of the network device is "Firewall", reflect the difference on the switchover destination site.

For details, refer to "15.7 Network Configuration Information" in the "Reference Guide (Command/XML) CE".

4.2.10 Reflecting Customization of Roles [Switchover Destination Site]

Customized basic roles are not taken over to the switchover destination site.

When role customization was performed on the switchover source site and the customized content has not been reflected on the switchover destination site, perform the same modification on the switchover destination site.

For details on how to customize roles, refer to "5.1.3 Customizing Roles" in the "Design Guide CE".

4.2.11 Mounting the Datastore to a VM Host [Switchover Destination Site]

For VMware virtual L-Server switchover (VM guest), after stopping the replication, rescan the datastore from VMware vCenter Server on the switchover destination site.

For virtual L-Server switchover (VM guest), mount the datastore or volume replicated on the switchover destination site on the VM host.

[VMware]

1. Output the information of the storage that is specified as the destination of the L-Servers and images, to a file. In the following example, the result is output to outfile.csv.

- For Site Switchover

[Windows Manager]

> *Installation_folder*\SVROR\Manager\bin\rcxadm config vsfilter -outfile outfile.csv \<RETURN\>

[Linux Manager]

\# /opt/FJSVrcvmr/bin/rcxadm config vsfilter -outfile outfile.csv \<RETURN\>

- For Tenant Switchover (tenant1)

[Windows Manager]

> *Installation_folder*\SVROR\Manager\bin\rcxadm config vsfilter -tenant tenant1 -outfile outfile.csv \<RETURN\>

[Linux Manager]

\# /opt/FJSVrcvmr/bin/rcxadm config vsfilter -tenant tenant1 -outfile outfile.csv \<RETURN\>

- For Tenant Switchover (tenant2, tenant3)

[Windows Manager]

> *Installation_folder*\SVROR\Manager\bin\rcxadm config vsfilter -tenant tenant2,tenant3 -outfile outfile.csv \<RETURN\>

[Linux Manager]

\# /opt/FJSVrcvmr/bin/rcxadm config vsfilter -tenant tenant2,tenant3 -outfile outfile.csv \<RETURN\>

Note

When specifying vsfilter for multiple tenants, or specifying -global simultaneously, configure the same specifications for -tenant and -global after this operation.

For details on the rcxadm config vsfilter command, refer to "B.3 rcxadm config".

When only cloning images are stored in datastores, the dsmount.pl command (described later) tries to mount the datastores on each VM host used for the switchover. To mount only the datastores containing cloning images on specific VM hosts, edit the lines where the value of the vmhosts column is blank in the output file (outfile.csv) following the description below.

```
RCXVSFILTER_v1.0
[VMware]
#operation,type,vstorage_name,datastore_name,mountpath,vmhosts
mount,nfs,A,A,/vmfs/volumes/UUID4,
mount,vmfs,B,B,/vmfs/volumes/UUID1,VMhost1:VMhost2
```

Enter either the IP address of the VM host on which the datastore is to be mounted or the name for specifying the VM host on the VMware vCenter Server, in the vmhost column. To specify multiple VM hosts, enter those VM hosts separated by colons (":").

2. Perform mounting of the datastore using the file that was output in step 1 as the input.

Execute this command using the command prompt from which the vCLI command can be executed.

When using Windows, the vCLI command prompt can be selected from the start menu in the OS on which vCLI is installed. For details, refer to the vCLI manuals.

If necessary, copy dsmount.pl and output.csv to the server where vCLI is installed.

- When a datastore using FC or iSCSI connection (vmfs) exists

Execute the following command to mount the datastore on the VM host:

> **perl dsmount.pl -input outfile.csv -server** *IP_address_of_management_software* **-username** *user_name* **-type vmfs**
\<RETURN\>

- When a datastore using an NAS connection (nfs) exists

  Execute the following command to mount the datastore on the VM host:

  >**perl dsmount.pl -input outfile.csv -server** *IP_address_of_management_software* **-username** *user_name* **-type nfs -listfile file** <RETURN>

  Enter password:*password*<RETURN>

  For the NFS connection information file, specify the file prepared in "3.4 Configuring Managed Resources".

  For details on the dsmount.pl command, refer to "B.4 dsmount.pl".

  The processing status of the dsmount.pl command can be confirmed from output messages or the dsmount execution log.

  For details on the dsmount execution log, refer to "D.3 Logs Regarding the dsmount Command".

3. Perform the update process after mounting the datastore, using the file that was output in step 1 as the input.

   Execute this command using the command prompt from which the vCLI command can be executed.

   When using Windows, the vCLI command prompt can be selected from the start menu in the OS on which vCLI is installed. For details, refer to the vCLI manuals.

   Copy vmfile_update.pl and output.csv to the server where vCLI is installed, if necessary.

   >**perl vmfile_update.pl -input outfile.csv -server** *IP_address_of_management_software* **-username** *user_name* <RETURN>

   Enter password:*password*<RETURN>

   ### Note

   Do not perform read/write operations on the datastore while executing the above command.

   For details on vmfile_update.pl command, refer to "B.5 vmfile_update.pl".

4. Rescan the datastore from VMware vCenter Server.

   [OVM for SPARC]

   Mount the replicated volume for the SPARC server on the switchover destination site.

   For details on how to mount the volume, refer to the "Oracle VM Server for SPARC Administration Guide".

4.2.12 Switchover Using the Batch Command [Switchover Destination Site]

Perform switchover using a batch command.

When the automatic collection of switchover information is enabled, performing switchover using the batch command disables the setting.

If the maintenance mode of image is set, release the maintenance mode of image before executing the batch command.

[Windows Manager]

```
>Installation_folder\SVROR\Manager\bin\rcxadm imagemgr set -attr vm.clone.maintenance=false <RETURN>
```

[Linux Manager]

```
# /opt/FJSVrcvmr/bin/rcxadm imagemgr set -attr vm.clone.maintenance=false <RETURN>
```

- For Site Switchover

  Execute the batch command on the switchover destination site to switch the site.

  [Windows Manager]

```
>Installation_folder\SVROR\Manager\bin\rcxrecovery <RETURN>
```

[Linux Manager]

```
# /opt/FJSVrcvmr/bin/rcxrecovery <RETURN>
```

- For Tenant Switchover

  Execute the batch command on the switchover destination site to switch over tenants.

  Note

  ・・

  When performing the switchover of the last tenant that will remain on the switchover source site, specify the -global option in addition to the -tenant option. For the Active-Active operation, do not use the -global option.

  ・・

  - For Tenant Switchover (tenant1) in the Active-Active Operation

    [Windows Manager]

    ```
    Installation_folder\SVROR\Manager\bin\rcxrecovery -tenant tenant1 <RETURN>
    ```

    [Linux Manager]

    ```
    # /opt/FJSVrcvmr/bin/rcxrecovery -tenant tenant1 <RETURN>
    ```

  - When switching over tenants (tenant2, tenant3) in the Active-Active operation (No tenants will remain on the switchover source site after the switchover operation)

    [Windows Manager]

    ```
    >Installation_folder\SVROR\Manager\bin\rcxrecovery -tenant tenant2,tenant3 -global <RETURN>
    ```

    [Linux Manager]

    ```
    # /opt/FJSVrcvmr/bin/rcxrecovery -tenant tenant2,tenant3 -global <RETURN>
    ```

  For details on the rcxrecovery command, refer to "B.2 rcxrecovery".

  The switchover status of the rcxrecovery command can be confirmed from output messages or the DR execution log.

  For details on the DR execution log, refer to "D.2 Logs Regarding the rcxrecovery Command".

  In addition, the following operations require manual operations or decisions by an operator. Respond to inquiries from the system to continue execution of the command.

  - For VMware virtual L-Server switchover (VM guest), the following messages are displayed.

    It is necessary to manually delete the network settings on which cleanup is performed in the network settings "corresponding to network resources" configured on the switchover destination site beforehand. It is necessary to manually create the network (virtual switches, port groups) which has been configured on the switchover source site beforehand.

    After the operation is complete, enter "y", and continue the command.

    ```
    For network resources that have been cleaned up, clear their network configurations manually
    using VM management software or the network devices. Also, if you have manually configured
    the network on the primary site, configure the network for the backup site again.
    Press [y] when the reconfiguration is complete. : y
    ```

  - When neither the -tenant option nor the -nocleanup option are specified for cleanup of the switchover destination site, an inquiry will be displayed to ask if you really want it to be cleaned up. Press "y" to approve the cleanup and continue the rcxrecovery command. If cleanup of the switchover destination site cannot be performed, press "n" to quit the command.

  - When VM management software is not configured on a physical L-Server using the physical/virtual L-Server switchover (VM host/VM guest) method, it is necessary to manually restore the VM management software during switchover. The rcxrecovery command will show a prompt while waiting for the restoration of VM management software. In that case, continue the command after restoration of VM management software is completed.

- If there is a physical L-Server with VMware ESXi installed on the switchover target server, it is necessary to register the VM host with SVOM and register the Resource Orchestrator agent with the Resource Orchestrator manager during execution of the rcxrecovery command.

  The command will be suspended until registration of the VM host and agent is completed. When the registration is completed, resume the command.

  If the Resource Orchestrator agent has already been registered with the Resource Orchestrator manager, it is not necessary to register the agent again.

If the maintenance mode of images is released before execution of the batch command, set the maintenance mode of images as necessary.

[Windows Manager]

```
>Installation_folder\SVROR\Manager\bin\rcxadm imagemgr set -attr vm.clone.maintenance=true
<RETURN>
```

[Linux Manager]

```
# /opt/FJSVrcvmr/bin/rcxadm imagemgr set -attr vm.clone.maintenance=true <RETURN>
```

Information

- The rcxrecovery command performs the following:

  · Mapping of storage

  Storage resource mapping is performed, based on the files defining the relations between the storage on the switchover source and destination sites.

  · Division of import resources

  Imported resources are divided using the following units:

    · Resources in the global pool and resources belonging to individual tenants

    · Physical L-Server resources and virtual L-Server resources

    · Deletion of the environment of the switchover destination site

  Deletes the following environments used for switchover destination site operations.

    · L-Platform Templates

    · L-Platform Configuration Information

    · Resource Information

    · Accounting information

    · Metering Logs

    · Usage Charges

    · Import information

  Import the following information:

    · L-Platform Templates

    · L-Platform Configuration Information

    · Resource Information

    · Accounting information

    · Metering Logs

    · Usage charge files

· When performing Active-Active operation, the accounting information for the switchover source and destination sites is merged and then registered on the switchover destination site. Check the accounting information and modify or delete it if necessary.

For details on the procedures to modify and delete accounting information, refer to "15.3 Operate Accounting Information" in the "Operation Guide CE".

🅖 Note

Configured physical servers and linked L-Servers for which only configuration definition has been created are not covered by disaster recovery switchover.

To facilitate the operation for linking with L-Servers again after switchover, execute the following rcxadm config command in advance on the switchover source site, and then back up the configuration information.

[Windows Manager]

```
>Installation_folder\SVROR\Manager\bin\rcxadm config filter -convert -indir indir -outdir
outdir <RETURN>
```

[Linux Manager]

```
# /opt/FJSVrcvmr/bin/rcxadm config filter -convert -indir indir -outdir outdir <RETURN>
```

The following information will be output to *outdir*, using the file name convert.txt.

After completing the restoration procedure, perform creation of a link with an L-Server and setting the scope again as shown below:

```
[command]
rcxadm lserver convert -with BX900_1 -name physical_lserver_1
rcxadm lserver convert -with BX900_3 -name physical_lserver_2 -to /tenant_1
rcxadm lserver convert -with BX900_6 -name physical_lserver_3 -label test_label3 -comment
test_comment3 -to /folder_1
[user]
user_1, physical_lserver_1
user_1, /tenant_1/physical_lserver_2
user_2, /folder_1/physical_lserver_2
[usergroup]
usergroup_1, physical_lserver_1
usergroup_2, /folder_1/physical_lserver_3
```

- Storage using the ETERNUS dynamic LUN mirroring is switched to the LUN that was prepared on the switchover destination site when the switchover operation is performed after a disaster. Operation may be different if the storage is not released even after deleting an L-Platform.

- Perform operation so that the import of the resource configuration information and user definition file (XML file) using the rcxrecovery command is not executed at the same time as modification of the resource configuration information or user definition file (XML file) due to L-Server creation, or export operations using the rcxmgrexport command.

- If the -allon option or the -alloff option is not specified for the rcxrecovery command, the power status of L-Servers recovered using the rcxrecovery command becomes the same as that when the switchover information was collected from the switchover source site. L-Servers start up in order of the priority set for L-Servers.

- The RC console may not display the correct power status of L-Servers immediately after a disaster recovery switchover. Wait for about three minutes after the switchover to see the correct power status of L-Servers.

- As the performance information (the information displayed in the dashboard and in operational status displays) depends on the configuration of the switchover source site, this is not carried over to the switchover destination site when switched over. The information on the switchover destination site is displayed.

- When connection networks of ROR console on the admin server have different IP addresses between the switchover source and destination sites, and the FQDN is to be taken over by the switchover destination site, change the IP address for the FQDN registered in the DNS server to the IP address of the admin server on the switchover destination site after the switchover is performed.

When the FQDN is taken over from the switchover source site to the switchover destination site, clear the caches or temporary internet files of Web browsers that are used to connect to the ROR console on clients.

When test certificates are used, import the certificate of the switchover destination site to the browser if the certificate was not imported during installation.

For details, refer to "Chapter 5 Importing a Certificate to a Browser" in the "Setup Guide CE".

When switchover to the switchover destination site is performed, switchover may fail due to an import failure. In this case, take corrective action for the import failure and perform the switchover operation again.

If the failure occurred while the switchover process was being performed, performing switchover again will skip the process for the resources that have already been switched and only process the resources that have not been switched yet.

When switchover is performed with the setting that clears the configuration information of the destination site (without the -nocleanup option specified), if the process "cleanup of resources" reads "completed", perform the switchover again with the -nocleanup" option specified.

The following shows an example of the case where the VM guest could not be restored during L-Server import.

📄 Example
. . . .

Example 1

1. As an error occurred during import, the following error is displayed:

```
>rcxrecovery <RETURN>
FJSVrcx:ERROR:62569:/tenant1/l-platform1/l-server1:lserver:import was interrupted.
Message=:67154: VM Guest not found
```

2. The status of the relevant resources is displayed to help determine the cause of the error.

```
>rcxadm config show -type lserver -name /tenant1/l-platform1/l-server1 -dir dir1 -format
xml<RETURN>
```

For -dir, specify the folder that was most recently exported in the folder below.

- *The folder specified in the rcxrecovery -dir option*

[Windows Manager]

- *The import folder specified in #rcxrecovery_define of fa_dr.rcxprop\ManagerExport\ROR_export_date*

[Linux Manager]

- *The import folder specified in #rcxrecovery_define of fa_dr.rcxprop/ManagerExport/ROR_export_date*

3. Delete the resource where the problem occurred from the export file. Make a note of the name of the deleted resource.

```
>rcxadm config filter -exclude lserver -name /tenant1/l-platform1/l-server1 -indirdir1-
outdirdir2 <RETURN>
```

4. Use the export file output by the command in step 3 to overwrite the file in the folder specified for -indir in step 3.

5. Import again.

```
>rcxrecovery-nocleanup<RETURN>
```

Example 2

1. As an error occurred during import, the following error is displayed:

```
>rcxrecovery <RETURN>
FJSVrcx:ERROR:67335:registering of VM guest failed. detail=(registervm L-ServerB-2:task
result error, vmerrno=104,ip=192.168.201.70,host=192.168.201.115)
```

2. Identify the L-Server on which the error occurred.

In the switchover information storage folder, check the l_servers.xml file that was most recently exported.

[Windows Manager]

The import folder specified in #rcxrecovery_define of fa_dr.rcxprop\ManagerExport\ROR_*export_date*\l_servers.xml

[Linux Manager]

The import folder specified in #rcxrecovery_define of fa_dr.rcxprop/ManagerExport/ROR_*export_date*/l_servers.xml

In the xml file, find the VM guest name (L-ServerB-2) displayed in the error message, and check the name and id in the L-Server element in which the entry is included.

```
<LServer name="L-ServerB" id="******">
...
<VmGuest name="L-ServerB-2">
```

3. Check resource_folders.xml in the switchover information storage folder.

   When there are L-Platforms and tenants in which the L-Server with id checked in step 2 is included in the xml file, check the names.

```
<Folder name="TenantB" tenant="TENANT">
...
<Folder name="L-platformB" tenant="LPlatform">
...
<LServer name="L-ServerB" id="******">
```

4. Delete the resource where the problem occurred from the export file. Make a note of the name of the deleted resource.

```
>rcxadm config filter -exclude lserver -name /tenantB/l-platformB/L-ServerB -indir dir1 -
outdir dir2 <RETURN>
```

   Add the tenant name, the L-Platform name, and the L-Server name checked in steps 2 and 3 to -name, connecting them with slashes ("/").

   - When a tenant is included

     /tenantB/l-platformB/L-Server-B

   - When a tenant is not included

     /L-Server-B

   Specify the folder checked in step 2 for -indir.

   [Windows Manager]

   The import folder specified in #rcxrecovery_define of fa_dr.rcxprop\ManagerExport*ROR_export_date*

   [Linux Manager]

   The import folder specified in #rcxrecovery_define of fa_dr.rcxprop/ManagerExport/*ROR_export_date*

5. Use the export file output by the command in step 4 to overwrite the file in the folder specified for -indir in step 4.

6. Import again.

```
>rcxrecovery-nocleanup<RETURN>
```

[OVM for SPARC]

  - Cloning images (system packages) are excluded from the recovery target.

When restoring cloning images, after switchover is completed, perform the following procedure on the switchover destination site.

  1. Create a cloning image with the same name as the cloning image on the switchover source on the switchover destination site.

  2. Register the cloning image created in step 1 in the image pool imported from the switchover source site.

  3. Perform synchronization of the image information.

For details, refer to "8.3.7 Synchronizing Image Information" in the "User's Guide for Infrastructure Administrators CE".

- When OVM for SPARC has been switched over, the auto-boot? value is "true".

  When the auto-boot? value is required to be "false" for operations, change the auto-boot? value to "false" on OVM for SPARC after switchover.

- The MAC addresses of NICs before and after switchover may be different values. In that case, the recognition order of NICs in the guest OS may be affected.

  Check if the same communications with the IP addresses from before switchover can also be performed after switchover. When communications cannot be performed, modify the settings of NICs on the guest OS and NICs on the VM management software.

- Configure the same items that are configured in the VM management software before switchover for the items in the switchover destination.

- When the data disk is connected to the switchover target, and ZFS is used on the guest OS, ZFS storage pools other than the root will be exported after switchover.

  After starting the guest OS, if necessary, import the ZFS storage pool. When there are services affected by the state in which the ZFS storage pool is temporarily exported, restart the services.

  For details on how to import the ZFS storage pool, refer to the manuals of Solaris OS.

 Point

• •

When the automatic collection of switchover information is enabled, performing cleanup disables the setting.

Refer to "4.2.16 Exporting Configuration Information and Resuming Automatic Collection of Switchover Information [Switchover Destination Site]" to enable the setting when necessary.

• •

4.2.13 Restoring Directory Service Information [Switchover Destination Site]

When using Single Sign-On authentication, restore the directory service information. For the restoration procedure, refer to the manuals of the directory service software.

However, after the switchover operation, to restore the switchover destination site to its previous state, backup the directory service information on the switchover destination site before performing restoration. The backed up information of the directory service is used during "4.5 Operation after Failback".

4.2.14 Checking Imported L-Platforms [Switchover Destination Site]

If the switchover information is collected during L-Platform deployment or reconfiguration, it contains the L-Platform configuration information that does not reflect the actual resource status.

If the switchover information is imported using the rcxrecovery command, reflect the target resource status on the imported L-Platform configuration information.

Depending on the status when an L-Platform was imported, subsequent action may be required.

The rcxrecovery command outputs a log for the L-Platform being processed and records the actions performed on the L-Platform.

Check the log output, and take appropriate action, if required.

For the content of the output logs and the corrective actions, refer to "D.1 Logs Regarding L-Platforms".

4.2.15 Recovery of Usage Charges [Switchover Destination Site]

- Send usage charge files

Usage charge files for each tenant of the exported month will be recovered to the following directory on the switchover source site. Refer to "15.4.6 Sending Usage charges" in the "Operation Guide CE" for the format of the usage charge files.

- Usage charge files

Stored folder

[Windows Manager]

Installation_folder\RCXCTMG\Charging\importdata*yyyyMMddHHmm*

[Linux Manager]

/var/opt/FJSVctchg/importdata/*yyyyMMddHHmm*

yyyyMMddHHmm indicates the date and time when the switchover operation was performed.

- File Name

    - *yyyyMM_Tenant_name*[*_Deleted_date*].zip

    - *yyyyMM* is the cutoff year and month of the tenant.

    - "*_Deleted_date*" will be appended if the tenant is deleted.

These usage charge files will be needed for the accounts manager to determine the usage charges for each tenant on the month of the recovery.

Send these files to the accounts manager of each tenant based on the tenant information file. The tenant information file is a file describing the tenant and it holds information such as tenant name, cutoff date, accounting E-mail address and so on. The tenant information file is stored in the same directory as the usage charge files.

- Tenant Information File

Stored folder

[Windows Manager]

Installation_folder\RCXCTMG\Charging\importdata*yyyyMMddHHmm*

[Linux Manager]

/var/opt/FJSVctchg/importdata/*yyyyMMddHHmm*

yyyyMMddHHmm indicates the date and time when the switchover operation was performed.

- File Name

tenant_info.csv

- Format

CSV file with "Tenant name", "Tenant display name", "Tenant deleted date", "Tenant last cutoff date", "Tenant next cutoff date", and "Accounting E-mail address" columns.

```
#TenantName,TenantDisplayName,TenantDeletedDate,TenantLastCutoffDate,TenantNextCutoffDate,Accounting
MailAddress
 tenant01,tenant001,,2012-05-31,2012-06-30,tenant1@example.com
 tenant02,tenant002,,2012-05-31,2012-06-30,tenant2@example.com
 tenant03,tenant003,2012-05-27 16:48,2012-05-31,2012-06-30,tenant3@example.com
 tenant04,tenant004,,2012-05-31,2012-06-30,tenant4@example.com
```

Send usage charge files to the accounts manager as follows.

- Operations to Perform Batch Switchover of All Resources

Send the recovered usage charge files of each tenant to the accounts manager. The tenant corresponding to each usage charge file can be determined from the file name. Obtain the accounting E-mail addresses from the tenant information file and send the usage charge files.

- Operation Involving Resource Switchover by Tenant

Obtain the accounting E-mail addresses of the switchover tenant from the tenant information file and send the target usage charge files.

When sending the usage charge files, also notify the recipient of the following information.

- The usage files of the switchover destination site will be sent separately on the day after the cutoff date.

- Usage charges for the month of the recovery have to be calculated with the usage charge files of the affected site and the switchover destination site.

In cases such as when the accounting calculation is stopped due to the disaster on the day of the cutoff of the tenant or the tenant has already been deleted, there is no accumulated data on the switchover destination site. Therefore, the usage charge files will not be sent from the switchover destination site. Notify the accounts manager that those tenants can be charged only from the usage charge files from the switchover source site. The cutoff date of the tenant can be obtained from tenant information file.

- Notify the tenant administrator

On the switchover destination site, the usage charges for that site only are displayed in the Usage Charge window. Therefore, the infrastructure administrator has to inform tenant administrators of this fact, and if necessary, disclose the usage charge information of the switchover source site.

📑 Note

Calculation of the usage charge for the L-Platform imported from the switchover source site to the switchover destination site starts on the day after the switchover. Usage for the day when the switchover was performed is not charged.

In the Usage Charge window, the usage charge until the previous date is displayed. Therefore, the usage charge for an L-Platform imported from the switchover source site to the switchover destination site can be checked from two days after the switchover.

4.2.16 Exporting Configuration Information and Resuming Automatic Collection of Switchover Information [Switchover Destination Site]

Execute the rcxmgrexport command to export the configuration information.

For the specific procedures, refer to "a. Export the Required Information" in "1. Export the Required Information from the Switchover Source Site" in "4.1 Normal Operation".

When switchover information is being automatically collected, execute the following command to resume the process.

- Operation collecting the information periodically

    - When performing virtual L-Server switchover (VM guest), and not performing physical L-Server switchover (physical OS)

      [Windows Manager]

      >*Installation_folder***SVROR****Manager****bin****rcxmgrexport -interval** *minutes* **-base** <RETURN>

      [Linux Manager]

      ```
      # /opt/FJSVrcvmr/bin/rcxmgrexport -interval minutes -base <RETURN>
      ```

- In other cases

    [Windows Manager]

    >*Installation_folder***SVROR****Manager****bin****rcxmgrexport -interval** *minutes* <RETURN>

    [Linux Manager]

    1. Execute the following command:

       ```
       # /opt/FJSVrcvmr/bin/rcxmgrexport -interval minutes <RETURN>
       ```

       When the replication software being used is ACM-CCM or SnapMirror, the procedure after this point is not required.

