ServerView

FUJITSU

ServerView Resource Orchestrator Cloud Edition V3.1.1

Operation Guide

Windows/Linux

Preface

Purpose of This Document

This manual explains how to operate ServerView Resource Orchestrator Cloud Edition (hereinafter Resource Orchestrator).

Intended Readers

This manual is written for system administrators who will use Resource Orchestrator to operate the infrastructure in private cloud or data center environments.
When setting up systems, it is assumed that readers have the basic knowledge required to configure the servers, storage, network devices, and server virtualization software to be installed. Additionally, a basic understanding of directory services such as Active Directory and LDAP is necessary.

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 Managing Tenants

Explains the management of tenants.

Chapter 5 Managing Templates

Explains the management of templates.

Chapter 6 Managing Resources and Resource Pools

Explains the management of resources and resource pools.

Chapter 7 Management of L-Platform

Explains the management of L-Platforms.

Chapter 8 Changing Settings

Explains how to modify various setting information.

Section 3 Maintenance

Chapter 9 Hardware Maintenance

Explains the maintenance of hardware.

Chapter 10 Backup and Restoration

Explains how to use the backup and restore provided by Resource Orchestrator.

Section 4 Monitoring

Section 5 High Availability and Disaster Recovery

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
[Solaris]	Sections related to Solaris

[VMware]	Sections related to VMware
[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 2.2]	Sections related to Oracle VM Server for x86 2.2
[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
[Citrix Xen]	Sections related to Citrix XenServer
[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 Fujitsu M10.

    - FUJITSU M10-1/M10-4/M10-4S

- Fujitsu M10 is sold as SPARC M10 by fujitsu in Japan. Fujitsu M10 and SPARC M10 are identical products.

- 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].

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 are abbreviated. When executing commands, do so using the path given in "Name".

Web Site URLs

URLs provided as reference sources within the main text are correct as of August 2013.

Please understand that they are subject to change without notice.

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(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 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

Abbreviation	Products
	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)
Windows Server 2012	Microsoft(R) Windows Server(R) 2012 Standard Microsoft(R) Windows Server(R) 2012 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
Linux	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) 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) SUSE(R) Linux Enterprise Server 11 for x86 SUSE(R) Linux Enterprise Server 11 for EM64T
Red Hat Enterprise Linux	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)

Abbreviation	Products
	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) 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 Enterprise Linux 5	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)
Red Hat Enterprise Linux 6	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)
RHEL5-Xen	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
RHEL-KVM	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
DOS	Microsoft(R) MS-DOS(R) operating system, DR DOS(R)
SUSE Linux Enterprise Server	SUSE(R) Linux Enterprise Server 11 for x86 SUSE(R) Linux Enterprise Server 11 for EM64T
OVM for x86 2.2	Oracle(R) VM Server for x86 2.2
OVM for x86 3.2	Oracle(R) VM Server for x86 3.2

Abbreviation	Products
OVM for SPARC	Oracle(R) VM Server for SPARC
Oracle VM Manager	Oracle(R) VM Manager
Citrix XenServer	Citrix XenServer(R) 6.0 Citrix XenServer(R) 6.0.2 Citrix XenServer(R) 6.1.0
ESC	ETERNUS SF Storage Cruiser
GLS	PRIMECLUSTER GLS
Navisphere	EMC Navisphere Manager
Solutions Enabler	EMC Solutions Enabler
MSFC	Microsoft Failover Cluster
Solaris	Oracle Solaris10 05/09 (Update7) Media Pack Oracle Solaris11 11/11 Media Pack Oracle Solaris11.1 Media Pack
SCVMM	System Center Virtual Machine Manager 2008 R2 System Center 2012 Virtual Machine Manager
VMware	VMware vSphere(R) 4 VMware vSphere(R) 4.1 VMware vSphere(R) 5 VMware vSphere(R) 5.1
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 Tools	VMware(R) Tools
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 Client	VMware vSphere(R) Client
VMware vCenter Server	VMware(R) vCenter(TM) Server
VMware vClient	VMware(R) vClient(TM)
VMware FT	VMware(R) Fault Tolerance
VMware DRS	VMware(R) Distributed Resource Scheduler
VMware DPM	VMware(R) Distributed Power Management
VMware vDS	VMware(R) vNetwork Distributed Switch
VMware Storage VMotion	VMware(R) Storage VMotion
VIOM	ServerView Virtual-IO Manager
BladeLogic	BMC BladeLogic Server Automation
Internet Explorer	Windows(R) Internet Explorer(R) 8 Windows(R) Internet Explorer(R) 9 Windows(R) Internet Explorer(R) 10

Abbreviation	Products
ServerView Agent	ServerView SNMP Agents for MS Windows (32bit-64bit) ServerView Agents Linux ServerView Agents VMware for VMware ESX Server
RCVE	ServerView Resource Coordinator VE
ROR	ServerView Resource Orchestrator
ROR VE	ServerView Resource Orchestrator Virtual Edition
ROR CE	ServerView Resource Orchestrator Cloud Edition
Resource Coordinator	Systemwalker Resource Coordinator Systemwalker Resource Coordinator Virtual server Edition

Export Administration Regulation Declaration

Documents produced by FUJITSU may contain technology controlled under the Foreign Exchange and Foreign Trade Control Law of Japan. Documents which contain such technology should not be exported from Japan or transferred to non-residents of Japan without first obtaining authorization from the Ministry of Economy, Trade and Industry of Japan in accordance with the above law.

Trademark Information

- BMC, BMC Software, and the BMC Software logo are the exclusive properties of BMC Software, Inc., are registered with the U.S. Patent and Trademark Office, and may be registered or pending registration in other countries.

- Citrix(R), Citrix XenServer(R), Citrix Essentials(TM), and Citrix StorageLink(TM) are trademarks of Citrix Systems, Inc. and/or one of its subsidiaries, and may be registered in the United States Patent and Trademark Office and in other countries.

- EMC, EMC2, CLARiiON, Symmetrix, and Navisphere are trademarks or registered trademarks of EMC Corporation.

- HP is a registered trademark of Hewlett-Packard Company.

- Linux is a trademark or registered trademark of Linus Torvalds in the United States and other countries.

- Microsoft, Windows, MS-DOS, Windows Server, Windows Vista, Excel, Active Directory, and Internet Explorer are either registered trademarks or trademarks of Microsoft Corporation in the United States and other countries.

- NetApp is a registered trademark of Network Appliance, Inc. in the US and other countries. Data ONTAP, Network Appliance, and Snapshot are trademarks of Network Appliance, Inc. in the US and other countries.

- Oracle and Java are registered trademarks of Oracle and/or its affiliates in the United States and other countries.

- Oracle is a registered trademark of Oracle Corporation and/or its affiliates.

- Red Hat, RPM and all Red Hat-based trademarks and logos are trademarks or registered trademarks of Red Hat, Inc. in the United States and other countries.

- SUSE is a registered trademark of SUSE LINUX AG, a Novell business.

- VMware, the VMware "boxes" logo and design, Virtual SMP, and VMotion are registered trademarks or trademarks of VMware, Inc. in the United States and/or other jurisdictions.

- ServerView and Systemwalker are registered trademarks of FUJITSU LIMITED.

- All other brand and product names are trademarks or registered trademarks of their respective owners.

Notices

- The contents of this manual shall not be reproduced without express written permission from FUJITSU LIMITED.

- The contents of this manual are subject to change without notice.

Issue Date and Version

Month/Year Issued, Edition	Manual Code
November 2011, First Edition	J2X1-7611-01ENZ0(00)
December 2011, Edition 1.1	J2X1-7611-01ENZ0(01)
January 2012, Edition 1.2	J2X1-7611-01ENZ0(02)
February 2012, Edition 1.3	J2X1-7611-01ENZ0(03)
March 2012, Edition 1.4	J2X1-7611-01ENZ0(04)
April 2012, Edition 1.5	J2X1-7611-01ENZ0(05)
July 2012, Second Edition	J2X1-7611-02ENZ0(00)
October 2012, Third Edition	J2X1-7611-03ENZ0(00)
December 2012, Fourth Edition	J2X1-7611-04ENZ0(00)
January 2013, Fifth Edition	J2X1-7611-05ENZ0(00)
January 2013, Edition 5.1	J2X1-7611-05ENZ0(01)
January 2013, Edition 5.2	J2X1-7611-05ENZ0(02)
March 2013, Edition 5.3	J2X1-7611-05ENZ0(03)
June 2013, Edition 5.4	J2X1-7611-05ENZ0(04)
August 2013, Edition 5.5	J2X1-7611-05ENZ0(05)

Copyright

Contents

Part 1   Overview

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 CE".

Flow of Service Provision Using Applications

The flow of service provision using applications in an environment where Resource Orchestrator has been installed is as shown below.

Figure 1.1 Flow of Service Provision Using Applications
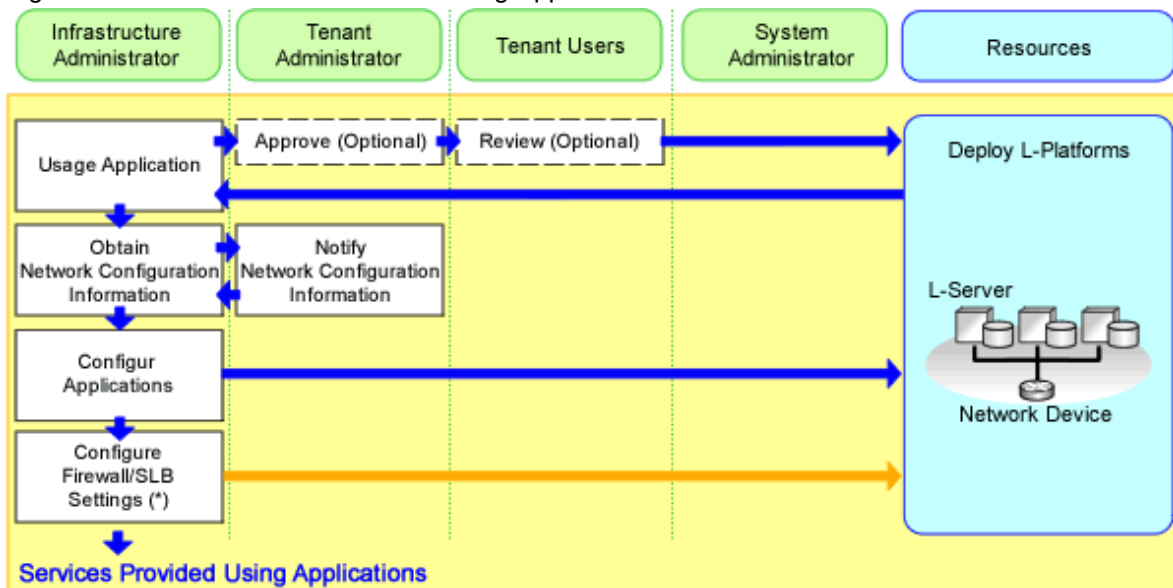
* Note: Necessary when using firewalls (Firewall), server load balancers (SLB), or L2 switches.

