

# **FUJITSU Software**

## **ServerView Resource Orchestrator**

### **Virtual Edition V3.1.2**

A decorative horizontal band with a red-to-dark-red gradient, featuring abstract, glowing white and red lines that swirl and intersect, creating a sense of motion and technology.

# Operation Guide

Windows/Linux

J2X1-7605-06ENZ0(04)  
November 2015

# Preface

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## Purpose of This Document

This manual explains how to operate FUJITSU Software ServerView Resource Orchestrator Virtual Edition (hereinafter Resource Orchestrator).

## Intended Readers

This manual is written for people who will operate Resource Orchestrator.

An overview of the functions provided in Resource Orchestrator can be found in "Chapter 2 Overview" of the "Design Guide VE". It is strongly recommended that you read this chapter before using this manual.

Resource Orchestrator allows administrators to choose between two different views according to their level of authority or the kinds of operations that need to be performed. For details, refer to "Chapter 3 Resource Management Overview" in the "User's Guide VE".

## Structure of This Document

This manual is composed as follows:

### Section 1 Overview

#### [Chapter 1 Overview of Operations, Maintenance, and Monitoring](#)

Provides an overview of the operation, maintenance, and monitoring of Resource Orchestrator.

### Section 2 Operation

#### [Chapter 2 Starting and Stopping Managers and Agents](#)

Explains the methods for deliberately starting and stopping managers and agents.

#### [Chapter 3 Managing User Accounts](#)

Explains the management of user accounts.

#### [Chapter 4 Server Switchover](#)

Explains how to use the server switchover function.

#### [Chapter 5 Event Handling](#)

Explains the event handling function.

### Section 3 Maintenance

#### [Chapter 6 Hardware Maintenance](#)

Explains the maintenance of hardware.

#### [Chapter 7 Maintaining Software with Cloning \[Physical Servers\]](#)

Explains how to perform software maintenance using the cloning function.

#### [Chapter 8 Backup and Restoration of Managed Servers](#)

Explains how to back up and restore managed servers.

#### [Chapter 9 Backup and Restoration of Admin Servers](#)

Explains how to back up and restore the admin server.

#### [Chapter 10 Backing Up and Restoring Image Files](#)

Explains how to back up and restore system images and cloning images.

## Section 4 Monitoring

### Chapter 11 Monitoring Resources

Explains how to monitor the configuration and status of managed resources.

### Chapter 12 Collecting Power Consumption Data and Displaying Graphs

Explains how to export the power consumption data collected from registered power monitoring targets and how to display it as graphs, and also describes the exported data's format.

## Section 5 Modification

### Chapter 13 Modifying Settings

Explains how to modify various setting information.

### Appendix A Notes on Operating ServerView Resource Orchestrator

Gives important reminders for the operation of Resource Orchestrator.

## Web Site URLs

URLs provided as reference sources within the main text are correct as of November 2015.

Please understand that they are subject to change without notice.

## 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
[OVM for x86 3.2]	Sections related to Oracle VM Server for x86 3.2

[OVM for SPARC]	Sections related to Oracle VM Server for SPARC
[Physical Servers]	Sections related to physical servers

- 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 M10.
  - SPARC M10-1/M10-4/M10-4S
- Fujitsu M10 is the product name used for SPARC M10 when they are sold outside Japan.
- References and character strings or values requiring emphasis are indicated using double quotes ( " ).
- Window names, dialog names, menu names, and tab names are shown enclosed by brackets ( [ ] ).
- Button names are shown enclosed by angle brackets (< >) or square 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 "#".
- If using Windows 8 or Windows Server 2012, please note the following:  
Operations descriptions in this manual use examples assuming operating systems up to Windows 7 and Windows Server 2008 - if using this product with Windows 8 or Windows Server 2012, read instructions regarding the [Start] menu as if they were instructions for the [Apps] page.  
Display the [Apps] page by right-clicking in the [Start] screen, and then clicking on [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.

- When using Windows 64-bit (x64)  
C:\Program Files (x86)\Resource Orchestrator

- When using Windows 32-bit (x86)

C:\Program Files\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 used in this manual:

Abbreviation	Products
Windows	Microsoft(R) Windows Server(R) 2003 R2, Standard Edition Microsoft(R) Windows Server(R) 2003 R2, Enterprise Edition Microsoft(R) Windows Server(R) 2003 R2, Standard x64 Edition Microsoft(R) Windows Server(R) 2003 R2, Enterprise x64 Edition Microsoft(R) Windows Server(R) 2008 Standard Microsoft(R) Windows Server(R) 2008 Enterprise Microsoft(R) Windows Server(R) 2008 R2 Standard Microsoft(R) Windows Server(R) 2008 R2 Enterprise Microsoft(R) Windows Server(R) 2008 R2 Datacenter 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(R) XP Professional operating system 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 Server 2003	Microsoft(R) Windows Server(R) 2003 R2, Standard Edition Microsoft(R) Windows Server(R) 2003 R2, Enterprise Edition Microsoft(R) Windows Server(R) 2003 R2, Standard x64 Edition Microsoft(R) Windows Server(R) 2003 R2, Enterprise x64 Edition
Windows 2003 x64 Edition	Microsoft(R) Windows Server(R) 2003 R2, Standard x64 Edition Microsoft(R) Windows Server(R) 2003 R2, Enterprise x64 Edition
Windows Server 2008	Microsoft(R) Windows Server(R) 2008 Standard Microsoft(R) Windows Server(R) 2008 Enterprise Microsoft(R) Windows Server(R) 2008 R2 Standard Microsoft(R) Windows Server(R) 2008 R2 Enterprise Microsoft(R) Windows Server(R) 2008 R2 Datacenter
Windows 2008 x86 Edition	Microsoft(R) Windows Server(R) 2008 Standard (x86) Microsoft(R) Windows Server(R) 2008 Enterprise (x86)
Windows 2008 x64 Edition	Microsoft(R) Windows Server(R) 2008 Standard (x64) Microsoft(R) Windows Server(R) 2008 Enterprise (x64)

Abbreviation	Products
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 PE	Microsoft(R) Windows(R) Preinstallation Environment
Windows XP	Microsoft(R) Windows(R) XP Professional operating system
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
Linux	Red Hat(R) Enterprise Linux(R) AS (v.4 for x86) Red Hat(R) Enterprise Linux(R) ES (v.4 for x86) Red Hat(R) Enterprise Linux(R) AS (v.4 for EM64T) Red Hat(R) Enterprise Linux(R) ES (v.4 for EM64T) Red Hat(R) Enterprise Linux(R) AS (4.5 for x86) Red Hat(R) Enterprise Linux(R) ES (4.5 for x86) Red Hat(R) Enterprise Linux(R) AS (4.5 for EM64T) Red Hat(R) Enterprise Linux(R) ES (4.5 for EM64T) Red Hat(R) Enterprise Linux(R) AS (4.6 for x86) Red Hat(R) Enterprise Linux(R) ES (4.6 for x86) Red Hat(R) Enterprise Linux(R) AS (4.6 for EM64T) Red Hat(R) Enterprise Linux(R) ES (4.6 for EM64T) Red Hat(R) Enterprise Linux(R) AS (4.7 for x86) Red Hat(R) Enterprise Linux(R) ES (4.7 for x86) Red Hat(R) Enterprise Linux(R) AS (4.7 for EM64T) Red Hat(R) Enterprise Linux(R) ES (4.7 for EM64T) Red Hat(R) Enterprise Linux(R) AS (4.8 for x86) Red Hat(R) Enterprise Linux(R) ES (4.8 for x86) Red Hat(R) Enterprise Linux(R) AS (4.8 for EM64T) Red Hat(R) Enterprise Linux(R) ES (4.8 for EM64T) Red Hat(R) Enterprise Linux(R) 5 (for x86) Red Hat(R) Enterprise Linux(R) 5 (for Intel64) Red Hat(R) Enterprise Linux(R) 5.1 (for x86) Red Hat(R) Enterprise Linux(R) 5.1 (for Intel64) Red Hat(R) Enterprise Linux(R) 5.2 (for x86) Red Hat(R) Enterprise Linux(R) 5.2 (for Intel64) Red Hat(R) Enterprise Linux(R) 5.3 (for x86) Red Hat(R) Enterprise Linux(R) 5.3 (for Intel64) Red Hat(R) Enterprise Linux(R) 5.4 (for x86) Red Hat(R) Enterprise Linux(R) 5.4 (for Intel64) Red Hat(R) Enterprise Linux(R) 5.5 (for x86) Red Hat(R) Enterprise Linux(R) 5.5 (for Intel64) Red Hat(R) Enterprise Linux(R) 5.6 (for x86) Red Hat(R) Enterprise Linux(R) 5.6 (for Intel64) Red Hat(R) Enterprise Linux(R) 5.7 (for x86) Red Hat(R) Enterprise Linux(R) 5.7 (for Intel64) Red Hat(R) Enterprise Linux(R) 5.8 (for x86) Red Hat(R) Enterprise Linux(R) 5.8 (for Intel64)

Abbreviation	Products
	<p>Red Hat(R) Enterprise Linux(R) 5.9 (for x86)  Red Hat(R) Enterprise Linux(R) 5.9 (for Intel64)  Red Hat(R) Enterprise Linux(R) 5.10 (for x86)  Red Hat(R) Enterprise Linux(R) 5.10 (for Intel64)  Red Hat(R) Enterprise Linux(R) 5.11 (for x86)  Red Hat(R) Enterprise Linux(R) 5.11 (for Intel64)  Red Hat(R) Enterprise Linux(R) 6 (for x86)  Red Hat(R) Enterprise Linux(R) 6 (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)  SUSE(R) Linux Enterprise Server 10 Service Pack 2 for x86  SUSE(R) Linux Enterprise Server 10 Service Pack 2 for EM64T  SUSE(R) Linux Enterprise Server 10 Service Pack 3 for x86  SUSE(R) Linux Enterprise Server 10 Service Pack 3 for EM64T  SUSE(R) Linux Enterprise Server 11 for x86  SUSE(R) Linux Enterprise Server 11 for EM64T  SUSE(R) Linux Enterprise Server 11 Service Pack 1 for x86  SUSE(R) Linux Enterprise Server 11 Service Pack 1 for EM64T  Oracle Enterprise Linux Release 5 Update 4 for x86 (32 Bit)  Oracle Enterprise Linux Release 5 Update 4 for x86_64 (64 Bit)  Oracle Enterprise Linux Release 5 Update 5 for x86 (32 Bit)  Oracle Enterprise Linux Release 5 Update 5 for x86_64 (64 Bit)</p>
Red Hat Enterprise Linux	<p>Red Hat(R) Enterprise Linux(R) AS (v.4 for x86)  Red Hat(R) Enterprise Linux(R) ES (v.4 for x86)  Red Hat(R) Enterprise Linux(R) AS (v.4 for EM64T)  Red Hat(R) Enterprise Linux(R) ES (v.4 for EM64T)  Red Hat(R) Enterprise Linux(R) AS (4.5 for x86)  Red Hat(R) Enterprise Linux(R) ES (4.5 for x86)  Red Hat(R) Enterprise Linux(R) AS (4.5 for EM64T)  Red Hat(R) Enterprise Linux(R) ES (4.5 for EM64T)  Red Hat(R) Enterprise Linux(R) AS (4.6 for x86)  Red Hat(R) Enterprise Linux(R) ES (4.6 for x86)  Red Hat(R) Enterprise Linux(R) AS (4.6 for EM64T)  Red Hat(R) Enterprise Linux(R) ES (4.6 for EM64T)  Red Hat(R) Enterprise Linux(R) AS (4.7 for x86)  Red Hat(R) Enterprise Linux(R) ES (4.7 for x86)  Red Hat(R) Enterprise Linux(R) AS (4.7 for EM64T)  Red Hat(R) Enterprise Linux(R) ES (4.7 for EM64T)  Red Hat(R) Enterprise Linux(R) AS (4.8 for x86)  Red Hat(R) Enterprise Linux(R) ES (4.8 for x86)  Red Hat(R) Enterprise Linux(R) AS (4.8 for EM64T)  Red Hat(R) Enterprise Linux(R) ES (4.8 for EM64T)  Red Hat(R) Enterprise Linux(R) 5 (for x86)  Red Hat(R) Enterprise Linux(R) 5 (for Intel64)  Red Hat(R) Enterprise Linux(R) 5.1 (for x86)  Red Hat(R) Enterprise Linux(R) 5.1 (for Intel64)  Red Hat(R) Enterprise Linux(R) 5.2 (for x86)  Red Hat(R) Enterprise Linux(R) 5.2 (for Intel64)</p>





Abbreviation	Products
	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)
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
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 Red Hat(R) Enterprise Linux(R) 5.3 (for x86) Linux Virtual Machine Function Red Hat(R) Enterprise Linux(R) 5.3 (for Intel64) Linux Virtual Machine Function Red Hat(R) Enterprise Linux(R) 5.4 (for x86) Linux Virtual Machine Function Red Hat(R) Enterprise Linux(R) 5.4 (for Intel64) Linux Virtual Machine Function Red Hat(R) Enterprise Linux(R) 5.5 (for x86) Linux Virtual Machine Function Red Hat(R) Enterprise Linux(R) 5.5 (for Intel64) Linux Virtual Machine Function Red Hat(R) Enterprise Linux(R) 5.6 (for x86) Linux Virtual Machine Function Red Hat(R) Enterprise Linux(R) 5.6 (for Intel64) Linux Virtual Machine Function Red Hat(R) Enterprise Linux(R) 5.7 (for x86) Linux Virtual Machine Function Red Hat(R) Enterprise Linux(R) 5.7 (for Intel64) Linux Virtual Machine Function Red Hat(R) Enterprise Linux(R) 5.8 (for x86) Linux Virtual Machine Function Red Hat(R) Enterprise Linux(R) 5.8 (for Intel64) Linux Virtual Machine Function Red Hat(R) Enterprise Linux(R) 5.9 (for x86) Linux Virtual Machine Function Red Hat(R) Enterprise Linux(R) 5.9 (for Intel64) Linux Virtual Machine Function Red Hat(R) Enterprise Linux(R) 5.10 (for x86) Linux Virtual Machine Function Red Hat(R) Enterprise Linux(R) 5.10 (for Intel64) Linux Virtual Machine Function Red Hat(R) Enterprise Linux(R) 5.11 (for x86) Linux Virtual Machine Function Red Hat(R) Enterprise Linux(R) 5.11 (for Intel64) Linux Virtual Machine Function
XenServer 6	Citrix XenServer(R) 6.0 Citrix Essentials(TM) for XenServer 6.0, Enterprise Edition
DOS	Microsoft(R) MS-DOS(R) operating system, DR DOS(R)
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 EM64T SUSE(R) Linux Enterprise Server 10 Service Pack 3 for x86 SUSE(R) Linux Enterprise Server 10 Service Pack 3 for EM64T SUSE(R) Linux Enterprise Server 11 for x86 SUSE(R) Linux Enterprise Server 11 for EM64T SUSE(R) Linux Enterprise Server 11 Service Pack 1 for x86 SUSE(R) Linux Enterprise Server 11 Service Pack 1 for EM64T

Abbreviation	Products
Oracle Enterprise Linux	Oracle Enterprise Linux Release 5 Update 4 for x86 (32 Bit) Oracle Enterprise Linux Release 5 Update 4 for x86_64 (64 Bit) Oracle Enterprise Linux Release 5 Update 5 for x86 (32 Bit) Oracle Enterprise Linux Release 5 Update 5 for x86_64 (64 Bit)
Solaris	Oracle Solaris10 05/09 (Update7) Media Pack Oracle Solaris11 11/11 Media Pack Oracle Solaris11.1 Media Pack
OVM for x86 3.2	Oracle VM Server for x86 v3.2.1 Oracle VM Server for x86 v3.2.2 Oracle VM Server for x86 v3.2.3 Oracle VM Server for x86 v3.2.4 Oracle VM Server for x86 v3.2.6 Oracle VM Server for x86 v3.2.7
OVM for SPARC	Oracle(R) VM Server for SPARC
SCVMM	System Center Virtual Machine Manager 2008 R2 System Center 2012 Virtual Machine Manager System Center 2012 R2 Virtual Machine Manager
VMware	VMware(R) Infrastructure 3 VMware vSphere(R) 4 VMware vSphere(R) 4.1 VMware vSphere(R) 5 VMware vSphere(R) 5.1 Vmware vSphere(R) 5.5
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 Infrastructure 3	VMware(R) Infrastructure 3
VMware Infrastructure Client	VMware(R) Infrastructure Client
VMware vSphere 4.0	VMware vSphere(R) 4.0
VMware vSphere 4.1	VMware vSphere(R) 4.1
VMware vSphere 5	VMware vSphere(R) 5
VMware vSphere 5.1	VMware vSphere(R) 5.1
VMware vSphere 5.5	VMware vSphere(R) 5.5
VMware vSphere Client	VMware vSphere(R) Client
VMware vCenter Server	VMware(R) vCenter(TM) Server
VMware vClient	VMware(R) vClient(TM)
VMware Horizon View	VMware Horizon View 5.2.x VMware Horizon View 5.3.x VMware Horizon 6.0 (with View)
VIOM	ServerView Virtual-IO Manager
BladeLogic	BMC BladeLogic Server Automation

Abbreviation	Products
ServerView Agent	ServerView SNMP Agents for MS Windows (32bit-64bit) ServerView Agents Linux ServerView Agents VMware for VMware ESX Server
Excel	Microsoft(R) Office Excel(R) 2003 Microsoft(R) Office Excel(R) 2007 Microsoft(R) Office Excel(R) 2010
Excel 2003	Microsoft(R) Office Excel(R) 2003
Excel 2007	Microsoft(R) Office Excel(R) 2007
Excel 2010	Microsoft(R) Office Excel(R) 2010
Internet Explorer	Windows(R) Internet Explorer(R) 8 Windows(R) Internet Explorer(R) 9 Windows(R) Internet Explorer(R) 10 Windows(R) Internet Explorer(R) 11
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
Resource Coordinator VE	ServerView Resource Coordinator VE Systemwalker Resource Coordinator Virtual server Edition
Resource Orchestrator	FUJITSU Software ServerView Resource Orchestrator

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March 2012, Edition 1.4	J2X1-7605-01ENZ0(04)
April 2012, Edition 1.5	J2X1-7605-01ENZ0(05)
July 2012, Second Edition	J2X1-7605-02ENZ0(00)
October 2012, Third Edition	J2X1-7605-03ENZ0(00)
December 2012, Fourth Edition	J2X1-7605-04ENZ0(00)
January 2013, Fifth Edition	J2X1-7605-05ENZ0(00)
January 2013, Edition 5.1	J2X1-7605-05ENZ0(01)
January 2013, Edition 5.2	J2X1-7605-05ENZ0(02)
January 2013, Edition 5.3	J2X1-7605-05ENZ0(03)
June 2013, Edition 5.4	J2X1-7605-05ENZ0(04)
August 2013, Edition 5.5	J2X1-7605-05ENZ0(05)
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February 2014, Edition 6.1	J2X1-7605-06ENZ0(01)
April 2014, Edition 6.2	J2X1-7605-06ENZ0(02)
June 2014, Edition 6.3	J2X1-7605-06ENZ0(03)
November 2015, Edition 6.4	J2X1-7605-06ENZ0(04)

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# Part 1 Overview

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# **Chapter 1 Overview of Operations, Maintenance, and Monitoring**

This chapter provides an overview of operation, maintenance, and monitoring of Resource Orchestrator.