    2. When the Resource Orchestrator manager and the replication software are installed on the same server

       Add the following path to the start of the "/etc/cron.d/SVROR_rcxmgrexportwrapper" file depending on the type of replication software that will be used.

       - NaviSphere

       PATH=/bin:/usr/bin:/opt/Navisphere/bin

       - Solutions Enabler

       PATH=/bin:/usr/bin:/usr/symcli/bin

After adding the paths, it is not necessary to restart the OS or cron services.

- Operation collecting the configuration definition information after changes are made

  - When performing virtual L-Server switchover (VM guest), and not performing physical L-Server switchover (physical OS)

  [Windows Manager]

```
>Installation_folder\SVROR\Manager\bin\rcxmgrexport -event on -base <RETURN>
```

  [Linux Manager]

```
# /opt/FJSVrcvmr/bin/rcxmgrexport -event on -base <RETURN>
```

  - In other cases

  [Windows Manager]

```
>Installation_folder\SVROR\Manager\bin\rcxmgrexport -event on <RETURN>
```

  [Linux Manager]

```
# /opt/FJSVrcvmr/bin/rcxmgrexport -event on <RETURN>
```

4.2.17 Cleaning Up the Switchover Source Site

When the switchover source site is operating, clean up the configuration information of the switchover source site. It is not necessary to perform this procedure when the switchover source site is not operating due to a disaster, or reinstalling the manager in order to perform recovery.

- For the Active-Active operation, execute the rcxadm config cleanup -tenant command to clean up the resources corresponding to the tenants that were switched over.

- When the tenants are not operating on the switchover source site when performing the final tenant switchover for site switchover or tenant switchover using the Active-Standby operation, execute the rcxadm config cleanup command to clean up the entire site.

- When performing switchover other than the above, execute the rcxadm config cleanup -tenant command to clean up the resources corresponding to the tenants that were switched over.

Information

Executing the rcxadm config cleanup command either deletes the following resources or unregisters them from the resource pool.

- When the -tenant option is specified

Table 4.7 List of Resources to Be Cleaned Up (with the -tenant Option Specified)

	Resources Belonging to the Specified Tenant	Global Resources Used by the Specified Tenant	Other Resources
User	-	-	-
User Group	-	-	-
L-Servers	Yes	-	-
L-Server Templates	-	-	-
Image	Yes	Yes	-
AddressSet	Yes	Yes (*)	-
Network	Yes	Yes (*)	-
Pool	Yes	Yes (*)	-
Folder	-	-	-
VMHost	No	No (*)	-
Server	No	No (*)	-

	Resources Belonging to the Specified Tenant	Global Resources Used by the Specified Tenant	Other Resources
Virtual_Storage	No	No (*)	-
Disk	No	No (*)	-
Network_device	No	No (*)	-
Customized role	-	-	-

Yes: Deletion of resources

No: Unregistration from the resource pool

-: Not applicable

* Note: When the user who executed the command is the last user of the specified tenant, the resources will be processed.

- When the -tenant option is not specified (when cleaning up an entire site)

Table 4.8 List of Resources to Be Cleaned Up (without the -tenant Option Specified)

	Resources Belonging to Tenants	Global Resources Used by Tenants	Other Resources
User	-	-	Yes (*1)
User Group	-	-	Yes (*2)
L-Servers	Yes	-	Yes
L-Server Templates	-	-	Yes
Image	Yes	Yes	Yes
AddressSet	Yes	Yes	Yes
Network	Yes	Yes	Yes
Pool	Yes	Yes	Yes
Folder	-	-	Yes
VMHost	No	No	No
Server	No	No	No
Virtual_Storage	No	No	No
Disk	No	No	No
Network_device	No	No	No
Customized role	-	-	Yes

Yes: Deletion of resources

No: Unregistration from the resource pool

-: Not applicable

*1: Infrastructure administrators and dual-role administrators whose access scope is "all" are excluded.

*2: The user groups with "supervisor" users are excluded.

For details on the rcxadm config cleanup command, refer to "B.3 rcxadm config".

When executing the cleanup command in the above cases, add the -postdr option and the -deluser option with the following conditions. When using internal authentication, do not add the -deluser option.

Table 4.9 -postdr Option Conditions for Addition

Virtual L-Server Switchover (VM guest)	-postdr Option
Switched over	Added
Not switched over	Not added

Table 4.10 -deluser Option Conditions for Addition

Directory Service Information	-deluser Option
Shared among sites	Not added
Not shared among sites	Added

Information

When the -postdr option is added to the cleanup command (rcxadm config cleanup), it unregisters the virtual L-Server resources and images deleted from managers, and VM guest information and VM image information linked to the resources ,from the VM management software.

This operation is necessary for synchronization of information on VM management software and Resource Orchestrator, when using the virtual L-Server switchover (VM guest) method.

When the -deluser option is added to the cleanup command (rcxadm config cleanup), it deletes the user resources deleted from managers and user information linked to the resources from directory services.

When directory services are shared between sites, deleting user information from directory services disables recovery of the deleted user information, so ensure users are not deleted.

Example

- After site switchover, when performing virtual L-Server switchover (VM guest), and directory service information is shared among sites

[Windows Manager]

>*Installation_folder*\SVROR\Manager\bin\rcxadm config cleanup -postdr <RETURN>

[Linux Manager]

/opt/FJSVrcvmr/bin/rcxadm config cleanup -postdr <RETURN>

- When not performing virtual L-Server switchover (VM guest) in the tenant, and the directory service information is not shared among sites, after switchover of tenant (tenant1), which is not the last one

[Windows Manager]

>*Installation_folder*\SVROR\Manager\bin\rcxadm config cleanup -tenant tenant1 -deluser <RETURN>

[Linux Manager]

/opt/FJSVrcvmr/bin/rcxadm config cleanup -tenant tenant1 -deluser <RETURN>

Point

- When the cleanup target L-Servers are in Unknown status, only the management information of managers is cleaned up. As the entities of the VM guest inventory and the cloning images are not deleted, manually delete them from the VM management software, after the managed servers are recovered.

When the automatic collection of switchover information is enabled, performing cleanup disables the setting.

Refer to "3.7 Configuring Automatic Collection of Switchover Information" to enable the configuration.

When operation is performed with the switchover information storage folder specified as the additional recovery information folder as described in the "Information" of "3.3 Manager Installation and Configuration", perform "4.6 Additional Recovery Operation after Failback" before performing recommencement of automatic collection of switchover information.

4.3 Operation after Switchover

This section explains notes on operation until failback of the switched configuration is performed after switchover.

When Resuming Replication of the Disk of the Switchover Information Storage Folder for Continued Switchover Being Performed in Phases

When using the replication function of a storage unit to replicate the LUN on which the switchover information storage folder exists between sites, in preparation for the next switchover, execute the following operations on the switchover source site or the site on which replication was defined.

1. On the switchover destination site, unmount the "switchover information storage folder" disk that was mounted in "4.2.5 Mounting the Switchover Information Storage Folder [Switchover Destination Site]".

2. In the switchover source site or the site on which replication was defined, resume the replication of the disk containing the "switchover information storage folder" from the switchover source site to the switchover destination site, which was stopped in "4.2.4 Stopping Storage Replication [Switchover Source Site or the Site for Which Replication Definitions Have Been Created]".

📝 Example

・・

Example for the "switchover information storage folder" to be unmounted

[Windows Manager]

E drive

[Linux Manager]

/DRImport

・・

When Performing Tenant Switchover while the Switchover Source Site is Operating

For global resources shared with the tenants for which switchover is not performed and the resources of L-Server templates, the same resources may exist in both the switchover source and destination sites. When modifying the settings of the corresponding resources, perform the same modifications for the resources of the two sites.

For example, when editing L-Server template A in the switchover destination site, edit L-Server template A in the switchover source site using the GUI or the CLI in the same way.

When the Accounts Manager Invoices Usage Charges

The procedure is as follows.

a. Invoicing Usage Charges

The person responsible for billing calculates and invoices tenants for usage during the month when a disaster occurred based on the usage charge file for the month at the switchover source site sent by the infrastructure administrator and the usage charge file sent from the switchover destination site. The calculation procedure using the files mentioned above is as follows.

1. Extract usage charge detail files

Extract usage charge files from both the switchover source site and destination sites, and obtain usage charge detail files for each L-Platform. The name format of the usage charge detail files is as follows.

For details, refer to "15.4.6.2 Usage charge Detail File" in the "Operation Guide CE".

File Name

yyyyMM_L-PlatformID.csv

2. Prevent duplicate charging for products charged monthly

For each L-Server in the usage charge detail file, if the UsageFrequency column for the image, CPU, and memory is set to "1 month", compare the values of the ItemAmount columns in the usage charge detail files from the switchover source site and the switchover destination site and delete the row with the lower value. For the rows for the disks, delete only the rows with the same size and pool name from the switchover source site usage charge file. If there are multiple pairs of rows with the same size and pool name, delete only one for each pair. If there are no products being charged monthly, then this operation can be omitted.

3. Merge usage charge detail files

For each L-Platform, copy the rows after line 2 of the csv data of the switchover destination site and add them to the end of the usage charge detail file from the switchover source site.

4. Calculate the usage charges of L-Platforms

   Calculate the usage charges of L-Platforms. Total the values of the ItemAmount column of the usage charge detail file.

5. Calculate the usage charges of tenants

   Perform steps b to d for every L-Platform and total the usage charges of L-Platforms to calculate the tenant usage charge.

When Tenant Switchover was Performed

The following limitations apply to L-Platform templates:

- Image information referencing a cloning image in a global pool may be unavailable.

- Segment information referencing a network resource in a global pool may be unavailable.

- Deployment fails if you subscribe to using an L-Platform template containing unavailable image or segment information.

This unavailable template information becomes available when the resources of all the global pools are switched over.

When Switchover Was Performed Using the Active-Active Operation

After switchover, do not mix resources that have been switched from the switchover source site with resources that were already on the switchover destination site. If mixed, resources cannot be found and failback will fail.

Patterns where resources are mixed are as follows:

- When linking global pools that were already on the switchover destination site to the tenants switched over using DR

- When linking global pools switched over using DR to the tenants that were already on the switchover destination site

- When moving resources that were already on the switchover destination site to the global pools switched over using DR

- When moving resources switched over using DR to the global pools that were already on the switchover destination site

- When creating an L-Platform/L-Server using both the resources switched over using DR and those that were already on the switchover destination site

In order to identify on which site the corresponding resources were created, it is recommended to add their site names to the beginning of the resource names.

For details, refer to "2.6.3 Items to Be Different between the Switchover Source and Destination Sites".

Do not change the name of resources that were created during switchover.

When Additional Recovery Is Planned

When additional recovery is planned on the switchover source site after the switchover operation, do not perform the following operations.

- Unmounting or deletion from VM hosts and physical servers on disks used by the following resources which are to be restored, on the switchover source site

  - L-Servers

  - L-Platforms

  - Tenants

  - Image Resources

- Reuse of disks used by the following resources which are to be restored, in the switchover source site

  - L-Servers

  - L-Platforms

  - Tenants

  - Image Resources

- Editing and deletion of L-Platform templates used for deployment of L-Platforms outside the switchover, on the switchover destination site

When Switchover Was Performed Using the Blade Chassis Degradation Configuration

When switchover was performed using the blade chassis degradation configuration, perform the following operations after the switchover, as necessary.

- Network resources using LAN switch blades to be degraded as external connection ports are created in the switchover destination site without port specification. Configure the external connection ports of network resources as necessary.

  For details, refer to "5.4.4 Configuring VLANs on LAN Switch Blades" in the "User's Guide for Infrastructure Administrators (Resource Management) CE".

- When virtual L-Server switchover (VM guest) is performed, confirm that the virtual network created on the VM management software is automatically configured. If the virtual network is not configured automatically, refer to the information on virtual networks shown in the VM profiles of the target VM and create a virtual network with the same name as the switchover source site on the VM host.

When Resuming Replication of Disks belonging to the Replication Target Storage Pool after the Switchover Source Site is Recovered

When performing virtual L-Server switchover (VM guest), ensure that the datastore used by resources switched to the switchover destination site cannot be referred to by VM management software, after recovery of the switchover source site. For details, refer to "LUNs with FC, iSCSI, or NAS connections" of "Table 3.1 Replication of Storage Units" in "3.1 Pre-setup Preparations".

For all switchover methods, resume the replication of the disk containing "the disk resources and virtual storage resources which are stored in the target storage pool for replication" from the switchover source site to the switchover destination site, which was stopped in "4.2.4 Stopping Storage Replication [Switchover Source Site or the Site for Which Replication Definitions Have Been Created]" **in the opposite direction**, in preparation for future switchovers.

4.4 Failback after Recovery of the Switchover Source Site

This section explains the failback operation from the switchover destination site to the switchover source site after the hardware environment on the switchover source site is recovered.

Failback can be performed using the same procedure as switchover.

For details on the procedure, refer to "4.2 Switchover between Sites Using the Disaster Recovery Function" except for "1. Save Configuration Information" in "4.2.1 Stopping Services and Releasing Resources [Switchover Destination Site]". When doing so, replace the "switchover source site" with the "switchover destination site", and vice versa.

In addition, it is necessary to perform the following operation in advance, as preparation. The "switchover source site" and the "switchover destination site" mentioned in the following procedure are the same as those described in the above sections.

1. Clear Management Software Information

   When a disaster does not damage the entire switchover source site, it is possible that some management software information remains in the hardware that has not been damaged in the disaster. Examples of such management software information are host affinity on ETERNUS and reserved DHCP addresses. In that case, clear any remaining management software information on the recovered primary site.

   In addition, if an unplanned switchover (one that switches to the switchover destination site without being able to access the switchover source site) is performed on an environment for physical L-Server switchover (physical OS) or physical/virtual L-Server switchover (VM host/VM guest), the VIOM information on the previous switchover source site may not match the actual physical server status.

   To correct the status after an unplanned switchover, perform inventory boot on all physical servers managed by VIOM of the previous switchover source site before performing failback.

2. Install the Switchover Source Site

   Configure the environment on the failback destination site. This environment needs to be prepared in the same way as the switchover destination site was. For details on the installation procedure, refer to "Chapter 3 Installation".

3. Create Files Used for Switchover

   Edit the files created in "3.6 Creating Files Used for Switchover".

   Replace the contents of resources on the switchover source site with that of resources on the switchover destination site.

4. Collect Failback Information

   Collect failback information from the switchover destination site. For details on how to collect the failback information, refer to "4.1 Normal Operation".

5. Start Replication from the Switchover Destination Site

   Start storage unit replication from the switchover destination site to the switchover source site.

For the Active-Active operation, the following operations must be performed after failback.

- Recovery of Definition Files

   When definition files are merged in "4.2.8 Restoring the Configuration Files of the Switchover Source Site [Switchover Destination Site]", delete unnecessary configurations from definition files on the switchover destination site (failback source site).

- Deletion of Unnecessary Resources

   Even when performing failback by tenant, users, user groups, roles, and L-Server templates are imported with the resources on the switchover destination site. Delete any unnecessary resources manually.

Note
. . . .

In the following cases, ensure storage unit LUN replication from the switchover destination site to the switchover source site is performed.

- There are physical L-Server disks created using dynamic LUN mirroring. and,

- When replication has been performed using a copy pair automatically defined when creating an L-Server during failback.

In this condition, the disk after failback is handled in the same way as a disk allocated during dynamic LUN mirroring in normal operation.

When deleting a disk allocated in the dynamic LUN mirroring, LUN replication stops and the replication destination disk is also deleted.

When storage unit LUN replication from the switchover source site to the switchover destination site is not performed, an error will occur when deleting an L-Server or a disk.
. . . .

4.5 Operation after Failback

This section explains the differences between the operation after failback to the switchover source site and the normal operation.

Invoicing Usage Charges

When switching back to the state before charging usage for the month when a disaster occurred using the switchover destination site

The person responsible for billing calculates and invoices tenants for usage during the month when a disaster occurred based on the usage charge file for the month at the switchover source site sent by the infrastructure administrator and the usage charge files sent from the switchover source and destination sites.

Refer to "4.3 Operation after Switchover" for information on how to calculate the usage charge.

When a failback occurred after usage charge has already been invoiced for the month when a disaster occurred at the switchover destination site, perform invoicing using the same procedure as the normal operation.

When Restoring the Switchover Destination Site after Failback

On the switchover destination site, perform the following procedure to restore it to the state it was in before the switchover operation.

1. Restore the network device configurations to the state they were in before the switchover operation.

   The execution procedure is the same as the switchover operation procedure.

   For details, refer to "4.2.7 Restoring the Network Device Configuration of the Switchover Source Site [Switchover Destination Site]".

2. Restore each configuration file to the state it was in before the switchover operation was performed.

   The execution procedure is the same as the switchover operation procedure.

For details, refer to "4.2.8 Restoring the Configuration Files of the Switchover Source Site [Switchover Destination Site]" and "4.2.9 Reflecting the Changes to the Settings of the Switchover Source Site [Switchover Destination Site]".

3. Execute the batch command specifying the configuration information of the switchover destination site prepared in advance.

   The execution procedure is the same as the switchover operation procedure.

   For details, refer to "4.2.12 Switchover Using the Batch Command [Switchover Destination Site]".

   For the prepared configuration information of the switchover destination site, refer to "4.2.1 Stopping Services and Releasing Resources [Switchover Destination Site]".

4. Restore the directory service information. (When using Single Sign-On authentication)

   For details, refer to "4.2.13 Restoring Directory Service Information [Switchover Destination Site]".

5. Check the imported L-Platform.

   For details, refer to "4.2.14 Checking Imported L-Platforms [Switchover Destination Site]".

6. Recover usage charges.

   For details, refer to "4.2.15 Recovery of Usage Charges [Switchover Destination Site]".

7. If the configuration for limitation of switchover scope is included in the configuration information collected during "4.2.15 Recovery of Usage Charges [Switchover Destination Site]", after execution of the batch command (rcxrecovery), execute the additional recovery command (rcxrecovery -salvage).

   The procedure to perform additional recovery is the same as the one at the switchover source site after a failback operation.

   For details, refer to "4.6 Additional Recovery Operation after Failback".

For the Active-Active operation, restore the status before the switchover by specifying tenants, which were cleaned up during the switchover procedure, using the -tenant option.

💾 Example
....

In Active-Standby operation, confirm that all resources switched from the switchover source site to the switchover destination site by switchover have been restored on the switchover source site by failback, and then execute the batch command by specifying the prepared configuration information of the switchover destination site.

[Windows Manager]

```
>Installation_folder\SVROR\Manager\bin\rcxrecovery -dir C:\Users\Administrator\work\Export -vmmgr
vmmgr_file <RETURN>
```

[Linux Manager]

```
# /opt/FJSVrcvmr/bin/rcxrecovery -dir /root/work/Export -vmmgr vmmgr_file <RETURN>
```

For details on the rcxrecovery command for batch execution, refer to "B.2 rcxrecovery".

In the Active-Active operation, the batch command should be used when restoring the tenants on the switchover destination site cleaned up following "4.2.1 Stopping Services and Releasing Resources [Switchover Destination Site]" after tenants that were switched over to the switchover destination site by a switchover operation are switched back to the switchover source site.

When executing the command, specify the tenants that were cleaned up and the configuration information of the switchover destination site that was prepared beforehand, using the option.

[Windows Manager]

```
>Installation_folder\SVROR\Manager\bin\rcxrecovery -dir C:\Users\Administrator\work\Export -tenant TenantA -vm_pool pool_file
<RETURN>
```

[Linux Manager]

```
# /opt/FJSVrcvmr/bin/rcxrecovery -dir /root/work/Export -tenant TenantA -vm_pool pool_file <RETURN>
```

For details on the rcxrecovery command for batch execution, refer to "B.2 rcxrecovery".
....

4.6 Additional Recovery Operation after Failback

This section explains additional recovery on the switchover source site after a failback operation.

For the additional recovery function, refer to "2.4 Limitation of switchover scope and additional recovery".

Before performing additional recovery, confirm that the following conditions are satisfied.

- For additional recovery by tenant, failback of tenants to be restored from the switchover destination site to the switchover source site is complete.

- For additional recovery of an entire site, failback of all tenants and global resources from the switchover destination site to the switchover source site is complete.

- Disks used by the following resources that are to be restored have not been deleted or unmounted from VM hosts and physical servers in the switchover source site.

    - L-Servers

    - L-Platforms

    - Tenants

    - Image Resources

- Disks used by the following resources that are to be restored have not been reused on the switchover source site.

    - L-Servers

    - L-Platforms

    - Tenants

    - Image Resources

- Switchover information used at switchover is deployed in the additional recovery information folder.

For details on how to specify additional recovery information folders, refer to "3.3 Manager Installation and Configuration".

In case the switchover information has been corrupted on the switchover source site, copy the information from the switchover destination site to the switchover source site.

The procedure for additional recovery operation is as follows:

1. Perform additional recovery using a batch command.

    ## 📘 Example

    ....

    - For Tenant Restoration (tenant1)

        [Windows Manager]

        >*Installation_folder***SVROR\Manager\bin\rcxrecovery -salvage -tenant tenant1** <RETURN>

        [Linux Manager]

        # **/opt/FJSVrcvmr/bin/rcxrecovery -salvage -tenant tenant1** <RETURN>

    - For Restoration of Tenants (tenant2, tenant3) and Global Resources not Being Used

        [Windows Manager]

        >*Installation_folder***SVROR\Manager\bin\rcxrecovery -salvage -tenant tenant2,tenant3 -global** <RETURN>

        [Linux Manager]

        # **/opt/FJSVrcvmr/bin/rcxrecovery -salvage -tenant tenant2,tenant3 -global** <RETURN>

        For details on the rcxrecovery command for batch execution, refer to "B.2 rcxrecovery".

    ....

2. The processing status of the command for additional recovery is displayed in the same way as for a batch command. For details, refer to "4.2.12 Switchover Using the Batch Command [Switchover Destination Site]".

When Failback Was Performed Using the Blade Chassis Degradation Configuration

During failback, network resources are recovered on the switchover destination site according to the settings of network resources on the switchover source site.

After failback, configure the following setting as necessary.

- Configure the external connection ports of network resources.

For details, refer to "5.4.4 Configuring VLANs on LAN Switch Blades" in the "User's Guide for Infrastructure Administrators (Resource Management) CE".

Appendix A Settings for Software ID Prefixes

This appendix explains settings for software ID prefixes.

A software ID in the format "fixed prefix (SW) + eight-digit serial number" is attached to the software information.

This applies to the software information registered when installing the product and that registered by users.

In the case of Active-Active operation, software information with the same software ID may be registered on both sites. The software ID prefix can be changed to avoid this.

After changing the software ID prefix, execute the batch conversion command for the software ID.

This converts the software ID of the registered software information into a software ID with the newly set prefix.

Point

- There is no problem if different software ID prefixes are specified between the switchover source site and the switchover destination site. It is possible to set the default prefix "SW" on the switchover source site and change the prefix to the one other than "SW" on the switchover destination site.

- Perform change of the software ID prefix and conversion of the software ID using the batch conversion command for the software ID at one of the following timings.

  - When configuring the Resource Orchestrator manager

  - Immediately before performing Active-Active operation switchover

Procedure

Use the following procedure to set the software ID prefix and reflect the changes on the existing software ID (batch conversion of the ID).

1. Open a definition file using a text editor.

   The definition file is stored in the following location.

   [Windows Manager]

   Installation_folder\RCXCFMG\config\vsys_config.xml

   [Linux Manager]

   /etc/opt/FJSVcfmg/config/vsys_config.xml

2. Add the following definition to the definition file.

   The added line must be placed between <properties> and </properties>.

   ```
   <entry key="software-id-prefix">[prefix]</entry>
   ```

Table A.1 Items to specify

Key Name	Description
software-id-prefix	Specify the desired prefix using two alphanumeric characters. The prefix is case-sensitive. If a string not meeting the above conditions is specified, the default "SW" is set. Also if this item is not specified, the default "SW" is set.

Example

```
<?xml version="1.0" encoding="UTF-8"?>
<!DOCTYPE properties SYSTEM "http://java.sun.com/dtd/properties.dtd">
```

```
<properties>

...

<entry key="software-id-prefix">SA</entry>

...

</properties>
```

・・

3. Save the definition file.

4. Restart the manager.

   For details on how to restart the manager, refer to "2.1 Starting and Stopping Managers" in the "Operation Guide CE".

5. Execute the batch conversion command for the software ID.

   For details on the batch conversion command for the software ID, refer to "B.7 cfmg_changesoftwareid".

Appendix B Commands

This appendix explains the commands used for disaster recovery in Resource Orchestrator.