1. Application for use

   The tenant user applies to use an L-Platform.

   For details, refer to "5.2 Subscribe to an L-Platform" in the "User's Guide for Tenant Users CE".

2. Approval

   The tenant administrator approves the application by a tenant user to use an L-Platform.

   For details, refer to "9.3 Approving an Application" in the "User's Guide for Tenant Administrators CE".

3. Assessment

   The infrastructure administrator assesses the content of the application to use an L-Platform from the tenant administrator or tenant user.

   For details, refer to "10.2 Assessing an Application" in the "User's Guide for Infrastructure Administrators CE".

4. Notification of settings for firewalls and server load balancers

   When using a firewall or a server load balancer, the infrastructure administrator prepares a script for configuring the firewall or server load balancer.

   Based on the information provided by the infrastructure administrator, the tenant administrator notifies the tenant user of the configuration information for the firewall or server load balancer.

5. Configure firewalls

   When configuring an application on an L-Server that has been deployed on the public LAN, the tenant user needs to create a rule that enables access to that L-Server from the public LAN.

6. Configure applications

   The tenant user performs the installation and environment settings necessary for the application to be provided as a service by the L-Server.

7. Confirm communication with applications

   The tenant user checks that there are no problems with the applications installed on the L-Server, and that the L-Server can be accessed from the public LAN.

   When a firewall has not been configured, configure one.

   If there are no problems in the communication check, proceed to the next step.

   If there are problems, resolve them and check communication again.

8. Configure server load balancers

   When an L-Platform has a server load balancer deployed, the tenant user performs configuration of the server load balancer.

9. Check communication with server load balancers

   When an L-Platform has a server load balancer deployed, test that the settings of the server load balancer are correct.

   It is necessary to configure the rules for the firewall so that communication using the virtual IP address configured for the server load balancer is possible.

   If there are no problems in the communication check, proceed to the next step.

   If there are problems, resolve them and check communication again.

10. Configure firewalls

    Configure address translation and firewall rules, and then test that communication with the L-Server is possible.

    If the test shows no problems, configuration of the L-Platform operation environment is complete.

    If there are problems, resolve them and check communication again.

1.1 Operation, Maintenance, and Monitoring by Infrastructure Administrators

This section explains operation, maintenance, and monitoring by infrastructure administrators when using Resource Orchestrator.

Infrastructure Administrator (infra_admin) Operations

Refer to the "User's Guide for Infrastructure Administrators (Resource Management) CE" for the [Resource] tab operations.

Refer to the "User's Guide for Infrastructure Administrators CE" for other operations.

Infrastructure Administrator (infra_admin) Management Operations

The operations that infrastructure administrators (infra_admin) can perform are as follow.

- Management of resources and resource pools

    - Registration, modification, and deletion of resources

    - Creation, deletion, modification of global pools and tenant local pools

    - Review and confirmation of application status and L-Platform usage applications

- Management of tenants

    - Creation, modification, and deletion of tenants

- Create a tenant administrator

- Creation, modification, and deletion of user accounts

- Management of templates

- Creation, modification, and deletion of L-Platform templates (*)

- Creation, modification, and deletion of L-Server templates

* Note: To check subscription requests submitted by using a created L-Platform template, use a dual-role administrator account. For more details, refer to "Appendix B Applying (Subscribe) for L-Platform Usage by Dual-Role Administrators" in "User's Guide for Infrastructure Administrators".

Infrastructure Administrator (infra_admin) Maintenance Operations

Maintenance operations that infrastructure administrators (infra_admin) can perform are as follow:

- Hardware maintenance

- System maintenance (*2)

- Backup and restoration of admin servers (*2)

*2: OS administrative privileges are necessary for OS maintenance and backup and restore of admin servers.

Infrastructure Administrator (infra_admin) Monitoring Operations

Monitoring operations that infrastructure administrators (infra_admin) can perform are as follow:

- Monitoring of resource pools using dashboard

- Monitoring of L-Platform operation statuses

- Monitoring of resource capacity (servers, storage and network)

- Monitoring of operation logs and audit logs

1.2 Operation, Maintenance, and Monitoring by Tenant Administrators

For details on operations, maintenance and monitoring by tenant administrators, refer to the "User's Guide for Tenant Administrators CE".

1.3 Operation, Maintenance, and Monitoring by Tenant Users

For details on operations, maintenance and monitoring by tenant users, refer to the "User's Guide for Tenant Users CE".

Part 2　Operation

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.
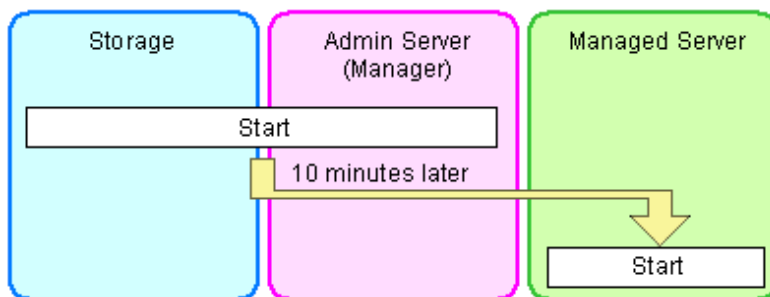
Additionally, when using the HBA address rename function, the HBA address rename setup service should be started on a dedicated server (HBA address rename server) and left running continuously. For details on starting, stopping, and confirming the state of the HBA address rename setup service, refer to "Chapter 10 Settings for the HBA address rename Setup Service" in the "Setup Guide CE".

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 Sub Web Server (Mongrel3)
    Resource Coordinator Sub Web Server (Mongrel4)
    Resource Coordinator Sub Web Server (Mongrel5)
    Resource Coordinator DB Server (PostgreSQL)
    ServerView Resource Orchestrator Service Catalog Manager DB Service(Dashboard)
    ServerView Resource Orchestrator Service Catalog Manager DB Service(Charging)
    ServerView Resource Orchestrator Service Catalog Manager REST Service(Charging)

- Related Services

    Deployment Service
    TFTP Service

PXE Services
DHCP Server (*)
Systemwalker SQC DCM
Interstage BPM Analytics eRule Engine (EFServer)
Systemwalker MpJobsch9
Systemwalker MpMjes
Systemwalker MpMjes9
Systemwalker Runbook Automation DB Service
Shunsaku Conductor cmdbc
Shunsaku Sorter cmdbo01

* 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 rcxmgrctl 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 "5.19 rcxmgrctl" in the "Reference Guide (Command/XML) CE".

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
  rcxmongrel3
  rcxmongrel4
  rcxmongrel5
  rcxhttpd

- Database (PostgreSQL)

  rcxdb

- Related Services

  scwdepsvd
  scwpxesvd
  scwtftpd
  dhcpd (*)

  * 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 scwtftpd status <RETURN>
# service dhcpd status <RETURN>
```

Services are started and stopped using the rcxmgrctl 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 "5.19 rcxmgrctl" in the "Reference Guide (Command/XML) CE".

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.

- In Basic mode, the following manager services are started.

    In Basic mode, the procedure to start and stop the services and the procedure to check their statuses are same as those in standard mode.

    [Windows Manager]

    - 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)

    [Linux Manager]

    - Manager Services

        rcvmr

        Manager services also include the following daemons.

        rcxmanager
        rcxtaskmgr
        rcxmongrel1
        rcxmongrel2
        rcxhttpd

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.

📝 Note

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

    - Systemwalker SQC DCM

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 "5.3 rcxadm agtctl" in the "Reference Guide (Command/XML) CE".

- Related Services

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

    - Deployment Agent

    - Systemwalker SQC DCM

[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.

    [Linux]

    - Systemwalker SQC DCM

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>
    ```

    To check the running state of the service of Systemwalker SQC DCM, execute the following command:

    ```
    # /etc/rc0.d/K00ssqcdcm <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 "5.3 rcxadm agtctl" in the "Reference Guide (Command/XML) CE".

- 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>
# /etc/rc2.d/S99ssqcdcm start <RETURN>
```