For additional information on the operation, maintenance, and monitoring of this product, refer to the configuration information in the "Setup Guide VE".



# Part 2 Operation

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## Chapter 2 Starting and Stopping Managers and Agents

This chapter explains how to manually start or stop managers and agents.

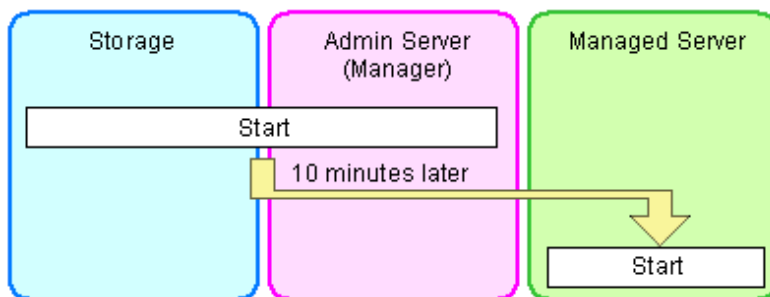
To use Resource Orchestrator, both the manager and agents must be running.

The manager and agent services are configured to start automatically upon startup of their respective servers (admin server, managed server). Normally, there should be no need to manually start or stop either the manager or agents. To start or stop a manager or an agent intentionally, refer to "2.1 Starting and Stopping Managers" and "2.2 Starting and Stopping Agents".

### Note

When using the HBA address rename function, ensure that the manager is started before starting any managed servers. The power on procedure should be managed as follows: first, start the admin server together with any storage devices, and start the managed servers 10 minutes later.

Managed servers will not boot up properly if they are started before the manager. Make sure that the manager is running before starting managed servers.



Additionally, when using the HBA address rename function, the HBA address rename setup service should be started on a dedicated server (HBA address rename server) and left running continuously. For details on starting, stopping, and confirming the state of the HBA address rename setup service, refer to "Chapter 6 Settings for the HBA address rename Setup Service" in the "Setup Guide VE".

## 2.1 Starting and Stopping Managers

The Resource Orchestrator manager starts automatically on the admin server.

This section explains how to manually start or stop the manager and how to check its running state.

[Windows Manager]

The manager is made up of the following two groups of Windows services:

#### - Manager Services

- Resource Coordinator Manager
- Resource Coordinator Task Manager
- Resource Coordinator Web Server (Apache)
- Resource Orchestrator Sub Web Server (Mongrel)
- Resource Orchestrator Sub Web Server (Mongrel2)
- Resource Coordinator DB Server (PostgreSQL)

#### - Related Services

- Deployment Service
- TFTP Service
- PXE Services
- DHCP Server (\*)

\* Note: Required when managed servers belonging to different subnets from the admin server exist.

From the Windows Control Panel, open [Administrative Tools]. Then, open the [Services] window to check the state of each service.

Services are started and stopped using the rcxadm mgrctl command (start and stop subcommands).

Using this command, manager services and related services can be started or stopped at the same time.

For details on the command, refer to "5.11 rcxadm mgrctl" in the "Reference Guide (Command) VE".

To start or stop a manager in a clustered configuration, right-click the manager application shown under the failover cluster manager tree, and select either [Bring this service or application online] or [Take this service or application offline].

[Linux Manager]

The manager is made up of the following two groups of Linux services:

- Manager Services

rcvmr

Manager services also include the following daemons.

rcxmanager

rcxtaskmgr

rcxmongrel1

rcxmongrel2

rcxhttpd

- Database (PostgreSQL)

rcxdb

- Related Services

scwdepsvd

scwpxesvd

scwftpd

dhcpcd (\*)

\* Note: Required when managed servers belonging to different subnets from the admin server exist.

The status of each of those services can be confirmed from the service command, as shown below.

```
# service rcvmr status <RETURN>
# service scwdepsvd status <RETURN>
# service scwpxesvd status <RETURN>
# service scwftpd status <RETURN>
# service dhcpcd status <RETURN>
```

Services are started and stopped using the rcxadm mgrctl command (start and stop subcommands).

Using this command, manager services and related services can be started or stopped at the same time.

For details on the command, refer to "5.11 rcxadm mgrctl" in the "Reference Guide (Command) VE".

To start or stop a manager in a clustered configuration, use the cluster administration view (Cluster Admin).

For details, refer to the PRIMECLUSTER manual.

### Note

- When using ServerView Deployment Manager on an admin LAN, all services related to Resource Orchestrator will be automatically disabled. To prevent conflicts with ServerView Deployment Manager, do not start these services in order. For details, refer to "Appendix B Co-Existence with ServerView Deployment Manager" in the "Setup Guide VE".
- Resource Orchestrator cannot be operated if any of the manager services are stopped. Ensure that all services are running when Resource Orchestrator is running.

- If the manager is unable to communicate on the admin LAN when started up (because of LAN cable disconnections or any other causes), PXE Services may not start automatically. If PXE Services are stopped, investigate the network interface used for the admin LAN and confirm whether it can communicate with other nodes on the admin LAN.

If the manager cannot communicate with admin LAN nodes, restore the admin LAN itself and restart the manager.

## 2.2 Starting and Stopping Agents

---

The Resource Orchestrator agent starts automatically on managed servers. This section explains how to manually start or stop an agent and how to check its power state.



To prevent conflicts, related services are uninstalled from the Resource Orchestrator agent when using ServerView Deployment Manager on the admin LAN. In such cases, there is no need to start or stop those services when starting or stopping the Resource Orchestrator agent.

[Windows] [Hyper-V]

The agent consists of the following two Windows services:

- Agent Service  
Resource Coordinator Agent
- Related Services  
Deployment Agent

From the Windows Control Panel, open [Administrative Tools]. Then, open the [Services] window to check the state of each service. The following explains how to start and stop each service.

- Agent Service  
Agents can be started and stopped using the start and stop subcommands of the `rcxadm agtctl` command. For details of the command, refer to "5.2 `rcxadm agtctl`" in the "Reference Guide (Command) VE".

- Related Services

From the Windows Control Panel, open [Administrative Tools]. Then, open the [Services] window to stop or start the following service.

- Deployment Agent

[Linux] [VMware] [Xen] [KVM]

The agent consists of the following services.

- Agent Service
- Related Services  
- Deployment Agent

For VMware vSphere 4.0 or later version, Deployment Agent is not automatically started, as backup and restore, and cloning functions cannot be used. It is not necessary to start up.

Execute the following commands to determine whether the agent is running or not. If those commands show that the processes for the agent and deployment services are running, then the agent can be asserted to be running.

- Agent Service

```
# /bin/ps -ef | grep FJSVssagt <RETURN>
```

- Related Services

```
# /bin/ps -ef | grep scwagent <RETURN>
```

The following explains how to start and stop each service.

- Agent Service

Agents can be started and stopped using the start and stop subcommands of the `rcxadm agtctl` command. For details of the command, refer to "5.2 `rcxadm agtctl`" in the "Reference Guide (Command) VE".

- Related Services

Execute the following command to start or stop the collection of image files, deployment of image files, and server startup control.

**Starting an L-Server**

```
# /etc/init.d/scwagent start <RETURN>
```

**Stop**

```
# /etc/init.d/scwagent stop <RETURN>
```

[Solaris] [Solaris Zones] [OVM for SPARC]

The agent consists of the following services.

- Agent Service

Execute the following commands to determine whether the agent is running or not. If those commands show that the processes for the agent and deployment services are running, then the agent can be asserted to be running.

```
# /bin/ps -ef | grep FJSVrcvat <RETURN>
```

The following explains how to start and stop each service.

Agents can be started and stopped using the start and stop subcommands of the `rcxadm agtctl` command.

For details of the command, refer to "5.2 `rcxadm agtctl`" in the "Reference Guide (Command) VE".

## Chapter 3 Managing User Accounts

This chapter explains the management of user accounts.

Managing users of Resource Orchestrator prevents operational errors by end users' and enables stable operation of systems.

For details on user accounts, refer to "Chapter 5 Defining User Accounts" in the "Design Guide VE".

For the functions available for user accounts of Resource Orchestrator, refer to "A.2.1 List of Menus" in the "User's Guide VE".

# Chapter 4 Server Switchover

This chapter explains how to use the server switchover function.

## 4.1 Overview

Server switchover is a function that enables applications to be switched over to and restarted on a pre-assigned spare server when a primary server fails or needs to be shut down for maintenance.

Server switchover is the basis for the Auto-Recovery function, which is able to automatically switch over applications to a spare server upon failure.

Server switchover settings must be configured before using the server switchover function.

For details on server switchover settings and an overview of the server switchover function, refer to "Chapter 18 Server Switchover Settings" in the "User's Guide VE".



- When the switchover method is backup and restore

When backing up or restoring system images, or collecting and deploying cloning images, up to four processes can be executed simultaneously. If four processes are already being executed, any system image restore triggered by a switchover or failback operation will enter a standby state.

Any process put under standby state will be resumed after one of the already running processes completes.

- When the MAK method is used for license authentication

The license authentication may be requested again after server switchover or failback operations. In such cases, authenticate again as quickly as possible.

- When the switchover method is storage affinity

- If switchover to spare servers is performed, the storage settings of the spare servers will be deleted. Perform restoration referring to "[4.3 Post-Switchover Operations](#)".

- After switchover to spare servers is performed, even if failback is performed the storage settings for the spare servers are not automatically restored.

Restore the zoning and host affinity settings for storage units of spare servers following the procedure listed in the "Information" in "[4.3 Post-Switchover Operations](#)".

- The physics server which have a relationship with Physics L-Server cannot carry out server switchover.
- Please register primary server and spare server into the same VM pool. If the primary server and spare server are registered to different VM pool, display information of the server in VM pool will change after server switching over.

## 4.2 Switchover

A server switchover can be triggered either manually from the user, or automatically with the Auto-Recovery function.

Regardless of what triggered a switchover, the user must decide whether to switch back applications to their original server (failback), or let the spare server indefinitely take over those applications (takeover). Choosing takeover will result in the spare server becoming the new active server.

For details, refer to "[4.3 Post-Switchover Operations](#)".

Different switchover methods are available according to each managed server's hardware configuration.

For details, refer to the "Functions Available for Agents" in "2.5 Hardware Environment" in the "Design Guide VE".



- In configurations where a server OS is operating on a spare server, if the boot methods of primary servers and spare servers are different, server switchover may fail and damage the primary server OS. Ensure that the boot methods are the same.

- During switchover, server restarts and configuration changes may trigger SNMP Traps (which are shown in the Event Log). For details, refer to "Part 1 Messages Displayed by Virtual Edition and Cloud Edition" in "Messages".
- When using the backup and restore switchover method, do not start up the original primary server during or after the switchover operation.  
The primary server and spare server both run the same system image. Having the two servers running together will cause conflicts of IP addresses and other information. This can adversely affect the applications recovered on the spare server.  
If it becomes necessary to start the primary server, for maintenance or other tasks, ensure that it does not start up from the same system image as that of the spare server. This can be done by turning off the spare server first, or by stopping the primary server at its BIOS screen (before startup of the OS).
- When using PRIMERGY BX servers, the maintenance LED of a switched over server is automatically activated.
- If switchover takes place when a spare server is operating, the spare server is turned off.
- When switching over to the spare server of a VM host, the VM host of the spare server will be placed into VM maintenance mode. [VMware] [Hyper-V]
- After shutting down a spare server, if the power is not turned off within 15 minutes, the spare server will be forcibly powered off.

[OVM for SPARC]

- In the case of OVM for SPARC environment, save the using OVM configuration information's XML files in the follows while server switchover. Please delete it according to need.

Saving files' save address

[Control Domain]  
/etc/opt/FJSSVrcvat/config

File Name

ovm\_config year month day hour minute second.xml  
time of file end is UTC.

- When domain configuration information's XML files are not saved in control domain before server switching over, domain configuration cannot be recovered after server switching over. In this case, it is necessary to rebuild the domain configuration.

Not only primary server, spare server used as OVM for SPARC is the same.

For details on OVM configuration information's XML file saving, refer to "18.5.4 XML file of OVM Configuration Information" in the "User's Guide VE".

- When performing server switchover using the backup and restore method in a SAN data server environment that uses local boot, configure a target disk for image operations on both the primary server and the spare server.

If the switchover is performed without configuring the target disk for image operations, data may be overwritten on an unintended disk. For details, refer to "9.1.13 Changing Target Disks of Image Operations" in the "User's Guide VE".



## Auto-Recovery

- For PRIMERGY BX servers

By enabling Auto-Recovery in the spare server settings of a server, it will be automatically switched over to a spare server when its status changes to either "error" or "fatal", and no response is obtained from its OS.

- For rack mount servers, tower servers, SPARC Enterprise, and FUJITSU M10

By enabling Auto-Recovery in the spare server settings of a server, it will be automatically switched over to a spare server when it receives an "Error" level SNMP trap, and no response is obtained from its OS.

For the decision criteria for whether an OS has stopped, refer to "9.4 Conditions Required for Auto-Recovery" in the "Setup Guide VE".



## Manual Switchover

Use the following procedure to manually switch over applications from a primary server to a spare server.

Manual switchover can be performed either at will when necessary, or to verify that the switchover process operates properly.

For details on the conditions for a server switchover, refer to "Conditions for Server Switchover" in "9.3 Server Switchover Conditions" in the "Setup Guide VE".

1. In the ROR console server resource tree, right-click the physical OS or VM host to be switched, and select [Spare Server]-[Switchover] from the popup menu.

The [Execute Switchover Operation] dialog is displayed.

2. Select the switchover destination server.

If "Automatic allocation" is selected, the switchover destination server is automatically selected.

3. Click <OK>.

The configuration for server switchover is started. The process status can be checked in the Recent Operations area of the ROR console. The primary server stops, and the physical OS or VM host starts on the spare server. For the backup and restore method, clicking <Cancel> in the Recent Operations area displays the confirmation dialog.



If the server switchover/failback operation is canceled, the original server will be powered off. To continue server operations, power on the server. If the server switchover/failback operation is canceled, OS images that have the same information (such as IP addresses) as that of the original server may remain on the internal disk of the destination server.



- Manual switchover can be performed regardless of the status of the primary server.
- If "Automatic allocation" is selected for Auto-Recovery or manual switchover, the spare server to be allocated will be selected based on the following order of priority:
  1. Physical servers with no settings configured
  2. Physical servers for which HBA address rename information or a VIOM server profile is configured
  3. Physical servers with no agents registered

Spare servers are selected based on the names of their physical servers, in the following order of priority.

1. "-"
2. Numbers
3. Uppercase letters
4. Lowercase letters

## 4.3 Post-Switchover Operations

---

### 4.3.1 Operations after server switching over

---

After a switchover was performed (either manually or automatically), perform either one of the following post-switchover recovery procedures.

For details on how to replace hardware, refer to "[Chapter 6 Hardware Maintenance](#)".

When using the storage affinity switchover method, confirm the HBA status of servers on ESC, before recovering them using Resource Orchestrator.

- When the HBA status before switchover is "unknown"  
Delete the HBA.
- When the HBA status is displayed as "access path inheritance is required" (yellow icon) after switchover  
Perform access path inheritance.

For details, refer to the "ETERNUS SF Storage Cruiser Operation Guide".

- When performing "[Failback](#)"  
Perform the following operations.
  1. Replace failed server hardware to recover.
  2. Perform "[Failback](#)" to keep the configuration created before server switchover.

When using the storage affinity switchover method, after performing failback operations confirm the HBA status of servers on ESC and perform the same corrective actions as performed after switchover. After performing corrective action, for a spare server that had an agent registered, restore the zoning of spare servers and host affinity configurations for storage units following the procedures described in "Information".

When OVM for SPARC environment is used as a spare server, for the recovery methods of the spare server, refer to "[4.3.2 Recovery of OVM for SPARC Environment](#)".

- When performing "[Takeover](#)"  
Perform the following operations.
  1. Replace failed server hardware to recover.
  2. Perform "[Takeover](#)" to keep the configuration created by a server switchover.

When using storage affinity switchover methods and a spare server that had an agent registered, restore the zoning of spare servers and host affinity configurations for storage units following the reference procedures in "Information" below.

When OVM for SPARC environment is used as a spare server, for the recovery methods of the spare server, refer to "[4.3.2 Recovery of OVM for SPARC Environment](#)".

### Information

For a server takeover procedure, server hardware can be replaced either before or after the "[Takeover](#)" operation.

Use the following procedures to restore the zoning of spare servers and host affinity configurations for storage units in the storage affinity switchover methods.

1. Check the zoning and host affinity configurations for spare servers using the zoning and host affinity information displayed in "WWN Settings" of the [Resource Details] tab.
2. Use the storageadm zone info command to confirm the zoning and host affinity configurations.
3. Use the storageadm zone add/delete command to confirm the zoning of spare servers and host affinity configurations.

For details on how to use the storageadm zone command, refer to the "ETERNUS SF Storage Cruiser Operation Guide".

### Note

When the failed server is a VM host, that VM host will be placed into VM maintenance mode. After restoring the failed server and executing "[Failback](#)" or "[Takeover](#)", in order to use the failed server, release the VM maintenance mode if necessary.

## Failback

Use the following procedure to return to a pre-switchover configuration.

For details on the conditions for server failback, refer to "Conditions for Server Failback" in "9.3 Server Switchover Conditions" in the "Setup Guide VE".

1. In the ROR console server resource tree, right-click the physical OS or VM host that was switched over to the spare server, and select [Spare Server]-[Failback] from the popup menu.

The [Failback] dialog is displayed.

2. Click <OK>.

The configuration for server switchover is started. The process status can be checked in the Recent Operations area of the ROR console. The spare server is stopped and the server OS is switched back to the primary server. For the backup and restore method, clicking <Cancel> in the Recent Operations area displays the confirmation dialog.