B.1 rcxmgrexport

Name

[Windows Manager]

Installation_folder\SVROR\Manager\bin\rcxmgrexport - Collecting switchover information of Disaster Recovery

[Linux Manager]

/opt/FJSVrcvmr/bin/rcxmgrexport - Collecting switchover information of Disaster Recovery

Format

```
rcxmgrexport -help
rcxmgrexport [-dir directory] [[-noretry]| [-timeout value]]
rcxmgrexport -interval minutes [-base] | off rcxmgrexport -event on [-base] | off
rcxmgrexport -status rcxmgrexport [-drlist [-error]] [-dir dir]
```

Function description

rcxmgrexport is the command used to collect information necessary for switchover using DR (Disaster Recovery).

Subcommands

None.

Option

-help

Specify this option to display the instructions for using this command.

-dir *directory*

Specify the folder to store information necessary for switchover using Disaster Recovery.

📖 Example

. . . .

[Windows Manager]

> *Installation_folder*\SVROR\Manager\bin\rcxmgrexport -dir D:\Export\ManagerExport <RETURN>

[Linux Manager]

/opt/FJSVrcvmr/bin/rcxmgrexport -dir /DRExport/Export/ManagerExport <RETURN>

. . . .

When omitted, the information is stored in the folder specified in the following file.

[Windows Manager]

Installation_folder\SVROR\Manager\etc\customize_data\fa_dr.rcxprop

[Linux Manager]

/etc/opt/FJSVrcvmr/customize_data/fa_dr.rcxprop

-noretry

Use this option to return directly to the command prompt without waiting for the operation being executed on the admin server to complete its execution.

Export can only be performed when no other operation is being executed. If an operation is being executed, this command will return an error.

-timeout *value*

Use this option to wait the number of seconds specified in value for completion of the operation being performed on the admin server. If the operation is not completed within the specified time, this command will return an error.

If this option is omitted, the default value (3600 seconds) is set. When this option is specified, value can be specified between 1 and 172800 (2 days).

Use this option to return an error when the operation being executed on the admin server does not complete its execution after the expiration of the number of seconds specified in value.

Periodical export may not be able to start its process while the manager is executing a time-consuming operation such as L-Server creation. Specify this option to cancel the operation after the specified number of seconds has elapsed.

The following message is output at a 600-second interval while the operation is running.

INFO:Manager operation is still running

-interval *minutes* **| off**

Specify this subcommand when periodically starting or stopping the operations to collect the information necessary for switchover to Disaster Recovery.

When starting the operation, specify the time interval for collection in *minutes*. Specify an integer between 1 and 1439.

The information is collected at the time interval specified in *minutes*. Only the newest version of the collected information remains.

When stopping operations, specify "off".

When operation is started, rcxmgrexport, rcxrepdef, and rcxstorage are executed periodically.

The information necessary for switchover using Disaster Recovery is stored in the folder specified using default=directory in the following file.

Therefore, set values for rcxmgrexport, rcxrepdef, and rcxstorage.

[Windows Manager]

Installation_folder\SVROR\Manager\etc\customize_data\fa_dr.rcxprop

[Linux Manager]

/etc/opt/FJSVrcvmr/customize_data/fa_dr.rcxprop

The operations to collect switchover information are the same type as operations with the -noretry option and the -timeout option omitted.

To check whether periodical collection of the information necessary for switchover using Disaster Recovery is enabled, use the -status option to check the setting.

When periodical collection is configured, the log of collection operations is stored at the following location:

[Windows Manager]

Installation_folder\SVROR\Manager\var\dr\rcxmgrexport_interval*

[Linux Manager]

/var/opt/FJSVrcvmr/dr/rcxmgrexport_interval*

-event on | off

When starting or stopping operation, specify the information necessary for switchover to Disaster Recovery to collect the information at the timing of collection of configuration definition information.

When starting operations, specify "on". Only the newest version of the collected information remains.

When stopping operations, specify "off".

When operation is started, rcxmgrexport, rcxrepdef, and rcxstorage are executed at the timing of information collection.

The information necessary for switchover using Disaster Recovery is stored in the folder specified in the following file.

Set values for rcxmgrexport, rcxrepdef, and rcxstorage.

[Windows Manager]

Installation_folder\SVROR\Manager\etc\customize_data\fa_dr.rcxprop

[Linux Manager]

/etc/opt/FJSVrcvmr/customize_data/fa_dr.rcxprop

The timing of information collection is as follows.

- rcxmgrexport

    - L-Platform operations (creation, modification, deletion, starting, stopping)

- rcxrepdef

    - Registration of resources to a storage pool, Unregistration of resources from a storage pool

    - L-Server creation, L-Server deletion (when Dynamic LUN mirroring is used)

    - Attachment of disks to an L-Server, Detachment of disks from an L-Server (when Dynamic LUN mirroring is used)

- rcxstorage

    - L-Server creation, L-Server deletion

    - Attachment of disks to an L-Server, Detachment of disks from an L-Server

The range of the operations to collect switchover information using the rcxmgrexport command is the same as those with the -noretry option and the -timeout option omitted.

Required Option Setting Information for the rcxrepdef Command

Before starting automatic switchover information collection, edit the following DR definition file to provide necessary argument information for the rcxrepdef command that is executed for information collection.

[Windows Manager]

Installation_folder\SVROR\Manager\etc\customize_data\fa_dr.rcxprop

[Linux Manager]

/etc/opt/FJSVrcvmr/customize_data/fa_dr.rcxprop

Lines other than the following that begin with sharp signs ("#") are comments in this DR definition file.

- #rcxrepdef_define

- #rcxstorage_define

- #rcxmgrexport_define

- #rcxrecovery_define

- #dr_storagepool

- #exclude_lserver

- #salvage_define

- #DR Operation Method

- #Config File Switchover

Blank lines in this DR definition file are regarded as meaningless and skipped.

```
#rcxrepdef_define
# (omitted)
#
ccm, ,argument value for -local option, argument value for -remote option
```

```
snapmirror, ,argument value for -local option, argument value for -remote option
navisphere,argument value for -rhost option, argument value for -local option, argument value for
-remote option
solutionenabler,argument value for -rhost option, argument value for -local option, argument value
for -remote option
```

For details on the values to be set, refer to "5.22 rcxrepdef" in the "Reference Guide (Command/XML) CE".

To check whether collection of the information necessary for switchover using Disaster Recovery upon update of the configuration definition information is enabled, use the -status option to check the setting.

The log of switchover information collection that is performed during configuration changes can be found in the following location.

[Windows Manager]

Installation_folder\SVROR\Manager\var\dr\rcxmgrexport_event*

[Linux Manager]

/var/opt/FJSVrcvmr/dr/rcxmgrexport_event*

📌 **Note**

. . . .

The collection methods enabled with the -interval option and the -event option cannot be used simultaneously. When switching the methods, execute the command specifying "off" in the option to stop the present operation. After that, execute the other command to start the new operation.

. . . .

-base

When operation is started with the -event on option or the -interval option also specified, only rcxmgrexport is executed at the timing of information collection.

Specify this option when using "virtual L-Server switchover (VM guest)", not "physical L-Server switchover (physical OS)" as the switchover method.

-status

Displays whether the -interval and -event options are enabled or disabled.

-drlist

Use this option to display the following resource types of the DR target resources.

  - Tenants

  - L-Platforms

  - L-Servers

  - Images

-error

As both DR target storage and non DR target storage are being used, the following resource types that cannot be switched are displayed.

  - L-Servers

  - Images

-dir *dir*

Specify the folder to store information necessary for switchover using Disaster Recovery.

When specifying the -drlist or the -drlist -error option, specify the folder in which the exported data collected using the rcxmgrexport command is stored.

When omitted, the information will be stored in the folder specified as the output destination of the rcxmgrexport command in the following file:

[Windows Manager]

Installation_folder\SVROR\Manager\etc\customize_data\fa_dr.rcxprop

[Linux Manager]

/etc/opt/FJSVrcvmr/customize_data/fa_dr.rcxprop

Note

When the switchover information is collected manually using the command rather than using automatic collection using the -interval option or the -event option, switchover information collected in the past is not automatically deleted.

For this reason, when old versions of switchover information are no longer necessary, delete such information manually.

Example

Switchover information storage folders are composed as follows.

To delete the information other than the newest switchover information, delete the folders (in this example, the lines with [Deletion target]) other than the ones with the latest time stamp.

```
\ROR20140212123224 [Deletion target]
\ROR20140324100000
\CFMG20140212123224 [Deletion target]
\CFMG20140324100000
\CONFIG_FILE20140212123224 [Deletion target]
\CONFIG_FILE20140324100000
\CTMG_CHARGE20140212123224 [Deletion target]
\CTMG_CHARGE20140324100000
\CTMG_METER20140212123224 [Deletion target]
\CTMG_METER20140324100000
\OtherBackupFiles\disk_vstorage_info20140212123224 [Deletion target]
\OtherBackupFiles\disk_vstorage_info20140324100000
```

Requirements

Permissions

Refer to "5.1.2 Roles and Available Operations" in the "Design Guide CE".

Location

Admin server

Exit Status

This command returns the following values:

0

The command executed successfully.

1

An error has occurred.

Example

```
 rcxmgrexport <RETURN>
=== MMM DD HH:MM:SS YYYY === : Exporting ServerView Resource Orchestrator config info .....
=== MMM DD HH:MM:SS YYYY === : OK
=== MMM DD HH:MM:SS YYYY === : Exporting ServerView Resource Orchestrator config files .....
=== MMM DD HH:MM:SS YYYY === : OK
=== MMM DD HH:MM:SS YYYY === : Exporting ServerView Resource Orchestrator Service Configuration
Manager config info .....
=== MMM DD HH:MM:SS YYYY === : OK
```

```
=== MMM DD HH:MM:SS YYYY === : Exporting ServerView Resource Orchestrator Service Catalog Manager
charging info .....
=== MMM DD HH:MM:SS YYYY === : OK
=== MMM DD HH:MM:SS YYYY === : Exporting ServerView Resource Orchestrator Service Catalog Manager
metering log .....
=== MMM DD HH:MM:SS YYYY === : OK


> rcxmgrexport -drlist <RETURN>
TYPE NAME
---- ----
L-Server /tenant_1/l-server_1
Image /image_1
Image /image_2

> rcxmgrexport -drlist -error <RETURN>
TYPE NAME
---- ----
L-Server /tenant_1/l-server_1
```

B.2 rcxrecovery

Name

[Windows Manager]

Installation_folder\SVROR\Manager\bin\rcxrecovery - Disaster Recovery switchover

[Linux Manager]

/opt/FJSVrcvmr/bin/rcxrecovery - Switchover of Disaster Recovery

Format

```
rcxrecovery -help
rcxrecovery [-dir directory] [-map mapping_dir] [-mirror storage_file] [-vmmgr vmmgr_file]
            [-vm_pool pool_file] [-nocleanup] [-allon| -alloff] [-salvage] [-config_file_switchover
{on -type {Active-Active| Active-Standby}| off}]
rcxrecovery [-dir directory] [-map mapping_dir] [-mirror storage_file] [-vmmgr vmmgr_file]
            [-vm_pool pool_file] [-nocleanup] [-allon| -alloff] -global [-tenant
tenant1[,tenant2,,,]] [-salvage]
            [-config_file_switchover {on -type {Active-Active| Active-Standby}| off}]
rcxrecovery [-dir directory] [-map mapping_dir] [-mirror storage_file] [-vmmgr vmmgr_file]
            [-vm_pool pool_file] [-allon| -alloff] -tenant tenant1[,tenant2,,,] [-salvage]
            [-config_file_switchover {on -type {Active-Active| Active-Standby}| off}]
```

Function description

rcxrecovery is the command to perform switch over using DR (Disaster Recovery).

Subcommands

None.

Option

-help

Specify this option to display the specifications for this command.

-dir *directory*

Specify the folder to store the information for the target of switchover due to Disaster Recovery.

 Example

[Windows Manager]

> *Installation_folder*\SVROR\Manager\bin\rcxrecovery -dir E:\Export\ManagerExport <RETURN>

[Linux Manager]

/opt/FJSVrcvmr/bin/rcxrecovery -dir /DRImport/Export/ManagerExport <RETURN>

If omitted, the ManagerExport folder under the folder (hereinafter, import definition folder) specified for import=directory will be specified in the following folder.

[Windows Manager]

Installation_folder\SVROR\Manager\etc\customize_data\fa_dr.rcxprop

[Linux Manager]

/etc/opt/FJSVrcvmr/customize_data/fa_dr.rcxprop

When specifying this option, also specify the following options, if necessary.

- -map

- -mirror

- -vmmgr

- -vm_pool

-map *mapping_dir*

Specify the folder in which the mapping files that define the relationships of the server names between the switchover source site and the switchover destination site are stored.

If the -dir option and this option are omitted, the MAP folder under the import definition folder will be used. If there is no import definition folder, mapping of server names will not be performed.

When names of physical servers on the server tree or VM management software registered on the VM management tree of Resource Orchestrator are different between the switchover source site and the switchover destination site, creation of mapping definitions enables defining of the relationship between sites.

This file must be located in the MAP folder under the switchover information storage folder and be a csv file that includes the following content.

- Any file name can be used.

- Comments cannot be set in this definition file.

- Blank lines in this definition file are regarded as meaningless and skipped.

- Enter the physical server mapping definitions in a single file.

- When defining physical server mapping, enter "#PhysicalServer" in a single line in this definition file. Enter the mapping definitions for physical servers after this line.

- Each physical server mapping definition should be stated in a single line, separating two corresponding physical server names using a comma (",").

- Enter mapping definitions for VM management software in a single file.

- When defining VM management software mapping, enter "#VMManagementSoftware" in a single line in this definition file. Enter the mapping definitions for VM management software after this line.

- Each VM management software mapping definition should be stated in a single line, separating two corresponding VM management software names using a comma (",").

Example

```
#PhysicalServer
Server1-1,Server2-1
Server1-2,Server2-2
#VMManagementSoftware
VMM1-1,VMM2-1
VMM1-2,VMM2-2
```

Server1-1 and *Server1-2* are the server names on the switchover source site.

Server2-1 and *Server2-2* are the server names on the switchover destination site.

VMM1-1 and *VMM1-2* are the VM management software names on the switchover source site.

VMM2-1 and *VMM2-2* are the VM management software names on the switchover destination site.

Information

Mapping definitions of physical servers and VM management software can be described in the MAP folder using either one of the following file configurations.

- Enter descriptions in a single file

- Enter descriptions in (two) different files

When including both the definition of physical server mapping and the definition of VM management software in the same file, do not give the descriptions as follows:

- Describing the physical server mapping definitions after the line including "#VMManagementSoftware", and before the line including "#PhysicalServer"

- Describing the VM management software mapping definitions after the line including "#PhysicalServer", and before the line including "#VMManagementSoftware"

-vm_pool *vm_pool*

Specify the definition file that defines the VM pool to which the VM host belongs.

When this option is specified, the switchover operation is performed assuming that the VM host has been pre-configured.

Create the file defining VM hosts on which the switchover target virtual L-Server is operating under the switchover information storage folder as follows.

- Specify the file name as vm_pool.csv.

- Lines beginning with sharp signs ("#") are comments in this definition file.

- Blank lines in this definition file are regarded as meaningless and skipped.

Example

```
#vmpool_name,vmhost_name,vmhost_type
/VMHostPool,192.168.2.1,VMware
/VMHostPool,192.168.2.2,OVM-SPARC
/tenant1/TenantVMHostPool,vmhost1.example.org,VMware
/tenant1/TenantVMHostPool,vmhost2.example.org,OVM-SPARC
/tenant2/TenantVMHostPool,192.168.10.15
```

- Specify the VM pool name of the switchover source site for vmpool_name.

- Specify the VM host name (displayed on the server tree of the ROR console in the switchover destination site) of the switchover destination site to be registered in the vmpool_name in the switchover destination site for vmhost_name.

- Specify the VM host type for vmhost_type.

  "VMware" and "OVM-SPARC" can be specified for vmhost_type. If this option is omitted, "VMware" is set.

  - When registering multiple VM hosts in a VM pool, enter multiple lines.

If omitted, the vm_pool.csv file under the folder (hereinafter, import definition folder) specified for import=directory will be specified in the following folder.

[Windows Manager]

Installation_folder\SVROR\Manager\etc\custmize_data\fa_dr.rcxprop

[Linux Manager]

/etc/opt/FJSVrcvmr/customize_data/fa_dr.rcxprop

-mirror *storage_file*

Specify the intermediate files for output mapping using the -recovery option and -mode prepare option of the rcxstorage command on the switchover source site.

If the -dir option and this option are omitted, the storage_file under the import definition folders will be assigned. When there is no storage_file under the import definition folder, mapping of storage will not be performed.

-vmmgr *vmmgr_file*

Specify the VM management software definition file to register VM management software on the switchover destination site.

If the -dir option and this option are omitted, the vmmgr_file.txt under the import definition folder will be assigned. When there is no vmmgr_file.txt under the import definition folder, VM management software cannot be registered.

Create the information in the switchover information storage folder in order to register VM management software of Resource Orchestrator on the switchover destination site.

  - Specify the file name as vmmgr_file.txt.

  - Lines beginning with sharp signs ("#") are comments in this definition file.

  - Blank lines in this definition file are regarded as meaningless and skipped.

Example

```
#name soft name ip user name password physical-lserver
vcenter, vmware-vc, 192.168.1.24, admin, admin, no
scvmm, ms-scvmm, 192.168.100.77, root, root, yes
```

Each item to specify is explained below. Use the information registered on the switchover source site.

  - name:

    The name of VM management software to register in Resource Orchestrator.

  - soft name:

    Specify the type of VM management software. The only specifiable values are vmware-vc (vCenter) and ms-scvmm (SCVMM).

  - ip:

    Specify the IP address of VM management software.

  - user name:

    Specify the user ID used when logging in to VM management software.

  - password:

    Specify the password used when logging in to VM management software.

  - physical-lserver:

    Specify "yes", when creating VM management software on a physical L-Server.

    Specify "no", when not creating VM management software on a physical L-Server.

When "no" is specified, as messages to recover VM management software are output during command execution and the process is stopped, perform recovery while operations are stopped.

-nocleanup

Specify this option when not clearing the configuration definition information of a switchover destination site during switchover when a disaster occurs.

This option is valid during switchover including global environments.

When this option is omitted, the environment of the switchover destination site will be cleared. When clearing environments, whether the environments must be deleted or not is confirmed during the command execution. When "y" is entered for an inquiry, switchover destination site environments are cleared and the switchover operation continues. When "n" is entered, the switchover operation is aborted.

-allon

After switchover, specify this option when powering on all L-Servers.

When this option is omitted, L-Servers will be powered on based on their startup status when the switchover information was obtained.

-alloff

Specify this option to power off all L-Servers after switchover.

When this option is omitted, L-Servers will be powered on based on their startup status when the switchover information was obtained.

-global

Specify this option when switching over resources in the global pool.

When this option and the -tenant option are omitted, all resources on the switchover source site will be switched over. When this option is specified, configuration definition information on the switchover destination site will be cleared.

-tenant *tenant1*

Specify the tenant for switchover.

When this operand is omitted by specifying the global option, the resources included in the tenant cannot be switched over.

When this option is specified and -global option is omitted, configuration definition information on the switchover destination site will not be cleared.

-salvage

Use this option to recover the resources that were degraded by the limitation of switchover scope after failback.

When this option is specified, it is assumed that the -nocleanup option and the -config_file_switchover off option are also specified.

For how to use this option, refer to "4.6 Additional Recovery Operation after Failback".

Note

- When there are many imported L-Platforms or L-Servers, the information for L-Platforms or L-Servers may not be displayed in the [Usage Condition] tab. After a while, confirm the information in the [Usage Condition] tab again.

- When an error occurs while using this command, an error cause message is displayed. Take corrective action based on the displayed message, then execute the command again. If the previous command was executed with the option that clears the configuration definition information of the switchover destination site and "cleanup of resources" ended with "completed", then specify the -nocleanup option when you execute the command again. This option will skip unnecessary configuration cleanup of the switchover destination site that has already been performed.

When the automatic collection of switchover information is enabled, executing rcxrecovery disables the setting.

After the switchover is completed, enable the setting referring to "3.7 Configuring Automatic Collection of Switchover Information".

-config_file_switchover

Use this option to forcibly enable or disable automatic takeover of configuration files.

- When "on" is specified

Automatic takeover of configuration files is enabled regardless of the value of "#Config File Switchover" in the DR definition file (fa_dr.rcxprop).

- -type {Active-Active| - It is necessary to specify it with the Active-Standby} option.

- - When -type Active-Active is specified, the operation is the same as when "DR_operation_method=1" is defined for "#DR Operation Method" in the DR definition file (fa_dr.rcxprop).

- - When -type Active-Standby is specified, the operation is the same as when "DR_operation_method=2" is defined for "#DR Operation Method" in the DR definition file (fa_dr.rcxprop).

- When "off" is specified

Automatic takeover of configuration files is disabled regardless of the value of "#Config File Switchover" in the DR definition file (fa_dr.rcxprop).

Requirements

Permissions

Refer to "5.1.2 Roles and Available Operations" in the "Design Guide CE".

Location

Admin server

Exit Status

This command returns the following values:

0

The command executed successfully.

1

An error has occurred.

Example

```
>rcxrecovery <RETURN>
 --------------------------------------------------------
 The following administrative information that exists on the
 manager will be deleted.
 - L-Platform templates
 - L-Platform configuration information
 - Resource information
 - L-Servers
 - L-Server templates
 - Tenants
 - Resource folders
 - Image resources
 - Customized role
 - Users
 - User groups
 - Network resources
 - Address resources
 - Resource pools
 * Resources registered in pools will be unregistered.
 - Accounting information
 - Metering logs
Please specify the "-nocleanup"option when you do not want
to delete the administrative information.
Caution: In the following case, reply "n" to this prompt to
quit the command and rerun the command with "-nocleanup"
option.
```

```
- rcxrecovery had been executed to failover the whole site
or global resources, and
- "-nocleanup" had not been specified, and
- rcxrecovery had exited with some error after the 2nd
process "cleanup of resources" had completed, and
- rcxrecovery has rerun after the error had been recovered.
------------------------------------------------------------
Press [y] to continue rcxrecovery, or [n] to cancel
rcxrecovery. : y
[xx:xx:xx] (1/8)check of input data : completed
[xx:xx:xx] (2/8)cleanup of resources : completed
[xx:xx:xx] (3/8)copy and configure the definition files : completed
[xx:xx:xx] (4/8)import physical resources : completed
------------------------------------------------------------
When this is in the process of physical/virtual L-Server
switchover (VM host/VM guest) and the VM management
software (vCenter Server/SCVMM) is not installed on
physical L-Servers which are in switchover scope, the
configuration of VM management software in switchover
source site needs to be restored to the VM management
software in switchover destination site here.
After the restoration of the VM management software
configuration is complete, press Y to continue.
------------------------------------------------------------
Press [y] when restoration is complete. : y
[xx:xx:xx] (5/8)register/refresh VM management software : completed
[xx:xx:xx] (6/8)import virtual resources : completed
[xx:xx:xx] (7/8)import middleware information : completed
[xx:xx:xx] (8/8)start/stop L-Platform, L-Servers : completed
[xx:xx:xx] rcxrecovery finished
```

B.3 rcxadm config

Name

[Windows Manager]

Installation_folder\SVROR\Manager\bin\rcxadm config - Import and export of configuration information

[Linux Manager]

/opt/FJSVrcvmr/bin/rcxadm config - Import and export of configuration information

Format

rcxadm config map -file *resource_map_file* -dir *directory*

rcxadm config filter {-tenant *tenant_name*| -global| -type vm| -exclude vm | -exclude *type* -name *name* | -convert} -indir *indir* -outdir *outdir*

rcxadm config show -type *type* -name *name* -dir *directory* -format xml

rcxadm config cleanup [-tenant *tenant_name*] [-deluser] [[-predr]| [-postdr]]

rcxadm config vsfilter [-tenant *tenant1*[,*tenant2*[,...]]] [-global] [-dir *dir*] [-vm_pool *vm_pool*] -outfile *file.csv*

Function description

rcxadm config is the command to import or export configuration information, when executing DR (Disaster Recovery).

Subcommands

map

Links exported configurations of Resource Orchestrator with resources of the switchover destination site.

filter

Perform filtering in order to divide and import exported configurations of Resource Orchestrator.

show

Displays the detailed information of exported configurations of Resource Orchestrator.

cleanup

Deletes the resource management information of the manager.

vsfilter

Outputs the information of the storage in which the virtual disks for cloning images/L-Servers in the scope specified by -tenant or -global have been deployed and the information of the VM host on which such storage is mounted to a file.

The types of the storage for extraction and the virtual storage information to be extracted are as follows:

VMware

Datastore

The file which is output is used as the input for the script which mounts multiple storage units in a batch to the VM host (dsmount.pl).

When executing this command, specify all tenants and global in which cloning images/L-Servers for which the virtual storage to be extracted is specified as the disk deployment destination have been registered, at the same time. If the specification is insufficient, a command error will occur.

Option

-dir *directory*

Specify the folders to store configuration information for linking with resources.

-file *resource_map_file*

Specify XML files which describe storage links.