Stop

```
# /etc/init.d/scwagent stop <RETURN>
# /etc/rc0.d/K00ssqcdcm 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 "5.3 rcxadm agtctl" in the "Reference Guide (Command/XML) CE".

Chapter 3 Managing User Accounts

This chapter explains the management of user accounts.

Creation, Viewing, and Modification of User Accounts

Only users that hold the role of infrastructure administrator, tenant administrator, or administrator can create user accounts.

For details on operations by infrastructure administrators, refer to "Chapter 3 Configuring Users for Infrastructure Administrators" in the "User's Guide for Infrastructure Administrators (Resource Management) CE".

For details on operations by tenant administrators, refer to "Chapter 10 Tenant" in the "User's Guide for Tenant Administrators CE".

Viewing and Modification of Information of Logged in Users

To view and modify the information of logged in users, use [Account] on the ROR console for the operation.

For details on [Account], refer to "Chapter 13 Account" in the "User's Guide for Infrastructure Administrators CE".

Chapter 4 Managing Tenants

This chapter explains the management of tenants.

Tenant Creation

The flow of tenant creation is as follows:

1. Register Tenants

   Input the tenant information and register tenants.

2. Create a Tenant Administrator

   Create a tenant administrator.

3. Create a Local Pool for Tenants

   The following two types of resource pool operations can be performed:

   - Local Pool

     A resource pool which can be used only for tenants.
     A resource stored in a local pool cannot be used by a user of another tenant.

   - Global Pool

     A common resource pool which can be used by the entire system.

   For details on how to select resource pools, refer to "Chapter 6 Defining Tenants and Resource Pools" in the "Design Guide CE".
   When using a local pool, create a local pool used only by the tenant registered in step 1.

4. Register Resources

   Register the resources created in step 3 in the local pool.

For details, refer to "11.3 Creating a Tenant" in the "User's Guide for Infrastructure Administrators CE".

Tenant Operation

Use the [Tenant] tab in the ROR console for the following operations.

For details on the [Tenant] tab, refer to "Chapter 11 Tenant" in the "User's Guide for Infrastructure Administrators CE".

- Register Tenants

- Create a Tenant Administrator

- Create a Tenant Resource Pool

- Create and Delete Tenants

Chapter 5 Managing Templates

This chapter explains the management of templates.

- L-Platform Templates

    An L-Platform template is the template to define the logical configuration of ICT resources and software.
    An L-Platform is composed of an L-Platform template.
    Use the [Template] tab to create, modify, and delete L-Platform templates.
    For details on the [Template] tab, refer to "Chapter 8 Template" in the "User's Guide for Infrastructure Administrators CE".

- L-Server Templates

    An L-Server template is the template defining the specifications of an L-Server (number of CPUs, memory capacity, disk capacity, and number of NICs) used for an L-Platform.
    Use the [Resource] tab to create, modify, and delete L-Server templates.

    For details on L-Server template operations, refer to "Chapter 15 L-Server Template Operations" in the "User's Guide for Infrastructure Administrators (Resource Management) CE".

Chapter 6 Managing Resources and Resource Pools

This chapter explains the management of resources and resource pools.

6.1 Managing Resource Pools

This section explains the management of resource pools.

The following resource pool operations are possible:

- Addition and modification of tenants and local pools

- Deletion of local pools within tenants

- Addition, modification, and deletion of global pools

When changing the global pool that can be used by tenants, perform the operation from the [Tenant] tab on the ROR console.

For details on the [Tenant] tab, refer to "Chapter 11 Tenant" in the "User's Guide for Infrastructure Administrators CE".

6.2 Managing Resources

This section explains the management of resources.

Use the [Resource] tab in the ROR console to register, change, or delete resources.

- Register Resources

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

- Change Resources

  Refer to "Chapter 7 Changing Resources" in the "User's Guide for Infrastructure Administrators (Resource Management) CE".

- Delete Resources

  Refer to "Chapter 9 Deleting Resources" in the "User's Guide for Infrastructure Administrators (Resource Management) CE".

For details on how to add network devices, refer to "9.5.3 Procedure for Addition of Network Devices", and for details on how to add or modify connection destinations of network devices, refer to "9.5.4 Procedure for Addition or Modification of Connection Destinations of Network Devices".

6.3 Managing L-Servers

This section explains the management of L-Servers.

L-Server Operations

Refer to "Chapter 17 L-Server Operations" in the "User's Guide for Infrastructure Administrators (Resource Management) CE".

Use of Physical Servers or Virtual Machines as L-Servers

Configured physical servers or virtual machines can be used as L-Servers.

For details, refer to "Chapter 18 Linking L-Servers with Configured Physical Servers or Virtual Machines" in the "User's Guide for Infrastructure Administrators (Resource Management) CE".

Chapter 7 Management of L-Platform

This chapter explains the management of L-Platform.

7.1 Review for L-Platform Usage Applications

Use the [Request] tab of the ROR console to review applications to use from tenant users for operations such as subscribe, reconfigure, and cancel of L-Platforms.
For details on the [Request] tab, refer to "Chapter 10 Request" in the "User's Guide for Infrastructure Administrators CE".

7.2 Administration of L-Platform

This section explains how to perform L-Platform operations.

7.2.1 Deleting Unnecessary Data

Information about L-Platforms and servers no longer required that remains on the **L-Platform management** Window can be deleted.

What is actually done is that the unneeded L-Platform information or server information status is changed to "Finished with return" with the cfmg_deletesysdata (Unnecessary Data Deletion) command so that it is no longer displayed in the L-Platform management View.

Refer to "10.3 cfmg_deletesysdata (Unnecessary Data Deletion)" in the "Reference Guide (Command/XML) CE" for details on this command.

7.2.2 Updating the Cloning Image

In this product, the resource ID is used when managing the cloning image.

If the cloning image has been updated, the resource ID will be changed, so the image information must be updated in order to reflect the changed resource ID.

If the cloning image has been updated, use an operation from the "Template" window to update the image information.

Refer to "8.3.7 Synchronizing Image Information" in the "User's Guide for Infrastructure Administrators for CE" details.

🅿 Point
. . . .
To use both cloning image (the cloning image before the update and the cloning image after the update) in the L-Platform template, updating a single cloning image will not work. Instead, these cloning images must be created separately.
. . . .

7.2.3 Importing to L-Platform

This section explains how to import physical servers, virtual machines, and L-Servers to an L-Platform.

There are the following two ways of importing physical servers, virtual machines, and L-Servers to the L-Platform Management function:

- Convert configured physical servers or virtual machines into L-Servers, then import the converted L-Servers to the L-Platform

  Follow the procedure described below to convert configured physical servers or virtual machines into L-Servers and import to the L-Platform:

  a. Convert the physical servers or virtual machines into L-Servers

     Refer to "Chapter 18 Linking L-Servers with Configured Physical Servers or Virtual Machines" in the "User's Guide for Infrastructure Administrators (Resource Management) CE".

  b. Network Information Settings for Converted L-Servers

     Refer to "7.2.3.1 Network Information Settings for Converted L-Servers".

c. Importing the L-Server for which network information has been set

　　　Refer to "".

- Import L-Servers created in the ROR console into the L-Platform

　　Refer to "".

7.2.3.1 Network Information Settings for Converted L-Servers

Set the network information for the L-Servers converted in "Chapter 18 Linking L-Servers with Configured Physical Servers or Virtual Machines" in the "User's Guide for Infrastructure Administrators (Resource Management) CE".

Execute the rcxadm lserver attach -define command to set network information.

The setting of network information via the rcxadm lserver attach -define command can only be performed on the L-Server before it is imported into the L-Platform management function.

Also, the rcxadm lserver attach -define command can only be executed when using Solaris Zone and OVM for SPARC.

If adding multiple network interface cards (NICs), execute the rcxadm lserver attach -define command only the same number of times as there are NICs being added.

Refer to "3.6 rcxadm lserver" in the "Reference Guide (Command/XML) CE" for details.

7.2.3.2 Importing L-Servers

The Import L-Server command (cfmg_importlserver) can be used to import servers that have been deployed, or the VM guests that have been imported using the ROR Console, to the L-Platform Management function.

Refer to "10.4 cfmg_importlserver (Import L-Server)" in the "Reference Guide (Command/XML) CE" for details on this command.

Note

- When an L-Server for infrastructure administrator is imported to an L-Platform, the operation privileges of the L-Server are transferred to the tenant administrator or the tenant user.

  When this L-Server is released from the L-Platform by the cfmg_deletelserver command, the L-Server is changed back to the one for infrastructure administrator.

- L-Servers without network interface cards (NICs) cannot be imported.

- No initial password information will be set for an L-Server that has been imported without image information being specified.
  In the **L-Platform Management** window, click the **Initial PWD** button in the **L-Platform Details** page - the window that is opened displays "Initial password is [.]".

- An L-Server that is under a tenant cannot be imported to a different tenant.

- When importing an L-Server that is not under a tenant, switch the power off for the L-Server targeted for import.

- Do not import physical L-Servers that have VM hosts installed. Refer to "Appendix D Installing VM Hosts on Physical L-Servers" in the "Setup Guide CE" for information on installing VM hosts on a physical L-Server.

- If Solaris zones have been configured on a guest domain and that guest domain is registered as a VM host, virtual L-Servers linked with that guest domain cannot be imported into the L-Platform.

- When importing an L-Server that does not use an L-Server template, it is necessary to register a usable L-Server template in the L-Platform beforehand.
  When you want to specify a particular L-Server template in the L-Server being imported, register image information that specifies the L-Server template beforehand, then specify that image information with the -image option. When image information is not specified, then any L-Server template of those registered will be set.

7.2.3.3 Releasing L-Servers

L-Servers that have been imported into the L-Platform management function can be released from the L-Platform by using the L-Server release command (cfmg_deletelserver).

Refer to "10.2 cfmg_deletelserver (Release L-Server)" in the "Reference Guide (Command/XML) CE" for more information about the command.