### Note

- If the server switchover/failback operation is canceled, the original server will be powered off. To continue server operations, power on the server. OS images that have the same information (such as IP addresses) as that of the original server may remain on the internal disk of the destination server.
- When using PRIMERGY BX servers, the maintenance LED of a primary server is automatically deactivated after a server failback.
- When the spare server is using I/O virtualization, the spare server will be powered on after failback.

### When using backup and restore for the server switchover method

- Do not start up the original spare server during or after a failback operation.  
As the primary server and spare server both run the same system image, having the two servers running together will cause conflicts of IP addresses and other information. This can adversely affect the applications switched back to the spare server.  
If it becomes necessary to start the primary server, for maintenance or other tasks, ensure that it does not start up from the same system image as that of the spare server. This can be done by turning off the primary server first, or by stopping the spare server at its BIOS screen (before startup of the OS).
- When it is necessary to transfer newly generated data from the spare server to the primary server, back up the spare server before performing failback.  
Refer to "Backing Up a System Image" in "16.2 Backup" in the "User's Guide VE", and replace the "managed server" with "spare server".  
Unless there is a need to keep the data that was generated on the spare server while active, backup of the spare server can be skipped. In that case, a system image backed up prior to failure will be restored to the primary server.
- When a hard disk is replaced in a failed server, configure the target disks of image operations again.  
If the switchover is performed without configuring the target disk for image operations, data may be overwritten on an unintended disk.  
For details, refer to "9.1.13 Changing Target Disks of Image Operations" in the "User's Guide VE".

## Takeover

Use the following procedure to keep the configuration created by a server switchover:

1. In the ROR console server resource tree, right-click the physical OS or VM host that was switched over to the spare server, and select [Spare Server]-[Takeover] from the popup menu.

The [Takeover] dialog is displayed.

2. Click <OK>.

The spare server continues operating as the primary server and the server that functioned as the primary server before switchover becomes a spare server.

If the spare server was originally shared by multiple primary servers, all those servers will now use the original primary server as their spare server.

## Example

### 1. Status before switchover

Application 1: Server A (active) - Server B (spare)  
Application 2: Server C (active) - Server B (spare)

### 2. Status after a fault in Server A triggered a switchover of Application 1

Application 1: Server A (fault) - Server B (active)  
Application 2: Server C (active) - Server B (\*)

### 3. Status after replacing Server A and letting Server B take over Application 1

Application 1: Server B (active) - Server A (spare)  
Application 2: Server C (active) - Server A (spare)

\* Note: At this point, manual switchover or Auto-Recovery from Server C to Server B becomes impossible.

## Note

Once server switchover has taken place, Auto-Recovery and manual server switchover cannot be performed until either failback or takeover has been executed.

Perform either failback or takeover to enable switchover to be performed again.

## 4.3.2 Recovery of OVM for SPARC Environment

When OVM for SPARC environment is used as a spare server, please recover according to the following methods.

1. Set domain configuration into the status of factory-default. Carry it out on XSCF.

```
XSCF> setdomainconfig -p 0 -c default <RETURN>
```

2. Set control domain's auto boot to be true, and set disk in boot-device.

```
XSCF> setpparam -y -p 0 -s bootscript 'setenv auto-boot? true <RETURN>  
setenv boot-device disk name' <RETURN>
```

3. Set Autoboot(Guest Domain) of physics partition operation mode on XSCF to be off.

```
XSCF> setpparmode -p 0 -m guestboot=off <RETURN>
```

4. Confirm the spare server's zoning and host affinity setting from zoning and host affinity information which is displayed in "WWN Information" of [Resource Details] tab.
5. Confirm zoning and host affinity setting by storageadm zone info command.
6. Use storageadm zone add/delete command to recover the spare server's zoning and host affinity setting.  
For the usage of storageadm zone command, refer to "ETERNUS SF Storage Cruiser Operation Guide".
7. Start up the control domain's OS.
8. Import it when ZFS storage pool is used in control domain.

However when "18.5.2 Definition File of ZFS Storage Pool Information [Solaris] [Solaris Zone] [OVM for SPARC]" of "User's Guide VE" has already been set by spare server's control domain, you need to import it manually.

- a. Confirm the status of ZFS storage pool.

```
primary# zpool list <RETURN>
```

- b. Import the object's ZFS storage pool.

```
primary# zpool import ZFS storage pool name <RETURN>
```

9. Recover all domain configurations in system from domain configuration's XML file saved before server switching over.

```
primary# ldm init-system -r -I domain configuration's XML file <RETURN>
```

10. Reset the physics I/O device which is distributed into control domain, IO domain.

It's possible to set both control domain and IO domain in physics I/O device in OVM specification. Please reset the distribution of physics I/O device.

11. Reset the port number which is used in domain's console.

The port number set in guest domain may be null in OVM specification.  
Please reset the port number which is used in domain's console.

12. When there is IO domain, start it earlier than guest domain.

13. Import it when ZFS storage pool is used in guest domain.

However when "18.5.2 Definition File of ZFS Storage Pool Information [Solaris] [Solaris Zone] [OVM for SPARC]" of "User's Guide VE" has already been set in guest domain, you need to import it manually.

- a. Login guest domain.
- b. Confirm the status of ZFS storage pool.

```
# zpool list <RETURN>
```

- c. Import ZFS storage pool of the object.

```
# zpool import ZFS storage pool name <RETURN>
```

14. Recover non-global zone when guest domain is used as a Solaris zone.

- a. Confirm the status of the non-global zone.

```
# zoneadm list -vc <RETURN>
```

- b. Run attach and boot of non-global zone to startup the non-global zone according to need.

15. Save configuration information into service processor.

```
# ldm add-spconfig configuration information name <RETURN>
```

## Chapter 5 Event Handling

This appendix explains the event handling function.

This function allows execution of a pre-defined file whenever the admin server receives SNMP Traps (events) from a registered device. This function works with the following devices.

- Chassis (Management Blade, Management Board)
- Managed Servers (ServerView)
- Remote Management Controller
- LAN Switch

The following file is executed each time an event occurs.

[Windows Manager]

*Installation\_folder*\SVROR\Manager\etc\trapop.bat Argument 1 Argument 2 Argument 3 Argument 4 Argument 5 Argument 6

[Linux Manager]

/etc/opt/FJSVrcvnr/trapop.sh Argument 1 Argument 2 Argument 3 Argument 4 Argument 5 Argument 6

The default-installed file will log each event, but will not trigger any action based on those events.

However, it is possible to trigger operations such as email notifications or calls to external management software (command calls or event notifications) by providing a custom-script to use in place of the default script.

- The following information is passed as arguments:
  - Argument 1  
Message describing the event
  - Argument 2  
IP address of the device in which the event occurred
  - Argument 3  
Host name (FQDN) inferred from the IP address received in Argument 2 (when the name cannot be inferred, this is set to the device's IP address)
  - Argument 4  
Number of milliseconds counted from 01/01/1970 00:00:00 GMT until the current time
  - Argument 5  
Event level ("INFO", "WARNING", or "ERROR")
  - Argument 6  
Name of the device in which the event occurred

For the following events, however, only the event log is displayed. The file is not executed.

- Events logged during ROR console operations, command execution, or automatic server switchovers due to Auto-Recovery
  - Start of processing, in-progress status, end of processing
  - Changes in resource status during a running process
  - Errors that occur within Resource Orchestrator
- Errors detected from regular monitoring (when no SNMP Trap is sent, or when SNMP traps do not reach the manager because of communication errors or an abnormally high load on the system)



## Note

In a clustered manager configuration, it is necessary to store the same file on both the primary and secondary nodes for this function to work properly.

### E-Mail Notification Sample

Below is a sample program that will send e-mail notifications for each event received.

To customize e-mail contents and adapt the program to your practical configuration, it is recommended to create your own version using this sample as a reference.

[Windows Manager]

Set the following addresses (in the "E-Mail Notification Sample") to match actual environment values.

- Mail Server Address
- Sender Address
- Destination Address

**E-Mail Notification Sample** (*Installation\_folder\SVROR\Manager\etc\trapop.bat*)

```
@echo off

rem set MAIL_SERVER_ADDRESS=server.address          <- mail server address
rem set MAIL_FROM=from_your@e-mail.address         <- sender address
rem set MAIL_TO=to_your@e-mail.address             <- destination address

rem set MAIL_SUBJECT="Resource Coordinator VE (%COMPUTERNAME%) event mail"

rem set SENDMAIL_VBS=sendmail.vbs

rem set MAILCMD=cscript "%~dp0%SENDMAIL_VBS%" %MAIL_FROM% %MAIL_TO% %MAIL_SUBJECT%
%MAIL_SERVER_ADDRESS% %1 %2 %3 %4 %5 %6 //nologo
rem %MAILCMD%
```

When actually using this script, remove all comments and enter appropriate addresses.

```
@echo off

set MAIL_SERVER_ADDRESS=server.address          <- mail server address
set MAIL_FROM=from_your@e-mail.address         <- sender address
set MAIL_TO=to_your@e-mail.address             <- destination address

set MAIL_SUBJECT="Resource Coordinator VE (%COMPUTERNAME%) event mail"

set SENDMAIL_VBS=sendmail.vbs

set MAILCMD=cscript "%~dp0%SENDMAIL_VBS%" %MAIL_FROM% %MAIL_TO% %MAIL_SUBJECT% %MAIL_SERVER_ADDRESS%
%1 %2 %3 %4 %5 %6 //nologo
%MAILCMD%
```

## Information

The sample `sendmail.vbs` file (stored in the same folder as `trapopt.bat`) makes use of Windows CDO (Microsoft Collaboration Data Objects) to connect to an external SMTP server and send e-mail notifications.

For details on VBScript and CDO, refer to the technical reference provided by Microsoft.

[Linux Manager]

Set the following addresses (in the "E-Mail Notification Sample") to match actual environment values.

- Sender Address
- Destination Address

**E-Mail Notification Sample** (`/etc/opt/FJSVrcvmr/trapop.sh`)

```
#!/bin/sh

# MAIL_FROM=from_your@e-mail.address  <- sender address
# MAIL_TO=to_your@e-mail.address      <- destination address

# HOSTNAME=`/bin/uname -n`
# MAILCMD="/usr/sbin/sendmail -t"

# $MAILCMD <<ENDMAIL
# From: $MAIL_FROM
# To: $MAIL_TO
# Subject: Resource Coordinator VE($HOSTNAME) event mail

# -----
# Resource Coordinator VE: event mail
# -----
# $1

# ENDMAIL
```

When actually using this script, remove all comments and enter appropriate addresses.

```
#!/bin/sh

MAIL_FROM=from_your@e-mail.address  <- sender address
MAIL_TO=to_your@e-mail.address      <- destination address

HOSTNAME=`/bin/uname -n`
MAILCMD="/usr/sbin/sendmail -t"

$MAILCMD <<ENDMAIL
From: $MAIL_FROM
To: $MAIL_TO
Subject: Resource Coordinator VE($HOSTNAME) event mail

-----
Resource Coordinator VE: event mail
```



```
-----  
$1
```

```
ENDMAIL
```



## Information

.....  
The above sample assumes that the sendmail command is available on the admin server. Adapt the path to the sendmail command to your own environment. The outgoing SMTP server can be defined by changing the sendmail command's configuration files.  
.....

# Part 3 Maintenance

---

---

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# Chapter 6 Hardware Maintenance

This chapter explains how to perform hardware maintenance.

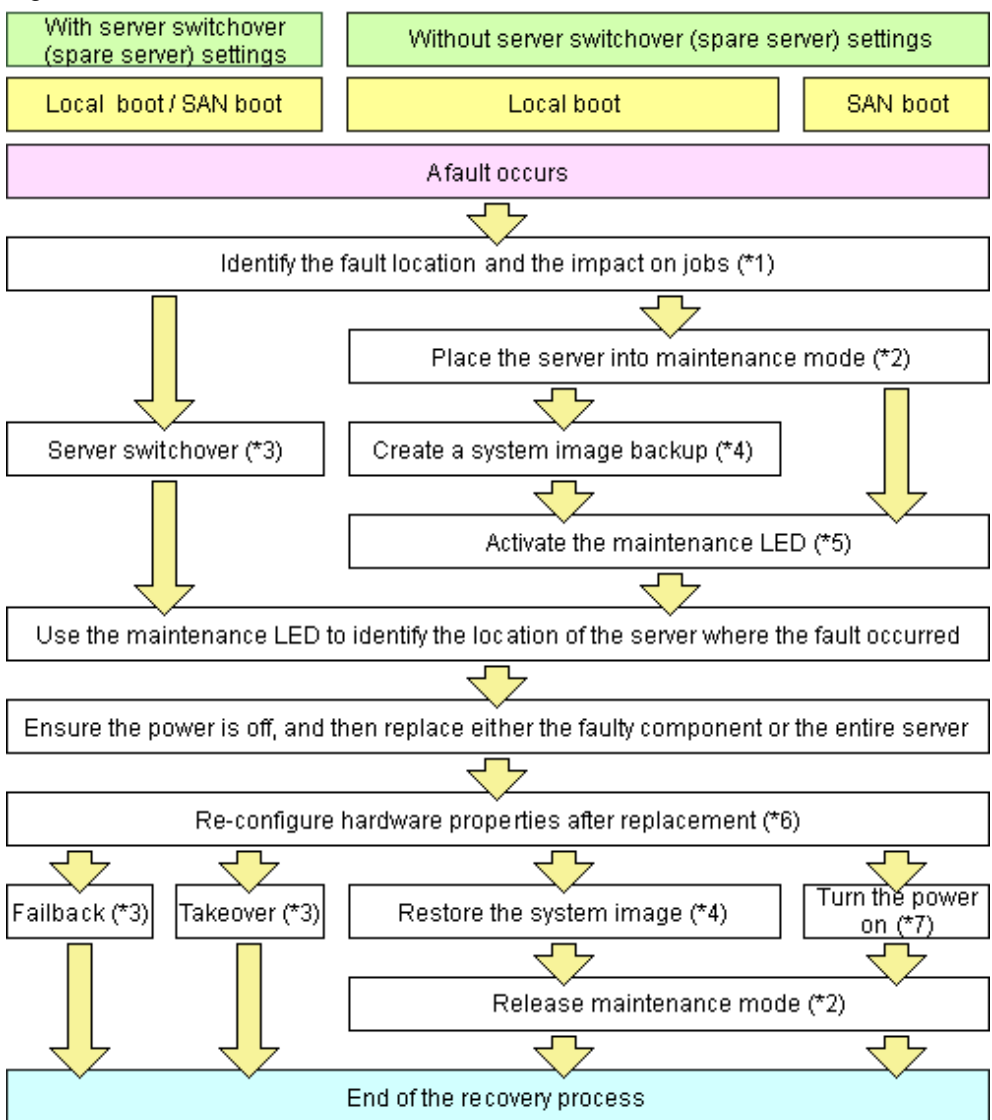
## 6.1 Overview

This section explains how to perform maintenance on the hardware devices managed by Resource Orchestrator.

### Flow of Hardware Maintenance when a Server Fails

The following flowchart shows the procedure for maintaining hardware when failures occur on registered servers.

Figure 6.1 Flow of Hardware Maintenance when a Server Fails



\*1: For details on how to identify failures, refer to "11.3 Addressing Resource Failures".

\*2: For details on how to configure and release the maintenance mode, refer to "Appendix C Maintenance Mode" in the "User's Guide VE".

\*3: For details on server switchover, failback, and takeover, refer to "Chapter 4 Server Switchover".

\*4: For details on backing up and restoring system images, refer to "Chapter 16 Backup and Restore" in the "User's Guide VE".

\*5: For details on maintenance LED operations, refer to "6.2.1 Maintenance LED". Please note that maintenance LED operations are only supported for PRIMERGY BX servers.

\*6: For details on reconfiguring hardware properties, refer to "6.3.1 Reconfiguration of Hardware Properties".

\*7: For details on power control, refer to "Chapter 14 Power Control" in the "User's Guide VE".

The following hardware replacements can be performed:

- Replacing Servers

Replace a server that has been registered in Resource Orchestrator.  
For details on replacing servers, refer to "[6.3.2 Replacing Servers](#)".

- Replacing Server Components

Replace hardware components (such as a NIC, HBA, or hard disk) of a registered server.  
For details on replacing or adding server components, refer to "[6.3.3 Replacing and Adding Server Components](#)".

- Replacing Non-Server Hardware

Replace registered chassis, management blades, or any other hardware components external to servers.  
For details on replacing non-server hardware, refer to "[6.3.4 Replacing Non-server Hardware](#)".

## 6.2 Blade Server Maintenance

---

This section explains the maintenance of blade servers.

### 6.2.1 Maintenance LED

---

This section explains how to operate maintenance LEDs.

Activating a server blade's maintenance LED make it easy to identify a server from others. When replacing servers, it is recommended to use this function to identify which server blade should be replaced.

To activate the maintenance LED of a managed server running either a physical OS or a VM host, the server should be placed into maintenance mode first.

For details on maintenance mode, refer to "Appendix C Maintenance Mode" in the "User's Guide VE".



- Maintenance LED control is only available for PRIMERGY BX servers. The actual LED used as an identification LED differs between server models.
    - For PRIMERGY BX600 servers, the power LED is used (blinks when activated).
    - For PRIMERGY BX900 servers, the ID indicator is used (lit when activated).
  - If SNMP agent settings within the management blade configuration are incorrect, maintenance LED operations in Resource Orchestrator will end successfully, but the state of the identification LED will not change. Configure the settings correctly, referring to "6.2 Configuring the Server Environment" in the "Design Guide VE".
- 

### Activating a Maintenance LED

Use the following procedure to activate a server blade's maintenance LED.

1. In the ROR console server resource tree, right-click the target server, and select [LED]-[ON] from the popup menu.

The [Turning on Maintenance LED] dialog is displayed.

2. Click <OK>.

Selecting the [Automatically turn off] checkbox will automatically shut down the server after activating its maintenance LED.



## Note

Once the maintenance LED of a server blade is activated, new errors detected in that server cannot be checked from its LED anymore. Check the server status directly from the ROR console.

### Deactivating a Maintenance LED

Use the following procedure to deactivate a server blade's maintenance LED.

1. In the ROR console server resource tree, right-click the target server, and select [LED]-[OFF] from the popup menu.

The [Turning off Maintenance LED] dialog is displayed.

2. Click <OK>.

The maintenance LED is turned off.

## 6.2.2 Reconfiguration of Hardware Properties

---

This section explains how to reconfigure hardware properties for replaced hardware.

After hardware replacement, it is necessary to reconfigure Resource Orchestrator with the new hardware properties.

For PRIMERGY BX servers, the hardware properties are automatically reconfigured.



## Note

- When replacing a server itself or the NIC used for either the admin or public LAN, be sure to perform this operation after the replacement.  
If it is not, there is a possibility that operations on the server will not run correctly.
- After replacing the hardware, the server status becomes "unknown". The appropriate status can be restored by reconfiguring the hardware properties from the server.