-tenant *tenant_name*

Specify the names of the tenants to performing filtering for.

-global

Specify when performing filtering of resources commonly used among tenants.

-type vm

Specify when performing filtering of resources related to virtual L-Servers.

-exclude vm

Specify when performing filtering of resources other than those related to virtual L-Servers.

-exclude *type*

Specify the resource types to perform filtering of. The following types can be selected:

- lserver
- lplatform

-name *name*

Specify the names of the resources to perform filtering for or display details of.

-convert

The information that links a configured physical server with an L-Server is created in *outdir*.

-indir *indir*

Specify the folders for storing the configuration information of filtering targets.

-outdir *outdir*

Specify the folders for storing filtered configuration information.

-type *type*

Specify the type of resources to display details of. The following types can be selected:

- lserver

- network

-format xml

Specify the xml format to use when displaying details.

📋 **Example**

∙∙

convert.txt

```
[command]
 rcxadm lserver convert -with BX900_1 -name physical_lserver_1
 rcxadm lserver convert -with BX900_3 -name physical_lserver_2 -to /tenant_1
 rcxadm lserver convert -with BX900_6 -name physical_lserver_3 -label test_label3 -comment
test_comment3 -to /folder_1
 [user]
 user_1, physical_lserver_1
 user_1, /tenant_1/physical_lserver_2
 user_2, /folder_1/physical_lserver_2
 [usergroup]
 usergroup_1, physical_lserver_1
 usergroup_2, /folder_1/physical_lserver_3
```

∙∙

-tenant *tenant_name*

- For the vsfilter Subcommand

  Extracts the images/L-Servers in the tenant specified for *tenant_name*.

- For the config Subcommand

  For *tenant name*, specify the information of the tenant which the resources to be deleted belong to (the value specified using rcxrecovery **-**tenant when performing failback using DR).

-deluser

Deletes the user information associated with the resource management information that was deleted from the manager, from the user management software.

-predr

Unregisters the VM guest information associated with the resource management information that was deleted from the manager, from the VM management software.

-postdr

Unregisters the VM guest information and VM image information associated with the resource management information that was deleted from the manager, from the VM management software.

-global

Extracts the storage information of the images registered in the global pool and L-Servers from tenants.

When this option and the -tenant option are omitted, all storage information of all cloning images/L-Servers in the configuration definitions will be extracted.

-dir *dir*

Specify the folder to store the information for the target of switchover due to Disaster Recovery. If omitted, the ManagerExport folder under the folder (hereinafter, import definition folder) specified for import=directory will be specified in the following folder.

[Windows Manager]

Installation_folder\SVROR\Manager\etc\custmize_data\fa_dr.rcxprop

[Linux Manager]

/etc/opt/FJSVrcvmr/customize_data/fa_dr.rcxprop

-vm_pool *vm_pool*

Specify the definition file that defines the VM pool to which the VM host belongs. For details on the content to include in the file, refer to "B.2 rcxrecovery".

If omitted, the vm_pool.csv file under the folder (hereinafter, import definition folder) specified for import=directory will be specified in the following folder.

[Windows Manager]

Installation_folder\SVROR\Manager\etc\custmize_data\fa_dr.rcxprop

[Linux Manager]

/etc/opt/FJSVrcvmr/customize_data/fa_dr.rcxprop

-outfile

Use this option to specify the name of the file to which the extracted virtual storage information is output.

For each virtual storage, the following information is stored in CSV format:

  - Virtual storage type (vmfs, nfs)

  - Device path name on the VM host

  - The list of the VM hosts to which the storage will be mounted

The information is extracted from the VM pool definition file. The target of extraction is the definition file of the VM pool in which the VM hosts with L-Servers deployed were registered.

Specify a relative or absolute path.

Note

. . . .

When the automatic collection of switchover information is enabled, performing cleanup disables the setting.

After the switchover is completed, enable the setting referring to "3.7 Configuring Automatic Collection of Switchover Information".

. . . .

Exit Status

This command returns the following values:

0

The command executed successfully.

non-zero

An error has occurred.

Output Example

```
RCXVSFILTER_v1.0
 [VMware]
#operation,type,vstorage_name,datastore_name,mountpath,vmhosts
mount,vmfs,storage_A,storage_A,/vmfs/volumes/UUID1,vmhost1.example.org:vmhost2.example.org
mount,vmfs,storage_B,storage_B,/vmfs/volumes/UUID2,vmhost1.example.org:vmhost2.example.org
mount,vmfs,storage_E,storage_E,/vmfs/volumes/UUID3,192.168.10.1
mount,nfs,storage_X,storage_X,/vmfs/volumes/UUID4,192.168.10.2:192.168.10.3
```

B.4 dsmount.pl

Name

[Windows Manager]

Installation_folder\SVROR\Manager\sys\dr_vmware_script\dsmount.pl - Mounting of a datastore to a VM host

[Linux Manager]

/opt/FJSVrcvmr/sys/dr_vmware_script/dsmount.pl - Mounting of a datastore to a VM host

Format

```
perl dsmount.pl -input file [-server soft_ip] [-username username] [-password password] {-type vmfs | -
type nfs -listfile file [-unmount]}
```

Function description

This command mounts the VMFS/NFS datastore for which mount is specified for the operation in the specified storage information file to a VM host.

When an error occurs, in addition to the item name for which the error occurred, the line in which the error occurred in the storage information file specified using -input may be output. In this case, the processing of preceding lines has been completed for the corresponding items.

To execute the script, it is necessary to install VMware: vCLI (an external tool that controls VM software) on a server which can communicate with the VM management software beforehand.

When executing the script, it operates according to the settings of vCLI Connection Options. For details on vCLI Connection Options, refer to the VMware manual.

Refer to "vSphere Command-Line Interface Concepts and Examples" from the "vSphere Command-Line Interface Documentation page" at the following URL:

```
URL: http://www.vmware.com/support/pubs/vsphere-esxi-vcenter-server-pubs.html
```

Option

-server soft_ip

Specify the IP address of VMware vCenter Server.

When omitted, the same operation as when "--server" is omitted in vCLI Connection Options will be performed.

-username username

Enter the name of a VIOM vCenter Server user account.

Specify a user with administrative privileges.

When omitted, the same operation as when "--username" is omitted in vCLI Connection Options will be performed.

-password password

Enter the password of the VIOM vCenter Server user account.

When omitted, the same operation as when "--password" is omitted in vCLI Connection Options will be performed.

-input input

Specify a storage information file.

For details on the file creation procedure, refer to "B.3 rcxadm config".

Specify the file using a relative or absolute path.

-type nfs

Performs mounting of an NFS datastore

-type vmfs

Performs resignaturing of the VMFS datastore. After resignaturing, the datastore name will be restored to its original name.

Resignaturing is performed to make the VMFS database copy recognizable by ESX or ESXi because it is not otherwise recognized as a datastore.

When resignaturing is performed, the datastore is temporarily renamed to "snap-*snapID*-*oldLabel*" but it is renamed again to "*oldLabel*" before the completion of the script.

Be sure the prerequisites for resignaturing have been satisfied before executing the script.

For details on resignaturing and prerequisites, refer to "Resignature a VMFS Datastore Copy" in the VMware manual available at:

Refer to the document of the corresponding version at the following URL:

vSphere Storage Guide

```
URL: http://www.vmware.com/support/pubs/vsphere-esxi-vcenter-server-pubs.html
```

-unmount

Performs unmounting instead of the mounting operation.

-listfile

Specify the CSV file, which contains NFS connection information.

- Lines beginning with sharp signs ("#") are comments in this CSV file.

- Blank lines in this CSV file are regarded as meaningless and skipped.

- Do not use multibyte characters for datastore names.

Specification format of the CSV is as follows:

```
Datastore name,IP address or domain name,NFS path
```

```
storage_X,192.168.3.230,/nfs/data
```

Exit Status

This command returns the following values:

0

The command executed successfully.

1

An error has occurred.

Example

```
>perl dsmount.pl -input out.csv -type vmfs -username Administrator <RETURN>
Enter password:
```

B.5 vmfile_update.pl

Name

[Windows Manager]

Installation_folder\SVROR\Manager\sys\dr_vmware_script\vmfile_update.pl - Updating of virtual machine files

[Linux Manager]

`/opt/FJSVrcvmr/sys/dr_vmware_script/vmfile_update.pl` - Updating of virtual machine files

Format

```
perl vmfile_update.pl -input file [-server soft_ip] [-username username] [-password password]
```

Function description

This command updates virtual machine files for the datastore for which mount is specified for the operation in the specified storage information file.

To execute the script, it is necessary to install VMware: vCLI (an external tool that controls VM software) on a server which can communicate with the VM management software beforehand.

When executing the script, it operates according to the settings of vCLI Connection Options. For details on vCLI Connection Options, refer to the VMware manual.

Option

-server *soft_ip*

Specify the IP address of VMware vCenter Server.

When omitted, the same operation as when "--server" is omitted in vCLI Connection Options will be performed.

-username *username*

Enter the name of a VIOM vCenter Server user account.

Specify a user with administrative privileges.

When omitted, the same operation as when "--username" is omitted in vCLI Connection Options will be performed.

-password *password*

Enter the password of the user account.

When omitted, the same operation as when "--password" is omitted in vCLI Connection Options will be performed.

-input *file*

Specify a storage information file.

For details on the file creation procedure, refer to "B.3 rcxadm config".

Specify a relative or absolute path.

Exit Status

This command returns the following values:

0

The command executed successfully.

1

An error has occurred.

Example

```
>perl vmfile_update.pl -input out.csv -username Administrator <RETURN>
Enter password:
```

B.6 rcxdrcheck

Name

[Windows Manager]

Installation_folder\SVROR\Manager\bin\rcxdrcheck - Disaster Recovery configuration check

[Linux Manager]

/opt/FJSVrcvmr/bin/rcxdrcheck - Disaster Recovery configuration check

Format

```
rcxdrcheck -mode {prepare| check} [-config_dir dir]
                        [-dir dir] [-image_dir dir] [-map mapping_dir]
                        [-mirror storage_file] [{-vmmgr vmmgr_file| -vm_pool pool_file}]
                        [-global] [-tenant tenant1[,tenant2...]]
```

Function description

rcxdrcheck is the command to check the DR (Disaster Recovery) configuration.

This command performs the following checks on the switchover source site:

Items Checked by the DR Configuration Check Tool

Table B.1 Items Checked by the DR Configuration Check Tool

Check No.	Check Item
1	Presence of LUN replication in the switchover scope (excluding LUNs with OVM for SPARC configurations)
2	Whether there are virtual storage resources with avoidance of duplicated storage names applied
3	Whether files to be used during switchover have been created
4	Whether operations that require re-output of the configuration information file are performed on Resource Orchestrator after the configuration information file has been output
5	Whether the path of the image storage folder has been changed to "*Switchover_information_storage_folder*\Image"

6	**For Active-Active operation**
	
	  - Whether resource names overlap between the sites
	
	  - Whether the resources used for switchover have been released from the resource pool on the switchover destination site
	
	For Active-Standby operation
	
	  - Whether resource names overlap between the sites

7	Whether the scopes of the network resources overlap between the sites
8	Whether the scopes of the address set resources overlap between the sites
9	Whether the servers and VM host resources required during switchover exist on the switchover destination site
10	Whether the network device resources required during switchover exist on the switchover destination site
11	Whether the same version level of ROR CE managers are used on both sites
12	Whether the installation folder of the ROR CE manager on both sites matches
13	Whether the admin LAN IP address of the admin server is same on both sites
14	That IP addresses set for the storage devices registered in the admin server do not overlap between sites
15	That configured server IP addresses do not overlap between sites
16	Whether address set resources and network resources are stored in the tenant
17	Whether the prefixes used for software IDs differ between sites

Check No.	Check Item
18	If the DR definition file (fa_dr.rcxprop) is correctly configured
19	If resources with the same names as the resources on the switchover source site exist on the switchover destination site

If necessary, before executing this command, edit the following definition file for the DR configuration check tool, using the ROR manager for the target site.

[Windows Manager]

Installation_folder\SVROR\Manager\etc\customize_data\drcheck.rcxprop

[Linux Manager]

/etc/opt/FJSVrcvmr/customize_data/drcheck.rcxprop

It is necessary to specify the -config_dir option when all of the following conditions are met:

  - "rcxdrcheck_prepare_define" is not specified in the definition file

  - The command is executed with "prepare" specified for the "-mode" option

When all of the following conditions are met, it is necessary to specify the -config_dir option.

  - "rcxdrcheck_check_define" is not specified in the definition file

  - The command is executed with "check" specified for the "-mode" option

It is necessary to specify the -dir option when all of the following conditions are met:

  - "#rcxmgrexport_define" is not specified in the DR definition file (fa_dr.rcxprop)

  - The command is executed with "check" specified for the "-mode" option

Set the following items in the definition file for the DR configuration check tool.

For the values that can be set for each item, refer to the following example.

[Windows Manager]

Installation_folder\SVROR\Manager\etc\customize_data\drcheck.rcxprop.sample

[Linux Manager]

/etc/opt/FJSVrcvmr/customize_data/drcheck.rcxprop.sample

Table B.2 Items to Set in the Definition File of the DR Configuration Check Tool

Item Name	Content
DR_switchover_method	Specify the switchover method. If this item is not configured, an inquiry message is output when the command is executed.
DR_operation_method	Specify the DR switchover operation method. If this item is not configured, an inquiry message is output when the command is executed.
excluded_check_items	Specify the items that will not be checked. When this item has not been configured, the DR configuration check is performed for all check items.
rcxdrcheck_prepare_define	Specify the folder to which the configuration information of the switchover destination site used by the DR configuration check tool is output. This folder is the folder on the ROR manager on the switchover destination site. Secure 100 MB or more free space for the storage folder.
rcxdrcheck_check_define	Specify the folder in which the configuration information of the switchover destination site used by the DR configuration check tool is stored. This folder is the folder on the ROR manager on the switchover source site. Secure 100 MB or more free space for the storage folder.

Subcommands

None.

Option

-mode {prepare| check}

Specify "prepare" or "check".

Table B.3 Operation Modes of the DR Configuration Check Tool

Option to Specify	Target Site of the rcxdrcheck Command	Remarks
prepare	Switchover destination site	The information of the ROR manager.
check	Switchover source site	The DR configuration check tool is executed.

-config_dir *dir*

- When "prepare" is specified for the -mode option

Specify the folder to which the configuration information of the switchover destination site used by the DR configuration check tool is output. This folder is the folder on the ROR manager on the switchover destination site.

📝 **Example**

. . . .

[Windows Manager]

>*Installation_folder*\SVROR\Manager\bin\rcxdrcheck -mode prepare -config_dir C:\Users\Administrator\work\drcheck_prepare_dir <RETURN>

[Linux Manager]

/opt/FJSVrcvmr/bin/rcxdrcheck -mode prepare -config_dir /root/work/drcheck_prepare_dir <RETURN>

. . . .

When omitted, the information is stored in the folder specified for "rcxdrcheck_prepare_define" in the following file:

[Windows Manager]

Installation_folder\SVROR\Manager\etc\customize_data\drcheck.rcxprop

[Linux Manager]

/etc/opt/FJSVrcvmr/customize_data/drcheck.rcxprop

📝 **Example**

. . . .

[Windows Manager]

```
#Specify the rcxdrcheck export folder
#ex) rcxdrcheck_prepare_define=D:\Export\drcheck_prepare_dir
rcxdrcheck_prepare_define=D:\Export\drcheck_prepare_dir
```

[Linux Manager]

```
#Specify the rcxdrcheck export folder
#ex) rcxdrcheck_prepare_define=D:\Export\drcheck_prepare_dir
rcxdrcheck_prepare_define=/DRExport/Export/drcheck_prepare_dir
```

. . . .

- When "check" is specified for the -mode option

Specify the folder in which the configuration information of the switchover destination site used by the DR configuration check tool is stored. This folder is the folder on the ROR manager on the switchover source site.

📗 **Example**

. . . .

[Windows Manager]

```
>Installation_folder\SVROR\Manager\bin\rcxdrcheck -mode check -config_dir C:\Users\Administrator
\work\drcheck_check_dir <RETURN>
```

[Linux Manager]

```
# /opt/FJSVrcvmr/bin/rcxdrcheck -mode check -config_dir /root/work/drcheck_check_dir <RETURN>
```

. . . .

When omitted, the information is stored in the storage folder specified for "rcxdrcheck_check_define" in the following file:

[Windows Manager]

Installation_folder\SVROR\Manager\etc\customize_data\drcheck.rcxprop

[Linux Manager]

/etc/opt/FJSVrcvmr/customize_data/drcheck.rcxprop

📗 **Example**

. . . .

[Windows Manager]

```
#Specify the rcxdrcheck check folder
# ex) rcxdrcheck_check_define=D:\Export\drcheck_check_dir
rcxdrcheck_check_define=D:\Export\drcheck_check_dir
```

[Linux Manager]

```
#Specify the rcxdrcheck check folder
# ex) rcxdrcheck_check_define=D:\Export\drcheck_check_dir
rcxdrcheck_check_define=/DRExport/Export/drcheck_check_dir
```

. . . .

-dir *dir*

When "check" is specified for the -mode option, specify the following options, if necessary.

Specify the folder on the switchover source site where the Disaster Recovery switchover information is stored.

📗 **Example**

. . . .

[Windows Manager]

```
>Installation_folder\SVROR\Manager\bin\rcxdrcheck -mode check -dir D:\Export\ManagerExport
<RETURN>
```

[Linux Manager]

```
# /opt/FJSVrcvmr/bin/rcxdrcheck -mode check -dir /DRExport/Export/ManagerExport <RETURN>
```

. . . .

When omitted, it is handled as though the ManagerExport folder, which is stored at one level higher than the folder specified for "#rcxmgrexport_define" in the following file, is specified.

[Windows Manager]

Installation_folder\SVROR\Manager\etc\customize_data\fa_dr.rcxprop

[Linux Manager]

/etc/opt/FJSVrcvmr/customize_data/fa_dr.rcxprop

When specifying this option, also specify the following options, if necessary.

- -image_dir

- -map

- -mirror

- -vmmgr

- -vm_pool

-image_dir *dir*

Specify the image file storage folders of physical servers. When specifying the -dir option, also specify this option.

When the -dir option and this option are omitted, it is handled as if the Image folder, which is stored at one level higher than the folder specified for "#rcxmgrexport_define" in the following file, is specified.

[Windows Manager]

Installation_folder\SVROR\Manager\etc\customize_data\fa_dr.rcxprop

[Linux Manager]

/etc/opt/FJSVrcvmr/customize_data/fa_dr.rcxprop

-map *mapping_dir*

Specify the folder in which the mapping files that define the relationships of the server names between the switchover source site and the switchover destination site are stored. When specifying the -dir option, also specify this option.

When the -dir option and this option are omitted, it is handled as if the MAP folder, which is stored at one level higher than the folder specified for "#rcxmgrexport_define" in the following file, is specified.

[Windows Manager]

Installation_folder\SVROR\Manager\etc\customize_data\fa_dr.rcxprop

[Linux Manager]

/etc/opt/FJSVrcvmr/customize_data/fa_dr.rcxprop

When changing the physical server name registered in the server tree or the VM management software name registered in the management software tree between the switchover source site and the switchover destination site, create a file under the MAP folder with the following content before executing the rcxdrcheck command.

- Any file name can be used.

- Comments cannot be set in this definition file.

- Blank lines in this definition file are regarded as meaningless and skipped.

- Enter the physical server mapping definitions in a single file.

- When defining physical server mapping, enter "#PhysicalServer" in a single line in this definition file. Enter the mapping definitions for physical servers after this line.

- Each physical server mapping definition should be stated in a single line, separating two corresponding physical server names using a comma (",").

- Enter mapping definitions for VM management software in a single file.

- When defining VM management software mapping, enter "#VMManagementSoftware" in a single line in this definition file. Enter the mapping definitions for VM management software after this line.

- Each VM management software mapping definition should be stated in a single line, separating two corresponding VM management software names using a comma (",").

📑 Example

· ·

```
#PhysicalServer
Server1-1,Server2-1 Server1-2,Server2-2#VMManagementSoftware
VMM1-1,VMM2-1 VMM1-2,VMM2-2
Server1-1 and Server1-2 are the server names on the switchover source site.
```

```
Server2-1 and Server2-2 are the server names on the switchover destination site.
VMM1-1 and VMM1-2 are the VM management software names on the switchover source site.
VMM2-1 and VMM2-2 are the VM management software names on the switchover destination site.
```

Information

Mapping definitions of physical servers and VM management software can be described in the MAP folder using either one of the following file configurations.

- Enter descriptions in a single file

- Enter descriptions in (two) different files

When including both the definition of physical server mapping and the definition of VM management software in the same file, do not give the descriptions as follows:

- Describing the physical server mapping definitions after the line including "#VMManagementSoftware", and before the line including "#PhysicalServer"

- Describing the VM management software mapping definitions after the line including "#PhysicalServer", and before the line including "#VMManagementSoftware"

-vm_pool *vm_pool*

Specify the definition file that defines the VM pool to which the VM host belongs. When this option is specified, the pre-check operation is performed assuming that virtual L-Server switchover is specified. When specifying the -dir option, also specify this option.

When the -dir option and this option are omitted, it is handled as if the vm_pool.csv file, which is stored at one level higher than the folder specified for "#rcxmgrexport_define" in the following file, is specified.

[Windows Manager]

Installation_folder\SVROR\Manager\etc\customize_data\fa_dr.rcxprop

[Linux Manager]

/etc/opt/FJSVrcvmr/customize_data/fa_dr.rcxprop

Create the file defining VM hosts on which the switchover target virtual L-Server is operating under the switchover information storage folder as follows.

- Specify the file name as vm_pool.csv.

- Lines beginning with sharp signs ("#") are comments in this definition file.

- Blank lines in this definition file are regarded as meaningless and skipped.

Example

```
#vmpool_name,vmhost_name,vmhost_type
/VMHostPool,192.168.2.1,VMware
/VMHostPool,192.168.2.2,OVM-SPARC
/tenant1/TenantVMHostPool,vmhost1.example.org,VMware
/tenant1/TenantVMHostPool,vmhost2.example.org,OVM-SPARC
/tenant2/TenantVMHostPool,192.168.10.15
```

- Specify the VM pool name of the switchover source site for vmpool_name.

- Specify the VM host name (displayed on the server tree of the ROR console in the switchover destination site) of the switchover destination site to be registered in the vmpool_name in the switchover destination site for vmhost_name.

- Specify the VM host type for vmhost_type.

  "VMware" and "OVM-SPARC" can be specified for vmhost_type. If this option is omitted, "VMware" is set.

- When registering multiple VM hosts in a VM pool, enter multiple lines.

-vmmgr *vmmgr_file*

Specify the VM management software definition file to register VM management software on the switchover destination site. When this option is specified, the pre-check operation is performed assuming that physical/virtual L-Server switchover is specified. When specifying the -dir option, also specify this option.

When the -dir option and this option are omitted, it is handled as if the vmmgr_file.txt file, which is stored at one level higher than the folder specified for "#rcxmgrexport_define" in the following file, is specified.

[Windows Manager]

Installation_folder\SVROR\Manager\etc\customize_data\fa_dr.rcxprop

[Linux Manager]

/etc/opt/FJSVrcvmr/customize_data/fa_dr.rcxprop

Create the information in the switchover information storage folder in order to register VM management software of Resource Orchestrator on the switchover destination site.

- Specify the file name as vmmgr_file.txt.

- Lines beginning with sharp signs ("#") are comments in this definition file.

- Blank lines in this definition file are regarded as meaningless and skipped.

Example

```
#name soft name ip user name password physical-lserver
vcenter, vmware-vc, 192.168.1.24, admin, admin, no
scvmm, ms-scvmm, 192.168.100.77, root, root, yes
```

-mirror *storage_file*

Specify the intermediate files for mapping that were output by executing the rcxstorage command with the -recovery option and -mode prepare option on the switchover source site. When specifying the -dir option, also specify this option.

When the -dir option and this option are omitted, it is handled as if the storage_file file, which is stored at one level higher than the folder specified for "#rcxmgrexport_define" in the following file, is specified.

[Windows Manager]

Installation_folder\SVROR\Manager\etc\customize_data\fa_dr.rcxprop

[Linux Manager]

/etc/opt/FJSVrcvmr/customize_data/fa_dr.rcxprop

-global

Performs the DR configuration check on global resources.

When this option and the -tenant option are omitted, the DR configuration check is performed on all resources on the switchover source site.

-tenant *tenant1*

Performs the DR configuration check on tenant resources and the global resources related to the tenant.

When this option and the -global option are omitted, the DR configuration check is performed on all resources on the switchover source site.

Exit Status

This command returns the following values:

0

The command executed successfully.

1

An error has occurred.

Check Results

The following check results are output in the "Result" for each check item.