7.2.4 Cases when Guest OS Information is not Set Automatically [RHEL-KVM][Citrix Xen][OVM for x86 3.2]

In some cases the following guest OS information is not set automatically following deployment:

- IP address

- Default gateway

- Host name

In such cases, the problems below occur, because the IP address and host name were already set in the server when cloning images were collected.

- If a user subscribes to multiple servers concurrently, multiple servers with the same settings are deployed on a single network.

- Users cannot access the server.

The following explains the conditions under which the information is not set automatically, and the operation methods to be used in such cases.

Conditions

The conditions under which the information is not set automatically depend on the server virtualization software.

Server virtualization software	Conditions
RHEL-KVM	The guest OS is none of the following: - Linux - Windows Server 2008 R2
Citrix XenServer	If using Linux Manager or if using Windows Manager and a cloning image where "OS setting" are disabled. Refer to "17.5.1 Collecting and Registering" in the User's Guide for Infrastructure Administrators (Resource Management) CE for information on "OS setting" when collecting cloning images.
OVM for x86	There are no particular conditions. The problem may occur in any guest OS.

Operation Method

There are two methods of operating L-Platform:

a. Manual configuration by the infrastructure administrator after deployment

1. Configure the following settings, and then collect cloning images.

- Do not set the IP Address as a fixed value.

- Disable the problematic service in advance if using the same host name on multiple servers, such as when sharing a Windows file.

2. The administrator (infrastructure administrator, tenant administrator, or dual-role administrator) notes in the Description column for the L-Platform template that the administrator must set the IP addresses after deployment is finished.

3. After server deployment has finished, the infrastructure administrator must verify the IP addresses and the host name in the **L-Platform** tab, verify the default gateway in the **Resources** tab, connect a console to the deployed server, and then configure the OS manually.

4. Notify the user that access has been enabled.

b. Importing to L-Platform by the infra administrator

1. In response to a request from a user, the infrastructure administrator creates L-Server using the **Resources** tab.

2. Import to the L-Platform Management (refer to "7.2.3.2 Importing L-Servers" for details).

3. Notify the user that access has been enabled.

7.2.5 Startup Priority Level Settings

Any server with a startup priority level set to 0 will not startup or shutdown when performing batch power operations.

An information message will be output to **vsys_trace_log** for any server that did not startup or shutdown.

If any server that either did not startup or shutdown actually needs to be started up or shut down, refer to the information message and use the **StartLServer** or **StopLServer** command to startup or shutdown individually.

Refer to "2.3.5 StartLServer (Starts a Server)" and "2.3.6 StopLServer (Stops a Server)" in the "Reference Guide (API)" for details on this command.

7.2.6 Action to Take when an Error has Occurred

When an error has occurred during a cancellation application by a tenant user, the cancellation application may become impossible.

In that case, confirm the L-Platform ID, and use the **Disable L-Platform Application** command to make the cancellation application possible again for the user.

For information on the **Disable L-Platform Application** command, refer to "10.10 recoverService (Disable L-Platform Application)" in the "Reference Guide (Command/XML) CE".

When a Problem Occurs during L-Platform Operation

The flow of when a problem occurs, after the following operations for an L-Platform are implemented by a tenant user, is as below.

- Creation, modification, or deletion of an L-Platform

- Configuration or modification of network devices such as firewalls or server load balancers

Figure 7.1 Flow of Corrective Actions when a Problem Occurs during L-Platform Operation
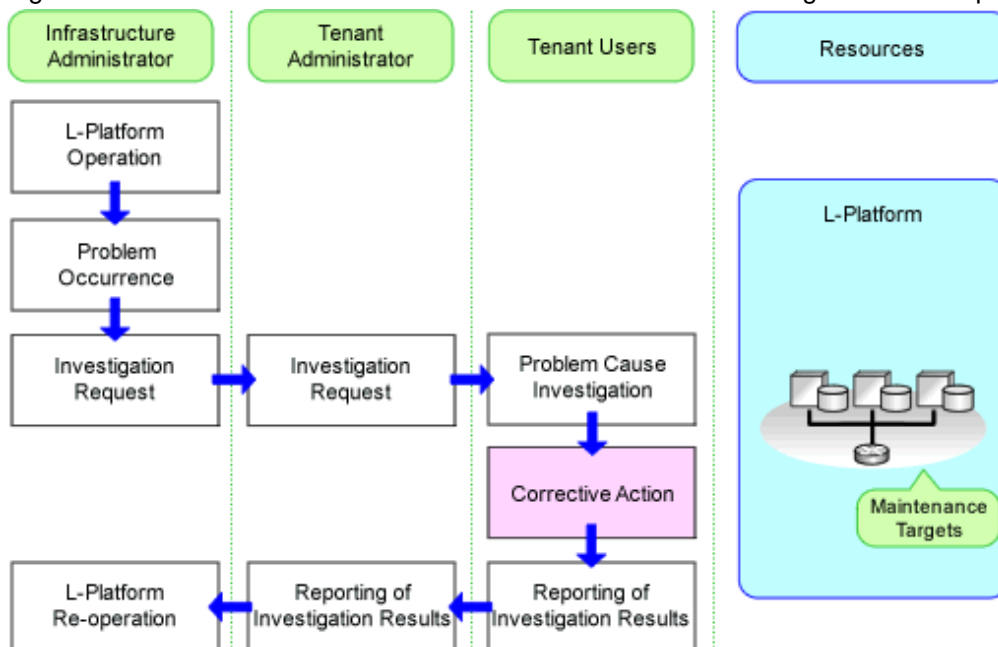
1. The tenant user performs L-Platform creation, modification or deletion, or network device configuration or modification.

2. Problem Occurrence

   L-Platform creation, modification or deletion, or network device configuration or modification ends abnormally.

3. Investigation Request

The tenant user requests investigation of the cause of the operation failure by the tenant administrator. When requesting investigation, provide detailed information about the failed operation or output message.

The tenant administrator provides the information obtained from the tenant user to the infrastructure administrator, and requests investigation of the cause of the operation failure.

4. Problem Cause Investigation

Based on the information obtained from the tenant administrator, the infrastructure administrator investigates problems with the script configuring the network devices, the hardware, or the communication route.

5. Corrective Action

The infrastructure administrator performs the following corrective actions:

   - When there are errors in the script configuring the network device, the infrastructure administrator modifies the script.

   - When an error occurs on hardware or the communication route, the infrastructure administrator replaces the hardware.

6. Reporting of Investigation Results

After completing corrective action, the infrastructure administrator reports the results of investigation to the tenant administrator or the tenant user, and requests operation of the L-Platform.

7. Operation of the L-Platform

The tenant user performs operation of the L-Platform again.

7.2.7 Setting Alive Monitoring

When using alive monitoring on an L-Platform, it needs to be deployed specifying an L-Server template in which the setting of activity monitoring is enabled.

For information on creating L-Server templates, refer to "Chapter 15 L-Server Template Operations" in the "User's Guide for Infrastructure Administrators (Resource Management) CE".

If the settings are changed after deployment, change the "Type of Server(specifications)" by reconfiguring the L-Platform.

Register different L-Server templates where heartbeat settings are enabled and disabled.

Also use L-Server template names that make it easy to distinguish whether heartbeat settings are enabled or disabled.

Example
. . . .
  - L-Server template name where heartbeat settings are disabled

    VMware_Small

  - L-Server template name where heartbeat settings are enabled

    VMware_Small_Monitoring
. . . .

7.2.8 Redundancy Settings

When deploying a server with redundancy settings to an L-Platform, it is necessary to deploy by specifying an L-Server template that has redundancy settings enabled.
Refer to "Chapter 15 L-Server Template Operations" in the "User's Guide for Infrastructure Administrators (Resource Management) CE" for information on how to create L-Server templates.

If the settings are changed after deployment, change the "Type of Server(specifications)" by reconfiguring the L-Platform.
Register different L-Server templates where redundancy settings are enabled and disabled.
Also use L-Server template names that make it easy to distinguish whether redundancy settings are enabled or disabled.

Example

- L-Server template name where redundancy settings are disabled

    VMware_Small

- L-Server template name where redundancy settings are enabled

    VMware_Small_HA

7.2.9 Automatic Server Release Settings

When deploying a server with automatic server release settings to an L-Platform, it is necessary to deploy by specifying an L-Server template that has automatic server release settings enabled.
Refer to "Chapter 15 L-Server Template Operations" in the "User's Guide for Infrastructure Administrators (Resource Management) CE" for information on how to create L-Server templates.

If the settings are changed after deployment, change the "Type of Server(specifications)" by reconfiguring the L-Platform.
Register different L-Server templates where automatic server release settings are enabled and disabled.
Also use L-Server template names that make it easy to distinguish whether automatic server release settings are enabled or disabled.

Example

- L-Server template name where automatic server release settings are disabled

    VMware_Small

- L-Server template name where automatic server release settings are enabled

    VMware_Small_Repurpose

7.2.10 Default Values on the L-Server Template

If an overcommit value has not been set for the L-Server template selected in "type" on the **Reconfiguration** page of the L-Platform subscription window, then the values set in VM specific information definition file will not be used, even if the file is used. Rather, the following values are applied:

[VMware]

- CPU Reserved: 0.1GHz

- CPU Shares: 1000

- Memory Reserved: Memory Size

- Memory Shares: Memory Size * 10240

[Hyper-V]

- CPU Reserved: 0.1GHz

- CPU Weight: 100

- Memory RAM: Memory Size

- Memory Weight: 5000

[Citrix Xen]

- CPU Weight: 100

- Memory Reserved: Memory Size

With L-Server templates used in L-Platforms, set the values for overcommit in the L-Server templates rather than in a definition VM specific information definition file.

7.2.11 Changing Server Specifications on a VM Host

In L-Platform subscription and L-Platform configuration changes, the upper limits of the server's specifications are determined by the maximum number of CPUs, maximum CPU frequency, and the maximum memory capacity values specified in the L-Platform template's image information.

After deploying an L-Platform, and if the server's CPUs, CPU frequency, and memory capacity are to be changed from the VM host, make sure you specify values that do not exceed the maximum values specified in the image information of the L-Platform template.

If the values specified for the CPUs, CPU frequency, and memory capacity exceed the maximum values specified in the image information of the L-Platform template, those values will be changed back to match the maximum values when the configuration is changed.

P Point

. . . .

Do not change the server's CPUs, CPU frequency, and memory capacity from the VM host if possible.

. . . .

Chapter 8 Changing Settings

This chapter explains how to change settings.

8.1 Registering and Deleting Application Process Assessors

This section explains how to register and delete application process assessors.

8.1.1 Registering an Application Process Assessor

This section explains how to register an infrastructure administrator or dual-role administrator as an application process assessor.

Add all infrastructure administrator and dual-role administrator to the directory service IflowUsers group in order to use application processes. Use the LDIF file to register an application process assessor at the directory server. Follow the procedure below to register as application process assessor.

1. Create an infrastructure administrator or dual-role administrator.

2. Add the infrastructure administrator or dual-role administrator as a member of the IflowUsers group.

📑 Note

- Infrastructure administrators and dual-role administrators who have not been registered in the "IflowUsers" group cannot conduct assessment in application processes. Also, if infrastructure administrators and dual-role administrators not registered in the "IflowUsers" group select the **Request** tab in the ROR Console, the following error message appears:

```
Error message : Failed to authenticate the user.
```

- Administrators (dual-role administrators) created during installation are not registered in the "IflowUsers" group. Add them to the "IflowUsers" group.

- If an email address is not set, assessment request emails are not sent, and reservation notification emails are not sent when an error occurs.

- If no infrastructure administrators or dual-role administrators are registered in the IflowUsers group, the following message is displayed after the application is forwarded from the **Forward screen** window when the user subscribes to the service:

```
PCS1002
An error occurred while processing application.
Please contact the infrastructure administrators.
```

Refer to "18.2.1 Registering an Application Process Assessor" in the "Setup Guide CE" for information on how to register application process assessor.

8.1.2 Deleting an Application Process Assessor

This section explains how to delete an infrastructure administrator or dual-role administrator from the application process assessors.

8.1.2.1 Deleting an Infrastructure Administrator/dual-role Administrator from IflowUsers Group

Follow the procedure below to delete an infrastructure administrator or dual-role administrator from the IflowUsers group members.

For OpenDS

1. Create an LDIF file.

   Edit a sample LDIF file to create the file. An example of an LDIF file is shown below.

```
# Delete manager from IflowUsers
dn: cn=IflowUsers,ou=group,dc=fujitsu,dc=com
changetype: modify
delete: member
member:cn=manager,ou=users,dc=fujitsu,dc=com
```

2. Execute the ldapmodify command.

[Windows Manager]

Specify the created LDIF file, and then execute the ldapmodify command.

```
OpenDS Installation_folder\bat\ldapmodify.bat" -p <port number> -f <ldif file> -D <administrator
user DN> -w <password>
```

An execution example is shown below.

```
c:\> c:\Program Files (x86)\Fujitsu\ServerView Suite\opends\bat\ldapmodify -p 1473 -D
"cn=Directory Manager" -w admin -f c:\ldif\deleteuserfromgroup.ldif
Processing MODIFY request for cn=IflowUsers,ou=group,dc=fujitsu,dc=com
MODIFY operation successful for DN cn=IflowUsers,ou=group,dc=fujitsu,dc=com
```

[Linux Manager]

Specify the created LDIF file, and then execute the ldapmodify command.

```
# OpenDS Installation_folder/bin/ldapmodify" -p <port number> -f <ldif file> -D <administrator
user DN> -w <password>
```

An execution example is shown below.

```
# /opt/fujitsu/ServerViewSuite/opends/bin/ldapmodify -p 1473 -D "cn=Directory Manager" -f /tmp/
ldif/adduser2group.ldif -w admin
Processing MODIFY request for cn=IflowUsers,ou=group,dc=fujitsu,dc=com
MODIFY operation successful for DN cn=IflowUsers,ou=group,dc=fujitsu,dc=com
```

🔖 Note

- In the command input line, enter the command as one line without entering any line feeds.

- For the directory service port number, administrator DN, and administrator DN password, enter the values that were set during installation.

For Active Directory

1. From the Start menu, open [Control Panel]-[Administrative Tools]-[Active Directory Users and Computers].

2. Select the name of a domain that is managed by Active Directory.

3. Right-click "IflowUsers" of the organizational unit "Group", and select [Property].

4. Select the [Members] tab, and select the members to delete from the member list, and click the [Remove] button.

5. A confirmation dialog will be displayed. Click [Yes].

6. After returning to the property window of the group, confirm that the members have been deleted correctly,

   and click the [OK] button.

8.2 Settings for Sending Email

This section explains how to change settings for sending an email.

Settings for the Email Sent from Tenant Management

Email sent from the tenant management will be enabled only if the tenant has set the Performing tenant management setting.

When an operation such as registering a tenant or adding or changing a user has been performed, notification to that effect is sent to the tenant administrators, tenant users, and tenant email addresses within that same tenant.

Refer to "18.1 Settings for Sending Email" in the "Setup Guide CE" for information on how to change settings for e-mail sent from tenant administrators.

Settings for Email Sent from the L-Platform Management Window

Email sent from the L-Platform management window notifies the end or failure of processing to the tenant administrators and the tenant users when the tenant users have used the ROR Console to perform an application to use L-Platform, an L-Platform modification, or an application to cancel L-Platform.

Refer to "18.1 Settings for Sending Email" in the "Setup Guide CE" for information on how to change settings for email sent from the L-Platform Management window.

Email Sent from the Usage Charge Calculator

Email will be enabled if the calculator for charges is used.

A usage charge file is sent to the set email address with the monthly usage charges for each tenant.

Refer to "18.1.4 Email Sent from the Usage Charge Calculator" in the "Setup Guide CE" for information on the email settings used for the usage charge calculator.

Email Sent via an Application Process

An email will be sent via the application process when changes or requests have been made.

The following notification will be sent for an application to use L-Platform, an L-Platform modification, or an application to cancel L-Platform from the L-Platform management window:

- Notification of acceptance of application, rejection of application, and dismissal of application to the tenant users

- Notification of request for approval and dismissal of application to the tenant administrators

- Notification of request for assessment to the infrastructure administrators

Refer to "18.1.6 Settings for Email Sent via the Application Process" in the "Setup Guide CE" for information on how to change settings for email sent from an application process."

Settings for the Email Sent from the Dashboard

Email sent from the Dashboard will be enabled only if using the dashboard alert function.

The dashboard sends notifications to e-mail address setting in Customizing Email Send Settings if the global pool use rate exceeds the threshold value.

Refer to "18.1.7 Settings for Email Sent from the Dashboard" in the "Setup Guide CE" for information on how to set settings for email sent from the dashboard alert function.

8.3 Settings for Port Number of Admin Servers

This section explains how to change the port number of the admin server as follows:

- ROR console server port number

- L-Platform management port number

- Interstage Business Process Manager Analytics rule engine port number

Stop the manager before changing the port number. Restart the manager after changing the port number.

Refer to "2.1 Starting and Stopping Managers" for information on how to start and stop the manager.

Note that there is no need to stop and start the manager for each port number.

Changing the Port Number of the ROR Console Server

The procedure for changing the port number is as follows.

1. Modify the portal.properties file.

   Open the following file:

   [Windows Manager]

   ```
   Installation_folder\RCXCTMG\SecurityManagement\conf\portal.properties
   ```

   [Linux Manager]

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

   Change the port numbers specified in the following URLs. Set the same values in the port numbers:

   - portalSsl.url

   - authedPortal.url

   - sendmail.auth.url

2. Start the Interstage Management Console.

   The procedure for starting the Interstage Management Console is as follows:

   [Windows Manager]

   From the **Start** menu, select **All Programs** > **Interstage** > **Application Server** > **Interstage Management Console**.

   [Linux Manager]

   1. Start the Web browser.

   2. Specify the URL of the Interstage Management Console.

      The URL format is as follows:
      (If SSL encrypted communication is not being used)

      http://[*Host name*]:[*Port number*]/IsAdmin/

      (If SSL encrypted communication is being used)

      https://[*Host name*]:[*Port number*]/IsAdmin/

   3. Login to the Interstage Management Console.

3. Change the port number.

   Select **System** > Services > Web Server > **RCXCT-ext** > Web Server Settings to change the port number.

Changing the port number of L-Platform management

The procedure for changing the port number is as follows.

1. Modify the portal.properties file.

   Open the following file:

   [Windows Manager]

   ```
   Installation_folder\RCXCTMG\SecurityManagement\conf\portal.properties
   ```

   [Linux Manager]

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

Change the port numbers specified in the following URL:

- vsys.host

An example is shown below. The parts in italics show the information that is changed.

```
vsys.host = http://192.168.11.22:8013/vsys/services/VSYS/
```

2. Modify the managerview_config.xml file.

   Open the following file.

   [Windows Manager]

   ```
   Installation_folder\RCXCTMG\MyPortal\config\managerview_config.xml
   ```

   [Linux Manager]

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

   Modify the value of the entry tag with vsys-port as the key value.

   - The entry tag with vsys-port as the key value

   An example is shown below. The section in italics is the information to be modified.

   ```
   <entry key="vsys-port">8013</entry>
   ```

Interstage Business Process Manager Analytics rule engine port number

The procedure for changing the port number is shown below.

Note

. . . .

Port numbers can be changed to a value between 32768 and 65535.

[Windows Manager]

Do not use values between 49152 and 65535, because they are used as default values for Windows OS ephemeral ports (DYNAMIC AND/ OR PRIVATE PORTS) in Windows Server 2008 and later versions.

[Linux Manager]

Do not use values between 32768 and 61000, because they are used as default values for Linux ephemeral ports (DYNAMIC AND/OR PRIVATE PORTS).

. . . .

1. Change the alertserviceconf.properties file.

   Open the following file:

   [Windows Manager]

   ```
   installation_folder\J2EE\ijserver\IBPMMServer\apps\ibpmm.war\conf\alertserviceconf.properties
   ```

   [Linux Manager]

   ```
   /var/opt/FJSVj2ee/deployment/ijserver/IBPMMServer/apps/ibpmm.war/conf/
   alertserviceconf.properties
   ```

   Change the port number specified below:

   - EF_HOST_PORT

   An example is shown below - italics indicate information modified:

```
EF_HOST_PORT=40320
```

2. Change ef_server.conf.

   Open the following file:

   [Windows Manager]

   ```
   installation_folder\IBPMA\bpmm\efs\bin\ef_server.conf
   ```

   [Linux Manager]

   ```
   /opt/FJSVibpma/efs/conf/ef_server.conf
   ```

   Change the value specified below:

   - port

   An example is shown below - italics indicate information modified:

   ```
   port = 40320
   ```

8.4 Editing Information in the Home Window

This section explains how to edit the information that is displayed on the lower part of the home window of the ROR Console.

Point

. . . .

- The information can also be used to notify tenant administrators and tenant users of who to contact.

- The messages can also be edited in the home window. Refer to "3.2 Editing the Home Messages" in the "User's Guide for Infrastructure Administrators CE" for details.

. . . .

Information are divided into those for infrastructure administrators and those for tenant administrators and tenant users, so use the following respective text files to edit them:

For infrastructure administrators

   [Windows Manager]

   ```
   Installation_folder\SVROR\Manager\etc\customize_data\home_tab\home_infra_mes.txt
   ```

   [Linux Manager]

   ```
   /etc/opt/FJSVrcvmr/customize_data/home_tab/home_infra_mes.txt
   ```

For tenant administrators and tenant users

   [Windows Manager]

   ```
   Installation_folder\SVROR\Manager\etc\customize_data\home_tab\home_tenant_mes.txt
   ```

   [Linux Manager]

   ```
   /etc/opt/FJSVrcvmr/customize_data/home_tab/home_tenant_mes.txt
   ```

Settings

Enter the message, line by line, in the following format:

```
date, message
```

- UTF-8 must be used as the character code in the text file.

- There is no schedule format specified. If no schedule is required, use a comma at the start of the line, and then subsequently enter the message.

- Enter a string of up to 30 characters for the schedule. Commas (,) cannot be included.

- Enter a string of up to 250 characters for the message. Commas (,) can be included.

Example of settings

```
2011/11/11,Maintenance is scheduled for the Kanto network on the weekend.
,Upgraded the operation management software.
```

8.5 Settings for L-Platform Management

This section explains how to change the settings for L-Platform management.

8.5.1 Settings for Permissions to Change L-Platform Templates

Specify whether to permit modification of the value specified in the L-Platform template when an L-Platform usage application is made in the L-Platform Management window.

Note that if modification is not permitted, it is not possible to modify the configuration of L-Platforms that have already been deployed.

🅿 **Point**

. . . .

Settings for Permissions to Change L-Platform Templates can be set by "Setup Wizard" on the ROR Console.

For details of "Setup Wizard", refer to "3.1 Setup Wizard" in the "User's Guide for Infrastructure Administrators CE".

. . . .

Stopping the manager

Stop the manager.
Refer to "2.1 Starting and Stopping Managers" for information on how to stop the manager.

Changing L-Platform templates

The procedure for changing the settings for whether or not changes to the L-Platform templates in the L-Platform management window are to be permitted is as follows:
Open the following file.

[Windows Manager]

```
Installation_folder\RCXCTMG\MyPortal\config\custom_config.xml
```

[Linux Manager]

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

The following information must be modified:

- The entry tag with no-configuration as the key value

Modify the value of the entry tag with no-configuration as the key value. The section in italics is the information to be modified.
Specify "false" to allow the L-Platform template to be modified. Specify "true" to not allow it to be modified. The default value is "false".

```
<entry key="no-configuration">false</entry>
```

Starting the manager

Start the manager.
Refer to "2.1 Starting and Stopping Managers" for information on how to start the manager.

8.5.2 Subnet Settings at Segment Editing

It is possible to change the method for setting up the subnets that are allocated to segments when performing an application to use L-Platform. Use the following procedure to use network resource names rather than IP addresses to select which subnets to allocate to segments during subnet setup.

Refer to "8.3.15 L-Platform Reconfiguration" in the "User's Guide for Tenant Administrators CE" for details on changing the configuration.

🅿 Point
. . . .
Subnet Setting at Segment Editing can be set by "Setup Wizard" on the ROR Console.

For details of "Setup Wizard", refer to "3.1 Setup Wizard" in the "User's Guide for Infrastructure Administrators CE".
. . . .

1. Open the Manager View settings file in a text editor.

   The Manager View settings file is stored in the following location:

   [Windows Manager]

   ```
   Installation_folder\RCXCTMG\MyPortal\config\managerview_config.xml
   ```

   [Linux Manager]

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

2. Add the following key and value.

Key name	Content
network-list-show-resource-name	false: Uses the IP address to select a subnet. (This is the default value. This is applicable even when this key is not defined.) true: Uses the network resource name to select a subnet.

3. Save the file.

4. Restart the manager.
   Refer to "2.1 Starting and Stopping Managers" for information on how to Restart the manager.

8.5.3 Settings for the Simplified Reconfiguration Function

The simplified reconfiguration function is a function that allows specification changes to be performed for a server, when a new system is being created or when a configuration is being changed after deployment, simply by selecting a server type.

When this function is enabled, individual values cannot be changed directly.

To change the settings for this function, perform the following procedure.

Refer to "8.3.15 L-Platform Reconfiguration" in the "User's Guide for Tenant Administrators CE" for details on changing the configuration.

🅿 Point
. . . .
Settings for the Simplified Reconfiguration Function can be set by "Setup Wizard" on the ROR Console.

For details of "Setup Wizard", refer to "3.1 Setup Wizard" in the "User's Guide for Infrastructure Administrators CE"
. . . .

1. Open the settings file in a text editor.

   The settings file is stored in the following location:

   [Windows Manager]

   ```
   Installation_folder\RCXCTMG\MyPortal\config\managerview_config.xml
   ```

[Linux Manager]

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

2. Add the following key and value:

Key name	Content
enable-easy-reconfigure	false: Disables the function. (This is the default value. This is applicable even when this key is not defined.) true : Enables the function

3. Save the file.

4. Restart the manager.
   Refer to "2.1 Starting and Stopping Managers" for information on how to restart the manager.

8.5.4 Distribution Ratio Settings

The distribution ratio settings set a simple selection method for the distribution ratios of CPUs and memory that correspond to the distribution ratio settings of VMware.

Note that the settings are enabled only if the simplified reconfiguration function has been disabled.

To change the settings, implement the following procedure:

Refer to "8.3.15 L-Platform Reconfiguration" in the "User's Guide for Tenant Administrators CE" for details on changing the configuration.

P Point

. . . .

Distribution Ratio Settings can be set by "Setup Wizard" on the ROR Console.

For details of "Setup Wizard", refer to "3.1 Setup Wizard" in the "User's Guide for Infrastructure Administrators CE".

. . . .

1. Use the editor to open the settings file.

   The settings file is stored in the following location:

   [Windows Manager]

   ```
   Installation_folder\RCXCTMG\MyPortal\config\managerview_config.xml
   ```

   [Linux Manager]

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

2. Add the following keys and values:

Key name	Content
share-easy-setting	false: Directly edits values. (This is the default value. This is applicable even when this key is not defined.) true: Selects from a list box the values to be set that show the distribution ratio of memory. The values to be set are as follows:

Value	Distribution ratio (share)
Low (500)	500
Standard (1,000)	1,000
High (2,000)	2,000

3. Save the file.

4. Restart the manager.

   Refer to "2.1 Starting and Stopping Managers" for information on how to restart the manager.

8.5.5 Application Process Settings

This section explains how to modify the application process settings.

8.5.5.1 How to Modify the Application Process Settings

This section explains how to modify the setting whether to use the application process.

📒 Note

. . . .

If the application process is being changed from "use" to "do not use" after the manager starts its operation, make sure that there are no pending processes before changing it.

If there are pending processes, perform the tasks below to end them:

- Cancel

- Approve or reject

- Accept or dismiss

Pending L-platforms can be checked using the listUnapprovalLplatform command (List of L-Platform Applications). Refer to "10.8 listUnapprovalLplatform (List of L-Platform Applications)" in the "Reference Guide (Command/XML) CE".

. . . .

Refer to "18.2 Application Process Settings" in the "Setup Guide CE" for information on how to change the setting for whether or not an application process is used.

8.5.5.2 How to Modify Application Process to be Used

This section explains how to modify the application process to be used.

📒 Note

. . . .

If the application process to be used is being changed after the manager starts its operation, make sure that there are no pending processes before changing it.

If there are pending processes, perform the tasks below to end them:

- Cancel

- Approve or reject

- Accept or dismiss

. . . .

Refer to "18.2 Application Process Settings" in the "Setup Guide CE" for information on how to change the application process to be used.

8.5.6 Editing the Environment Setup File for the L-Platform API

Refer to "18.7 Editing the Environment Setup File for the L-Platform API" in the "Setup Guide CE" for information on how to change the environment settings for the L-Platform API.

8.5.7 Edit the License Agreement

Refer to "18.12 Edit the License Agreement" in the "Setup Guide CE" for information on how to edit the license displayed in the L-Platform Management window.

8.5.8 Settings when RHEL5-Xen is used

Refer to "18.8 Settings when RHEL5-Xen is used" in the "Setup Guide CE" for information on the settings for when RHEL5-Xen is to be used.

8.5.9 Default Password Setting for Sent Emails

Refer to "18.1 Settings for Sending Email" in the "Setup Guide CE" for information on how to set whether to include the deployed server's default password in the emails sent when an L-Platform is deployed or a server is added to an L-Platform.

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

The maximum number of L-Servers that can be placed in an L-Platform Template and the maximum number of NICs in a segment of an L-Platform Template can be modified.

1. Use the editor to open the settings file.

   The settings file is stored in the following location:

   [Windows Manager]

   ```
   Installation_folder\RCXCTMG\MyPortal\config\managerview_config.xml
   ```

   [Linux Manager]

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

2. Add the following keys and values:

Key name	Content
maximum-number-of-connections-in-template	Specify the maximum number of L-Servers that can be placed in the L-Platform Template. Without a key, the default value is 30.
maximum-number-of-connections-in-segment	Specify the maximum number of NICs in the segment of the L-Platform Template. Without a key, the default value is 30.

   Note
   ....

   If there is a firewall, the maximum number of connections in the segment defined in the ruleset will be the smaller value out of the maximum number of servers in the ruleset and the configured value of the "maximum-number-of-connections-in-segment". Segments that are not defined in the firewall ruleset will use the configured value.
   ....

3. Save the file.

4. Restart the manager.
   Refer to "2.1 Starting and Stopping Managers" for information on how to restart the manager.

8.5.11 Customizing the User Rights for L-Platform Operations

It is possible to customize the user rights in the L-Platform management window to suit the role of the user (tenant administrator or tenant user).

Customize user rights according to the design changes made in "5.2 Customizing Access Authority for L-Platform Operations" in the "Design Guide CE".

You can use a command to customize user rights.

Refer to "Chapter 12 Access Authority Customize Commands" in the "Reference Guide (Command/XML) CE" for information on the command to customize user rights.

8.6 Settings for Tenant Management and Account Management

This section explains how to change the settings for the tenant management and the account management, and explains how to edit the user agreement that is displayed when registering a user.

8.6.1 Settings for Tenant Management and Account Management

This section explains how to change the settings for the tenant management and the account management.

- Display setting for user list
  This section explains the procedure for changing the setting for whether or not tenant users are to be displayed, when an infrastructure administrators has used the tenant management to display the user list.

- Setting for registration format of tenant users
  This section explains the procedure for changing the setting for whether a provisional account of a tenant user is to be registered or whether the tenant user is to be registered directly, when a tenant administrator registers a tenant user.

- Setting for execution authority of the tenant management
  This section explains the procedure for changing the setting for whether or not a tenant administrator can perform the following tenant management:

  - Add users

  - Delete users

  - Delegate user privileges

  - Set user password

- Password change notification email settings
  This section explains the procedure for modifying the settings when determining whether or not to include a new password within the body of the password change notification email that is sent once password settings are complete, in the event that a tenant administrator sets the user's password.

- Setting for execution authority of the account management
  This section explains the procedure for changing the setting for whether or not a tenant administrator or tenant user can perform the following account management:

  - Changing the user's own information

  - Changing the user's own password

- Directory service operation setting
  This section explains the procedure for changing the setting for whether or not registration to directory service can be performed and for whether or not password modification is to be allowed, when an infrastructure administrators or a tenant administrator registers a user.

Point

Setting for registration format of tenant users and Setting for execution authority of the tenant management can be set by "Setup Wizard" on the ROR Console. See the table below for the settings items can be set by "Setup Wizard" on the ROR Console.

For details of "Setup Wizard", refer to "3.1 Setup Wizard" in the "User's Guide for Infrastructure Administrators CE".

Stopping the manager

Stop the manager.
Refer to "2.1 Starting and Stopping Managers" for information on how to stop the manager.

Tenant Management Settings

The procedure for changing the setting of the tenant management is as follows.

1. Open the following file.

   [Windows Manager]

   ```
   Installation_folder\RCXCTMG\SecurityManagement\conf\portal.properties
   ```

   [Linux Manager]

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

2. The following information must be modified:

Setting item	Settings	
visible.tenantuser	Setting for infrastructure administrators operation	Specify "on" if both tenant administrators and tenant users are to be displayed in the user list for the tenant management, and specify "off" if only tenant administrators are to be displayed. The initial value is "on". If "off" has been specified, the tenant users will not be displayed in the User List window of the tenant management.
provisional.account (*)	Setting for tenant administrator operation	Specify "on" if a provisional account of a tenant user is to be created when the tenant management is to be used to register the tenant user, and specify "off" if the tenant user is to be registered directly. The initial value is "on". If "off" has been specified, the window for directly registering a tenant user will be displayed when registering a tenant user.
allowUpdate (*)		Specify "on" if the tenant management is to be performed, and specify "off" if it is not to be performed. The initial value is "off". If "off" has been specified, the Tenant tab will not be displayed on the ROR Console.
setPassword.tenantadmin.mailwithpasswd		When setting the user's password in tenant management, configure the settings to "on" to include the new password in the body of the password change notification email, or to "off" when not including the password in the email. The default value is set to "on". A new password will be included in the body of the password change notification email in the event that this value is omitted and/or the key is undefined.
leftMenu.modifyUser.admin.visible		Specify "on" if changing user account is to be performed using the account management, and specify "off" if it is not to be performed. The initial value is "on". If "off" has been specified, the Change user account button will not be displayed in the Account window of the account management.
leftMenu.changePassword.admin.visible		Specify "on" if changing user password is to be performed using the account management, and specify "off" if it is not to be performed. The initial value is "on". If "off" has been specified, the Change user password button will not be displayed in the Account window of the account management.
leftMenu.modifyUser.user.visible	Setting for tenant user operation	Specify "on" if changing user account is to be performed using the account management, and specify "off" if it is not to be performed. The initial value is "on".

Setting item		Settings
		If "off" has been specified, the Change user account button will not be displayed in the Account window of the account management.
leftMenu.changePassword.user.visible		Specify "on" if changing user password is to be performed using the account management, and specify "off" if it is not to be performed. The initial value is "on". If "off" has been specified, the Change user password button will not be displayed in the Account window of the account management.

* note : this can be set by "Setup Wizard" on the ROR Console.

A setting example is shown below.
If the line in red font below is missing, please add it.