### Prerequisites

The following prerequisites must be satisfied before this operation can be performed:

- Both the replaced server and replacement server must be the same model

A warning message is shown if the model of the replacement server differs from that of the replaced server.

- When replacing a PRIMERGY BX server, the replacement server must be inserted into the same slot as used for the replaced server

Hardware properties cannot be reconfigured from a server inserted in a different slot. An error occurs if no server is inserted in the slot occupied by the previous server.

- The replaced server and replacement server must both be of the same blade type

If the blade types of the replaced and replacement servers are different, an error will occur.

To move a server to a different slot within a chassis, the server must be deleted first, and then registered again after being inserted in its new slot.

### Pre-Configuration

For PRIMERGY BX servers, the hardware properties are automatically reconfigured.

## When not Performing Reconfiguration of Hardware Properties Automatically

This section explains when not performing reconfiguration of hardware properties automatically.

Configuring the values in the following definition file in advance makes it possible to select whether to perform reconfiguration of hardware information automatically.

Placeholder for the Definition File

[Windows Manager]  
*Installation\_folder*\SVROR\Manager\etc\customize\_data

[Linux Manager]  
 /etc/opt/FJSVrcvmr/customize\_data

Name of the Definition File

auto\_replace.rcxprop

Format of the Definition File

*Key = Value*

Items in the Definition File

Table 6.1 List of Specified Items

Item	Key	Value	Remarks
Automatic execution of hardware property reconfiguration	auto_replace	true false	Select whether to perform reconfiguration of hardware information automatically. - When specifying "true" Reconfiguration of hardware information is executed automatically. - When specifying "false" Reconfiguration of hardware information is not executed automatically. The default value is "true". When a character string other than "true" is specified, or the definition file is deleted, "false" is configured.

## Reconfiguring Hardware Properties after Server Replacement

If the definition file has already been created, there is no need to set the hardware information again.

If the definition file has not been created, use the following procedure to reconfigure properties for replaced hardware.

1. After hardware replacement, insert the server and check that the following message is displayed in the event log.

Server blade added

After the message is displayed, shut down the server if it is still powered on.

2. After approximately 30 seconds, right-click the target server in the ROR console server resource tree, and select [Hardware Maintenance]-[Re-configure] from the popup menu.

The [Re-configure Hardware Properties] dialog is displayed.

3. Click <OK>.

The original hardware properties of the selected managed server are updated with new hardware properties obtained from the replacement server. If the maintenance LED is on it will be turned off automatically.

## Note

When registering an agent and performing backups of system images or cloning images, perform one of the following.

- Restart the managed server after reconfiguring the hardware properties
- Restart the related services described in ["2.2 Starting and Stopping Agents"](#)

## 6.2.3 Replacing Servers

---

This section details the procedure to follow when replacing servers.

### Information

- Follow the same procedure when replacing servers where VM hosts are running.
- No specific action is required in Resource Orchestrator when replacing admin servers or HBA address rename setup service servers.

#### - Replacing a Server with Spare Servers Assigned

Use the following procedure to switch applications over to a spare server and replace a server with minimal interruption.

##### 1. Perform Server Switchover

Switch over the server to replace with its spare server.

For details on the switchover function, refer to ["Chapter 4 Server Switchover"](#).

After the server has been switched over, its maintenance LED is automatically activated, and the server is powered down.

##### 2. Replace the Server

Replace the server whose maintenance LED is activated.

Change the BIOS settings of the replacement server to match the operating environment.

For details on BIOS settings, refer to ["6.2 Configuring the Server Environment"](#) in the ["Design Guide VE"](#).

Shut down the server after completing BIOS settings.

##### 3. Reconfigure Hardware Properties after Replacement

After replacing the server, reconfigure Resource Orchestrator with the latest hardware properties.

For details on how to reconfigure hardware properties, refer to ["6.2.2 Reconfiguration of Hardware Properties"](#).

After hardware properties have been reconfigured, the maintenance LED is automatically turned off in the ROR console.

##### 4. Perform Post-server Switchover Operations

For details on the operations that must be performed after a server switchover, refer to ["4.3 Post-Switchover Operations"](#).

#### - Replacing a Server with no Spare Server Assigned

Use the following procedure to smoothly replace a server and resume its applications.

##### 1. Place the Server into Maintenance Mode

Place the primary server to replace into maintenance mode.

For details on maintenance mode, refer to ["Appendix C Maintenance Mode"](#) in the ["User's Guide VE"](#).

##### 2. Place the Server into VM Maintenance Mode

When the primary server is a VM host, and can be placed into VM maintenance mode, place it into VM maintenance mode.

For details on VM maintenance mode, refer to ["15.2 VM Maintenance Mode of VM Hosts"](#) in the ["User's Guide VE"](#).

##### 3. Create a System Image Backup

For local boot servers, create a system image backup when possible.

For details on backing up system images, refer to ["Chapter 16 Backup and Restore"](#) in the ["User's Guide VE"](#).

In SAN boot environments, the boot disk can be restored without having to back up and restore a system image.

#### 4. Activate the Maintenance LED

Activate the maintenance LED on the server that is to be replaced before shutting it down.  
For details on how to activate maintenance LEDs, refer to "[6.2.1 Maintenance LED](#)".

#### 5. Replace the Server

Replace the server whose maintenance LED is activated.  
Change the BIOS settings of the replacement server to match the operating environment.  
For details on BIOS settings, refer to "6.2 Configuring the Server Environment" in the "Design Guide VE".  
Shut down the server after completing BIOS settings.

#### 6. Reconfigure Hardware Properties after Replacement

After replacing the server, reconfigure Resource Orchestrator with the latest hardware properties.  
For details on how to reconfigure hardware properties, refer to "[6.2.2 Reconfiguration of Hardware Properties](#)".  
After hardware properties have been reconfigured, the maintenance LED is automatically turned off in the ROR console.

#### 7. Restore the Boot Disk

##### - Local Boot

There is no need to restore the boot disk if the original disk is installed on the replaced server. Simply power on the replacement server.

If the boot disk was replaced and a system image backup was collected, restore that backup.  
When the image operation target disk is configured, configure the image operation target disk before performing restoration.  
For details, refer to "9.1.13 Changing Target Disks of Image Operations" in the "User's Guide VE".  
Refer to "16.3 Restore" in the "User's Guide VE" for details on how to restore a system image. After the system image is restored, the server will be automatically powered on.  
If there is no backup of the system image, run the installation program again.

##### - SAN Boot

As the replaced server can be easily configured to access the original boot disk using HBA address rename there is no need to restore the boot disk. Simply power on the replacement server.

#### 8. Release VM Maintenance Mode

When the primary server was placed into VM maintenance mode, release the replaced server from VM maintenance mode.  
For details on VM maintenance mode, refer to "15.2 VM Maintenance Mode of VM Hosts" in the "User's Guide VE".

#### 9. Release Maintenance Mode

Release the replaced server from maintenance mode.  
For details on maintenance mode, refer to "Appendix C Maintenance Mode" in the "User's Guide VE".

#### - Servers with no Agent Registered

Use the following procedure to replace servers on which no Resource Orchestrator agent was registered.

##### 1. Activate the Maintenance LED

Activate the maintenance LED on the server that is to be replaced and shut down the server if it is still powered on.  
For details on how to activate maintenance LEDs, refer to "[6.2.1 Maintenance LED](#)".

##### 2. Replace the Server

Replace the server whose maintenance LED is activated.  
Change the BIOS settings of the replacement server to match the operating environment.  
For details on BIOS settings, refer to "6.2 Configuring the Server Environment" in the "Design Guide VE".  
Shut down the server after completing BIOS settings.

##### 3. Reconfigure Hardware Properties after Replacement

After replacing the server, reconfigure Resource Orchestrator with the latest hardware properties.  
For details on how to reconfigure hardware properties, refer to "[6.2.2 Reconfiguration of Hardware Properties](#)".  
After hardware properties have been reconfigured, the maintenance LED is automatically turned off in the ROR console.



## 6.2.4 Replacing Server Components

---

For details on replacing server components, refer to "6.3.3 Replacing and Adding Server Components".

## 6.2.5 Replacing Non-server Hardware

---

This section explains how to replace hardware external to servers.

### - Replacing Chassis

No specific action is required in Resource Orchestrator.

### - Replacing Management Blades

No specific action is required in Resource Orchestrator.

### - Replacing LAN Switch Blades

No specific action is required in Resource Orchestrator for PRIMERGY BX900/BX400 LAN switch blades in either IBP mode or Converged Fabric mode and for PY CB 10Gb FEX Nexus B22 LAN switch blades.

For other LAN switch blades of PRIMERGY BX models, after replacing a switch blade, update the new LAN switch blade with the VLAN settings that were previously configured in Resource Orchestrator.

Use the following procedure to replace a LAN switch blade.

1. Replace the faulty LAN switch blade.
2. Restore the LAN switch blade configuration backup (which includes all of the LAN switch blade settings) to the new LAN switch blade.

For LAN switch blades (PY CB DCB SW 10Gb 18/6/6), the Automatic Migration of Port Profile (AMPP) configuration of all ports and VLAN settings of external ports must be restored manually.

If the LAN switch blade configuration was not been backed up in advance, it has to be restored by configuring each setting (except VLAN settings) to the same values set during the initial installation.

Refer to the manual of the LAN switch blade used for details on how to back up and restore LAN switch blade configurations.

3. Update the new LAN switch blade with the latest VLAN settings configured in Resource Orchestrator.
  - a. In the ROR console server resource tree, right-click the target LAN switch, and select [Restore] from the popup menu.  
The [Restore LAN Switch] dialog is displayed.
  - b. Click <OK>.

VLAN settings are applied to the specified LAN switch blade.

For LAN switch blades (PY CB DCB SW 10Gb 18/6/6), only the VLAN settings of internal ports for which an Automatic Migration of Port Profile (AMPP) has not been configured are restored.



To replace LAN switch blades with different models, first delete the registered LAN switch blade, and then register the replacement LAN switch blade.

After the LAN switch blade is registered, the VLAN settings must be configured for the internal and external ports.

For details on the VLAN settings, refer to "7.3.4 Configuring VLANs on LAN Switch Blades" in the "User's Guide VE".

When the following configurations before and after replacement of a PRIMERGY BX900/BX400 series LAN switch blade are different, delete the registered LAN switch blade and register it again.

- Operation mode (IBP, VCS, or Converged Fabric mode, and another mode)
- VCS ID
- RBridge ID
- Fabric ID
- Domain ID

- Switch ID

---

### - Replacing Fibre Channel Switch Blades

No specific action is required in Resource Orchestrator.

In Resource Orchestrator, the settings for Fibre Channel switch blades are not restored.

Restore the settings for Fibre Channel switch blades based on the information in hardware manuals.

### - Replacing Storage Blades

No specific action is required in Resource Orchestrator when replacing a storage blade that does not contain the boot disk of a server blade.

Use the following procedure to replace a storage blade that contains the boot disk of a server blade.

1. Replace the storage blade.
2. Insert the server blade's boot disk in the new storage blade.
3. If the boot disk's content was backed up, restore it.

When the image operation target disk is configured, configure the image operation target disk before performing restoration. For details, refer to "9.1.13 Changing Target Disks of Image Operations" in the "User's Guide VE".

### Information

---

The backup and restore functions available in Resource Orchestrator can be used to restore the boot disk contents. For details, refer to "Chapter 16 Backup and Restore" in the "User's Guide VE".

---

## 6.3 Maintenance for Servers Other Than Blade Servers

---

This section explains server maintenance for servers other than blade servers.

### 6.3.1 Reconfiguration of Hardware Properties

---

This section explains how to reconfigure hardware properties for replaced hardware.

When replacing hardware or adding or removing server components, it is necessary to reconfigure Resource Orchestrator with the new hardware properties.

### Note

- 
- When replacing a server itself or the NIC used for either the admin or public LAN, be sure to perform this operation after the replacement.  
If it is not, there is a possibility that operations on the server will not run correctly.
  - When the system board or GSPB of a PRIMEQUEST server has been changed, ensure that this operation is performed. (\*)  
If it is not, there is a possibility that operations on the server will not run correctly.  
\* Note: For the PRIMEQUEST 2000 series, take GSPB as meaning IOU.
  - After replacing the hardware, the server status becomes "unknown". The appropriate status can be restored by reconfiguring the hardware properties from the server.
  - For PRIMEQUEST, after IOU replacement or immediately after powering on, the MAC Address for each partition that is obtained from the MMB becomes FF:FF:FF:FF:FF:FF. After each partition is powered on, the MAC Address of the correct LAN is obtained from the MMB. Reconfigure the hardware properties after powering on partitions.
-

## Prerequisites

The following prerequisites must be satisfied before this operation can be performed:

- Both the replaced server and replacement server must be the same model

A warning message is shown if the model of the replacement server differs from that of the replaced server.

- The replaced server and replacement server must both be of the same blade type

If the blade types of the replaced and replacement servers are different, an error will occur.

To move a server to a different slot within a chassis, the server must be deleted first, and then registered again after being inserted in its new slot.

## Reconfiguring Hardware Properties after Hardware Replacement or Addition or Removal of Server Components

- For Rack Mount and Tower Servers

Use the following procedure to reconfigure properties for replaced hardware.

1. If the agent or ServerView Agents has already been registered, power on the server.

### Additional Information

When a server using SAN boot has a hardware exchange that results in the MAC address used for the admin LAN being changed, the OS and an agent cannot be started.

In this case, the server should be started once, and the MAC address confirmed on the BIOS (hardware) screen. After the MAC address is confirmed, power off the server again.

2. In the ROR console server resource tree, right-click the target server and select [Hardware Maintenance]-[Reconfigure] from the popup menu.

The [Re-configure Hardware Properties] dialog is displayed.

3. Enter MAC addresses for the network interfaces used on the admin LAN.

This step can be skipped if no network interface was replaced.

- Admin LAN MAC Address (NIC1)

Required only if the agent is not registered.

### Additional Information

When a server is powered off for the reason given in the [Additional Information](#) in step 1, the item for input of the value of NIC1 is displayed. In this case, input the MAC address confirmed in the [Additional Information](#) in step 1.

- MAC address (NIC2) under SAN Boot/admin LAN redundancy

This item is only required for the following cases:

- When using the HBA address rename setup service
- When using GLS for admin LAN redundancy on the target server
- For the spare server of a managed server using admin LAN redundancy

4. Click <OK>.

The original hardware properties of the selected managed server are updated with new hardware properties obtained from the replacement server.

- For PRIMEQUEST Servers

Use the following procedure to reconfigure hardware properties after replacement of hardware or addition or removal of server components:

1. Replace the system board or GSPB, or add or remove server components.

For the PRIMEQUEST 2000 series, take GSPB as meaning IOU.

2. After approximately 30 seconds, right-click the target server in the ROR console server resource tree, and select [Hardware Maintenance]-[Re-configure] from the popup menu.

The [Re-configure Hardware Properties] dialog is displayed.

3. Click <OK>.

The original hardware properties of the selected managed server are updated with new hardware properties obtained from the replacement server.

- For Fujitsu M10/SPARC Enterprise Servers

Note that in this case there is no need to set the hardware information again.



When registering an agent and performing backups of system images or cloning images, perform one of the following.

- Restart the managed server after reconfiguring the hardware properties
- Restart the related services described in "[2.2 Starting and Stopping Agents](#)"

## 6.3.2 Replacing Servers

---

This section details the procedure to follow when replacing servers.



- Follow the same procedure when replacing servers where VM hosts are running.
- No specific action is required in Resource Orchestrator when replacing admin servers or HBA address rename setup service servers.

### For Rack Mount and Tower Servers

- Replacing a Server with Spare Servers Assigned

Use the following procedure to switch applications over to a spare server and replace a server with minimal interruption.

1. Perform Server Switchover

Switch over the server to replace with its spare server.

For details on the switchover function, refer to "[Chapter 4 Server Switchover](#)".

The server to replace is automatically powered off after switchover.

2. Replace the Server

Replace the server.

Change the BIOS settings of the replacement server to match the operating environment.

For details on BIOS settings, refer to "6.2 Configuring the Server Environment" in the "Design Guide VE".

Shut down the server after completing BIOS settings.

Configure the remote management controller of the replacement server with the same IP address, user name, password, and SNMP trap destination as those set on the original server.

3. Reconfigure Hardware Properties after Replacement

After replacing the server, reconfigure Resource Orchestrator with the latest hardware properties.

For details on how to reconfigure hardware properties, refer to "[6.3.1 Reconfiguration of Hardware Properties](#)".

When using VIOM, refer to the manual of ServerView Virtual-IO Manager and perform inventory boot on ServerView Virtual-IO Manager.

4. Perform Post-server Switchover Operations

For details on the operations that must be performed after a server switchover, refer to "[4.3 Post-Switchover Operations](#)".

- Replacing a Server with no Spare Server Assigned

Use the following procedure to smoothly replace a server and resume its applications.

1. Place the Server into Maintenance Mode

Place the primary server to replace into maintenance mode.

For details on maintenance mode, refer to "Appendix C Maintenance Mode" in the "User's Guide VE".

2. Place the Server into VM Maintenance Mode

When the primary server is a VM host, and can be placed into VM maintenance mode, place it into VM maintenance mode.

For details on VM maintenance mode, refer to "15.2 VM Maintenance Mode of VM Hosts" in the "User's Guide VE".

3. Create a System Image Backup

For local boot servers, create a system image backup when possible.

For details on backing up system images, refer to "Chapter 16 Backup and Restore" in the "User's Guide VE".

In SAN boot environments, the boot disk can be restored without having to back up and restore a system image.

4. Power OFF

Shut down the server to replace if it is still powered on.

For details on shutting down servers, refer to "Chapter 14 Power Control" in the "User's Guide VE".

5. Replace the Server

Replace the server.

Change the BIOS settings of the replacement server to match the operating environment.

For details on BIOS settings, refer to "6.2 Configuring the Server Environment" in the "Design Guide VE".

Shut down the server after completing BIOS settings.

Configure the remote management controller of the replacement server with the same IP address, user name, password, and SNMP trap destination as those set on the original server.

6. Reconfigure Hardware Properties after Replacement

After replacing the server, reconfigure Resource Orchestrator with the latest hardware properties.

For details on how to reconfigure hardware properties, refer to "[6.3.1 Reconfiguration of Hardware Properties](#)".

When using VIOM, refer to the manual of ServerView Virtual-IO Manager and perform inventory boot on ServerView Virtual-IO Manager.

7. Restore the Boot Disk

- Local Boot

There is no need to restore the boot disk if the original disk is installed on the replaced server. Simply power on the replacement server.