- OK: When DR can be executed correctly after checking the target items

- ERROR: When DR cannot be executed due to setting errors found when checking the target items

- WARNING: When DR can be executed, however settings that are not recommended were found when checking the target items

- SKIPPED: The target item is an item specified in "excluded_check_items" in the definition file for the DR configuration check tool

For corrective actions for ERROR and WARNING messages, refer to "C.3 Error Messages Regarding rcxdrcheck".

Example

- When outputting the information from the ROR manager on the switchover destination site

```
>rcxdrcheck -mode prepare <RETURN>
```

- When performing a check of the DR configuration check tool on the switchover source site

```
>rcxdrcheck -mode check <RETURN>
Please select the switchover method.
<DR Switchover Method>
1:Physical L-Server switchover
2:Physical/Virtual L-Server switchover
3:Virtual L-Server switchover
4:both Physical L-Server switchover and Physical/Virtual L-Server switchover
5:both Physical L-Server switchover and Virtual L-Server switchover
=>1
Please select the type of DR operation method.
<DR Operation Method>
1:Active-Active
2:Active-Standby
=>1
[hh:mm:ss] Disaster Recovery check tool start...
[hh:mm:ss] (01/19): Correctness of Storage Replication : completed
[hh:mm:ss] (02/19): Confliction of Storage Names : skipped
[hh:mm:ss] (03/19): Integrality of Rcxrecovery Input Files : completed
[hh:mm:ss] (04/19): Consistency of rcxmgrexport output : completed
[hh:mm:ss] (05/19): Location of Physical Image Folder : completed
[hh:mm:ss] (06/19): Confliction of Resource Name : completed
[hh:mm:ss] (07/19): Confliction of Network Resource : completed
[hh:mm:ss] (08/19): Confliction of AddressSet Resource : completed
[hh:mm:ss] (09/19): Consistency of Server Resource : completed
[hh:mm:ss] (10/19): Consistency of Network Device : completed
[hh:mm:ss] (11/19): Consistency of ROR Manager Version : completed
[hh:mm:ss] (12/19): Consistency of ROR manager Installation Folder : completed
[hh:mm:ss] (13/19): Consistency of Admin Lan IP Address : completed
[hh:mm:ss] (14/19): Confliction of Storage Units' IP Addresses : completed
[hh:mm:ss] (15/19): Confliction of Servers' IP Addresses : completed
[hh:mm:ss] (16/19): Use of Global AddressSet and Network : completed
[hh:mm:ss] (17/19): Confliction of Software ID : completed
[hh:mm:ss] (18/19): Correctness of definition file configuration : completed
[hh:mm:ss] (19/19): Consistency of Resource Name : completed
[hh:mm:ss] Disaster Recovery check tool end...
Check result are shown as the following:
Total: 19
OK: 16
ERROR: 1
WARNING: 1
```

```
SKIPPED: 1
Item 01: Correctness of Storage Replication
Result : ERROR
Detail:
ERROR:Storage resources on the switchover source site are not
replicated.target=storage_name1,storage_name2
Item 02: Confliction of Storage Names
Result : SKIPPED
Item 03: Integrality of Rcxrecovery Input Files
Result : OK
Item 04: Consistency of rcxmgrexport output
Result : OK
Item 05: Location of Physical Image Folder
Result : OK
Item 06: Confliction of Resource Name
Result : OK
Detail:
Item 07: Confliction of Network Resource
Result : OK
Item 08: Confliction of AddressSet Resource
Result : OK
Item 09: Consistency of Server Resource
Result : OK
Item 10: Consistency of Network Device
Result : WARNING
Detail:
WARNING:Network devices have not been prepared on the destination site.target=
net_dev1,net_dev2...
Item 11: Consistency of ROR Manager Version
Result : OK
Item 12: Consistency of ROR manager Installation Folder
Result : OK
Item 13: Consistency of Admin Lan IP Address
Result : OK
Item 14: Confliction of Storage Units' IP Addresses
Result : OK
Item 15: Confliction of Servers' IP Addresses
Result : OK
Item 16: Use of Global AddressSet and Network
Result : OK
Item 17: Confliction of Software ID
Result : OK
Item 18: Correctness of definition file configuration
Result : OK
Item 19: Consistency of Resource Name
Result : OK
```

B.7 cfmg_changesoftwareid

Name

[Windows Manager]

Installation_folder\RCXCFMG\bin\cfmg_changesoftwareid.bat - Batch conversion of software IDs

[Linux Manager]

/opt/FJSVcfmg/bin/cfmg_changesoftwareid - Batch conversion of software IDs

Format

```
cfmg_changesoftwareid [-f] [-prefix prefix_to_convert] [-utf8]
```

Function description

Converts the software IDs of the registered software information into the IDs with the prefix configured during "Appendix A Settings for Software ID Prefixes".

Before executing the command, it is necessary to set an appropriate prefix according to the description in "Appendix A Settings for Software ID Prefixes".

The conversion results are output in XML format to the standard output.

Table B.4 Output Format

```
<?xml version='1.0' encoding='UTF-8'?>

<ids>

<id>

<Type>[ID Type]</Type>

<before>[Original ID]</before>

<after>[Modified ID]</after>

</id>

...

<ids>
```

Table B.5 List of the XML Setting Items for Batch Conversion of Software IDs

Element Name	Description
ids	Outputs an id element for each converted ID.
id	Displays the conversion result for a single ID.
type	Displays the type of the converted ID. The output result of this command outputs "SOFTWARE", which indicates that the software ID has been converted.
before	Outputs the ID before conversion.
after	Outputs the ID after conversion.

If none of the IDs have been converted, the following is output:

```
<?xml version='1.0' encoding='UTF-8'?>
<ids />
```

Option

-f

Converts software IDs without requesting confirmation.

When this option is omitted, the following message requesting confirmation of conversion is displayed.

To perform the process, enter "Y" or "y".

```
Are you sure to change all software IDs? (Y/N)
```

-prefix *prefix_to_convert*

Specify the prefix used in the software IDs to convert.

When the software IDs to be converted contain "SW" which is the default prefix, this option can be omitted.

-utf8

Output using UTF-8.

This option is only valid when using a Windows manager.

When this option is omitted on a Windows manager, Shift_JIS (Windows-31J) is used when outputting the result.

For Linux managers, UTF-8 is always used regardless of whether this option is specified.

Exit Status

This command returns the following values:

0

The command executed successfully.

non-zero

An error has occurred.

Example

Setting the "SA" Prefix and Converting Existing IDs with "SW"

- vsys_config.xml

```
<?xml version="1.0" encoding="UTF-8"?>
<!DOCTYPE properties SYSTEM "http://java.sun.com/dtd/properties.dtd">
<properties>
...
    <entry key="software-id-prefix">SA</entry>
...
</properties>
```

- Execution Example

```
> cfmg_changesoftwareid.bat <RETURN>
Are you sure to change all software IDs? (Y/N) y
<?xml version='1.0' encoding='Windows-31J'?>
<ids>
  <id>
   <type> SOFTWARE</type>
   <before>SW00000001</before>
   <after>SA00000001</after>
  </id>
  ...
  <id>
    <type> SOFTWARE</type>
    <before>SW00000026</before>
    <after>SA00000026</after>
  </id>
 ...
<ids>
```

P Point

. . . .

- When the prefix of the software ID to be converted is "SW", the -prefix option can be omitted.

- Software IDs with the registered prefix "SW" are converted into software IDs with the prefix "SA" specified during "Appendix A Settings for Software ID Prefixes".

. . . .

Setting the "SB" Prefix and Converting Existing IDs with "SA"

- vsys_config.xml

```
<?xml version="1.0" encoding="UTF-8"?>
<!DOCTYPE properties SYSTEM "http://java.sun.com/dtd/properties.dtd">
<properties>
...
    <entry key="software-id-prefix">SB</entry>
```

```
  ...
 </properties>
```

- Execution Example

```
> cfmg_changesoftwareid.bat -prefix SA <RETURN>
Are you sure to change all software IDs? (Y/N) y
<?xml version='1.0' encoding='Windows-31J'?>
<ids>
  <id>
    <type> SOFTWARE</type>
    <before>SA00000001</before>
    <after>SB00000001</after>
  </id>
  ...
  <id>
    <type> SOFTWARE</type>
    <before>SA00000026</before>
    <after>SB00000026</after>
  </id>
  ...
<ids>
```

P Point

. . . .

- As the prefix of the software ID to be converted is "SA", it is necessary to specify using the -prefix option.

- Software IDs with the registered prefix "SA" are converted into software IDs with the prefix "SB" specified during "Appendix A Settings for Software ID Prefixes".

- Software IDs with prefixes other than "SA" are not converted.

. . . .

Appendix C Message

This appendix explains the messages that are output when using Disaster Recovery.

For messages other than those explained below, refer to the "Messages".

C.1 Error Messages Regarding dsmount.pl

This section explains error/warning messages regarding dsmount.pl.

ERROR: Option *option* requires an argument.
usage: *usage*

Description

No parameter value has been specified on the command line.

Corrective Action

Enter the required parameter value on the command line.

ERROR: Required command option *option* not specified.
usage: *usage*

Description

The required *option* has not been specified on the command line.

Corrective Action

Check if the parameter on the command line is correct.

ERROR: Option unmount should not have an argument.
usage: *usage*

Description

The command line option -unmount contains a parameter value.

Corrective Action

Delete the parameter value for the -unmount option.

ERROR: Unknown option: *option*.
usage: *usage*

Description

An invalid option has been included on the command line.

Corrective Action

Delete the invalid option.

ERROR: Error connecting to server at *server*: Perhaps host is not a vCenter or ESX server

Description

There is an error in the connected VMware vCenter Server or VMware ESX.

Corrective Action

Modify the parameter value for *server* which has been entered on the command line to VMware vCenter Server or VMware ESX.

ERROR: Cannot complete login due to an incorrect user name or password.

Description

There is an error in the user name or password entered on the command line.

Corrective Action

Correct the user name or password entered on the command line.

ERROR: Option type's argument must be "vmfs" or "nfs".
usage: *usage*

Description

The command line option -type does not exist or there is an error in the parameter value.

Corrective Action

Specify vmfs or nfs for the -type option on the command line.

ERROR: Failed to open file: *file*.

Description

The specified file cannot be opened.

Corrective Action

Check that the specified file exists and is readable.

ERROR: Invalid file format. Correct file format should be: #operation,type,vstorage_name,datastore_name,mountpath,vmhosts.
Detail:line *number* in *inputfile*.

Description

An error has occurred in line *number* in *input_file*.

Corrective Action

Modify the format of line *number* in *input_file*:

```
#operationtype,vstorage_name,datastore_name,mountpath,vmhosts
```

ERROR: Datastore type must be "nfs" or "vmfs".
Detail: line *number* in *input_file*.

Description

There is an error in the type of the datastore that requires resignaturing in *input_file*.

Corrective Action

Specify vmfs or nfs for the type of the datastore that requires resignaturing in *input_file*.

ERROR: Invalid file format. Correct file format should be: #datastore_name,server_name,sharepath.
Detail: line number in listfile.

Description

There is an error in the format in line *number* in *listfile*.

Corrective Action

Modify the format of line *number* in *listfile*:

```
datastore_name,server_name,sharepath
```

ERROR: Failed to find datastore datastore_name in listfile listfile.
Detail: line *number* in *input_file*.

Description

The nfs datastore name specified in input_file does not exist in the file listfile.

Corrective Action

Check if the datastore name on the corresponding line of *input_file* is correct.

Check also if the content of the *listfile* file is correct.

ERROR: Failed to find any host in server server.

Description

There are no hosts on the ESX server.

Corrective Action

Check if there is a host on the ESX server. If there is not, add the necessary host.

ERROR: Failed to find host host in server server.

Description

The host described in the input file specified using the input option is not included in vCenter.

Corrective Action

Check if the host described in the input file specified using the input option is included in vCenter.

If it is not, add the necessary host.

ERROR: Failed to mount datastore datastore_name to host *host1*,*host2*....

Description

From the *datastore_name* described in the input file specified using the input option, of all of the destination hosts, mounting *host1*,*host2*... failed.

Corrective Action

Refer to the error details described in the log file, dsmount.log.

For details on the dsmount.log file, refer to "D.3 Logs Regarding the dsmount Command".

Take corrective action based on the causes of the failed mounting, then execute the dsmount.pl command again.

Mounting of datastores may fail depending on the disk recognition process of the VM host on VMware and the timing of execution of the dsmount.pl command. Considering such cases, if the cause of the error is unknown, execute the dsmount.pl command again.

WARNING: Failed to mount datastore datastore_name to all VMhosts (VMhost=*host1*,*host2*...).
Rcxrecovery command can be executed though the images contained in the datastore will not be imported.

Description

As the mounting destination host is not specified for the *datastore_name* described in the input file specified using the input option, mounting on all hosts, *host1*,*host2*... has failed.

Corrective Action

Refer to the error details described in the log file, dsmount.log.

For details on the dsmount.log file, refer to "D.3 Logs Regarding the dsmount Command".

Take corrective action based on the causes of the failed mounting, then execute the dsmount.pl command again.

Mounting of datastores may fail depending on the disk recognition process of the VM host on VMware and the timing of execution of the dsmount.pl command. Considering such cases, if the cause of the error is unknown, execute the dsmount.pl command again.

C.2 Error Messages Regarding vmfile_update.pl

This section explains error messages regarding vmfile_update.pl.

ERROR: Option *option* requires an argument.

Description

A parameter has not been specified.

Corrective Action

Check if the parameter on the command line is correct.

ERROR: Required command option *option* not specified.
usage: *usage*

Description

The required option has not been specified on the command line.

Corrective Action

Ensure that the correct command line option has been specified.

ERROR: Unknown option: *option*.
usage: usage

Description

An invalid option is included in the command line.

Corrective Action

Delete the option displayed in *option* from the command line.

ERROR: Error connecting to server at *server*: Perhaps host is not a vCenter or ESX server

Description

There is an error in the connected vCenter or ESX server.

Corrective Action

Modify the parameter value for *server* which has been entered on the command line to vCenter or ESX.

ERROR: Cannot complete login due to an incorrect user name or password.

Description

There is an error in the user name or password entered on the command line.

Corrective Action

Correct the user name or password entered on the command line.

ERROR: Failed to open file: *file*.

Description

The specified file cannot be opened.

Corrective Action

Check that the specified file exists and is readable.

ERROR: Invalid file format. Correct file format should be: #*operation,type,vstorage_name,datastore_name,mountpath,vmhosts*. Detail: line *number* in *input_file*.

Description

There is an error in the format of line *number* in *input_file*.

Corrective Action

Modify the format of the line containing the error as follows:

#*operation,type,vstorage_name,datastore_name,mountpath,vmhosts*

ERROR: Datastore type must be "nfs" or "vmfs". Detail: line *number* in *input_file*.

Description

There is an error in the type of the datastore that requires updating in the input file.

Corrective Action

Specify vmfs or nfs for the type of the datastore that requires updating in the input file.

ERROR: Failed to find datastore *datastore_name* in datacenter.

Description

There is no datastore for the input file on the server.

Corrective Action

Check the datastore information in the input file and then execute the command again.

ERROR: Failed to update datastore *datastore_name,* line *number* in *input_file*. Detail: *vcli_detail*

Description

An error has occurred during the updating of datastore information.

Corrective Action

Check the datastore information and the state of the datastore in the error line, and then execute the command again.

C.3 Error Messages Regarding rcxdrcheck

This section explains error/warning messages regarding rcxdrcheck.

Java HotSpot(TM) 64-Bit Server VM warning: You have loaded library /opt/FJSVrcvmr/runtime/jruby/lib/native/i386-Linux/libjffi-1.0.so which might have disabled stack guard. The VM will try to fix the stack guard now. It's highly recommended that you fix the library with 'execstack -c <libfile>', or link it with '-z noexecstack'.

Description

This message is displayed when you attempt to load a 32-bit library in a 64-bit Java environment.

There is a possibility that the stack guard of the library has been disabled, so take corrective action.

Corrective Action

As the stack guard settings of the library have been enabled, there is no need to take corrective action for this message.

ERROR: This type of DR switchover is not supported.

Description

When "Active-Active operation method" is selected, this message is displayed in either of the following cases.

- When "Physical/Virtual L-Server switchover method" is selected

- When the "-tenant" option is not specified (site switchover is specified)

Corrective Action

When performing the Active-Active operation, physical/virtual L-Server switchover and switchover per site cannot be performed.

Refer to the output message, and check the switchover method, the switchover operation method, and the command options. After that, execute the command again.

ERROR: The check tool cannot be processed because the temporary folder %temp% cannot be accessed. Please set the TEMP environment variable of current user correctly, then rerun the check tool.

Description

When executing the command on Windows manager, this message is displayed for either of the following reasons.

- The TEMP environment variable is not set

- Multiple folder paths are set in the TEMP environment variable

Corrective Action

Make the %temp% folder accessible on the Windows manager by setting a single folder path to the TEMP environment variable. After that, execute the command again.

ERROR: The specified value is invalid.

Description

The numbers of the specified switchover method or the DR switchover operation method are not correct.

Corrective Action

1. Execute the command again.

2. Check the messages displayed for inquiries.

3. Enter the number of desired switchover method or DR switchover operation method to continue the command.

ERROR: Replication check of vmware datastores cannot be performed. Detail: vCLI is not installed or path of vCLI has not been set to environment variable.

Description

VMware vSphere CLI (vCLI) is not installed, or the path has not been added to the PATH environment variable.

Corrective Action

Check the following points regarding VMware vSphere CLI (vCLI).

- If vCLI is installed in the environment used to execute the DR configuration check tool

- When using the Windows manager, if the vCLI path has been added to the PATH environment variable.

ERROR: Storage resources on the switchover source site are not replicated.target=*storage_name1*(*storageIP*/*LUN_ID*),*storage_name2*(*storageIP*/*LUN_ID*)...

Description

LUNs within the switchover scope: Replication of *storage_name1*(*storageIP*/*LUN_ID*),*storage_name2*(*storageIP*/*LUN_ID*)... has not been performed.

Corrective Action

Take corrective action for each *storage_name* displayed in target.

- Perform storage replication

- Modify the definition file to be excluded from the scope of switchover

For details on how to modify the definition file, refer to "3.5 Configuring for Limiting Switchover Scope".

- Move to a resource pool which is not the switchover target -

ERROR: Virtual storage resources with additional numbers at the end of the name exist on the switchover source site.target=*vs_name1*,*vs_name2*...

Description

There are virtual storage resources, *vs_name1*,*vs_name2*..., for which processing to avoid overlapped names is performed.

Corrective Action

Modify the names of virtual storage resources displayed in "target", and ensure there are no virtual storage resources for which processing to avoid overlapped names is performed.

For details, refer to "E.1.3 Storage Preparations" in the "Design Guide CE".

ERROR: Output of rcxstorage not found.

Description

The rcxstorage configuration file required for physical L-Server switchover (physical OS) or physical/virtual L-Server switchover (VM host/VM guest) has not been created.

Corrective Action

Create the rcxstorage configuration file.

For details, refer to "3. Obtain the Storage Replication Information" in "4.1 Normal Operation".

ERROR: VM management software definition file not found.

Description

The definition file of VM management software required for physical/virtual L-Server switchover (VM host/VM guest) has not been created.

Corrective Action

Create the VM management software definition file.

For details, refer to "3. Create a definition file of VM management software [Physical/virtual L-Server switchover (VM host/VM guest)]" in "3.6 Creating Files Used for Switchover".

ERROR: VM pool definition file not found.

Description

The VM pool definition file required for virtual L-Server switchover (VM guest) has not been created.

Corrective Action

Create the VM pool definition file.

For details, refer to "4. Create a VM pool definition file [Virtual L-Server switchover (VM guest)]" in "3.6 Creating Files Used for Switchover".

ERROR: VM management software definition file exists.

Description

The VM management software definition file exists.

Corrective Action

Check the switchover method. For details, refer to "2.1 Switchover Methods".

When using virtual L-Server switchover (VM guest) or physical L-Server switchover (physical OS), delete the definition file of the VM management software.

ERROR: VM pool definition file exists.

Description

The VM pool definition file exists.

Corrective Action

Check the switchover method. For details, refer to "2.1 Switchover Methods".

When using physical/virtual L-Server switchover (VM host/VM guest) or physical L-Server switchover (physical OS), delete the VM pool definition file.

ERROR: Output of rcxstorage exists.

Description

The rcxstorage configuration file exists.

Corrective Action

Check the switchover method. For details, refer to "2.1 Switchover Methods".

When using virtual L-Server switchover (VM guest), delete the rcxstorage configuration file.

ERROR: Exported configuration information is out of date.

Description

After the switchover information file is exported, operations requiring the output of the switchover information file again are being performed.

Corrective Action

Execute the rcxmgrexport command again to collect the switchover information.

For details, refer to "B.1 rcxmgrexport".

ERROR: Resource names duplicated between sites. type=*type*. Conflicted resource names are displayed as follows.
Switchover Source Site: *resource_name1*, Switchover Destination Site: *resource_name2*

Description

The resource type is *type* and the same name is set for the switchover target resource *resource_name1* on the switchover source site and the resource *resource_name2* on the switchover destination site.

Corrective Action

Change the resource name on either the switchover source site or the switchover destination site so that no resource names are duplicated between the sites.

📓 Example

••

```
ERROR: Resource names duplicated between sites. type=Folder. Conflicted resource names are
displayed as follows.
Switchover Source Site: /VMHostPool, Switchover Destination Site: /VMHostPool
ERROR: Resource names duplicated between sites. type=Network. Conflicted resource names are
displayed as follows.
Switchover Source Site: /NetworkPoolDR/network1, Switchover Destination Site: /NetworkPool/network1
Switchover Source Site: /TenantA/TenantNetworkPool/network2, Switchover Destination Site: /TenantB/
TenantNetworkPool/network2
ERROR: Resource names duplicated between sites. type=Usergroup. Conflicted resource names are
displayed as follows.
```

```
Switchover Source Site: monitor, Switchover Destination Site:monitor
Switchover Source Site: test, Switchover Destination Site:test
```

ERROR: Network's VLAN ID overlapped between sites. Conflicted resource names are displayed as follows.
Switchover Source Site: *network_name1*, Switchover Destination Site: *network_name2*

Description

The VLAN ID of the network resource *network_name1* on the switchover source site and the VLAN ID of the network resource *network_name2* on the switchover destination site are the same.

Corrective Action

Recreate the network resource on either the switchover source site or the switchover destination site so that no VLAN IDs for network resources are duplicated between the sites.

For details, refer to "14.3.1 Creating New Network Resources" in the "User's Guide for Infrastructure Administrators (Resource Management) CE".

📖 Example

```
ERROR: Network's VLAN ID overlapped between sites. Conflicted resource names are displayed as
follows.
Switchover Source Site: /NetworkPoolDR/network1, Switchover Destination Site: /NetworkPool/
network2
Switchover Source Site: /TenantA/TenantNetworkPool/network3, Switchover Destination Site: /TenantB/
TenantNetworkPool/network4
```

ERROR: Server resources have not been registered on the destination site.target= *server_name1,server_name2...*

Description

There are no switchover target server resources displayed in "target" on the switchover destination site.

Corrective Action

Take one of the following corrective actions:

- Register the server displayed in "target" to the server tree on the switchover destination site.

- Correctly edit the physical server mapping definition file displayed in "target" on the switchover source site.

For details, refer to "1. Create the mapping definitions of physical servers [Physical L-Server switchover (physical OS), Physical/Virtual L-Server switchover (VM host/VM guest)]" in "3.6 Creating Files Used for Switchover".

ERROR: VM host resources have not been registered on the destination site.target= *host1,host2...*

Description

The VM host resources displayed in "target" do not exist on the switchover destination site.

Corrective Action

Take one of the following corrective actions:

- Register the VM host displayed in "target" in the server tree on the switchover destination site.

- Delete the server displayed in "target" from the VM pool definition file on the switchover source site.

- Delete the definitions of the VM pools that are not switchover targets from the VM pool definition file and add the definitions of the VM pools that are switchover targets.

For details, refer to "4. Create a VM pool definition file [Virtual L-Server switchover (VM guest)]" in "3.6 Creating Files Used for Switchover".

ERROR: Subnet of Admin LAN overlapped between sites. Conflicted resource names are displayed as follows.
Switchover Source Site: *network_name1*, Switchover Destination Site: *network_name2*

Description

The admin LAN subnet of the network resource *network_name1* on the switchover source site and the admin LAN subnet of the network resource *network_name2* on the switchover destination site are the same.

Corrective Action

Modify the settings of the network resource on either the switchover source site or the switchover destination site so that no admin LAN subnets for network resources are duplicated between the sites.

For details, refer to "5.11 Registering Admin LAN Subnets" in the "User's Guide for Infrastructure Administrators (Resource Management) CE".

Example

```
ERROR: Subnet of Admin LAN overlapped between sites. Conflicted resource names are displayed as
follows.
Switchover Source Site: /NetworkPoolDR/network1, Switchover Destination Site: /NetworkPool/network2
Switchover Source Site: /TenantA/TenantNetworkPool/network3, Switchover Destination Site: /TenantB/
TenantNetworkPool/network4
```

ERROR: Address set resources overlapped between sites. Conflicted resource names are displayed as follows.
Switchover Source Site: *address_set_name1*, Switchover Destination Site: *address_set_name2*

Description

The address scope of the address set resource *address_set_name1* on the switchover source site and the address scope of the address set resource *address_set_name2* on the switchover destination site are the same.