```
    ... omitted
allowUpdate = on
setPassword.tenantadmin.mailwithpasswd=off
    ... omitted
leftMenu.modifyUser.admin.visible=on
leftMenu.changePassword.admin.visible=on
leftMenu.modifyUser.user.visible=on
leftMenu.changePassword.user.visible=on

visible.tenantuser=on
provisional.acount=on
```

3. Open the following directory service operation definition file.

[Windows Manager]

```
Installation_folder\SVROR\Manager\etc\customize_data\ldap_attr.rcxprop
```

[Linux Manager]

```
/etc/opt/FJSVrcvmr/customize_data/ldap_attr.rcxprop
```

4. The following information must be modified:

Setting item		Settings
directory_service (*)	Setting for infrastructure administrators, tenant administrator, and tenant user operation	Specify "true" if user registration to directory service can be performed and password modification is to be allowed when the tenant management is to be used to register a user, and specify "false" if no user registration to directory service is to be performed and no password modification is to be allowed. The initial value is "true". If "false" has been specified, the Set password button will not be displayed in the User List window of the tenant management. In addition, the Change user password button will not be displayed in the Account window of the account management. Note that, if "false" is specified, users must already be registered in the directory service. Perform user registration according to the directory service to be used.

* note : this can be set by "Setup Wizard" on the ROR Console.

Edit only the "directory_service" line in the definition file.

A setting example is shown below.

```
directory_service=true
```

Starting the manager

Start the manager.

Refer to "2.1 Starting and Stopping Managers" for information on how to start the manager.

8.6.2 Editing the User Agreement when Registering a User

Refer to "18.13 Editing the User Agreement when Registering a User" in the "Setup Guide CE" for information on how to edit the agreement displayed in the "Registering Users" window when new tenant users perform the registration procedure.

8.7 Accounting Settings

This section explains how to modify the accounting settings.

8.7.1 Display Function Settings for Estimated Price

Usage fee (the estimated price) for the L-Platform template can be displayed in the L-Platform Management window based on L-Platform template accounting information.

This section describes how to modify settings according to whether usage fee (the estimated price) for the L-Platform template will be displayed.

P Point

. . . .

Display Function Settings for Estimated Price can be set by "Setup Wizard" on the ROR Console. See the table below for the settings items can be set by "Setup Wizard" on the ROR Console.

For details of "Setup Wizard", refer to "3.1 Setup Wizard" in the "User's Guide for Infrastructure Administrators CE".

. . . .

Procedures to modify the settings are as follows:

1. Open the following file.

   [Windows Manager]

   ```
   Installation_folder\RCXCFMG\config\vsys_config.xml
   ```

   [Linux Manager]

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

2. The following information must be modified:

Key	Description	Default value
use-charge (*)	Specifies whether usage fee (the estimated price) for the L-Platform template will be displayed. - yes: Display - no: Do not display	no

   * note: this can be set by "Setup Wizard" on the ROR Console.

   A setting example is shown below.

   ```xml
   <?xml version="1.0" encoding="UTF-8"?>
   <!DOCTYPE properties SYSTEM "http://java.sun.com/dtd/properties.dtd">
   <properties>
       ... omitted
       <entry key="use-charge">yes</entry>
   ```

```
    <entry key="charge-host">localhost</entry>
    <entry key="charge-port">3550</entry>
    <entry key="charge-uri">/resource/ver1.0</entry>
    ... omitted
</properties>
```

3. Open the following file.

[Windows Manager]

```
Installation_folder\RCXCTMG\MyPortal\config\custom_config.xml
```

[Linux Manager]

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

4. The following information must be modified:

Key	Description	Default value

estimation-mode (*1)	Specifies whether usage fee (the estimated price) for the L-Platform template will be displayed.
	
	  - 3: Display
	
	  - 0: Do not display
	
	Set to "3" if **use-charge** in vsys_config.xml is set to "yes", or to "0" if **use-charge** is set to "no".
		0

compatible-estimation (*2)	When overcommit is enabled, specify whether to calculate usage fee (the estimated price) using the operating value or the reserved value.
	
	  - true: Calculate using operating value (CPU performance and/or memory capacity)
	
	  - false: Calculate using reserved value (reserved CPU performance and/or reserved memory capacity)
		false

*1 : this can be set by "Setup Wizard" on the ROR Console.

*2 : These settings are only valid when the overcommit function is enabled. Refer to "18.6 Settings for the Overcommit Function" in the "Setup Guide CE" for further details.

Note also that these settings are only valid when either VMware or Hyper-V is used as the server virtualization software. If any other server virtualization software e is used, the usage fee (the estimated price) will be calculated using the operating value regardless of whether or not overcommit is enabled or disabled.

A setting example is shown below.