If the boot disk was replaced and a system image backup was collected, restore that backup.

When the image operation target disk is configured, configure the image operation target disk before performing restoration.

For details, refer to "9.1.13 Changing Target Disks of Image Operations" in the "User's Guide VE".

Refer to "16.3 Restore" in the "User's Guide VE" for details on how to restore a system image. After the system image is restored, the server will be automatically powered on.

If there is no backup of the system image, run the installation program again.

- SAN Boot

The replaced server can be easily configured to access the original boot disk using I/O virtualization. Therefore, there is no need to restore the boot disk. Simply power on the replacement server.

8. Release VM Maintenance Mode

When the primary server was placed into VM maintenance mode, release the replaced server from VM maintenance mode.

For details on VM maintenance mode, refer to "15.2 VM Maintenance Mode of VM Hosts" in the "User's Guide VE".

9. Release Maintenance Mode

Release the replaced server from maintenance mode.

For details on maintenance mode, refer to "Appendix C Maintenance Mode" in the "User's Guide VE".

- Servers with no Agent Registered

Use the following procedure to replace servers on which no Resource Orchestrator agent was registered.

1. Power OFF

Shut down the server to replace if it is still powered on.

For details on shutting down servers, refer to "Chapter 14 Power Control" in the "User's Guide VE".

2. Replace the Server

Replace the target server.

Change the BIOS settings of the replacement server to match the operating environment.

For details on BIOS settings, refer to "6.2 Configuring the Server Environment" in the "Design Guide VE".

Shut down the server after completing BIOS settings.

Configure the remote management controller of the replacement server with the same IP address, user name, password, and SNMP trap destination as those set on the original server.

3. Reconfigure Hardware Properties after Replacement

After replacing the server, reconfigure Resource Orchestrator with the latest hardware properties.

For details on how to reconfigure hardware properties, refer to "6.3.1 Reconfiguration of Hardware Properties".

When using VIOM, refer to the manual of ServerView Virtual-IO Manager and perform inventory boot on ServerView Virtual-IO Manager.

## For Fujitsu M10/SPARC Enterprise Servers

- Replacing a Server with Spare Servers Assigned

Use the following procedure to switch applications over to a spare server and replace a server with minimal interruption.

- When Replacing an HBA

1. Perform Server Switchover

Switch over the server to replace with its spare server.

For details on the switchover function, refer to "Chapter 4 Server Switchover".

The server to replace is automatically powered off after switchover.

2. Replace the Server

Replace the HBA of the server.

Change the OBP settings of the replacement server to match the operating environment.

For details on OBP settings, refer to "6.2 Configuring the Server Environment" in the "Design Guide VE".

Shut down the server after completing OBP settings.

Configure the remote management controller of the replacement server with the same IP address, user name, password, and SNMP trap destination as those set on the original server.

3. Change the WWN Information Settings

Change the WWN information settings for after server replacement to the WWN value of the HBA after server replacement.

Leave the value of the target CA as the one before changes were made.

4. Perform Post-server Switchover Operations

For details on the operations that must be performed after a server switchover, refer to "4.3 Post-Switchover Operations".



### Note

.....  
If takeover was performed before replacement of the HBA, release the spare server settings. Change the WWN information settings following the procedure in "Replacing a Server with no Spare Server Assigned".  
.....

- When not Replacing an HBA

1. Perform Server Switchover

Switch over the server to replace with its spare server.

For details on the switchover function, refer to "[Chapter 4 Server Switchover](#)".

The server to replace is automatically powered off after switchover.

2. Replace the Server

Replace components (other than the HBA) of the server.

Change the OBP settings of the replacement server to match the operating environment.

For details on OBP settings, refer to "6.2 Configuring the Server Environment" in the "Design Guide VE".

Shut down the server after completing OBP settings.

Configure the remote management controller of the replacement server with the same IP address, user name, password, and SNMP trap destination as those set on the original server.

3. Perform Post-server Switchover Operations

For details on the operations that must be performed after a server switchover, refer to "[4.3 Post-Switchover Operations](#)".

- Replacing a Server with no Spare Server Assigned

When WWN information has been configured, use the following procedure to change the WWN information to that of the WWPN value of the replaced HBA.

1. Delete the Target CA

When there are target CA settings in the WWN information, stop the server and then delete the target CA settings (set them as hyphens ("-")).

2. Replace the Server

Replace the HBA of the server.

Change the OBP settings of the replacement server to match the operating environment.

For details on OBP settings, refer to "6.2 Configuring the Server Environment" in the "Design Guide VE".

Shut down the server after completing OBP settings.

When the target CA was deleted in step 1, configure zoning and host affinity settings in the WWPN value of the replacement HBA.

For details, refer to the "ETERNUS SF Storage Cruiser Operation Guide".

3. Change the WWN Information Settings

Change the WWN information settings for after server replacement to the WWN value of the HBA after server replacement.

When the target CA was deleted in step 1, configure a new target CA.

After configuration, restart the server.

After starting the server, check the status of the server's HBA from ESC.

When the HBA status is "unknown", delete it.

When the HBA status is displayed as "access path inheritance is required" (yellow icon), perform access path inheritance.

For details, refer to the "ETERNUS SF Storage Cruiser Operation Guide".

When the target CA was not deleted in step 1, configure the target CA as a hyphen ("-").

 Information

In the case of OVM for SPARC environment

When server was exchanged, it is necessary to recover OVM for SPARC environment. For details, refer to "[4.3.2 Recovery of OVM for SPARC Environment](#)".

- When SPARC M10-4S are in a Building Block Configuration

No specific action is required in Resource Orchestrator.

## For PRIMEQUEST Servers

### - Replacing a Server with no Spare Server Assigned

Use the following procedure to smoothly replace a server and resume its applications.

#### 1. Place the Server into Maintenance Mode

Place the primary server to replace into maintenance mode.

For details on maintenance mode, refer to "Appendix C Maintenance Mode" in the "User's Guide VE".

#### 2. Place the Server into VM Maintenance Mode

When the primary server is a VM host, and can be placed into VM maintenance mode, place it into VM maintenance mode.

For details on VM maintenance mode, refer to "15.2 VM Maintenance Mode of VM Hosts" in the "User's Guide VE".

#### 3. Create a System Image Backup

For local boot servers, create a system image backup when possible.

For details on backing up system images, refer to "Chapter 16 Backup and Restore" in the "User's Guide VE".

In SAN boot environments, the boot disk can be restored without having to back up and restore a system image.

#### 4. Power OFF

Shut down the server to replace if it is still powered on.

For details on shutting down servers, refer to "Chapter 14 Power Control" in the "User's Guide VE".

#### 5. Replace the Server

Replace the server.

Use the Maintenance Wizard of the Management Board Web-UI to perform replacement.

For details on the Maintenance Wizard, refer to the PRIMEQUEST manual.

Also, change the BIOS settings of the replacement server to match the operating environment.

For details on BIOS settings, refer to "6.2 Configuring the Server Environment" in the "Design Guide VE".

Shut down the server after completing BIOS settings.

#### 6. Reconfigure Hardware Properties after Replacement

After replacing the server, reconfigure Resource Orchestrator with the latest hardware properties.

For details on how to reconfigure hardware properties, refer to "[6.3.1 Reconfiguration of Hardware Properties](#)".

#### 7. Restore the Boot Disk

##### - Local Boot

There is no need to restore the boot disk if the original disk is installed on the replaced server. Simply power on the replacement server.

If the boot disk was replaced and a system image backup was collected, restore that backup.

Refer to "16.3 Restore" in the "User's Guide VE" for details on how to restore a system image. After the system image is restored, the server will be automatically powered on.

If there is no backup of the system image, run the installation program again.

##### - SAN Boot

As the replaced server can be easily configured to access the original boot disk using HBA address rename there is no need to restore the boot disk. Simply power on the replacement server.

#### 8. Release VM Maintenance Mode

When the primary server was placed into VM maintenance mode, release the replaced server from VM maintenance mode.

For details on VM maintenance mode, refer to "15.2 VM Maintenance Mode of VM Hosts" in the "User's Guide VE".

#### 9. Release Maintenance Mode

Release the replaced server from maintenance mode.

For details on maintenance mode, refer to "Appendix C Maintenance Mode" in the "User's Guide VE".

### - Servers with no Agent Registered

Use the following procedure to replace servers on which no Resource Orchestrator agent was registered.



### 1. Power OFF

Shut down the server to replace if it is still powered on.

For details on shutting down servers, refer to "Chapter 14 Power Control" in the "User's Guide VE".

### 2. Replace the Server

Replace the server.

Use the Maintenance Wizard of the Management Board Web-UI to perform replacement.

For details on the Maintenance Wizard, refer to the PRIMEQUEST manual.

Also, change the BIOS settings of the replacement server to match the operating environment.

For details on BIOS settings, refer to "6.2 Configuring the Server Environment" in the "Design Guide VE".

Shut down the server after completing BIOS settings.

### 3. Reconfigure Hardware Properties after Replacement

After replacing the server, reconfigure Resource Orchestrator with the latest hardware properties.

For details on how to reconfigure hardware properties, refer to "[6.3.1 Reconfiguration of Hardware Properties](#)".

## 6.3.3 Replacing and Adding Server Components

---

This section explains how to replace and add server components.

### - Replacing and Adding Network Interfaces (Admin LAN, Public LAN)

The procedure used to replace and add network interfaces is the same as that described in "[6.3.2 Replacing Servers](#)".

For details, refer to "[6.3.2 Replacing Servers](#)".

When adding or removing network interfaces, if the target server is running Red Hat Enterprise Linux 5 or Citrix XenServer, after completing the steps described in "[6.3.2 Replacing Servers](#)", log in with administrative privileges on the managed server and execute the following command.

```
# /usr/local/sbin/macbindconfig create <RETURN>
```

[Citrix Xen]

When using Citrix XenServer, reinstall XenServer referring to the Citrix XenServer manual.

[Xen]

When using Red Hat Enterprise Linux 5 Virtualization (Xen-Based) and not using I/O Virtualization (VIOM), perform the following procedure.

1. Execute the following command to temporarily disable automatic startup of the xend daemon and then restart the managed server.

```
# chkconfig xend off <RETURN>
```

2. Once the server has restarted, execute the following commands to update MAC address bindings, re-enable automatic startup of the xend daemon, and restart the xend daemon itself.

```
# /usr/local/sbin/macbindconfig create <RETURN>
# chkconfig xend on <RETURN>
# service xend start <RETURN>
```

[Linux]

When the configuration of server components has been changed, check the configuration file of the OS, and make any necessary corrections. For details, refer to "Configuration File Check" in "2.2.1.1 Software Preparation and Checks" in the "Setup Guide VE".

[Red Hat Enterprise Linux 6]

When adding or removing network interfaces, if the target server is running Red Hat Enterprise Linux 6, after completing the steps described in "[6.3.2 Replacing Servers](#)", modify the configuration file.

For details, refer to "Configuration File Check" in "2.2.1.1 Software Preparation and Checks" in the "Setup Guide VE".

### - Replacing a GSPB

The procedure used to replace a GSPB is the same as that described in "Replacing a network interface".  
Replace NIC with GSPB in the procedure.

### - Replacing an HBA

The procedure used to replace an HBA is the same as that described in "6.3.2 Replacing Servers".  
For details, refer to "6.3.2 Replacing Servers".

- When using I/O virtualization, the replacement HBA will automatically inherit the WWN originally set on the replaced HBA. Therefore, there is no need to reconfigure access paths on the storage side.
- When configuring WWN information, it is necessary to change WWN information settings to the replaced HBA WWN values. For details on how to change WWN information, refer to "9.1.12 Changing WWN Settings for ETERNUS SF Storage Cruiser Integration" in the "User's Guide VE".

### - Replacing a boot disk (in local boot environments)

Use the following procedure to replace a boot disk.

1. Replace the faulty boot disk with a new one.
2. If the boot disk's content was backed up, restore it.

When the image operation target disk is configured, configure the image operation target disk before performing restoration.  
For details, refer to "9.1.13 Changing Target Disks of Image Operations" in the "User's Guide VE".



### Information

The backup and restore functions available in Resource Orchestrator can be used to restore the boot disk contents.  
For details, refer to "Chapter 16 Backup and Restore" in the "User's Guide VE".

### - Replacing a System Board

The procedure used to replace a system board is the same as that described in "6.3.2 Replacing Servers".  
For details, refer to "6.3.2 Replacing Servers".

### - Replacing an IO Board

No specific action is required in Resource Orchestrator when replacing an IO board.

### - Addition and Deletion of Server Parts for the PRIMEQUEST 2000 Series

When performing operations from MMB, or when performing addition or deletion of SBs and IOUs using Dynamic Reconfiguration, reconfigure the latest hardware information in Resource Orchestrator. For details on how to reconfigure hardware properties, refer to "6.3.1 Reconfiguration of Hardware Properties".

For details on how to add or delete server parts, refer to the operation management manuals for the PRIMEQUEST 2000 series.

### - Replacing Other Server Components

No specific action is required in Resource Orchestrator when replacing onboard server components like memory modules or other parts.

## 6.3.4 Replacing Non-server Hardware

---

This section explains how to replace hardware external to servers.

### - Replacing Management Blades

No specific action is required in Resource Orchestrator.  
No specific action is required when updating firmware.

When performing replacements or upgrading firmware, the status of the chassis and server blades mounted in the chassis may change to "unknown".

### - **Replacing Management Boards**

No specific action is required in Resource Orchestrator.

No specific action is required when updating firmware.

When performing replacements or upgrading firmware, the status of servers may change to "unknown".

### - **Replacing LAN Switches**

No specific action is required in Resource Orchestrator when replacing a LAN switch.

No specific action is required when updating firmware.

When performing replacements or upgrading firmware, the status of LAN switches may change to "unknown".

### - **Upgrading Firmware of PRIMEQUEST Chassis**

#### 1. Place the Server into Maintenance Mode

Place the server to upgrade the firmware of into maintenance mode.

For details on maintenance mode, refer to "Appendix C Maintenance Mode" in the "User's Guide VE".

#### 2. Place the Server into VM Maintenance Mode

When the primary server for firmware upgrade is a VM host, and can be placed into VM maintenance mode, place it into VM maintenance mode.

For details on VM maintenance mode, refer to "15.2 VM Maintenance Mode of VM Hosts" in the "User's Guide VE".

#### 3. Power the Server Off

Shut down the server for firmware upgrade if it is still powered on.

For details on shutting down servers, refer to "Chapter 14 Power Control" in the "User's Guide VE".

#### 4. Upgrade Firmware of PRIMEQUEST Chassis

Perform upgrade of the firmware of PRIMEQUEST chassis.

#### 5. Release VM Maintenance Mode

When the server of which the firmware was upgraded was placed into VM maintenance mode, release it from VM maintenance mode.

For details on VM maintenance mode, refer to "15.2 VM Maintenance Mode of VM Hosts" in the "User's Guide VE".

#### 6. Release Maintenance Mode

Release the server of which the firmware was upgraded from maintenance mode.

For details on maintenance mode, refer to "Appendix C Maintenance Mode" in the "User's Guide VE".

## **6.4 Storage Device Maintenance**

---

This section explains how to maintain storage devices.

### - **Replacing storage devices**

No specific action is required in Resource Orchestrator.

In Resource Orchestrator, the settings for storage devices are not restored.

Restore the settings for storage devices based on the information in hardware manuals.

### - **Replacing Fibre Channel switches**

No specific action is required in Resource Orchestrator.

In Resource Orchestrator, the settings for Fibre Channel switches are not restored.

Restore the settings for Fibre Channel switches based on the information in hardware manuals.

## **6.5 Power Monitoring Device (PDU or UPS) Maintenance**

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This section explains how to maintain power monitoring devices (PDU or UPS).

**- Replacing power monitoring devices (PDU or UPS)**

After replacing a power monitoring device, reconfigure the hardware properties of the power monitoring device (PDU or UPS). Use the following procedure to replace a power monitoring device.

1. Replace the faulty power monitoring device.
2. Set the admin LAN IP address and SNMP community on the replacement device to the same values as those that were set on the faulty device.
3. Reconfigure the power monitoring device's hardware properties.

- a. In the ROR console server resource tree, right-click the target power monitoring device (PDU or UPS), and from the popup menu, select [Hardware Maintenance]-[Re-configure].

The [Re-configure Hardware Properties] dialog is displayed.

- b. Click <OK>.

The target power monitoring device's hardware properties are reconfigured.

# Chapter 7 Maintaining Software with Cloning [Physical Servers]

This chapter explains how to perform software maintenance using server cloning.

## 7.1 Overview

---

Cloning servers allows users to apply patches and install or modify installed software on a managed server before propagating those changes to other servers.

After performing necessary maintenance tasks on one managed server, a cloning image can be collected from that server and deployed to other managed servers. This minimizes the time required for the software maintenance of multiple managed servers while reducing the risk of mistakes during operation.

Using the network parameter auto-configuration function also enables automatic configuration of public LAN settings for each cloned server. This is done by reconfiguring the network interfaces used for the public LAN following deployment of a cloning image.

For details on the cloning function, refer to "Chapter 17 Cloning [Physical Servers]" in the "User's Guide VE".



- Software maintenance tasks performed using the cloning function only apply to servers that share the same hardware and software configuration.
  - Deployment of a cloning image will reset the VLAN settings used for the public LAN of each target server. Those settings need to be restored either manually or automatically using the network parameter auto-configuration function.
  - The following data will also be reset on the servers to which a cloning image is deployed. If necessary, this data should be manually backed up (copied) before deployment, and restored once complete.
    - OS system log
    - Application settings and logs
- 

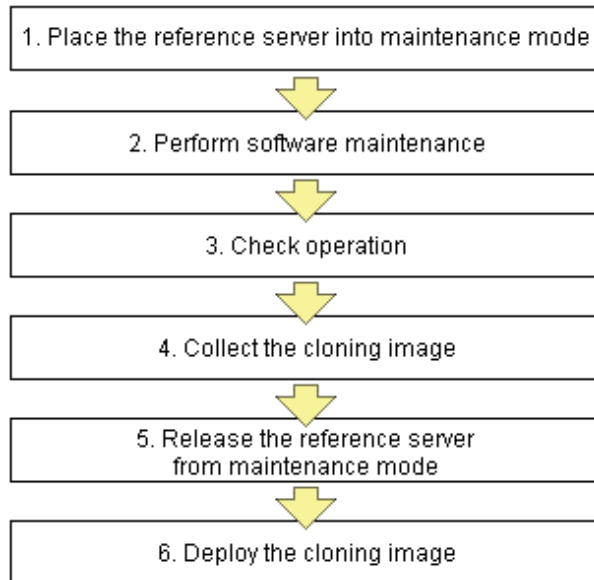
## 7.2 Software Maintenance Procedure

---

This section explains how to perform maintenance operations on managed servers.