Corrective Action

Recreate the address set resource on either the switchover source site or the switchover destination site so that address scopes of MAC addresses and WWN address set resources do not overlap between the sites.

For details, refer to "14.6 Address Set Resources" in the "User's Guide for Infrastructure Administrators (Resource Management) CE".

Example

```
ERROR: Address set resources overlapped between sites. Conflicted resource names are displayed as
follows.
Switchover Source Site: /AddressPool/mac1, Switchover Destination Site: /AddressPool/mac2
Switchover Source Site: /TenantA/TenantAddressPool/wwn1, Switchover Destination Site: /TenantB/
TenantAddressPool/wwn2
```

ERROR: Network devices have not been registered on the destination site.target= *net_dev1,net_dev2...*

Description

The network device resources displayed in "target" do not exist on the switchover destination site.

Corrective Action

Register the network device displayed in "target" in the network tree.

For details, refer to "5.7 Registering Network Devices" in the "User's Guide for Infrastructure Administrators (Resource Management) CE".

ERROR: ROR version does not match between sites.

Description

The version levels of the ROR CE managers are not the same between sites.

Corrective Action

Take one of the following corrective actions:

- Update the manager.

- Reconfigure the version of the switchover destination site manager to be the same as the switchover source site manager.

ERROR: Location of ROR installation folder does not match between sites.

Description

The installation folders of the ROR CE manager are not the same between sites.

Corrective Action

Reconfigure the manager to configure the same installation folder as that of the switchover source site.

ERROR: Admin LAN IP address of the admin server does not match between sites. IP addresses of both sites are displayed as follows.
Switchover Source Site: ip_address1, Switchover Destination Site: ip_address2

Description

ip_address1, the admin LAN IP address of the admin server on the switchover source site and *ip_address2*, the admin LAN IP address of the admin server on the switchover destination site, are not the same.

Corrective Action

Reconfigure the manager to use the same admin LAN IP addresses as that of the switchover source site.

Example

```
ERROR: Admin LAN IP address of the admin server does not match between sites. IP addresses of both
sites are displayed as follows.
Switchover Source Site:10.167.223.100, Switchover Destination Site: 10.167.223.101
```

ERROR: IP address of storage units conflicted between sites. Conflicted resource names are displayed as follows.
Switchover Source Site: storage_unit_name1, Switchover Destination Site: storage_unit_name2

Description

The same IP address is configured for the storage unit *storage_unit_name1* on the switchover source site and the storage unit *storage_unit_name2* on the switchover destination site.

Corrective Action

Re-create the IP address of the storage unit on either the switchover source site or the switchover destination site so that IP addresses of storage devices do not overlap between the sites.

Example

```
ERROR: IP address of storage units conflicted between sites. Conflicted resource names are
displayed as follows.
```

```
Switchover Source Site: storage_unit_name1, Switchover Destination Site: storage_unit_name2
Switchover Source Site: storage_unit_name3, Switchover Destination Site: storage_unit_name4
```

ERROR: IP address of servers conflicted between sites. Conflicted resource names are displayed as follows.
Switchover Source Site: *server_name1*, Switchover Destination Site: *server_name2*

Description

The same values are configured for the admin LAN IP address used by the physical L-Server on the physical server *server_name1* on the switchover source site and for the IP address used by the physical server *server_name2* on the switchover destination site.

Corrective Action

Perform the following procedure on the switchover destination site to ensure that the IP addresses of physical servers do not overlap between sites.

1. Delete the physical server with the overlapping address, which was displayed in the message, from the server tree.

2. Register the physical server deleted from the server tree in step 1 on the server tree again, using a different IP address from the physical server on the switchover source site.

📝 Example

```
ERROR: IP address of servers conflicted between sites. Conflicted resource names are displayed as
follows.
Switchover Source Site: server_name1, Switchover Destination Site: server_name2
Switchover Source Site: server_name3, Switchover Destination Site: server_name4
```

ERROR: Global addressset resource *addrset* is used by *tenant_name1, tenant_name2...*

Description

The global attribute address set resource *addrset* is used for the tenant *tenant_name1, tenant_name2....*

Corrective Action

Take one of the following corrective actions:

- Move the global address set resource displayed in the message to the tenant.

- Modify the settings to use only address set resources specific to the tenant.

ERROR: Invalid file format, detail=The value of "rcxstorage_define" in the definition file*filepath* not found.

Description

The path configured for "rcxstorage_define" in the configuration file displayed in *file_path* cannot be found.

Corrective Action

Confirm that the path configured for "rcxstorage_define" in the configuration file displayed in *file_path* is correct.

ERROR: Invalid file format, detail=The value of "rcxmgrexport_define" in the definition file *file_path* not found.

Description

When executing the rcxdrcheck command, there is an error in an item checked when the -dir option is not specified.

The path configured for "rcxmgrexport_define" in the configuration file displayed in *file_path* cannot be found.

Corrective Action

Confirm that the path configured for "rcxmgrexport_define" in the configuration file displayed in *file_path* is correct.

ERROR: Invalid file format, detail=The value of "salvage_define" in the definition file *file_path* not found.

Description

The path configured for "salvage_define" in the configuration file displayed in *file_path* cannot be found.

Corrective Action

Confirm that the path configured for "salvage_define" in the configuration file displayed in *file_path* is correct.

ERROR: Invalid file format, detail=The value of "DR Operation Method" in the definition file *file_path* is wrong.

Description

There is an error in the item checked when automatic takeover of configuration files is enabled.

There is an error in the content configured for "DR Operation Method" in the configuration file displayed in *file_path*.

Corrective Action

Confirm that one of the following values is correctly configured for "DR Operation Method" in the configuration file displayed in *file_path*.

- For the Active-Active DR operation method: DR_operation_method=1

- For the Active-Standby DR operation method: DR_operation_method=2

For details on automatic takeover of configuration files, refer to "3.3 Manager Installation and Configuration".

ERROR: Invalid file format, detail=The value of "DR Operation Method" has not been set to the definition file *file_path*.

Description

There is an error in the item checked when automatic takeover of configuration files is enabled.

There is no value configured for "DR Operation Method" in the configuration file displayed in *file_path*.

Corrective Action

Confirm that one of the following values is correctly configured for "DR Operation Method" in the configuration file displayed in *file_path*.

- For the Active-Active DR operation method: DR_operation_method=1

- For the Active-Standby DR operation method: DR_operation_method=2

For details on automatic takeover of configuration files, refer to "3.3 Manager Installation and Configuration".

ERROR: Invalid file format, detail=The value of "Config File Switchover" in the definition file *file_path* is wrong.

Description

There is an error in the content configured for "Config File Switchover" in the configuration file displayed in *file_path*.

Corrective Action

Confirm that the following value is correctly configured for "Config File Switchover" in the configuration file displayed in *file_path*.

- When enabling automatic takeover of configuration files: config_file_switchover=true

For details on automatic takeover of configuration files, refer to "3.3 Manager Installation and Configuration".

ERROR: Disk resources have not been prepared on the switchover destination site.target=/pool1/disk1, /pool1/disk2,...

Description

There is the following inconsistency between the switchover source and destination sites:

- Switchover source site

Disk resources *disk1*, *disk2*, ... which are linked to the virtual storage "vm-disk-vstorage" are configured as switchover targets.

- Switchover destination site

Disk resources with the same name as *disk1*, *disk2*, ... do not exist in the ROR database.

Corrective Action

Register the disk resources *disk1*, *disk2*, ... displayed for "target" on the switchover destination site.

For the registration procedure, refer to "Configuration when Performing Virtual L-Server Switchover (VM Guest)" in "3.4 Configuring Managed Resources".

WARNING: Invalid file format, detail=The value of "rcxstorage_define" has not been set to the definition file *file_path*.

Description

There is an error in the item checked during physical server switchover (physical OS) or physical/virtual L-Server switchover (VM host/ VM guest).

There is no value configured for "rcxstorage_define" in the configuration file displayed in *file_path*.

Corrective Action

When the situation is either of the following cases, configure the path to the switchover information storage folder for "rcxstorage_define" in the configuration file displayed for *file_path*.

- Physical L-Server switchover (physical OS) with Configuring Automatic Collection of Switchover Information enabled
- Physical/virtual L-Server switchover (VM host/VM guest) with Configuring Automatic Collection of Switchover Information enabled

WARNING: Invalid file format, detail=The value of "rcxmgrexport_define" has not been set to the definition file *file_path*.

Description

When executing the rcxdrcheck command, there is an error in an item checked when the -dir option is not specified.

There is no value configured for "rcxmgrexport_define" in the configuration file displayed in *file_path*.

Corrective Action

When the situation is either of the following cases, configure the path to the switchover information storage folder for "rcxmgrexport_define" in the configuration file displayed for *file_path*.

- When Configuring Automatic Collection of Switchover Information is enabled
- When executing the rcxmgrexport command without the -dir option specified

For details on the rcxmgrexport command, refer to "B.1 rcxmgrexport".

WARNING: Invalid file format, detail=The value of "salvage_define" has not been set to the definition file *file_path*.

Description

There is no value configured for "salvage_define" in the configuration file displayed in *file_path*.

Corrective Action

For "salvage_define" in the configuration file displayed in the *file_path*, enter the path to be specified when using the rcxrecovery -salvage command.

For details on the rcxrecovery -salvage command, refer to "B.2 rcxrecovery".

WARNING: Auto switchover of configuration files has not been turned on.

Description

There is no value configured for "Config File Switchover" in the configuration file displayed in *file_path*.

Corrective Action

When enabling automatic takeover of configuration files, configure "config_file_switchover=true" for "Config File Switchover" in the configuration file displayed in *file_path*.

For details on automatic takeover of configuration files, refer to "3.3 Manager Installation and Configuration".

ERROR: Software ID prefix has not been changed properly.

Description

Different values are not configured for the software ID prefixes of the two sites.

Corrective Action

Execute the software ID batch conversion command, "cfmg_changesoftwareid", and then configure different software ID prefixes for each site.

For details, refer to "Appendix A Settings for Software ID Prefixes".

WARNING: Global network resource *net* is used by *tenant_name1, tenant_name2...*

Description

The global attribute network resource *net* is used for the tenant *tenant_name1, tenant_name2....*

Corrective Action

Take one of the following corrective actions:

- Move the global network resource displayed in the message to the tenant.

- Modify the settings to only use the network resources specific to the tenant.

- During switchover, lock all tenants which use the corresponding network resources.

For details, refer to "4.2.2 Locking the Resources and Exporting the Configuration Information [Switchover Source Site]".

WARNING: The location of image file folder is not set correctly.

Description

When performing physical L-Server switchover (physical L-Server), the image file storage folder is not modified to "*switchover_information_storage_folder*\Image".

Corrective Action

Configure "*switchover_information_storage_folder*\Image" for the image file storage folder of the physical L-Server, and replicate the folder to the switchover destination site. Execute the following command to modify the image file storage folder of the physical L-Server to "*switchover_information_storage_folder*\Image".

[Windows Manager]

```
>Installation_folder\SVROR\Manager\bin\rcxadm mgrctl stop <RETURN>
>Installation_folder\SVROR\Manager\bin\rcxadm imagemgr set -attr
imagedir=switchover_information_storage_folder\Image <RETURN>
>Installation_folder\SVROR\Manager\bin\rcxadm mgrctl start <RETURN>
```

[Linux Manager]

```
# /opt/FJSVrcvmr/bin/rcxadm mgrctl stop <RETURN>
# /opt/FJSVrcvmr/bin/rcxadm imagemgr set -attr imagedir=switchover_information_storage_folder/
Image <RETURN>
# /opt/FJSVrcvmr/bin/rcxadm mgrctl start <RETURN>
```

For details, refer to "6.7 Changing the Image Folder Location" in the "User's Guide for Infrastructure Administrators (Resource Management) CE".

WARNING: Resource names duplicated between sites. type=*type*. Conflicted resource names are displayed as follows.
Switchover Source Site: *resource_name1*, Switchover Destination Site: *resource_name2*

Description

The resource type is *type* and the same name is set for the switchover target resource *resource_name1* on the switchover source site and the resource *resource_name2* on the switchover destination site.

Corrective Action

When *resource_name1* and *resource_name2* are different resources, change the resource name on either the switchover source site or the switchover destination site so that resource names do not overlap between the sites.

💠 Example
. . . .

```
WARNING: Resource names duplicated between sites. type=VirtualStorage. Conflicted resource names
are displayed as follows.
Switchover Source Site: /StoragePool/datastore1, Switchover Destination Site: datastore1
Switchover Source Site: /TenantA/TenantStoragePool/datastore2, Switchover Destination Site:
datastore2
```

. . . .

WARNING: Resources have not been unregistered on switchover destination site.target= *resource_name1,resource_name2*

Description

When performing switchover in Active-Active operation, the resource displayed in "target" is required for switchover, but registration from the resource pool in the switchover destination site is not canceled.

Corrective Action

Unregister the resource shown in "target" from the resource pool in the switchover source site in advance.

WARNING: Server resources have not been registered on the destination site.target= *server_name1,server_name2...*

Description

There are no switchover target server resources displayed in "target" on the switchover destination site.

Corrective Action

When the server resources displayed for "target" are out of the switchover scope, no action is necessary.

When the server resources displayed for "target" are included in the switchover scope, perform one of the following corrective actions:

- Register the server displayed in "target" to the server tree on the switchover destination site.

- Correctly edit the physical server mapping definition file displayed in "target" on the switchover source site.

For how to limit the scope of switchover, refer to "2.4 Limitation of switchover scope and additional recovery".

For details on how to edit mapping definition files, refer to "1. Create the mapping definitions of physical servers [Physical L-Server switchover (physical OS), Physical/Virtual L-Server switchover (VM host/VM guest)]" in "3.6 Creating Files Used for Switchover".

WARNING: VM host resources have not been registered on the destination site.target= *host1,host2...*

Description

The VM host resources displayed in "target" do not exist on the switchover destination site.

Corrective Action

When the VM host resources displayed for "target" are out of the switchover scope, no action is necessary.

When the VM host resources displayed for "target" are included in the switchover scope, perform one of the following corrective actions:

- Register the VM host displayed in "target" in the server tree on the switchover destination site.

- Delete the server displayed in "target" from the VM pool definition file on the switchover source site.

- Delete the definitions of the VM pools that are not switchover targets from the VM pool definition file and add the definitions of the VM pools that are switchover targets.

For how to limit the scope of switchover, refer to "2.4 Limitation of switchover scope and additional recovery".

For details on how to edit the VM pool definition file, refer to "4. Create a VM pool definition file [Virtual L-Server switchover (VM guest)]" in "3.6 Creating Files Used for Switchover".

Appendix D Output Logs when Switchover Occurs because of Disaster Recovery

This appendix explains the logs output when switchover occurs due to Disaster Recovery.

D.1 Logs Regarding L-Platforms

This appendix explains the logs regarding L-Platforms output when switchover occurs due to Disaster Recovery.

Information relating to the export or import process for L-Platform templates and L-Platform configurations is output to the following log when information is collected for Disaster Recovery switching, or when switching due to the occurrence of a disaster.

Log Output Destination

[Windows Manager]

Installation_folder\RCXCFMG\logs\vsys_dr_log

[Linux Manager]

/var/opt/FJSVcfmg/logs/vsys_dr_log

Log output format

The contents are output in one of the following formats:

- Format 1: date error-level message
- Format 2: date error-level message-ID message

When an error has occurred, the log is output in the format 2 with the error level "ERROR".

Corrective Actions for Logs

Check the output logs, and take the necessary corrective action.

For details on the output logs, refer to "D.1.1 Logs of L-Platforms Being Processed during Disaster Recovery Switchover Information Collection", "D.1.2 Logs that Reflect the Resource Status due to Automatic Processing of L-Platforms", and "D.1.3 Logs of L-Platforms Excluded from Recovery".

For details on the corrective actions for the output logs, refer to "D.1.4 Actions after Performing Disaster Recovery".

D.1.1 Logs of L-Platforms Being Processed during Disaster Recovery Switchover Information Collection

If switchover information is collected during L-Platform deployment or reconfiguration, it contains L-Platform configuration management information that does not reflect the actual resource status. Information on the L-Platform that was being processed is logged in the format described in this section.

For these L-Platforms, the process to automatically reflect the actual resource status in L-Platform configuration management information is performed at switchover For the logs output at this timing, refer to "D.1.2 Logs that Reflect the Resource Status due to Automatic Processing of L-Platforms".

- Log output format

Format 1

- Error level

WARN

- Message

Detailed information is output as the message.

item_1 = [*content_1*], *item_2* = [*content_2*], ... *item_n* = [*content_n*]

The following items are output.

Item Name	Content
Processing	Details of the processing that was in progress during export. One of the following is output: - "SUBSCRIBING": Deploying - "RECONFIGURING": Reconfiguring - "UNSUBSCRIBING": Unsubscribing - "TAKING SNAPSHOT": Taking a snapshot (virtual server), Backing up (physical server) - "RESTORING": Restoring - "CLONING": Collecting an image - "APPLYING UNSUBSCRIPTION": Applying an unsubscription - "APPLYING SUBSCRIPTION": Applying a subscription - "SAVING NEW CONFIGURATION": Saving a configuration of a new system - "APPLYING RECONFIGURE": Applying a reconfiguration - "SAVING RECONFIGURATION": Saving a configuration of a reconfiguration
L-Platform ID	The ID of the L-Platform that was being processed
System name	The L-Platform name
Tenant	The tenant of the L-Platform
User	The owner of the L-Platform
Template ID	The ID of the template the L-Platform uses
Server ID	The ID of the server being processed (It is output only when processing on a server.)
Server name	The name of the server being processed (It is output only when processing on a server.)
Date	The date and time of the processing

* Note: These items are only output when processing is performed for servers.

D.1.2 Logs that Reflect the Resource Status due to Automatic Processing of L-Platforms

For L-Platforms being processed while collecting the switchover information, the automatic processing for reflecting the actual resource status is performed. The type of automatic processing varies depending on the L-Platform configuration and status. Automatic processing will be logged in the following format:

- Log output format

Format 1

- Error level

INFO or WARN

- Message

Detailed information is output as the message.

item_1 = [*content_1*], *item_2* = [*content_2*], ... *item_n* = [*content_n*]

The common items given below will be output irrespective of the type of automatic processing.

Item Name	Content
Action	Details of the processing that was in progress during automatic processing One of the following is output: - "DELETED L-PLATFORM": Removed the L-Platform configuration information - "DELETED SERVER": Removed a server from the L-Platform configuration information - "DELETED DISK": Removed an extended disk from the L-Platform configuration information - "DELETED NIC": Removed an NIC from the L-Platform configuration information - "ADDED NIC": Added an NIC to the L-Platform configuration information - "ADDED SNAPSHOT INFORMATION": Added snapshot information - "DELETED SNAPSHOT INFORMATION": Removed snapshot information - "SET NETWORK DEVICE RESOURCE-ID": Configured a firewall resource ID - "SET DISK RESOURCE-ID": Configured a disk resource ID - "SET IP ADDRESS": Configured an IP address - "SET SERVER SPEC": Configured server specifications - "SET SCOPE OF L-PLATFORM": Configured owner's operation permission on the L-Platform - "CLEAR FLOW STATUS": Initialized the processing status of the application process - "LIST NETWORK DEVICE PARAMS": Output changes to firewall settings (*)
L-Platform ID	ID of the L-Platform to be automatically processed
System name	The L-Platform name
Tenant	The tenant of the L-Platform
User	The owner of the L-Platform

* Note: Parameter information set in the firewall device is not automatically reflected in L-Platform configuration information. You must confirm that the settings requested in the parameter changes are reflected in the firewall device. Automatic processing performed for a firewall is explained later in this section.

When automatic processing is performed for a server in an L-Platform, the following items will be output.

Item Name	Content
Server ID	ID of the server to be processed
Server name	Name of the server to be processed
Server spec	Server specs containing the resource status reflected by automatic processing. This item is output when the "Action" item is "SET SERVER SPEC". Setting items changed by automatic processing are output in the following format: **Format** Server spec = [*Setting_item_1* = [*Setting_1*], *Setting_item_2* = [*Setting_2*], ...] **Setting items** - "Number of CPUs": Number of CPUs - "CPU performance": CPU performance - "CPU reserved": Reserved CPU performance - "CPU shares": CPU shares - "Memory size": Memory capacity - "Memory reserved": Reserved memory capacity

Item Name	Content
	- "Memory shares": Memory shares
	- "Priority": Boot priority

When automatic processing is performed for a disk attached to a server, the following items will be output.

Item Name	Content
Disk ID	ID of the disk to be processed
Disk index	Index of the disk to be processed

When automatic processing is performed for an NIC attached to a server, the following items will be output.

Item Name	Content
NIC group index	Index of the NIC group to be processed (*1)
NIC NO	Serial number of the NIC to be processed (*2)
IP address	IP address (*3)

*1: For a grouped NIC

*2: For an NIC that is not grouped

*3: If an IP address has been set

When automatic processing is performed for a firewall, the following items will be output.

Item Name	Content
LNetDev name	Name of firewall to be processed
LNetDev ruleset	Details of parameter changes Details of changes made by the user are output in the following format: **Format** LNetDev ruleset = [{ *output_item_1* = [*content_1*], *output_item_2* = [*content_2*], ...}, ...] **Output items** - "name": Parameter name - "request value": Value specified by the user when changing the setting - "value": Setting prior to the change. This value is automatically changed to the requested value.
LNetDev parameter group list	List of parameter groups added or deleted, and their content. This item is output when a firewall setting is changed without the use of a ruleset. The content of a parameter group operated by the user is output in the following format: **Format** LNetDev parameter group list = [{ *Output_item_1* = [*Content_1*], *Output_item_2*= [*Content_2*], ...}, ...] **Output items** - "group name": Parameter group name - "group id": Parameter group ID - "operation": Operation performed by the user when changing the setting. "ADD" is output if a parameter group was added, and "DEL" is output if a parameter group was deleted. - "Parameters": Parameters added or deleted by the operation is output in the following format: **Format**

Item Name	Content
	parameters = [{ *Output_item_1* = [*Content_1*], *Output_item_2* = [*Content_2*]}, ...]
	Output items
	- "name": Parameter name
	- "value": Parameter setting

Automatic processing corrects management information for a firewall being reset, so it may look as if the setting was changed successfully even when it failed. Perform a switchover and check if the details output in the log are reflected in the device - if they are not, then enter the settings to the device.

D.1.3 Logs of L-Platforms Excluded from Recovery

When switchover scopes are limited, L-Platforms not included in the scopes are not recovered on the backup site.

This section describes the format of information regarding L-Platform not recovered because they are not in switchover scopes even though they are in switchover information.

For how to limit the scope of switchover, refer to "2.4 Limitation of switchover scope and additional recovery".

No action is required for these logs.

- Log output format

  Format 1

- Error level

  INFO

- Message

  Detailed information is output as the message.

```
EXCLUDE the L-Platform: item_1 = [content_1], item_2 = [content_2], ... item_n = [content_n]
```

The following items are output.

Item Name	Content
L-Platform ID	The ID of the L-Platform excluded from recovery
System name	The L-Platform name
Tenant	The tenant of the L-Platform
User	The owner of the L-Platform

D.1.4 Actions after Performing Disaster Recovery

After performing Disaster Recovery, check vsys_dr_log to see if the logs shown in "D.1.1 Logs of L-Platforms Being Processed during Disaster Recovery Switchover Information Collection" and "D.1.2 Logs that Reflect the Resource Status due to Automatic Processing of L-Platforms" are output.

This section explains the log output according to the processes described for the "Processing" item in "D.1.1 Logs of L-Platforms Being Processed during Disaster Recovery Switchover Information Collection".

a. SUBSCRIBING

  The L-Platform was being deployed by subscription or by importing L-Servers when it was exported.

  - Pattern1

Logs that Reflect the Resource Status due to	Error level	INFO
	Action item	- SET NETWORK DEVICE RESOURCE-ID

Automatic Processing of L-Platforms		- SET DISK RESOURCE-ID
		- SET IP ADDRESS
		- SET SCOPE OF L-PLATFORM
Condition	The L-Platform has been deployed successfully after being exported, and the resources exist. The resource status has been reflected in the L-Platform configuration information.	
Corrective Action	The L-Platform can be operated as is. No action required.	

- Pattern2

Logs that Reflect the Resource Status due to Automatic Processing of L-Platforms	Error level	INFO
	Action item	DELETED L-PLATFORM
Condition	The L-Platform was exported when its subscription was being processed, but the deployment failed, or it was exported when an L-Server was being imported as an L-Platform, but the processing was not completed. The L-Platform configuration information was deleted because the resources do not exist.	

Corrective Action	- If the subscription was not successfully processed, process it again.
	
	- If the import of an L-Server as a new L-Platform has not been completed, check the status of the orchestration tree on the [Resources] tab and take the following actions.
	
	  1. Check if the tenant contains the L-Platform ID name folder (*1).
	
	    Perform step 3 if it does not contain folders.
	
	    If it contains a folder, check if the folder also contains an L-Server to be imported.
	
	    Perform steps 2 and 3 if the folder does not contain an L-Server.
	
	    If the folder contains an L-Server, perform steps 2 and 3 after moving the target L-Server to a location where they can be imported, such as immediately below the tenant or root.
	
	  2. Delete the L-Platform ID name folder (*) in the tenant.
	
	  3. Import the L-Server again.	

* Note: The folder name can be specified according to "9.5 Setting the Method for Setting Resource Names" in the "Setup Guide CE". The default is L-Platform ID.

b. RECONFIGURING

The L-Platform was during a reconfiguration such as adding or deleting servers, disks or NICs, or changing server details when it was exported.

- Pattern1

Logs that Reflect the Resource Status due to Automatic Processing of L-Platforms	Error level	INFO
	Action item	- SET DISK RESOURCE-ID
		- SET IP ADDRESS
Condition	After the L-Platform has been exported while a server was being added by reconfiguration, the server was successfully added. The resource status has been reflected in the L-Platform configuration information.	
Corrective Action	The L-Platform can be operated as is. No action required.	

- Pattern2

Logs that Reflect the Resource Status due to	Error level	INFO
	Action item	DELETED SERVER

Automatic Processing of L-Platforms		
Condition	After the L-Platform has been exported while a server was being removed by reconfiguration, the server has been successfully removed, or the L-Platform has been exported while a server was being added by reconfiguration, so the server was not successfully added. The server was removed from the L-Platform configuration information because the resources do not exist.	
Corrective Action	If the L-Platform does not contain the required server, reconfigure it to add the server. If it contains segments to which no server or NIC is connected, reconfigure it to remove the segments.	

- Pattern3

Logs that Reflect the Resource Status due to Automatic Processing of L-Platforms	Error level	INFO
	Action item	SET DISK RESOURCE-ID
Condition	After the L-Platform has been exported while adding an extended disk by reconfiguration, the disk has been successfully added. The resource status has been reflected in the L-Platform configuration information.	
Corrective Action	The L-Platform can be operated as is. No action required.	

- Pattern4

Logs that Reflect the Resource Status due to Automatic Processing of L-Platforms	Error level	INFO
	Action item	DELETED DISK
Condition	After the L-Platform has been exported while removing an extension disk by reconfiguration, the disk has been successfully removed, or after the L-Platform has been exported while adding an extension disk by reconfiguration, the disk was not successfully added. The extended disk was removed from the L-Platform configuration information because the resource does not exist.	
Corrective Action	If the L-Platform does not contain required disks, reconfigure it to add an extension disk.	

- Pattern5

Logs that Reflect the Resource Status due to Automatic Processing of L-Platforms	Error level	INFO
	Action item	ADDED NIC
Condition	After the L-Platform has been exported while adding an NIC by reconfiguration, the NIC has been successfully added and the resource exists. An NIC has been added to the L-Platform configuration information based on the resource status.	
Corrective Action	The L-Platform can be operated as is. No action required.	

- Pattern6

Logs that Reflect the Resource Status due to Automatic Processing of L-Platforms	Error level	INFO
	Action item	DELETED NIC
Condition	After the L-Platform has been exported while removing an NIC by reconfiguration, the NIC has been successfully removed. The NIC was removed from the L-Platform configuration information because the resource does not exist.	
Corrective Action	If it contains segments to which no server or NIC is connected, reconfigure it to remove the segments.	

- Pattern7

Logs that Reflect the Resource Status due to Automatic Processing of L-Platforms	Error level	INFO
	Action item	SET SERVER SPEC
Condition	After the L-Platform has been exported while the server specification was being changed by reconfiguration, the specification change has been successfully processed. The resource status has been reflected in the L-Platform configuration information.	
Corrective Action	The L-Platform can be operated as is. No action required.	

- Pattern8

Logs that Reflect the Resource Status due to Automatic Processing of L-Platforms	Error level	WARN
	Action item	LIST NETWORK DEVICE PARAMS
Condition	L-Platform was exported while the firewall setting was being changed during a reconfiguration.	
Corrective Action	Reflect the setting in the firewall device as required.	

- Pattern9

Logs that Reflect the Resource Status due to Automatic Processing of L-Platforms	Error level	-
	Action item	-
Condition	The L-Platform has been exported while reconfiguring, but the automatic processing was not performed because no difference has been identified between the L-Platform configuration information and the resource status at switchover. The possible scenarios are as follows: - The L-Platform has been exported while the server was being removed, but the server was not successfully removed. - The L-Platform has been exported while the disk was being removed, but the disk was not successfully removed. - The L-Platform has been exported while the NIC was being removed, but the NIC was not successfully removed. - The L-Platform has been exported while the server specification was being changed, but the specification was not successfully changed. - The L-Platform has been exported while importing an L-Server to an existing L-Platform, and it was successfully imported. - The L-Platform has been exported while releasing an L-Server from an L-Platform, and the L-Server was not successfully released.	
Corrective Action	Reconfigure, if required.	

c. UNSUBSCRIBING

The L-Platform was being unsubscribed when it was exported.

- Pattern1

Logs that Reflect the Resource Status due to Automatic Processing of L-Platforms	Error level	INFO
	Action item	DELETED L-PLATFORM
Condition	After the L-Platform has been exported while it was being unsubscribed, it was successfully unsubscribed. The L-Platform configuration information was deleted because the resources do not exist.	
Corrective Action	No action required.	

- Pattern2

Logs that Reflect the Resource Status due to Automatic Processing of L-Platforms	Error level	-
	Action item	-
Condition	After the L-Platform has been exported while it was being unsubscribed, it was not successfully unsubscribed.	
Corrective Action	Unsubscribe it again.	

d. TAKING SNAPSHOT

The L-Platform that contains the virtual L-Server that the user was taking a snapshot of, or the physical L-Server that was being backed up, when it was exported.

- Pattern1

Logs that Reflect the Resource Status due to Automatic Processing of L-Platforms	Error level	INFO
	Action item	ADDED SNAPSHOT INFORMATION
Condition	After the virtual L-Server has been exported while taking a snapshot, a snapshot was obtained successfully, or after the physical L-Server has been exported while it was performing a backup, backup completed successfully. The snapshot/backup information was added in accordance with the status of resources.	
Corrective Action	No action required.	

- Pattern2

Logs that Reflect the Resource Status due to Automatic Processing of L-Platforms	Error level	INFO
	Action item	DELETED SNAPSHOT INFORMATION
Condition	After the virtual L-Server has been exported while taking a snapshot, a snapshot was obtained successfully, or after the physical L-Server has been exported while it was performing a backup, backup completed successfully. At this time, any old snapshots/backup data exceeding the maximum number of snapshot image versions were automatically deleted. The snapshot/backup information was deleted in accordance with the status of resources.	
Corrective Action	No action required.	

- Pattern3

Logs that Reflect the Resource Status due to Automatic Processing of L-Platforms	Error level	-
	Action item	-
Condition	After the virtual L-Server has been exported while taking a snapshot, it failed to take a snapshot, or after the physical L-Server has been exported while it was performing a backup, backup failed. Note that the end date in the snapshot/backup history will be blank and the status will display as an error.	
Corrective Action	Take another snapshot or perform another backup as required.	

e. RESTORING

The L-Platform contains servers that were being restored when it was exported. Redo the operation as needed.

In the history of snapshots or backups, the ending date is displayed as a blank and the status as an error.

f. CLONING

The L-Platform contains servers that were being collected images of when it was exported.

- Pattern1

Logs that Reflect the Resource Status due to Automatic Processing of L-Platforms	Error level	-
	Action item	-
Condition	The L-Platform has been exported while collecting an image. If it is successfully collected, the orchestration tree on the [Resources] tab contains a cloning image that matches.	
Corrective Action	If it contains a cloning image, you can create the corresponding image information and use it for operation. If it does not, collect it again.	

g. APPLYING UNSUBSCRIPTION

The L-Platform was in an application process of an unsubscription when it was exported.

  - Pattern1

Logs that Reflect the Resource Status due to Automatic Processing of L-Platforms	Error level	INFO
	Action item	DELETED L-PLATFORM
Condition	After the L-Platform has been exported while it was being unsubscribed, the unsubscription has been accepted and it was successfully unsubscribed. The L-Platform configuration information was deleted because the resources do not exist.	
Corrective Action	No action required.	

  - Pattern2

Logs that Reflect the Resource Status due to Automatic Processing of L-Platforms	Error level	INFO
	Action item	CLEAR FLOW STATUS
Condition	After the L-Platform has been exported while it was being unsubscribed, the unsubscription has not been processed because it has not been accepted, it was rejected, or the unsubscription was unsuccessful. The application status has been initialized because the resources exist.	
Corrective Action	If there is an unnecessary L-Platform, unsubscribe it again.	

h. APPLYING SUBSCRIPTION

The L-Platform was in an application process of a subscription when it was exported.

  - Pattern1

Logs that Reflect the Resource Status due to Automatic Processing of L-Platforms	Error level	-
	Action item	-
Condition	The L-Platform has been exported while subscribing to it.	
Corrective Action	Subscribe to it again, if required. If the orchestration tree on the [Resources] tab contains any L-Platform that matches, the L-Platform cannot be appropriately managed by this product. After saving necessary job data, migrate the data to the newly subscribed and deployed L-Platform. Use the cfmg_deletelplatform command to remove unnecessary L-Platforms only found on the [Resources] tab. Refer to "10.1 cfmg_deletelplatform (Delete L-Platform)" in the "Reference Guide (Command/XML) CE".	

i. SAVING NEW CONFIGURATION

The configuration of the L-Platform was saved when it was exported.

  - Pattern1

Logs that Reflect the Resource Status due to Automatic Processing of L-Platforms	Error level	-
	Action item	-
Condition	The L-Platform has been exported while its configuration was being saved.	
Corrective Action	Subscribe to it again, if required. If the orchestration tree on the [Resources] tab contains any L-Platform that matches, the L-Platform cannot be appropriately managed by this product. After saving necessary job data, migrate the data to the newly subscribed and deployed L-Platform. Use the cfmg_deletelplatform command to remove unnecessary L-Platforms only found on the [Resources] tab. Refer to "10.1 cfmg_deletelplatform (Delete L-Platform)" in the "Reference Guide (Command/XML) CE".	

j. APPLYING RECONFIGURE

The L-Platform was in an application process of a reconfiguration when it was exported.

- Pattern1

Logs that Reflect the Resource Status due to Automatic Processing of L-Platforms	Error level	-
	Action item	-
Condition	The L-Platform has been exported while its reconfiguration was being applied.	
Corrective Action	Check the status of the L-Platform and its resources. Reconfigure, if required.	

k. SAVING RECONFIGURATION

The configuration of a reconfiguration of the L-Platform was saved when it was exported.

- Pattern1

Logs that Reflect the Resource Status due to Automatic Processing of L-Platforms	Error level	-
	Action item	-
Condition	The L-Platform has been exported while its configuration was saved.	
Corrective Action	Check the status of the L-Platform and its resources. Reconfigure, if required.	

D.2 Logs Regarding the rcxrecovery Command

This section explains the Disaster Recovery (DR) execution log.

Table D.1 File Name, File Size, and Number of Versions of the DR Execution Log

Log Name	Description	File Size	Number of Versions
rcxrecovery.log	The DR execution log is output.	2 MB	Three versions (*)

* Note: If the number of versions exceeds three, the oldest version will be deleted.

Output Destination

Table D.2 Output Destination of the DR Execution Log [Windows Manager]

Output Folder	Output File
Installation_folder\SVROR\manager\var\dr	rcxrecovery.log (The newest log) rcxrecovery.log[.*n*] (*n* is the number of versions)

Table D.3 Output Destination of the DR Execution Log [Linux Manager]

Output Folder	Output File
/var/opt/FJSVrcvmr/dr	rcxrecovery.log (The newest log)

Output Folder	Output File
	rcxrecovery.log[.*n*] (*n* is the number of versions)

Output Format

Table D.4 Output Format of the DR Execution Log

Output Format
<datetime> <progress>:<message type>:<message id>:<message>

Table D.5 Output Items of the DR Execution Log

Item Name	Description
datetime	YYYY-MM-DD HH:MM:SS.sss (Local time). The date and time of the processing is output.
progress	Progress of rcxrecovery command processing
message type	Message type "INFO", "WARNING", or "ERROR" is output.
message id	ID of the error/warning message If it is not an error/warning message, "-" will be output.
message	Content of the message related to the processes or the error/warning message

📥 Example

. . . .

2014-09-30 07:19:24.849 (--/--): INFO:[-----]:default settings for the log file used

2014-09-30 07:19:25.651 (--/--): INFO:[-----]:rcxrecovery -tenant TenantA

2014-09-30 07:19:25.688 (1/8): INFO:[-----]:check of input data start

2014-09-30 07:30:38.863 (1/8): INFO:[-----]:check of input data end

2014-09-30 07:30:38.865 (2/8): INFO:[-----]:cleanup resources start

2014-09-30 07:30:38.866 (2/8): INFO:[-----]:cleanup resources end

2014-09-30 07:30:39.129 (--/--): INFO:[-----]:

For network resources that have been cleaned up, clear their

network configurations manually using VM management software

or the network devices. Also, if you have manually configured

the network on the primary site, configure the network for

the backup site again.

2014-09-30 07:37:10.865 (--/--): INFO:[-----]:

Press [y] when the reconfiguration is complete. : y(*)

2014-09-30 07:37:10.868 (3/8): INFO:[-----]:change network settings start

2014-09-30 07:37:10.869 (3/8): INFO:[-----]:change network settings end

2014-09-30 07:37:10.872 (4/8): INFO:[-----]:copy and configure the definition files start

2014-09-30 07:38:09.996 (4/8): INFO:[-----]:copy and configure the definition files end.....

2014-09-30 07:38:10.002 (5/8): INFO:[-----]:import physical resources start

2014-09-30 07:39:12.013 (5/8): INFO:[-----]:import physical resources end

2014-09-30 07:40:06.326 (6/8): INFO:[-----]:import virtual resources start

2014-09-30 07:40:59.790 (6/8): INFO:[-----]:import virtual resources end

2014-09-30 07:40:59.793 (7/8): INFO:[-----]:import middleware information start

2014-09-30 07:41:08.409 (7/8): ERROR:[67129]: 'ctchg_mergeacntinfo' is not recognized as an internal or external command,operable program or batch file.

D.3 Logs Regarding the dsmount Command

This section explains the dsmount execution log.

File Name, File Size, and Number of Versions of the dsmount Execution Log

Log Name	Description	File Size	Number of Versions
dsmount.log	The dsmount execution log is output.	5 MB	Two versions (*)

* Note: If the number of versions exceeds two, the oldest version will be deleted.

Output Destination

Output Destination of the dsmount Execution Log [Windows Manager]

Output Folder	Output File
Installation_folder\SVROR\manager\var\dr (*)	dsmount.log (The newest log) dsmount.log[.*n*] (*n* is the number of versions)

Output Destination of the dsmount Execution Log [Linux Manager]

Output Folder	Output File
/var/opt/FJSVrcvmr/dr (*)	dsmount.log (The newest log) dsmount.log[.*n*] (*n* is the number of versions)

* Note: If the output folder above already exists, a log file will be created in the folder. If the output folder above does not exist, a log file will be created in the current directory for the command prompt or the shell where the dsmount.pl command was executed.

Output Format

Output Format of the dsmount Execution Log

Output Format
<datetime> <message type> <message>

Output Items of the dsmount Execution Log

Item Name	Description
datetime	YYYY-MM-DD HH:MM:SS.sss (Local time). The date and time of the processing is output.
message type	Message type "INFO", "WARNING", or "ERROR" is output.
message	Content of the message related to the processes or the error/warning message When message type is "ERROR", the error details are output after "Detail" of the message. For detailed information on errors and corrective actions, refer to "Error Details and Corrective Actions".

Table D.6 Error Details and Corrective Actions

Error Details	Operation	Corrective Action
No unresolved VMFS snapshots with volume UUID *uuid* found.	Resignaturing a datastore (VMFS)	Confirm that the datastore can be recognized as a mount target candidate from the host, and then execute dsmount.pl again.
Timed out.	Renaming a datastore (VMFS)	Check the message describing the cause of the rename error from the GUI of vCenter, take corrective action based on the cause, and then execute the dsmount.pl command again.
read-only VMFS volume.	Rescanning a VM host	Check the access rights for the datastore and then execute dsmount.pl again.
mount *datastore* failed, reason given by server: Permission denied.	Mounting a datastore (NFS)	Check the access rights for the datastore and then execute dsmount.pl again.

For detailed information on the error above, as well as the cause and corrective actions of the other errors, refer to the VMware KB site at:

URL: http://kb.vmware.com

📝 Example

. . . .

2014-3-14 15:17:49 [INFO] "dsmount.pl -server 193.168.11.100 -username admin -input input.csv -type vmfs" started

...

2014-3-14 15:18:56 [INFO] Resignatrue datastore ds1 to host 193.168.11.109 started.

2014-3-14 15:19:10 [INFO] Resignatrue datastore ds1 to host 193.168.11.109 succeeded.

2014-3-14 15:19:11 [INFO] Resignature datastore ds2 to host 193.168.11.110 started.

2014-3-14 15:19:12 [ERROR] Resignature datastore ds2 to host 193.168.11.110 failed. Detail: No unresolved VMFS snapshots with volume UUID '53020886-bb158608-0289-60eb69a5c965' found.

2014-3-14 15:21:40 [INFO] Rename datastore snap-6235-ds1 to ds1 started.

2014-3-14 15:21:45 [ERROR] Rename datastore snap-6235-ds1 to ds1 succeeded.

2014-3-14 15:22:00 [INFO] Rename datastore snap-0938-ds2 to ds2 started.

2014-3-14 15:22:03 [ERROR] Rename datastore snap-0938-ds2 to ds2 failed. Detail: Timed out.

2014-3-14 15:22:05 [INFO] Rescan host 193.168.11.109 started.

2014-3-14 15:23:48 [INFO] Rescan host 193.168.11.109 succeeded.

2014-3-14 15:24:30 [INFO] Rescan host 193.168.11.109 started.

2014-3-14 15:24:39 [ERROR] Rescan host 193.168.11.109 failed. Detail: read-only VMFS volume.

2014-3-14 15:37:30 [INFO] Mount datastore nfs-ds1 to host 193.168.11.101 started.

2014-3-14 15:37:35 [INFO] Mount datastore nfs-ds1 to host 193.168.11.101 succeeded.

2014-3-14 15:37:40 [INFO] Mount datastore nfs-ds1 to host 193.168.11.101 started.

2014-3-14 15:37:41 [ERROR] Mount datastore nfs-ds1 to host 193.168.11.101 failed. Detail: mount 193.168.11.102:/home/test/nfs-ds1 failed, reason given by server: Permission denied.

...

2014-3-14 15:40:49 [INFO] "dsmount.pl -server 193.168.11.100 -username admin -input input.csv -type vmfs" finished.

. . . .

Appendix E Using the [Templates] and [L-Platforms] Tabs when Resources Are Locked

This appendix explains how to use the [Templates] tab and the [L-Platforms] tab when resources are locked.

P Point

. . . .

The information provided here is necessary for tenant administrators to create or edit L-Platform templates, and for tenant administrators or tenant users to subscribe or reconfigure L-Platforms.

Ensure that this information is provided with sufficient explanation to tenant administrators and tenant users.

. . . .

E.1 [Templates] Tab

Locked resources are treated as follows in the [Templates] tab of the [L-Platform Template] window:

- You cannot start using locked resources.

- If a resource specified in a template is locked, the template cannot be edited unless the resource is deleted from the L-Platform template.

Locking resources affects operations on segment information and template information.

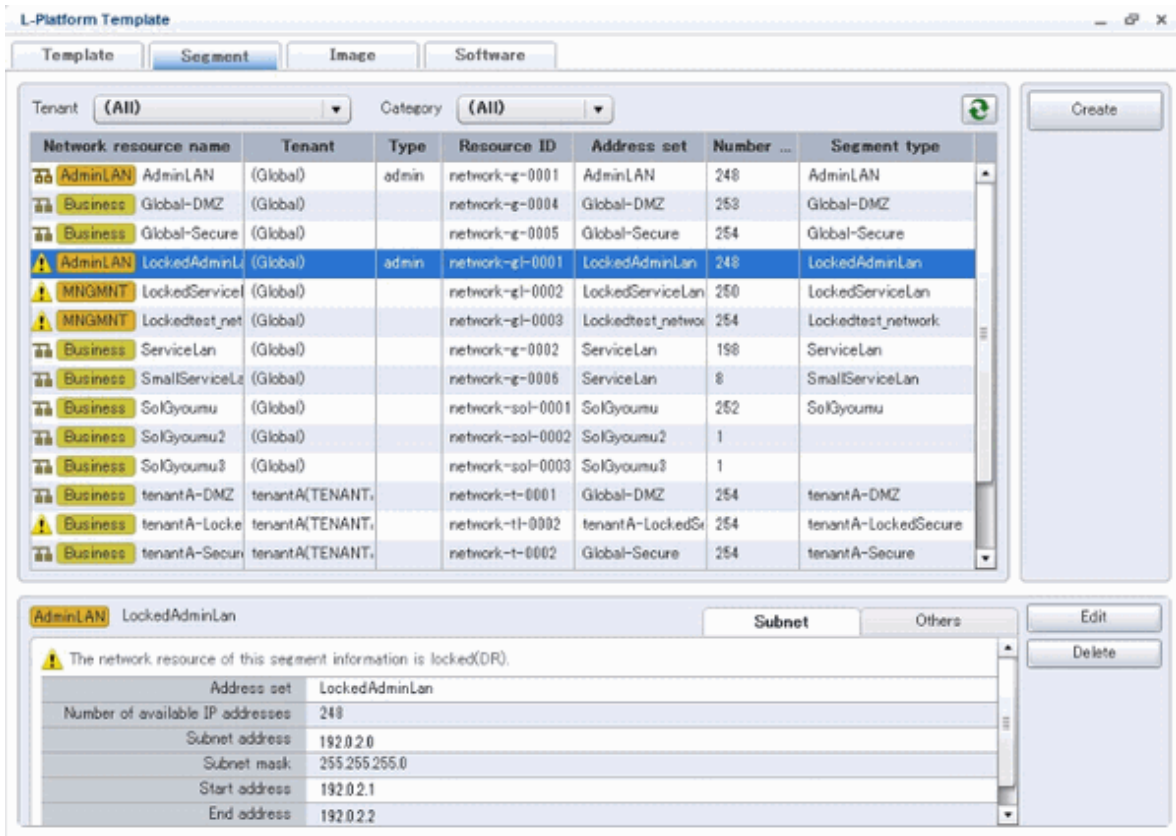The following sections describe the tabs used to manage this information.

E.1.1 Segment information

This section describes how segment information that uses locked network resources is treated in the [Segment] tab of the [L-Platform Template] window for each of the following items.

- Table Component of the [Segment] Tab

- [Create New Segment] Area

- [Edit Segment] Area

Table Component of the [Segment] Tab

During a failback, segment information that uses locked network resources is displayed with a warning icon at the left side of the list. When the segment information is selected, a warning icon and a message indicating that the network resource is locked are displayed in the details area at the lower part of the window.

[Create New Segment] Area

Locked network resources are not listed in the window for creating segment information.

[Edit Segment] Area

If the network resource specified in the segment information is locked, a warning icon and a message are displayed in the area for [Edit Segment] area.