Maintenance operations should be performed first on one reference server before propagating changes to the remaining target servers.

Figure 7.1 Software Maintenance Procedure Using Cloning



Each of these steps is explained below.

1. Place the Server into Maintenance Mode

- a. Stop all applications on the target server.
- b. In the ROR console server resource tree, right-click the target server (or its physical OS or VM host) and select [Maintenance Mode]-[Set] from the popup menu.  
For details on the maintenance mode, refer to "Appendix C Maintenance Mode" in the "User's Guide VE".

2. Perform Software Maintenance

Perform the necessary software maintenance tasks (such as patch application, or software addition or modification) on the reference server.

3. Check Operation

After completion of maintenance tasks, confirm that the OS and applications still operate properly to validate the changes made during maintenance.

4. Collect the Cloning Image

Once all changes have been validated, collect a cloning image from the reference server.  
For details on collecting cloning images, refer to "17.2 Collecting" in the "User's Guide VE".

5. Release the Reference Server from Maintenance Mode

Release the managed server from maintenance mode.  
In the ROR console server resource tree, right-click the server (or physical OS or VM host on the server) to be released from maintenance mode, and select [Maintenance Mode]-[Release] from the popup menu.  
For details on the maintenance mode, refer to "Appendix C Maintenance Mode" in the "User's Guide VE".

6. Deploy the Cloning Image

Propagate the changes made during maintenance by deploying the cloning image collected in step 4 to the remaining target servers.  
For details on how to deploy cloning images, refer to "17.3 Deploying" in the "User's Guide VE".

## **Chapter 8 Backup and Restoration of Managed Servers**

This chapter explains how to back up and restore managed servers.

This function enables backing up and restoration of system images of physical OS's and VM hosts.

For details, refer to "Chapter 16 Backup and Restore" in the "User's Guide VE".

# Chapter 9 Backup and Restoration of Admin Servers

This chapter explains how to back up and restore the admin server.

## 9.1 Overview

By backing up the resources of Resource Orchestrator listed below, it is possible to restore the admin server even if files needed to boot the OS are deleted, or files of the manager are deleted from the installation folder making it impossible to boot this software, or other mistakes made by system administrators result in damage to the system.

It is recommended that you create a backup once a system has been set up under Resource Orchestrator, and after the registration, modification, or deletion of resources. By backing up those resources periodically, the environment can be restored to its previous state (when the backup was created).

### 9.1.1 Resources Managed by This Product and Timing of Update

The resource files managed by Resource Orchestrator are as shown below:

- Configuration definition information of Resource Orchestrator (the database of the Resource Orchestrator manager)
- System images and cloning images (files in the image file storage folder)

Table 9.1 Backup Targets and Update Timing

Target Resources	Relevant Backup Command	Resources to Back Up when Configuring a System	When Backup is Necessary	Necessity of Stopping Managers	Remarks
Certificates	rcxkeydefbackup	Yes	None	Not Required	-
Session encryption keys	rcxkeydefbackup	Yes	After password saving (after execution of the rcxlogin -save command)	Not Required	-
System images and cloning images	scwbackup	Yes	After addition, deletion, and modification of physical server images	Not Required	-
Configuration definition information	rcxbackup	Yes	After creation, registration, modification, unregistration, and deletion of resources	Not Required	-
Information related to image files	scwbackup	Yes	After the registration and unregistration of VM hosts	Not Required	-
Definition files	rcxkeydefbackup	Yes	Modification of definition files	Not Required	-
Image management information	rcxkeydefbackup	Yes	After rcxadm imagemgr command operations	Not Required	-

Backup operations are necessary at the timing listed in "Table 9.1 Backup Targets and Update Timing", and after the following maintenance operations.

After backup, only when the following hardware configuration and configuration changes have not been performed, is it possible to perform restoration.

When performing hardware configuration or configuration changes, perform backup again.

- Replacement of a chassis, LAN switch, managed server, or power monitoring device hardware



- Replacement of the NIC of a managed server
- LAN connections between managed servers and LAN switches
- Server switchover or takeover (\*)
- Modification of the configuration of image operation target disks of managed servers

\* Note: If failback has been performed after server switchover, restore can be performed.



## Note

The configuration definition information managed by Resource Orchestrator is the target of backup and restore.

VM management software, VM hosts, VM guest boot images, and VM guest virtual disks are not the target of backup and restore. Perform backup and restore another way.

## 9.1.2 Backing Up the Admin Server

---

This section explains backup of the admin server.

The following two types of backup operations can be performed.

### Backup after Environment Creation

After environment creation, back up all of the management information (Resource Orchestrator resources on the admin server) using the following procedure.

For details, refer to "[9.2.1 Backing Up All Management Information](#)".

1. Back up certificates, session encryption keys, definition files, and image management information (rcxkeydefbackup)
2. Back up information related to image files, system images, and cloning images (scwbackup)
3. Back up configuration definition information (rcxbackup)

### Periodical Backup and the Backup of Configuration Definition Information

There are backup methods such as periodical backup operations in short intervals (such as backup performed once every hour) and backup performed repeatedly whenever the configuration definition information is updated.

For details, refer to "[9.2.2 Backing Up Configuration Definition Information](#)".

## 9.1.3 Restore

---

Restore backed up resources to the admin server using the following procedure.

For details, refer to "[9.3 Restoration](#)".

1. Reinstall the manager and restore the certificates, session encryption keys, definition files, and image management information (rcxkeydefrestore)
2. Restore information related to image files, system images, and cloning images (scwrestore)
3. Restore configuration definition information (rcxrestore)

When collecting backups periodically or after registering, modifying, or deleting resources, it is not necessary to collect all resources. It is usual to back up configuration definition information. When resources other than configuration definition information are updated, collect all resources of Resource Orchestrator on the admin server.



## Information

Recovery can be performed by first backing up the entire admin server disk, and then restoring it.

In clustered manager configurations, the disk shared between cluster nodes should also be backed up and restored.

When backing up Resource Orchestrator resources after backing up the entire disk of the admin server, restore the entire disk of the admin server and then perform steps 2 to 6 in "9.3 Restoration", and restore system images, cloning images, and configuration definition information.

---

## 9.1.4 Backup and Restore Commands

Use the backup and restore commands to perform backup and restoration of configuration definition information (the database of Resource Orchestrator manager).

The Backup and Restore commands support online backup, which is the backup of managers without stopping them.

After restoration, the status is the same as immediately after the backup operation.

For details on the command, refer to "Chapter 6 Backup and Restoration Operations for Configuration Definition Information" in the "Reference Guide (Command) VE".



---

### Execution Timing for the Backup and Restore Command

When executing the backup and restoration commands, take care regarding the following points:

- While the following operations are being performed, do not execute backup or restore of the admin server:
  - Server switchover and failback
  - Backup and restoration of system images
  - Collection and deployment of cloning images

When a periodical backup operation is performed without stopping the manager, if a conflict between the backup operation and the operations mentioned above occurs, the backup operation will be postponed until the operation is completed.

---

## 9.2 Backup

This section explains how to back up the admin server.

For the admin server, the following two types of backup operations can be performed.

- Backup after environment creation

For details, refer to "9.2.1 Backing Up All Management Information".

- Periodical Backup and the Backup of Configuration Definition Information

There are backup methods such as periodical backup operations in short intervals (such as backup performed once every hour) and backup performed repeatedly whenever the configuration definition information is updated.

For details, refer to "9.2.2 Backing Up Configuration Definition Information".

Before starting periodical backup, it is necessary to decide the following items:

### Backup Setting Items and What to Decide

- Frequency of Backing Up All Management Information

Decide how often you want to back up all of the management information.



After setting up a system

03:00 A.M. on the 1st day of every month

- Frequency of Periodical Backup

Specify how often you want to back up the configuration definition file.

### Example

Once every hour

- Backup Destination

Decide the disk on which the backup data will be stored.

It is recommended to specify a different disk from the one that Resource Orchestrator is installed on.

For details on the free disk space necessary for backups, refer to the notes in "[9.2.1 Backing Up All Management Information](#)".

## Backup Destination

The backup destination for configuration definition information can be defined beforehand. Define the following:

### Storage Location for the Tuning Parameter File

[Windows Manager]

*Installation\_folder*\SVROR\Manager\etc\customize\_data

[Linux Manager]

/etc/opt/FJSVrcvmr/customize\_data

### Name for the Tuning Parameter File

manager\_backup.rcxprop

### Format of the Tuning Parameter File

Set the following parameter in the tuning parameter file:

```
backup_dir=Backup_destination_folder
```

If this tuning parameter file is omitted, the backup data will be saved in the following folder:

[Windows Manager]

*Installation\_folder*\SVROR\Manager\var\backup

[Linux Manager]

/var/opt/FJSVrcvmr/backup

For details, refer to "[9.2.2 Backing Up Configuration Definition Information](#)".

### Note

- Backup files of the admin server should be stored on external storage media to prevent the backup data from being corrupted due to server failure.
- From the second and successive backups, there are no problems even if backed up folders and configuration definition information from the last time are deleted. Delete earlier backups when disk space constraints make it necessary to do so.
- While the following operations are being performed, do not execute backup:
  - Creation, modification, and deletion of resources
  - Server switchover and failback
  - Backup and restoration of system images
  - Collection and deployment of cloning images

When a periodical backup operation is performed without stopping the manager, if a conflict between the backup operation and the operations mentioned above occurs, the backup operation will be postponed until the operation is completed.

- In a clustered manager configuration, because files are stored on the shared disk, the files and folders to be copied in this procedure are those stored on the shared disk.

For details on the folder names used on the shared disk, refer to "Appendix D Manager Cluster Operation Settings and Deletion" in the "Setup Guide VE".

---

## 9.2.1 Backing Up All Management Information

---

This section explains the backup operation after configuring a system using Resource Orchestrator.

1. Back up certificates, session encryption keys, definition files, and image management information

Execute the `rcxkeydefbackup` command to back up certificates, session keys, definition files, and image management information. For details of the `rcxkeydefbackup` command, refer to "6.2 `rcxkeydefbackup`" in the "Reference Guide (Command) VE".

[Windows Manager]

`Installation_folder\SVROR\Manager\bin\rcxkeydefbackup`

[Linux Manager]

`/opt/FJSVrcvnr/bin/rcxkeydefbackup`

`>rcxkeydefbackup [-dir directory] [[-immediate]][[-timeout value]] <RETURN>`

Backup files are created in the specified folder, using the following format:

Format

[Windows Manager]

`Host_name_keydef_YYYYMMDD_HHMM.jar`

[Linux Manager]

`Host_name_keydef_YYYYMMDD_HHMM.tar.bz2`

Date/Time format

`YYYYMMDD` is the date when certificates, session keys, definition files, and image management information were backed up.

Item	Value
YYYY	Year
MMDD	Month and date
HHMM	Time

### Note

- When this command is executed while Resource Orchestrator is being operated, command execution will be postponed until the operation is complete.
- The file size of backup files varies depending on the number of definition files. The backup file for a configuration storing 100 definition files of 10 KB requires less than 1 MB. Use this size as a guide when you prepare the backup area.

As saved passwords are stored in the home directory of the OS user account for which the password was saved using the `rcxlogin` command, it is also recommended to back up of the contents of the home directory.

2. Back up information related to image files, system images, and cloning images

Execute the `scwbackup` command to back up information related to image files, system images, and cloning images.

For details of the `scwbackup` command, refer to "6.5 `scwbackup`" in the "Reference Guide (Command) VE".

[Windows Manager]

`Installation_folder\SVROR\Manager\bin\scwbackup`

[Linux Manager]  
/opt/FJSVrcvmr/bin/scwbackup

```
>scwbackup [-dir directory] [[-immediate]][[-timeout value]] <RETURN>
```

Information related to image files, system images, and cloning images are stored in the folders with the following formats created in the specified folder.

Format

*Host\_name\_scw\_YYYYMMDD\_HHMM*

Date/Time format

*YYYYMMDD* indicates when the system information was backed up.

Item	Value
YYYY	Year
MMDD	Month and date
HHMM	Time

### Note

- When this command is executed while Resource Orchestrator is being operated, command execution will be postponed until the operation is complete.
- The file size of backup files and directories varies depending on the number of resources in image files information. Prepare the area for backup information referring to "Image File Storage Area" in "2.4.2.7 Dynamic Disk Space" in the "Design Guide VE".

### 3. Back up virtual machines of VM management software

For details on how to perform backup, refer to the manual of the VM management software.

### 4. Back up configuration definition information

Execute the following commands to write configuration definition information. Specify a directory or folder to write the configuration definition information and the version XML to.

Specify the directory or folder using `-dir`. If the specified directory or folder does not exist, an error occurs.

For details of the `rcxbackup` command, refer to "6.1 `rcxbackup`" in the "Reference Guide (Command) VE".

[Windows Manager]  
*Installation\_folder*\SVROR\Manager\bin\rcxbackup

[Linux Manager]  
/opt/FJSVrcvmr/bin/rcxbackup

```
>rcxbackup [-dir directory] [[-immediate]][[-timeout value]] <RETURN>
```

Backup files are created in the specified folder, using the following format:

Format

[Windows Manager]  
*Host\_name\_YYYYMMDD\_HHMM.jar*

[Linux Manager]  
*Host\_name\_YYYYMMDD\_HHMM.tar.bz2*

Date/Time format

*YYYYMMDD* indicates when the configuration definition information was backed up.

Item	Value
YYYY	Year
MMDD	Month and date
HHMM	Time

### Note

- When this command is executed while Resource Orchestrator is being operated, command execution will be postponed until the operation is complete.
- The file size of backup files varies depending on the number of resources defined in the configuration definition information. The backup file for a configuration managing 1,000 VM guests requires less than 2 MB. Use this size as a guide when you prepare the backup area. Although this file is created as a compressed file, a decompressed file is temporarily created during the backup process. Therefore, sufficient free space for the decompressed file (e.g. approximately 150 MB for 1,000 VM guests) is necessary.

#### 5. Back up the directory service

When using a directory service for user management, back up the directory service.

For details on how to perform backup, refer to the manual of the directory service.

## 9.2.2 Backing Up Configuration Definition Information

This section explains backup methods such as periodical backup operations in short intervals (Example: Backup performed every hour) and backup performed repeatedly whenever the configuration definition information is updated.

Execute the following commands to write configuration definition information. Configuration definition information and the version XML are written to that directory or folder in compressed format. Specify the destination folder.

Specify the folder using `-dir`. If the specified folder does not exist, an error occurs.

For details of the `rcxbackup` command, refer to "6.1 `rcxbackup`" in the "Reference Guide (Command) VE".

[Windows Manager]

```
Installation_folder\SVROR\Manager\bin\rcxbackup
```

[Linux Manager]

```
/opt/FJSVrcvnr/bin/rcxbackup
```

```
>rcxbackup [-dir directory] [[-immediate]][[-timeout value]] <RETURN>
```

### Note

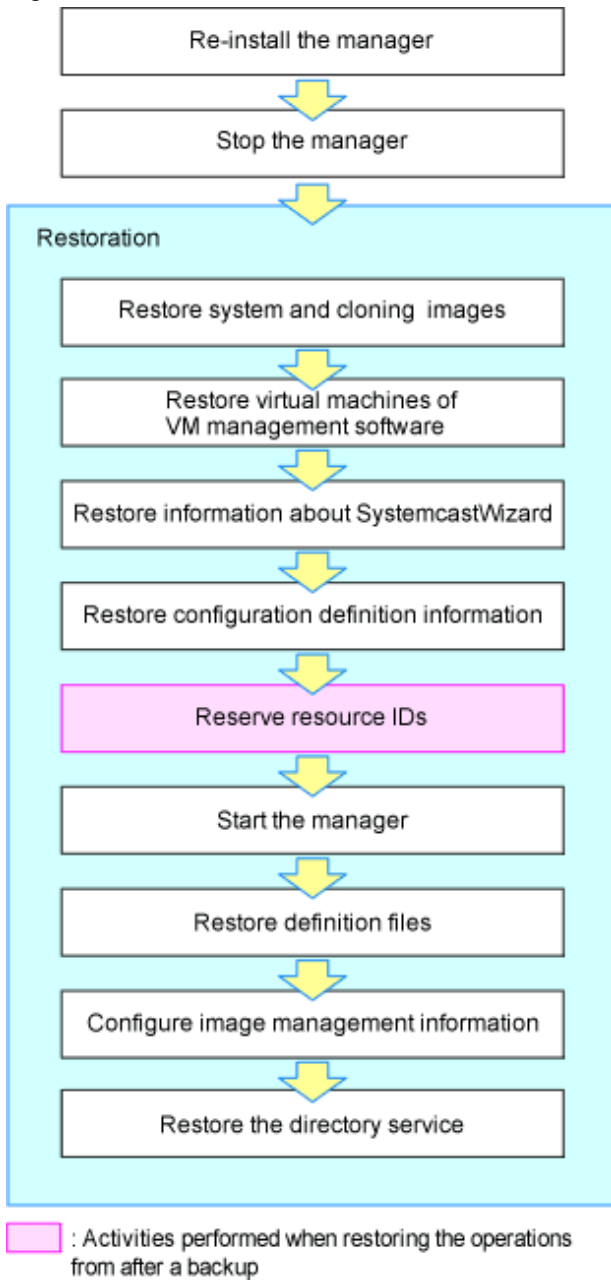
When this command is executed while Resource Orchestrator is being operated, command execution will be postponed until the operation is complete.

## 9.3 Restoration

This section explains how to restore the admin server.

Restore the admin server using the following procedure:

Figure 9.1 Flow of Admin Server Restoration



 **Note**

In a clustered manager configuration, restore backed up contents to the cluster-shared disk. For details on the folder names used on the shared disk, refer to "Appendix D Manager Cluster Operation Settings and Deletion" in the "Setup Guide VE".

Restore the admin server using the following procedure:

1. Reinstall the manager, stop it, restore the certificates, session encryption keys, definition files, and image management information
  - a. When the manager does not operate correctly due to damaged files, uninstall the manager and then reinstall it.

## Note

When using HBA address rename, the procedure for uninstallation during restoration is different. Do not perform the operation described in "1. Delete servers" in "Pre-uninstallation Advisory Notes" of "11.1.1 Preparations" in the "Setup Guide VE".

Stop the manager after re-installation.

For details on how to stop the manager, refer to "2.1 Starting and Stopping Managers".

- b. Execute the rcxkeydefrestore command to restore certificates, session encryption keys, definition files, and image management information.

For details of the rcxkeydefrestore command, refer to "6.3 rcxkeydefrestore" in the "Reference Guide (Command) VE".