Segment information can still be edited (to change category and segment type), even if network resources are locked.
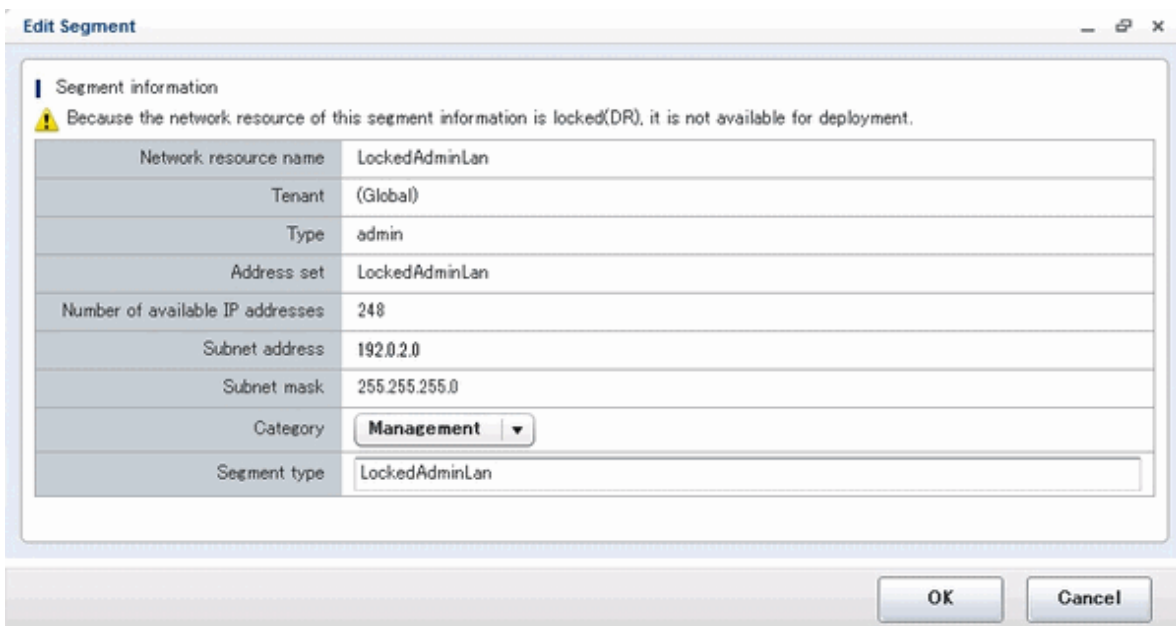
E.1.2 [Template] Tab

This section explains how template information that uses locked disk or network resources is treated in the [Templates] tab of the [L-Platform Template] window for each of the following items.

- Table Component of the [Templates] Tab

- Configuration

Table Component of the [Templates] Tab

You can check whether template information contains locked resources in this window.

If template information contains locked resources, a warning icon is displayed at the right side of the list at the left side of the page. When template information is selected, a message indicating that resources are locked is displayed in the template information area at the lower right of the window, and a warning icon is displayed with the information related to the locked resources.

Template information containing locked resources cannot be published.
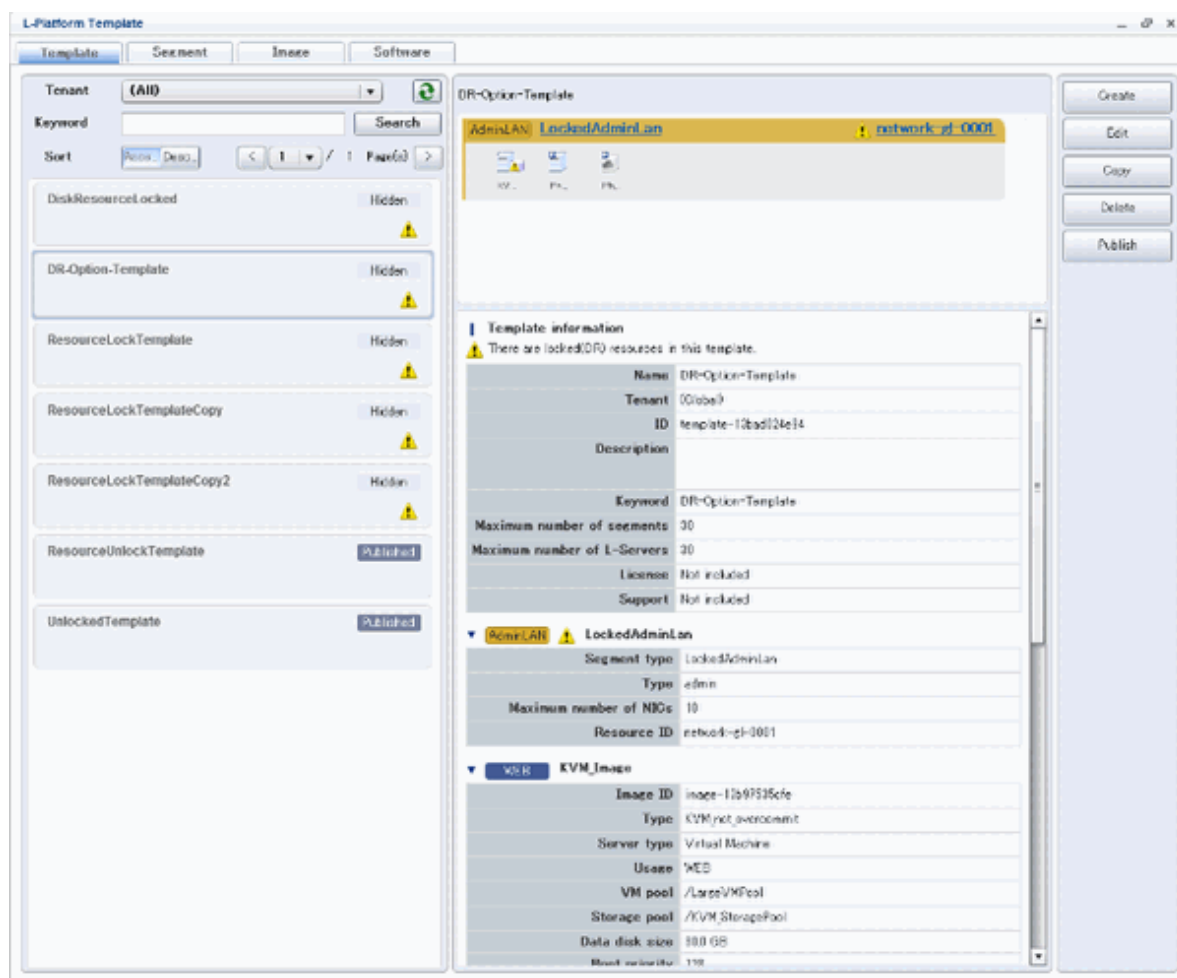
Configuration

When an L-Platform template is being created, copied, or edited, locked resources on the [Configure] page are treated as follows:

- Locked disk resources and segment information are not displayed as [Additional Options].

- If an L-Platform template contains locked network resources, the corresponding segment is displayed with a warning icon next to the network resource name in the header.

- If the L-Platform template contains locked disk resources, the corresponding server icon is displayed with a warning icon.

- When a segment contained in the L-Platform template is selected and resources are locked, messages indicating that the resources are locked are displayed in the element details area.

- When a server contained in the L-Platform template is selected and a disk with locked resources is selected in the element details area, messages indicating that the resources are locked are displayed.

- If the L-Platform template contains a locked network resource, images and SLBs cannot be added to the corresponding segment from [Additional Options].

When the [Next] button is clicked in the [Configure] page, the application checks whether the L-Platform template contains locked resources.

If it does, a message indicating that unusable resources are specified is displayed. Modify the L-Platform template in the [Configure] page so that it contains only usable resources, and then click the [Next] button.

E.2 [L-Platforms] Tab

Locked resources are treated as follows in the [L-Platforms] tab of the [L-Platform Management] window:

- L-Platform templates containing locked resources cannot be used to subscribe L-Platforms.

- When an L-Platform is being reconfigured and some of its resources are locked, information for the corresponding segments and servers cannot be modified.

The following sections describe how the operation of L-Platform subscription and L-Platform management is affected when there are locked resources.

## E.2.1 L-Platform Subscription

This section explains how L-Platform subscription is affected when there are locked resources for each of the following pages.

- The [Select Template] Page for New Configurations

- The [Select Template] Page for Saved Configurations

- The [Reconfigure] Page

The [Select Template] Page for New Configurations

You can check whether an L-Platform template contains locked resources on this page.

If an L-Platform template contains locked resources, a warning icon is displayed on the right side of the list in the left part of the window. When the L-Platform template is selected, a message indicating that resources are locked is displayed in the [L-Platform Overview] of the template details area at the lower right of the window, and a warning icon is displayed next to the information for the locked resources.
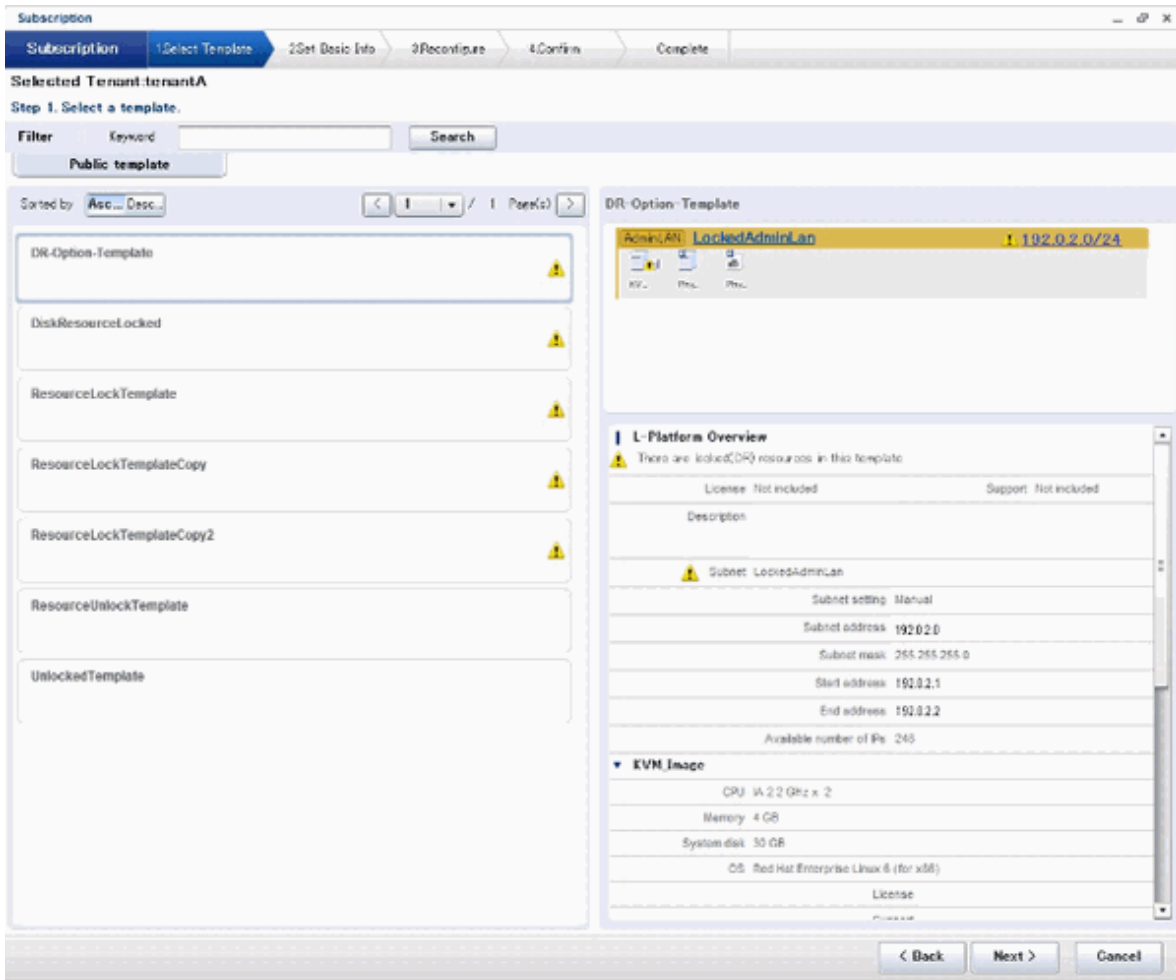
The [Select Template] Page for Saved Configurations

As with the page for a new configuration, you can check whether an L-Platform template contains locked resources on this page.

If an L-Platform template contains locked resources, a warning icon is displayed on the right side of the list in the left part of the window. When the L-Platform template is selected, a message indicating that resources are locked is displayed in the [L-Platform Overview] of the template details area at the lower right of the window, and a warning icon is displayed next to the information for the locked resources.

In addition, saved configurations of an L-Platform template that satisfy any of the conditions below cannot be used to subscribe an L-Platform.
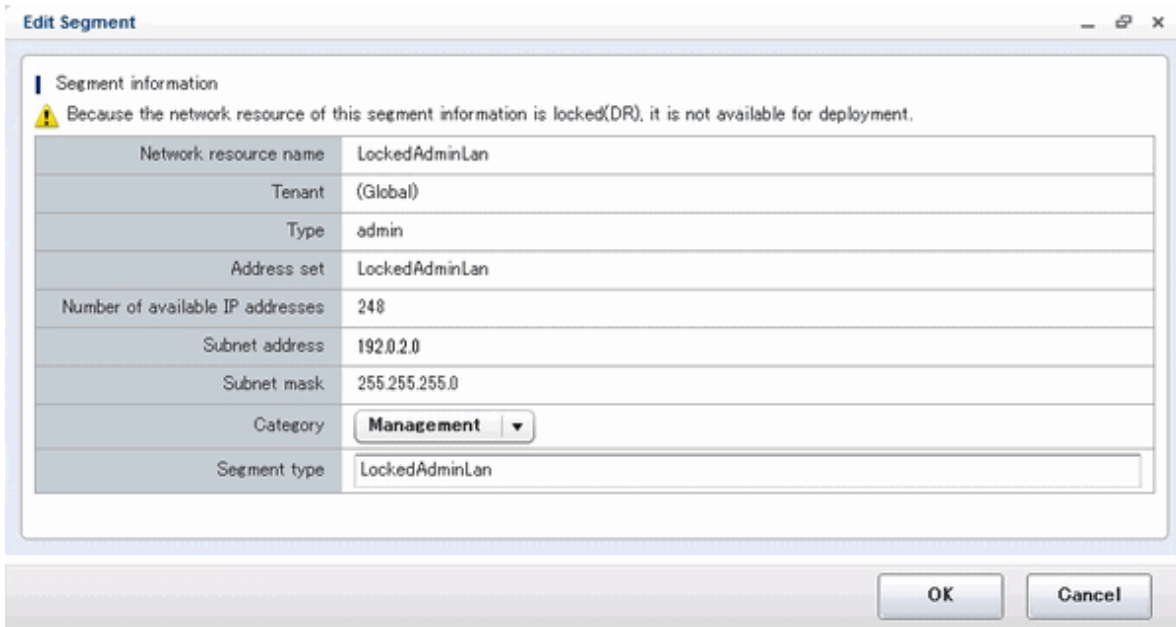
- It is for a new L-Platform subscription, and it contains locked resources.

- It is for an L-Platform reconfiguration, and it contains locked resources that have been added for the reconfiguration.

The [Reconfigure] Page

Locked resources are treated as follows in the [Reconfigure] page for subscribing an L-Platform:

- Locked disk resources and segment information are not displayed as [Additional Options].

- If an L-Platform template contains locked network resources, the corresponding segment is displayed with a warning icon next to the network resource name in the header.

- If the L-Platform template contains locked disk resources, the corresponding server icon is displayed with a warning icon.

- When a segment contained in the L-Platform template is selected and resources are locked, messages indicating that the resources are locked are displayed in the element details area.

- When a server contained in the L-Platform template is selected and a disk with locked resources is selected in the element details area, messages indicating that the resources are locked are displayed.

- If the L-Platform template contains a locked network resource, images cannot be added to the corresponding segment from [Additional Options].

Edit Segment

Segment information

⚠ Because the network resource of this segment information is locked(DR), it is not available for deployment.

Network resource name	LockedAdminLan
Tenant	(Global)
Type	admin
Address set	LockedAdminLan
Number of available IP addresses	248
Subnet address	192.0.2.0
Subnet mask	255.255.255.0
Category	Management ▼
Segment type	LockedAdminLan

OK   Cancel

E.2.2 L-Platform Management

This section explains how L-Platform management is affected when there are locked resources for each of the following pages.

- The [L-Platform Management] Page
- The [L-Platform Details] Page
- L-Platform Reconfiguration - The [Reconfigure] Page
- L-Platform Cancellation - The [Confirm] Page

The [L-Platform Management] Page

You can check whether an L-Platform contains locked resources on this page.

If an L-Platform contains locked resources, a warning icon is displayed on the right side of the list.

The [L-Platform Details] Page

Locked resources are treated as follows on this page:

- If the L-Platform contains locked network resources, the corresponding segment is displayed with a warning icon next to the network resource name in the header.
- If the L-Platform contains locked disk resources, the corresponding server icon is displayed with a warning icon.
- When a segment contained in the L-Platform is selected and resources are locked, messages indicating that the resources are locked are displayed in the element details area.
- When a server contained in the L-Platform is selected and a disk with locked resources is selected in the element details area, messages indicating that the resources are locked are displayed.

L-Platform Reconfiguration - The [Reconfigure] Page

Locked resources are treated as follows on this page:

- Locked disk resources and segment information are not displayed as [Additional Options].

- If the L-Platform contains locked network resources, the corresponding segment is displayed with a warning icon next to the network resource name in the header. The only possible operation on such a segment is deletion.

- If the L-Platform contains locked disk resources, the corresponding server icon is displayed with a warning icon. The only possible operation on locked disk resources of such a server is deletion.

- When a segment contained in the L-Platform is selected and resources are locked, messages indicating that the resources are locked are displayed in the element details area.

- When a server contained in the L-Platform is selected and a disk with locked resources is selected in the element details area, messages indicating that the resources are locked are displayed.

- If the L-Platform contains a locked network resource, servers (NICs) cannot be placed in the corresponding segment.

L-Platform Cancellation - The [Confirm] Page

Locked resources are treated as follows on this page:

- Even if the L-Platform contains locked resources, it can be canceled.

- If the L-Platform contains locked network resources, the corresponding segment is displayed with a warning icon next to the network resource name in the header.

- If the L-Platform contains locked disk resources, the corresponding server icon is displayed with a warning icon.

- When a segment contained in the L-Platform is selected and resources are locked, messages indicating that the resources are locked are displayed in the element details area.

- When a server contained in the L-Platform is selected and a disk with locked resources is selected in the element details area, messages indicating that the resources are locked are displayed.

Appendix F   Target Files of Automatic Takeover of Configuration Files

When automatic takeover of configuration files is enabled, the configuration files shown in the following table are taken over from the switchover source site by the switchover destination site during switchover (when the rcxrecovery command is executed).

During automatic takeover of configuration files, the definitions in the configuration file at the switchover source site are given priority.

The takeover targets are the configuration files that are created, modified, or deleted on the switchover source site.

"*" in the table indicates arbitrary files in the folders.

Table F.1 Target Files of Automatic Takeover of Configuration Files [Windows Manager]

Folder	File Name
Installation_folder\SVROR\Manager\etc\	trapop.bat
Installation_folder\SVROR\Manager\etc\customize_data\	create_image_previous_folder_name_scvmm.rcxprop
	disable_num_of_address_check.rcxprop
	folder.rcxprop
	get_cpu_enabled_cores.rcxprop
	manager.rcxprop
	manager_backup.rcxprop
	manager_memory.rcxprop
	network_device_model.xml
	network_list.rcxprop
	nic_index_map.rcxprop
	physical_l_server_modify.rcxprop
	physical_l_server_nicmodify_blade.rcxprop
	physical_l_server_nicmodify_rack.rcxprop
	power_timeout.rcxprop
	scsicontroller.rcxprop
	scw_nf_retry_define.rcxprop
	server_snmp.rcxprop
	server_spec.rcxprop
	spare_server_config.rcxprop
	storage.rcxprop
	sparc_vm.rcxprop
	tenant_config.xml
	tenant_move.rcxprop
	unm_mon.rcxprop
	unm_provisioning.rcxprop
	viom.rcxprop
	vnetwork_excluded_vmware.rcxprop
	vnetwork_hyperv.rcxprop
	vnetwork_oraclevm.rcxprop

Folder	File Name
	vnetwork_ovmforsparc.rcxprop
	vnetwork_solariscontainer.rcxprop
	vnetwork_rhelkvm.rcxprop
	vnetwork_rhelxen.rcxprop
	vnetwork_vmware.rcxprop
	zpool_and_zone_recovery.rcxprop
Installation_folder\SVROR\Manager\etc\customize_data\alive_monitoring\	Physical.rcxprop
Installation_folder\SVROR\Manager\etc\customize_data\nicdefctl\host\	*
Installation_folder\SVROR\Manager\etc\customize_data\nicdefctl\model\	*
Installation_folder\SVROR\Manager\etc\scripts\	*
Installation_folder\SVROR\Manager\etc\scripts\Exec_Script\	*
Installation_folder\SVROR\Manager\etc\scripts\network_resource\	Unm_network_setting.xml
Installation_folder\SVROR\Manager\etc\scripts\network_resource\ *Ruleset_Name*\	*
Installation_folder\SVROR\Manager\etc\scripts\Vendor_Name*Unit_Name* or *Model_Name*\common\	*
Installation_folder\SVROR\Manager\etc\scripts\Vendor_Name*Unit_Name* or *Model_Name*\operations*Ruleset_Name*\	*
Installation_folder\SVROR\Manager\etc\scripts\Vendor_Name*Unit_Name* or *Model_Name*\rulesets*Ruleset_Name*\	*
Installation_folder\SVROR\Manager\etc\user_scripts\	*
Installation_folder\SVROR\Manager\etc\vm\	delete_image_all_files_scvmm
	snapshot_skip_reconfig
	vds_vc
Installation_folder\SVROR\Manager\sys\usm\etc\	clariion.conf
	falconstor.conf
	symmetrix.conf
	usm.conf
Installation_folder\SVROR\Manager\var\lserver_repair\ruleset_backup\	*
Installation_folder\SVROR\ScwPro\tftp\rcbootimg\	awwn*.cfg

Table F.2 Target Files of Automatic Takeover of Configuration Files [Linux Manager]

Directory	File Name
/etc/opt/FJSVrcvmr/	trapop.sh
/etc/opt/FJSVrcvmr/customize_data/	create_image_previous_folder_name_scvmm.rcxprop
	disable_num_of_address_check.rcxprop
	folder.rcxprop
	get_cpu_enabled_cores.rcxprop
	manager.rcxprop
	manager_backup.rcxprop
	manager_memory.rcxprop
	network_device_model.xml

Directory	File Name
	network_list.rcxprop
	nic_index_map.rcxprop
	physical_l_server_modify.rcxprop
	physical_l_server_nicmodify_blade.rcxprop
	physical_l_server_nicmodify_rack.rcxprop
	power_timeout.rcxprop
	scw_nf_retry_define.rcxprop
	scsicontroller.rcxprop
	server_snmp.rcxprop
	server_spec.rcxprop
	spare_server_config.rcxprop
	storage.rcxprop
	sparc_vm.rcxprop
	tenant_config.xml
	tenant_move.rcxprop
	unm_mon.rcxprop
	unm_provisioning.rcxprop
	viom.rcxprop
	vnetwork_excluded_vmware.rcxprop
	vnetwork_hyperv.rcxprop
	vnetwork_oraclevm.rcxprop
	vnetwork_ovmforsparc.rcxprop
	vnetwork_solariscontainer.rcxprop
	vnetwork_rhelkvm.rcxprop
	vnetwork_rhelxen.rcxprop
	vnetwork_vmware.rcxprop
	zpool_and_zone_recovery.rcxprop
/etc/opt/FJSVrcvmr/customize_data/alive_monitoring/	Physical.rcxprop
/etc/opt/FJSVrcvmr/customize_data/nicdefctl/host/	*
/etc/opt/FJSVrcvmr/customize_data/nicdefctl/model/	*
/etc/opt/FJSVrcvmr/scripts/	*
/etc/opt/FJSVrcvmr/scripts/Exec_Script/	*
/etc/opt/FJSVrcvmr/scripts/network_resource/	Unm_network_setting.xml
/etc/opt/FJSVrcvmr/scripts/network_resource/*Ruleset_Name*/	*
/etc/opt/FJSVrcvmr/scripts/*Vendor_Name*/*Unit_Name or Model_Name*/common/	*
/etc/opt/FJSVrcvmr/scripts/*Vendor_Name*/*Unit_Name or Model_Name*/operations/*Ruleset_Name*/	*
/etc/opt/FJSVrcvmr/scripts/*Vendor_Name*/*Unit_Name or Model_Name*/rulesets/*Ruleset_Name*/	*
/etc/opt/FJSVrcvmr/user_scripts/	*

Directory	File Name
/etc/opt/FJSVrcvmr/vm/	delete_image_all_files_scvmm
	snapshot_skip_reconfig
	vds_vc
/opt/FJSVrcvmr/sys/usm/etc/	clariion.conf
	falconstor.conf
	symmetrix.conf
	usm.conf
/var/opt/FJSVrcvmr/lserver_repair/ruleset_backup/	*
/var/opt/FJSVscw-tftpsv/tftproot/rcbootimg/	awwn*.cfg

Information

. . . .

When the rcxmgrexport command is executed, the above configuration files are output to the following switchover information storage folder:

[Windows Manager]

Switchover information storage folder\ManagerExport\CONFIG_FILE*Date Exported*

[Linux Manager]

Switchover information storage directory/ManagerExport/CONFIG_FILE*Date Exported*

Even when automatic takeover of configuration files is disabled, making the content of the configuration file for the switchover destination file same as the one for the switchover source site is possible by referring to the configuration file for the switchover source site which is stored in the switchover information storage folder.

For details on the switchover information storage folder, refer to "3.2 Creating Switchover Information Storage Folders".

For details on the rcxmgrexport command, refer to "B.1 rcxmgrexport".

For details on automatic takeover of configuration files, refer to "3.3 Manager Installation and Configuration".

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