[Windows Manager]

```
Installation_folder\SVROR\Manager\bin\rcxkeydefrestore
```

[Linux Manager]

```
/opt/FJSVrcvmr/bin/rcxkeydefrestore
```

```
>rcxkeydefrestore -file filename <RETURN>
```

As saved passwords are stored in the home directory of the OS user account for which the password was saved, authentication may fail if the home directory contents were damaged. In that case, either restore the home directory contents or save the password again using the rcxlogin command.

2. Restore information related to image files, system images and cloning images

Execute the scwrestore command to restore information related to image files, system images, and cloning images.

For details of the scwrestore command, refer to "6.6 scwrestore" in the "Reference Guide (Command) VE".

[Windows Manager]

```
Installation_folder\SVROR\Manager\bin\scwrestore
```

[Linux Manager]

```
/opt/FJSVrcvmr/bin/scwrestore
```

```
>scwrestore -dir directory <RETURN>
```

3. Restore virtual machines of VM management software

For details on restoration, refer to the manual of the VM management software.

4. Restore configuration definition information

Restore the configuration definition information exported by following the instructions given in "9.2.2 Backing Up Configuration Definition Information".

Execute the following command:

For details of the rcxrestore command, refer to "6.4 rcxrestore" in the "Reference Guide (Command) VE".

[Windows Manager]

```
Installation_folder\SVROR\Manager\bin\rcxrestore
```

[Linux Manager]

```
/opt/FJSVrcvmr/bin/rcxrestore
```

```
>rcxrestore -file filename <RETURN>
```

## Note

Specify the command using an absolute path.



## 5. Start the manager

For details on how to start the manager, refer to "2.1 Starting and Stopping Managers".

## 6. Restore a directory service

When using a directory service for user management, restore the directory service.

For details on how to perform restoration, refer to the manual of the directory service.

When operating by the redundant configuration of Active Directory used in the single sign-on function of ServerView Operations Manager, and restoring by reinstalling Resource Orchestrator, do the Active Directory settings for redundancy configurations over again.

For details on the configuration procedure, refer to "Appendix G Migration Procedure when Using Active Directory with a Redundant Configuration" in the "Setup Guide VE".



### Note

- In a clustered manager configuration, restore backed up contents to the cluster-shared disk.  
For details on the folder names used on the shared disk, refer to "Appendix D Manager Cluster Operation Settings and Deletion" in the "Setup Guide VE".
  - If you are setting a VM host as a spare server, leave "operation" as a hyphen ("-") in the "SpareServer" section of the corresponding physical server. After completing restoration, configure the spare server for the target physical server from the ROR console.
  - While the following operations are being performed, do not execute restore:
    - Creation, modification, and deletion of resources
    - Server switchover and failback
    - Backup and restoration of system images
    - During collection and deployment of cloning images
  - When performing restoration of certificates, configuration definition information, and system images and cloning images, restore backups taken at the same point in time.
  - When the following changes are made to the following hardware settings or configuration definition information after backup, restoration is not possible. Ensure backup is performed again.
    - When backing up of all management information is necessary
      - Replacement of a chassis, LAN switch blade, managed server, or power monitoring device
      - Replacement of the NIC of a managed server
      - LAN connections between managed servers and LAN switch blades
    - Collection of snapshots
      - Server switchover or takeover (\*)
    - When backing up of configuration definition information again is necessary
- \* Note: If failback has been performed after server switchover, restore can be performed. During restoration of an admin server, do not perform the following operations:
- Migration of VM guests between VM hosts
  - Registration or release of VM guests on VM management software
- Managed servers using HBA address rename must be restarted after being restored.
  - Maintenance mode settings cannot be recovered after restoration. Set the maintenance mode in accordance with the information recorded at the time of backup.

- When an agent is registered on a managed server and when backup of system images and collection of cloning images is being used, perform either of the following after restoring the admin server.
    - Restart the managed server
    - Restart the services described in "[2.2 Starting and Stopping Agents](#)"
  - Connection information of LAN switches and NetworkViewer cannot be backed up. For details on how to register LAN switches and obtain the network information, refer to "13.2 Preparations" in the "User's Guide VE".
  - VIOM coordination user names and passwords cannot be backed up. Register VIOM coordination before performing restoration. For details on operation methods, refer to "7.1 Registering VIOM Coordination" in the "User's Guide VE".
-

# Chapter 10 Backing Up and Restoring Image Files

This chapter explains how to back up system images and cloning images stored on the admin server to external media and other disks, and how to restore image files backed up on external media or other disks to the admin server.

## 10.1 Configuration of Folders and Files

This section explains the configuration of image file folders on admin servers.

The descriptions in this section are based on Windows.

For Linux, change "Folder" to "Directory", and "\" to "/".

### 1. Folders

Image files are stored in the following folders (hereinafter image file storage folder).

- Default Destination

[Windows Manager]

```
"Installation_folder"\SVROR\ScwPro\depot\Cloneimg
```

[Linux Manager]

```
/var/opt/FJSVscw-deploysv/depot/CLONEIMG
```

- When the image files storage destination is changed after installation, using the rcxadm imagemgr command

[Windows Manager]

```
"Specified_folder"\Cloneimg
```

[Linux Manager]

```
"Specified_folder"/CLONEIMG
```

System images and cloning images are stored in different image file storage folders (hereinafter resource folder).

- System image resource folder

```
"Image_file_storage_folder"\Managed_server_name@0@0@Management_information@Management_information@ Version
```

*Managed\_server\_name* is the "physical\_server\_name" registered on the manager.

*Management\_information* is the fixed information.

*Version* is the version number of the system image of the managed server.

- Cloning image resource folder

```
"Image_file_storage_folder"\Cloning_image_name@ Version
```

*Cloning\_image\_name* is the name specified when collecting cloning images.

*Version* is the version number of cloning images.

### 2. Files

The following two files are stored in each resource folder for system images and cloning images.

- diskimg.fc2
- diskimg.ini

## 10.2 Backing Up Image Files

---

This section explains how to back up image files stored on the admin server.

### 1. Preparations

a. Confirm the following information regarding backup image files in the [Image List] tab on the ROR console.

- For system images  
Server name and version
- For cloning images  
Cloning image name and version

b. Logout from all ROR consoles.

c. For Resource Orchestrator, confirm that no operations are being performed.

### 2. Stop the Manager

For details on how to stop the manager, refer to "[2.1 Starting and Stopping Managers](#)".



Confirm whether both the "Manager Services" and "Related Services" have been stopped.

### 3. Back Up Image Files

Copy the resource folders corresponding to the items confirmed in step 1.

The backup operation can be performed to arbitrary folders or external recordable media other than the image file storage folder, using Explorer (for Windows) or the copy command.



The backup operation of image files should be performed for each resource folder.

Start the Manager

For details on how to start the manager, refer to "[2.1 Starting and Stopping Managers](#)".



Confirm whether both the "Manager Services" and "Related Services" have been started.

### 4. Post Operation Confirmation

a. In the ROR console, select the [Image List] tab.

b. Confirm whether the restored system images and cloning images displayed are the same as the ones displayed during preparation.

## 10.3 Restoring Image Files

---

This section explains the procedure to restore the image files backed up on external media.



- System images of managed servers which have not been registered with the manager should not be restored.

- Do not restore image files of managed servers which do not meet the following hardware conditions:
  - The model, motherboard, and CPU of the managed server are identical.
  - The hardware configuration of each server must be identical, including optional cards, expansion boards, and the slots they are mounted in.
  - Make sure that BIOS settings are properly configured. For details of BIOS settings, refer to "6.2.7 Configuring BIOS Settings of Managed Servers" in the "Design Guide VE".
  - All servers must use the same redundancy configuration (if any) and the same number of redundant paths for LAN and SAN connections. All servers must also be able to access the same network and storage devices.
- The maximum number of versions of image files managed by the manager is three. Do not restore image files of managed servers which exceed the maximum number of versions.

#### 1. Preparations

Confirm the system images and cloning images in the [Image List] tab on the ROR console.

#### 2. Delete Image Files

Delete system images and cloning images as necessary.

Delete any unnecessary system images and cloning images from the ROR console in advance, to avoid exceeding the maximum number of versions that can be retained for each managed server.

#### 3. Stop the Manager

For details on how to stop the manager, refer to "2.1 Starting and Stopping Managers".



#### Note

Confirm whether both the "Manager Services" and "Related Services" have been stopped.

#### 4. Restore Image Files

Copy each backed up resource folder to the image file storage folder.



#### Note

Copy the image files in the image file storage folders using the names of the resource folders when they were backed up.

However, if a resource folder of the same version exists, change the version part of the resource folder to an integer in the range of "1 to the maximum version number plus 1", which does not overlap.

#### 5. Start the Manager

For details on how to start the manager, refer to "2.1 Starting and Stopping Managers".



#### Note

Confirm whether both the "Manager Services" and "Related Services" have been started.

#### 6. Post Operation Confirmation

- a. In the ROR console, select the [Image List] tab.
- b. Confirm whether the restored system images and cloning images are displayed.

# Part 4 Monitoring

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# Chapter 11 Monitoring Resources

This chapter explains how to monitor the configuration and status of managed resources.

## 11.1 Overview

Resource Orchestrator can centrally monitor the configuration and status of servers or other managed resources directly from the ROR console. This enables the identification of resources experiencing problems, which reduces the time spent on system maintenance. Moreover, Resource Orchestrator can easily launch external management software to precisely locate faulty parts within a managed resource.

Monitoring is based on the following three components:

- Resources

The tree displays chassis, servers, LAN switches, physical OSs, VM hosts, VM guests, and power monitoring device relationships and statuses (either PDU or UPS for management software).

When a hardware problem occurs on a server, affected guest operating systems can be easily detected.



Power monitoring devices are not subject to monitoring.

- Events

Resource Orchestrator displays events such as hardware failures, server switchovers triggered by hardware failures, and the results of every performed operation.

- Recent Operations

Resource Orchestrator displays the progress status of the various operations performed on resources.

The following table shows the level of monitoring performed for each resource monitored in Resource Orchestrator.

Table 11.1 Monitoring Level for Each Resource Type

Resource	Status Monitoring	Event Monitoring
Chassis	Yes	Yes
Server	Yes	Yes
Physical OS	Yes	No
VM host	Yes	No
VM guest	Yes	No
VM management software	Yes	No
LAN switch	Yes	Yes
Power monitoring device	No	No

Yes: Supported

No: Not supported

### Regular Update of Resource Data

The Resource Orchestrator manager regularly updates resource data with information gathered from the following resources.

Table 11.2 List of Regularly Updated Resources and Their Related Resources

Resources Subject to Regular Update	Related Resources	Data Source
Chassis	Chassis	Server management unit

Resources Subject to Regular Update	Related Resources	Data Source
Server	Server Physical OS VM host (*1) VM guest (*1)	ServerView Agents (*2) Server management unit Server virtualization software
LAN switch	LAN switch	LAN switch Server management unit (*3)
VM management software	VM management software VM host (*1) VM guest (*1)	VM management software

\*1: When no VM management software is registered, the status of VM hosts and VM guests is updated during a regular update of their physical server. When VM management software is registered, their status is updated during the regular update of the VM management software.

\*2: Only for PRIMERGY servers and PRIMEQUEST.

\*3: Only for LAN switch blades mounted in a PRIMERGY BX chassis.

The time required to update all resources depends on the number of registered resources. For 1 chassis that contains 10 servers and 4 LAN switches, the update takes about 2 minutes. For 5 chassis that have identical configurations, the update should take about 10 minutes.

VM management software updates are independent from other resource updates, and takes approximately 3 minutes.

In the following cases, resource data is refreshed without waiting for the regular update.

- When a resource's state is changed as the result of an operation performed by Resource Orchestrator
- When a failure-triggered SNMP Trap is received from a resource

If a resource was operated externally to Resource Orchestrator, there may be a slight delay before its state is updated in the ROR console. To force an update of a resource's data, right-click the resource and select [Update] from the displayed menu. The time required to update resource data depends on the device. Generally, update should take no more than 40 seconds.

In order to restrain device and network load, resource data is not refreshed for 7 seconds following the last update time. However, when a failure-triggered SNMP Trap is received, resource data is refreshed unconditionally. When manually updating a resource from the menu right after performing an operation on that resource, if its data is not refreshed within 40 seconds, try updating it from the menu again.

## 11.2 Resource Status

Resources are monitored in the [Status] tab of the ROR console.

The [Status] tab shows the number of servers listed under the statuses "warning", "unknown", "error", or "fatal".

Servers whose status is "warning" or "unknown" are counted under "Warning", and servers whose status is "fatal" or "error" are counted under "Error".

Clicking on "Error" or "Warning", displays the resources under the corresponding status in the [Resource List] tab.



The status of resources can also be monitored from both the resource tree and the [Resource List] tab. When an error occurs, a status icon is added to the icon of the resource concerned.

Double-clicking on a resource icon displays the [Resource Details] tab, which provides detailed information about the corresponding resource.











### Icons Displayed in the ROR Console

The following table shows the resource icons used in BladeViewer and their associated meanings.

Table 11.3 Resource Icons

Icon	Meaning
	Server resource
	Chassis






Icon	Meaning
	Server
	Physical OS
	VM host
	Guest domain of OVM for SPARC registered as a VM host
	VM guest
	LAN switch
	Power monitoring device (*)
	PDU (*)
	UPS (*)
	Management software

\* Note: Power monitoring devices (PDU or UPS) are not subject to monitoring.

The following table shows the status icons used in Resource Orchestrator and their associated meanings. It also shows which status icons require corrective actions.

Table 11.4 Status Icons

Icon	Status	Meaning	Corrective Action
	normal	Normal	No action is necessary
	warning	Warning An error has occurred but the resource can still be used. (*1)	Action must be taken
	unknown	Unknown The status of the resource cannot be obtained. (*2, *3)	Action must be taken
	stop	Stop The resource has stopped and cannot be used.	No action is necessary
	error	Error An error whose cause is unknown has occurred and the resource cannot be used.	Action must be taken
	fatal	Fault A fault has occurred in the resource and the resource cannot be used.	Action must be taken

\*1: When a LAN switch is in "warning" status, it may mean that the LAN switch has been replaced with another model.

To use the LAN switch as it is, first delete the registered LAN switch, and then register it again.

\*2: When a VM guest is in "unknown" status, check the operation status of the VM host on which the VM guest is running.

\*3: When a LAN switch is in "unknown" status, check the physical connection between the LAN switch and admin LAN as well as whether or not the LAN switch is responding to commands.

### Note

- On the SPARC Enterprise T series, as statuses cannot be obtained from ILOM using SNMP, only "normal", "stop" or "unknown" statuses are shown, while "warning", "error", and "fatal" statuses cannot be detected. If an SNMP Trap indicating an error is displayed, check the status of the server on ILOM.

- For other servers, hardware statuses cannot be obtained from server management software (ServerView). Therefore, only "normal", "stop" or "unknown" statuses are shown, while "warning", "error", and "fatal" statuses cannot be detected.
- For PRIMEQUEST, all partitions within the same chassis may temporarily become "unknown" depending on the timing of change in power control status of the partition.
- For LAN switch blades operating in Converged Fabric mode, or LAN switch blade PY CB 10Gb FEX Nexus B22, statuses are not be obtained from LAN switch blades using SNMP. Therefore, "unknown" status is not detected.

Table 11.5 Physical Server Icons





















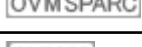



Icon	Meaning
	Spare server
	Server in maintenance mode

Table 11.6 OS Icons

Icon (Tree)	Icon (List)	Meaning
		Windows OS
		Linux OS
		Solaris OS
		VMware host OS
		Hyper-V host OS
		Citrix XenServer host OS
		Linux Xen host OS
		KVM host OS
		Solaris Zone host OS
		OVM for SPARC host OS
		Host OS of OVM for x86

## Information

- For server virtualization software, the following information is also displayed.
  - VM management software
 

VM management software statuses can be one of the following: "normal" or "unknown".  
If "unknown" is shown, check whether the VM management software is operating properly.
  - VM host
 

The status of a VM host is displayed in the same way as for a physical OS.
  - VM guest
 

Errors detected from server virtualization software are reflected in VM guest statuses.  
VM guest statuses can be one of the following: "normal", "warning", "error", "unknown", or "stop".  
For details, refer to "D.3 Functional Differences between Products" in the "Design Guide VE".
- For LAN switches, "error" and "fatal" are not displayed.  
Only "warning", "normal", or "unknown" are displayed.

## 11.3 Addressing Resource Failures

---

This section explains how to address problems like hardware failures that occur in a system.

### Basic Procedure

The following procedure is used to confirm and resolve problems using the ROR console:

1. Confirm the Existence of a Problem

For the confirmation method, refer to "[11.2 Resource Status](#)" and "A.3 Status Panel" in the "User's Guide VE".

2. Check the Event Log

Use the event log to check the device where the error occurred and the content of the event.

In some cases, a single problem can cause a series of events, so search back through past events to find events with dates that are close together.

3. Check the Status of Resources

From the resource tree, open the resource where the problem occurred and look for any affected chassis, physical servers, LAN switches, physical OSs, VM hosts, or VM guests.

If Auto-Recovery has been enabled for a physical OS or VM host, it will be automatically switched over with a spare server. If Auto-Recovery has not been enabled, server switchover can still be performed manually as long as a spare server has been designated.

For more information regarding server switchover, refer to "[4.2 Switchover](#)".

4. Perform Detailed Investigation and Recovery

From the [Resource Details] tab of the failed resource, launch the external management software to investigate the precise cause of the problem.

When no management software is available, confirm with the maintenance staff of the failed resource to investigate the problem.

Once this is done, perform the necessary maintenance work on any faulty hardware identified.

If a server hardware failure requires replacing a managed server, carry out the replacement operation as described in "[6.3.2 Replacing Servers](#)".

5. Perform Post-recovery Verification

Following recovery, confirm that there are no more icons indicating problems on the ROR console.

# Chapter 12 Collecting Power Consumption Data and Displaying Graphs

This chapter explains how to export the power consumption data collected from registered power monitoring targets and how to display it as graphs, and also describes the exported data's format.

## 12.1 Overview

This section details the power consumption data that is collected from registered power monitoring targets.

Resource Orchestrator calculates the power (in Watts) and energy (Watt-hours) consumed by a power monitoring target by multiplying its collected electrical current (Amperes) by its registered voltage value (Volts).

This data can then be exported to a file in CSV format or as a graph.

The data can then be summarized or visualized as a graph, using an external tool such as Excel, to obtain a graphical representation of the power consumed by each power monitoring target.

### Information

In Resource Orchestrator, power consumption is calculated as the product of electrical current (A) multiplied by voltage (V). Normally, power consumption is the product of an electrical current multiplied by a voltage and an additional phase factor (if the phase difference between the current and voltage is defined as " $\theta$ ", this factor is expressed as " $\cos \theta$ ").

### Note

This data should only be used as a reference to evaluate the power consumption status. It should not be used as an exact power consumption measurement for billing purposes.

## 12.2 Exporting Power Consumption Data

For details of how to export power consumption data, refer to "19.1 Exporting Power Consumption Data" in the "User's Guide VE".

## 12.3 Power Consumption Data File (CSV Format)

This section explains the power consumption data file format (CSV format).

Each defined item of the exported power consumption data is separated by a comma (",").

Each line is exported in the following format.

- Data format

Data is exported using the following format:

```
Time,power_monitoring_target_name(data_type)[,power_monitoring_target_name(data_type)]...  
time1,data1[,data1]...  
time2,data2[,data2]...
```

- Header line

The header line contains column titles identifying the data (from line 2 and later) that is displayed under each column. Each column title is set according to the data types that have been selected in the [Export Environmental Data (*power\_monitoring\_target\_type*)] dialog.

- Time

This column displays the date and time at which each data sample was collected.

Within data lines, the entry corresponding to this column is displayed in the following format: "*YYYY-MM-DD hh:mm:ss*"

("YYYY": Year, "MM": Month, "DD": Date, "hh:mm:ss": Hours:Minutes:Seconds). The time is displayed according to the time zone set in the admin server operating system.

- *power\_monitoring\_target\_name(data\_type)*

The *power\_monitoring\_target\_name* part displays the name of the selected target.

The *data\_type* part displays the following data types:

- Power (W) is shown as "power"
- Average Power (W) as "power-average"
- Energy (Wh) as "energy"

- Data lines

Each data line contains data values corresponding to each of the column titles shown in the header line.

A hyphen ("-") is displayed for any data that could not be collected.



## Note

- Regardless of the specified power monitoring target, the data held within Resource Orchestrator that fits the conditions given for the selected time span and rate will be exported.
- Depending on the statuses of specified power monitoring targets, the data corresponding to the specified time span and rate may not have been collected.  
In this case, a hyphen ("-") will be displayed for any data that could not be collected.  
Hyphens can be displayed when data was collected from another power monitoring target (including a deleted one) at the same collection time, and data was not collected from the specified power monitoring target.  
No data is collected from servers on which ServerView Agents is not running. In this case, missing data is shown using hyphens ("-").
- When power consumption data is exported, if the latest data is being collected at that point, some data may be shown using hyphens ("-").
- If the "Finest sampling" "rate" is selected in the [Export Environmental Data (*power\_monitoring\_target*)] dialog, the power and average power values will be equal for each data sample.
- If a "rate" other than "Finest sampling" has been selected in the [Export Environmental Data (*power\_monitoring\_target*)] dialog, values for each sample are displayed as follows. If data was collected at the displayed sample time, that value is displayed. If no data was collected at the displayed sample time, the last data collected in the time interval between that sample and the previous sample will be displayed.
- The energy (Wh) value of a finest sample is calculated under the assumption that the power value (W) collected for the sample stayed at the same value until the next sampling (in other words it is assumed that power values (W) do not vary during the duration of the polling interval).
- Only daily average data can be collected from blade chassis.
- Data collected from servers does not include power consumed by storage blades.
- For rates other than "Finest sampling", the energy value is calculated as the sum of energy samples. In such cases, the energy value of samples for which no data could be collected will be deemed to be 0.
- The average power (W) of each sample is calculated from the energy value (Wh) of that sample and its corresponding time interval.

## 12.4 Displaying Power Consumption Data Graphs

For details of how to display graphs of power consumption data, refer to "19.2 Displaying Power Consumption Data Graphs" in the "User's Guide VE".

# Part 5 Modifying

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# Chapter 13 Modifying Settings

This chapter explains configuration modification.

## 13.1 When Configuring Single Sign-On

This section explains how to reconfigure Single Sign-On.

### 13.1.1 Reconfiguration Procedure

If you cannot log in to the ROR console after installation, the environment setup may have failed. Stop the manager and then reconfigure the environment.

#### 13.1.1.1 Confirming Certificates

Check the CA Certificate registered with Resource Orchestrator using the following procedure.

1. Execute the following command:

```
rcxadm authctl diffcert<RETURN>
```

The difference of the CA certificate (keystore) of ServerView Operations Manager and the registered CA certificate (keystore) of Resource Orchestrator is displayed.

2. Check the displayed difference information.

The information is displayed as follows:

```
svs_cms  
ldaphost.fujitsu.com
```

When difference is displayed, registration of a CA certificate (keystore) may have failed. In this case, register the CA certificate referring to "[13.1.1.2 Registering Certificates](#)".

#### 13.1.1.2 Registering Certificates

Use the following procedure to register CA certificates to Resource Orchestrator.

1. Check the content of the CA certificate for updating.

Refer to "[13.1.1.1 Confirming Certificates](#)", and check the content of the CA certificate to update.

2. Update the CA certificate.

Execute the following command:

```
rcxadm authctl refreshcert -alias alias<RETURN>
```

Specify the alias of the certificate displayed by executing "Confirming Certificates" as *alias*.

When importing two or more certificates to Resource Orchestrator, repeat this procedure for each certificate.



.....  
If the root certificate has been registered in the CA certificate (keystore) of ServerView Operations Manager, import a root certificate to Resource Orchestrator.  
.....

3. Check the difference of the CA certificate.

Perform step 1 again, and check that the updated certificate is not displayed.

### 13.1.1.3 Checking Directory Service Connection Information

Check if the connection information of the directory service to be used has been correctly registered in Resource Orchestrator.

1. Execute the following Resource Orchestrator command.

```
rcxadm authctl show <RETURN>
```

The connection information registered in Resource Orchestrator is displayed.

2. Check the displayed connection information.

The information is displayed as follows:

```
host: hostx.fujitsu.com
port: 1474
base: dc=fujitsu,dc=com
bind: cn=Directory Manager
method: SSL
```

Check if the directory service settings and the displayed connection information are the same. In particular, note the following information:

- If port is the port for SSL communications
- If bind is the directory service administrator

(Check if the administrator is a directory service administrator, not a privileged user of Resource Orchestrator)

For details on how to check the connection settings of the OpenDS provided with ServerView Operations Manager, refer to the following manuals.

- "Configuring directory service access" and "ServerView user management with OpenDS" in "ServerView Suite User Management in ServerView"

3. When there is an error in the connection information, use the following procedure to register the correct information:
  - a. Stop the manager.
  - b. Execute the `rcxadm authctl sync` command and configure the correct connection information.
  - c. Start the manager.

For details on the `rcxadm authctl` command, refer to "5.3 `rcxadm authctl`" in the "Reference Guide (Command) VE".

## 13.1.2 Modifying Directory Service Connection Information

---

When a directory server's coordinator name (connected user name), a password, etc. have been changed, use the following procedure to reconfigure Single Sign-On.

1. Change the settings for the directory service of ServerView Operations Manager.

For details on how to change the directory service settings of ServerView Operations Manager, refer to the manuals of ServerView Operations Manager.

- "Configuring directory service access" in "ServerView Suite User Management in ServerView"

2. Refer to "[13.1.1.1 Confirming Certificates](#)" and check whether the CA certificate of ServerView Operations Manager has been imported correctly to the Resource Orchestrator keystore.
3. When the certificate has not been imported to the keystore, refer to "[13.1.1.2 Registering Certificates](#)" and register a certificate.



4. Execute the `rcxadm authctl sync` command and change the directory service connection information. For details on the `rcxadm authctl sync` command, refer to "5.3 `rcxadm authctl`" in the "Reference Guide (Command) VE".

### **13.1.3 When Certificates Have Expired**

---

When the CA certificate of ServerView Operations Manager or the directory server has expired, re-register the CA certificates after obtaining new certificates. For details on how to register the CA certificates, refer to "[13.1.1.2 Registering Certificates](#)".

# Appendix A Notes on Operating ServerView Resource Orchestrator

This appendix provides important reminders for the operation of Resource Orchestrator.

## Server Switchover

- In configurations where a server OS is operating on a spare server, if the boot methods of primary servers and spare servers are different, server switchover may fail and damage the primary server OS. Ensure that the boot methods are the same.  
It is recommended that system images of primary servers are regularly backed up in order to prepare for unexpected situations.
- Servers can be set as spare servers even if it may not be possible to switch over with them.  
Ensure that server switchover is possible after setting up spare servers.  
For details on server switchover conditions, refer to "9.3 Server Switchover Conditions" in the "Setup Guide VE".
- Auto-Recovery cannot be performed if maintenance mode has not been released.  
Ensure maintenance mode is released once maintenance operations are complete.
- When performing server switchover using the VIOM server profile exchange method, it is necessary to virtualize the MAC address by VIOM for the NIC used for admin LAN of the managed server.
- Note the following points regarding the occurrence of a fault in the switchover destination spare server during server switchover.
  - The server switchover state returns to pre-switchover state. Additionally, maintenance mode is set for the switchover source server, and server switchover processing ends. If the switchover source server has been stopped, the switchover source server does not start.
  - Even when more than one spare server is set for the primary server, there is no automatic switch to another spare server. Specify another spare server, then perform server switchover manually.
  - To perform operations on the switchover source server, start the server and then release maintenance mode. However, when Auto-Recovery is enabled and the switchover source server is faulty, Auto-Recovery occurs when maintenance mode is released. Restore the switchover source server to its pre-fault status and then release maintenance mode.
- The status of OVM for SPARC environment after server switching over is as follows.
  - The server switchover of OVM for SPARC will make all domains' power ON after server switching over.
  - When guest domain is used as Solaris zone, the power source startup status of non-global zone will become the status corresponding non-global zone's auto-boot? setting.
  - While switchover process, run service processor(XSCF)'s poweroff command to cut the power of primary server. While building IO domain, please think about the stop order to set shutdown group of each domain.
  - When the guest domain number in OVM for SPARC has increased, power operation time of SPARC M10-4S will increase. Please carry on power operation on real machine, and estimate timeout value based on actual measured value. For the changing method of timeout value, refer to "6.1.5 Setting Values for SPARC Enterprise M4000/M5000/M8000/M9000 and FUJITSU M10-4S" in the "Design Guide VE".
  - while server switchover of OVM for SPARC, only boot-device OBP setting will succeed to switchover target SPARC M10-4S. The other OBP setting will return to default value.
  - While server switchover of OVM for SPARC, Autoboot(Guest Domain) of physics partition operation mode will be set off on spare server's XSCF.
  - Make spare server's domain configuration at the status of factory-default while server switchover. When it comes to build spare server on OVM for SPARC configuration, please carry the follows out before switchover.
    - Save spare server's configuration information into XML file
    - OBP setting record of control domain, IO domain

For save/recovery of domain configuration, refer to "Oracle VM Server for SPARC Administration Guide" of Oracle Company.

## Redundancy Configurations for the Admin LAN

If communication issues occur on the admin LAN, or one of the network interfaces used by a managed server on the admin LAN fails, the following operations may result in errors. In such cases, restore the admin LAN network as quickly as possible.

- Backup and restore operations
- Collection and deployment of cloning images
- Server switchover and failback

## HBA address rename

- With Resource Orchestrator, the factory-set WWN of a managed server's HBA is overridden when the HBA address rename function is used. The WWN is reset to its factory-set value when the server is deleted from Resource Orchestrator. Before using HBAs in an environment that is not managed by Resource Orchestrator, first delete the server in which it is mounted using the ROR console. For information on deleting servers, refer to "11.2 Deleting Managed Servers" in the "User's Guide VE".
- The WWN of a managed server is set during startup, using a network boot session to connect to the admin server. Once set up with a proper WWN, the managed server reboots into its own Operating System. Therefore, a managed server may reboot during its startup.
- Do not move HBAs whose HBA address rename settings have been set up to different managed servers. If operating HBAs without resetting their WWNs, when the same WWN is configured on multiple servers data may be damaged by same volume access.

## ETERNUS SF Storage Cruiser Coordination

- When using ETERNUS SF Storage Cruiser integration for Resource Orchestrator, zoning of Fibre Channel switches connecting to the HBAs of managed servers, and host affinity configurations for storage units will be changed by the WWN information settings. When deleting a server, the relevant zoning and host affinity settings are also deleted. For information on deleting servers, refer to "11.2 Deleting Managed Servers" in the "User's Guide VE".
- When configuring WWN information during OS operation, do not delete existing configurations. If a server is deleted accidentally, users may be unable to access the disk, the OS may hang, or the contained data may be damaged.

## Changing the Manager's System Time

- When the admin server's system time is reset to a time in the past, the resource monitoring by the manager stops for this period. To reset the system time to more than just a few minutes in the past, return the time and then restart the manager. For details on how to restart the manager, refer to "2.1 Starting and Stopping Managers".

## Restarting Managers

By default, the manager services restart at 3:45 am every day for stable system operation.

The settings for restarting can be changed depending on the authority level. To change the configuration, perform the following:

- Configuration File
  - [Windows Manager]  
*Installation\_folde*\SVROR\Manager\rails\config\rcx\rcx\_manager\_params.rb
  - [Linux Manager]  
/opt/FJSVrcvmr/rails/config/rcx/rcx\_manager\_params.rb
- Configuration Parameters

Table A.1 Configuration Parameters

Parameter	Meaning	Initial Value
RESTART_ENABLE	Select the restart operation status. Specify one of the following: - When restarting the manager services Specify "true". - When not restarting Specify "false".	true
RESTART_HOUR	Specify the restart time (hour) from 0 to 23.	3
RESTART_MIN	Specify the restart time (minutes) from 0 to 59.	45
RESTART_CYCLE	Specify the restart interval (days) from 1 to 5.	1

- Parameter Change Procedure

1. Stop the manager.
2. Use an editor and change the parameters of the rcx\_manager\_params.rb file.
3. Start the manager.

For details on how to start and stop the manager, refer to "2.1 Starting and Stopping Managers".



**Note**

The conditions for restarting are, that more than RESTART\_CYCLE \* 24 hours have passed since manager was started and it is the time specified for RESTART\_HOUR and RESTART\_MIN.

For the stable operation of systems, configure the restarting of managers to occur on a daily basis.

## Changing Multiple Operations of Managers

For the manager, the number of processes executed at the same time is limited to optimize the memory usage.

Depending on the environment for use, the upper limit can be modified. To modify the configuration, edit the following definition file.

When there is no definition file, create one.

### Placeholder for the Definition File

[Linux Manager]

/etc/opt/FJSVrcvnr/customize\_data

[Windows Manager]

Installation\_folder\SVROR\Manager\etc\customize\_data

### Definition File Name

rcx\_base.rcxprop

### Format of the Definition File

Describe the definition file in individual lines as below:

<i>Key = Value</i>
--------------------

### Items in the Definition File

Specify the following items.

Table A.2 Items in the Definition File

Item	Key	Value	Remarks
Multiplicity	TASK_WORKER_COUNT	Specify the multiplicity from 5 - 30.	The initial value is "5". If there is no definition file, the default value is used.

Example of the Definition File

The following is an example of the definition file. In this example, the multiplicity is set to "10".

```
TASK_WORKER_COUNT=10
```

Changing Procedures of Definition Files

- When the manager is operating in a normal environment

1. Stop the manager.
2. Use an editor and change the value of TASK\_WORKER\_COUNT in the rcx\_base.rcxprop file.  
If there is no rcx\_base.rcxprop file, create one.
3. Start the manager.

- When the manager is operating in a cluster environment

[Windows Manager]

1. Stop the manager.
2. Place the shared disk of the manager online. Place other cluster resources offline.
3. Use an editor and change the value of "TASK\_WORKER\_COUNT" in the rcx\_base.rcxprop file on the shared disk.  
If there is no rcx\_base.rcxprop file, create one.

Placeholder for the Definition File

```
Drive_name\Fujitsu\ROR\SVROR\customize_data\rcx_base.rcxprop
```

4. Start the manager.

[Linux Manager]

1. Stop the manager.
2. Mount the shared disk for the admin server on the primary or secondary node.
3. Use an editor and change the value of TASK\_WORKER\_COUNT in the rcx\_base.rcxprop file on the shared disk.  
If there is no rcx\_base.rcxprop file, create one.

Placeholder for the Definition File

```
Mount_destination_of_shared_disk/Fujitsu/ROR/SVROR/etc/opt/FJSVrcvmr/customize_data/rcx_base.rcxprop
```

4. Unmount the shared disk for the admin server from the node mounted in step 2.
5. Restart the manager.

For details on how to start and stop the manager, refer to "2.1 Starting and Stopping Managers".



Memory usage will increase according to the multiplicity.

For details on the memory usage to increase, refer to "Table A.3 Increased Memory Use with Multiple Operations".

Calculate the memory used from a value in the table and the memory size required for the manager operations described in "2.4.2.8 Memory Size" in the "Design Guide VE", and then add memory if necessary.

Table A.3 Increased Memory Use with Multiple Operations

Multiplicity	Increase in Memory Use (Unit: MB)
5	-
6 - 14	$1080 + (Multiplicity * 40)$
15 - 30	$2104 + (Multiplicity * 40)$

## Changing Extended Partitioning Mode when Using the PRIMEQUEST 2000 Series

When using PRIMEQUEST 2000 series, if changing Extended Partitioning Mode of the partition to operate servers and hosts, use the following procedure to delete the currently using partition from Resource Orchestrator.

- When the currently used partition is a PPAR partition, and when using Extended Partition with "Enable" configured for PPAR [Extended Partitioning Mode]
  1. Delete the relevant managed server in the server tree.  
For information on deleting managed servers, refer to "11.2 Deleting Managed Servers" in the "User's Guide VE".
  2. Modify the settings of [Extended Partitioning Mode] from the management console of the PRIMEQUEST MMB.  
For details on how to modify Extended Partitioning Mode, refer to the operation management manuals for the PRIMEQUEST 2000 series.
  3. Register the relevant Extended Partition in the server tree.  
For details on how to register managed servers, refer to "7.5.2 Registering PRIMEQUEST Servers" in the "User's Guide VE".
- When the currently used partition is an Extended Partition, and when using a PPAR partition with "Disable" configured for PPAR [Extended Partitioning Mode]
  1. Delete the relevant managed server in the server tree.  
For information on deleting managed servers, refer to "11.2 Deleting Managed Servers" in the "User's Guide VE".
  2. Modify the settings of [Extended Partitioning Mode] from the management console of the PRIMEQUEST MMB.  
For details on how to modify Extended Partitioning Mode, refer to the operation management manuals for the PRIMEQUEST 2000 series.
  3. Register the relevant PPAR partition in the server tree.  
For details on how to register managed servers, refer to "7.5.2 Registering PRIMEQUEST Servers" in the "User's Guide VE".