```
<?xml version="1.0" encoding="UTF-8"?>
<properties>
    <entry key="estimation-mode">3</entry>
    <entry key="compatible-estimation">true</entry>
    ... omitted
</properties>
```

5. Restart the manager.

Refer to "2.1 Starting and Stopping Managers" for information on how to restart the manager.

8.7.2 Currency Information Settings

Currency information can be changed.
Currency information defined by ISO 4217 currency codes can be used. Default setting is USD ($).

The currency that can be used is shown below.

Currency code	Currency	Currency sign	Number of decimal places
USD	United States Dollar	$	2
JPY	Japanese Yen	¥	0
EUR	Euro	EUR	2
SGD	Singapore dollar	S$	2

To change the currency information, perform the following procedure:

1. Stop the manager.
   Refer to "2.1 Starting and Stopping Managers" for information on how to stop the manager.

2. Execute the Change currency information setting command to change the currency information.
   Refer to "11.3 currencyset (Change Currency Information Setting)" in the "Reference Guide (Command/XML) CE" for information on how to use the Change currency information setting command.

3. Start the manager.
   Refer to "2.1 Starting and Stopping Managers" for information on how to start the manager.

Note

....

Determine the currency used when installing the system.
Do not change the currency information once the operation starts.

....

Point

....

Number of decimal places

The maximum number of decimal places that can be used when displaying estimated charges or calculating the usage charge is the number of decimal places of the set currency unit. The unit of the unit price to be specified in the accounting information file depends on the number of decimal places of the set currency unit.
Refer to "15.2.2 Accounting Information File Format" for information on the accounting information file.

....

8.7.3 Metering Log Settings

This section explains how to change the metering log operational settings.

Follow the steps below to change the metering log operational settings.

1. Open the following operational settings file for metering logs:

   [Windows Manager]

   ```
   Installation_folder\RCXCTMG\Charging\conf\metering_log.properties
   ```

   [Linux Manager]

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

2. Change the relevant items in the operational settings file for metering logs:

Key	Description	Default value
retention_period	Retention period of log entries Logs will be deleted once their retention period has passed. Use the following format to specify the retention period: YYYY-MM-DD	0000-03-00

Key	Description	Default value
	Example: 0000-03-00: Retain logs for 3 months. 0005-00-00: Retain logs for 5 years.	
periodic_log_use (*1)	Specify whether or not to use the periodic log function: - yes: Use - no: Do not use	yes
periodic_log_schedule_time (*1)	Output time of periodic log Use the following format to specify the output time: HH:mm	00:00
periodic_log_schedule_type (*1)	Output frequency of periodic log Specify one of the following strings: - DAILY: Every day - WEEKLY: Every week - MONTHLY: Every month	DAILY

periodic_log_schedule_day
(*1)
	Output day of periodic log
	
	If periodic_log_schedule_type is WEEKLY or MONTHLY, this item is mandatory.(*2)
	
	- If periodic_log_schedule_type is WEEKLY:
	Use the following strings to specify the day of the week:
	
	  - MON
	
	  - TUE
	
	  - WED
	
	  - THU
	
	  - FRI
	
	  - SAT
	
	  - SUN
	
	Commas can be used as delimiters to specify a number of days of the week.
	
	- If periodic_log_schedule_type is MONTHLY:
	Use one of the following methods to specify a date:
	
	  - Numerics from 1 to 28 indicating the date
	
	  - LASTDAY string indicating the last day of the month
	
	A number of days cannot be specified with this method.
		No specification

*1: Changes to this setting are enabled by executing the Change periodic log schedule settings command after changing the settings file.

*2: If periodic_log_schedule_type is DAILY, the periodic_log_schedule_day value will be ignored.

An example of setting the operational settings file is shown below:

```
# delete setting of meteringlog database
# YYYY-MM-DD
# ex. 3 months ago     0000-03-00

retention_period=0000-03-00
```

```
# schedule of periodlog insert

periodic_log_use=yes

periodic_log_schedule_time=00:00

periodic_log_schedule_type=DAILY

periodic_log_schedule_day=
```

3. If an item other than retention_period has been changed, execute the Change periodic log schedule settings command.
   Refer to "11.1 ctchg_chgschedule (Change Periodic Log Schedule Settings)" in the "Reference Guide (Command/XML) CE" for information on the Change periodic log schedule settings command.

📙 **Note**

. . . .

Points to note when using the usage charge calculator

- Specify either the default value (3 months) or a period longer than the default value for retention_period.

- Do not change the values for the following keys from the default:

    - periodic_log_use

    - periodic_log_schedule_time

    - periodic_log_schedule_type

    - periodic_log_schedule_day

. . . .

8.7.4 Usage Charge Calculator Settings

This section describes how to change the settings for the usage charge calculator function.

The procedure for changing the settings is as follows:

1. Open the following operating environment file:

   [Windows Manager]

   ```
   Installation_folder\RCXCTMG\Charging\conf\accounting.properties
   ```

   [Linux Manager]

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

2. Set the following items in the operating environment file:

Key	Description	Default value
accounting.use (*)	Specify whether to use the usage charge calculator. - yes: Use the usage charge calculator. - no: Do not use the usage charge calculator.	no
gui.cutoffdate (*)	Specify the default for the cut-off date displayed in the tenant management window of the ROR console. Specify a value between 1 and 31. In cases where the specified date does not exist, the cut-off date will be the end of the month. For example, if 31 is specified, but the month only contains 30 days, then the 30th will be the cut-off date.	31

Key	Description	Default value
gui.sendmailaddress (*)	Specify the default for the address to send the usage fee displayed in the tenant management window of the ROR console.	None
usedtime.metering.cpu.perf.vserver	When overcommit is enabled, specify whether to calculate the CPU clock of the virtual server using CPU performance or CPU reserve performance. - cpu_perf: Calculate with CPU performance - cpu_reserve: Calculate with CPU reserve performance	cpu_reserve
usedtime.metering.memory.vserver	When overcommit is enabled, specify whether to calculate the memory usage of the virtual server using memory or memory reserve. - memory_size: Calculate with memory - memory_reserve: Calculate with memory reserve	memory_reserve

* note: This can be set by "Setup Wizard" on the ROR Console.

An example is shown below:

```
accounting.use = yes
... omitted
gui.cutoffdate = 20
gui.sendmailaddress = example@xxx.com
... omitted
usedtime.metering.cpu.perf.vserver = cpu_reserve
usedtime.metering.memory.vserver = memory_reserve
... omitted
```

3. Restart the Manager.

   Refer to "2.1 Starting and Stopping Managers" for information on how to restart the manager.

8.8 System Condition Server List Settings

This section explains how to change the System Condition Server List settings.

If the L-Platform Management overcommit function is enabled, the CPU and memory settings displayed in the System Condition Server List can be changed. Refer to "18.6 Settings for the Overcommit Function" in the "Setup Guide CE" for information on the L-Platform Management overcommit function settings.

Note

If the overcommit function is used, the settings must match those of the L-Platform Management overcommit function.

Point

System Condition Server List Setting can be set by "Setup Wizard" on the ROR Console.

For details of "Setup Wizard", refer to "3.1 Setup Wizard" in the "User's Guide for Infrastructure Administrators CE".

Use the procedure below to change the System Condition Server List settings.

1. Open the following file:

   [Windows Manager]

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

   [Linux Manager]

   ```
   /opt/FJSVcmdbm/CMDBConsole/WEB-INF/classes/viewlist_en.xml
   ```

2. Set the following items:

Settings item	Explanation
serverByOrg_ROR.bottom.column.11.isEnable	Set "true" to display the CPU Reserve Clock Rate. Set "false" to hide it. The default value is "false".
serverByOrg_ROR.bottom.column.14.isEnable	Set "true" to display the Memory Reserve Size. Set "false" to hide it. The default value is "false".

   A settings example is shown below.

   ```
   <?xml version="1.0" encoding="UTF-8"?>
   <properties>
       ... omitted
   <entry key="serverByOrg_ROR.bottom.column.11.isEnable">false</entry>
   <entry key="serverByOrg_ROR.bottom.column.11.label">Reserved CPU clock speed(GHz)</entry>
   <entry key="serverByOrg_ROR.bottom.column.11.path">/cmdb:item/cmdb:record[@type='observed']/
   rc:LogicalServer/@reservedCPUClock</entry>
   <entry key="serverByOrg_ROR.bottom.column.11.width">135</entry>
       ... omitted
   <entry key="serverByOrg_ROR.bottom.column.14.isEnable">false</entry>
   <entry key="serverByOrg_ROR.bottom.column.14.label">Reserved memory size(GB)</entry>
   <entry key="serverByOrg_ROR.bottom.column.14.path">/cmdb:item/cmdb:record[@type='observed']/
   rc:LogicalServer/@reservedMemorySize</entry>
   <entry key="serverByOrg_ROR.bottom.column.14.width">140</entry>
       ... omitted
   </properties>
   ```

📌 Note

- If the L-Platform Management overcommit function is disabled, when the viewlist_en.xml overcommit setting is enabled, the CPU Reserve Clock Rate and the Memory Reserve Size columns are displayed but the values are not displayed.

- When editing the viewlist_en.xml file, do not change any settings items other than serverByOrg_ROR.bottom.column.11.isEnable and serverByOrg_ROR.bottom.column.14.isEnable.

- Save the viewlist_en.xml file before you edit the file. If any settings other than serverByOrg_ROR.bottom.column.11.isEnable and serverByOrg_ROR.bottom.column.14.isEnable are changed, restore the saved file.

8.9 Settings for Event Log Output for CMDB Agent

This section explains how to change the settings that determine whether the start/end messages for CMDB agent information collection are output to event logs.

Use the following procedure to change the settings that determine whether to prevent start/end messages from being output to event logs or not.

1. Open the following files

   [Windows Manager]

```
Installation_folder\SWRBAM\CMDB\FJSVcmdbm\axis2\WEB-INF\services\mdr_cfmg\cmdb.properties
Installation_folder\SWRBAM\CMDB\FJSVcmdbm\axis2\WEB-INF\services\mdr_ror\cmdb.properties
```

[Linux Manager]

```
/opt/FJSVcmdbm/axis2/WEB-INF/services/mdr_cfmg/cmdb.properties
/opt/FJSVcmdbm/axis2/WEB-INF/services/mdr_ror/cmdb.properties
```

2. Set the following items:

   - schedule.syslog.disable

   Change the value above. A modification example is shown below. Change the part in italics.
   Set this item to "true" to prevent start/update messages from being output to event logs, or "false" otherwise.

   ```
   schedule.syslog.disable=true
   ```

3. Restart the CMDB.

   Open a command prompt and execute the following commands:

   [Windows Manager]

   ```
   Installation_folder\SWRBAM\CMDB\FJSVcmdbm\bin\cmdbstop
   Installation_folder\SWRBAM\CMDB\FJSVcmdbm\bin\cmdbstart
   ```

   [Linux Manager]

   ```
   /opt/FJSVcmdbm/bin/cmdbstop.sh
   /opt/FJSVcmdbm/bin/cmdbstart.sh
   ```

8.10 Reconfiguring Single Sign-On

This section explains how to reconfigure Single Sign-On.

8.10.1 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.

8.10.1.1 Confirming Certificates

Execute the keytool command and Resource Orchestrator command, and check if the CA certificate has been imported correctly.

1. Check the content of the CA certificate (keystore) of ServerView Operations Manager.

   Specify the password of a keystore of ServerView Operations Manager as the password of a keystore. Refer to the following manual for the password of a keystore of ServerView Operations Manager.

   The CA certificate (keystore) of ServerView Operations Manager is stored in the following location:

   - ServerView Operations Manager V6.1 or later

     [Windows]
     ServerView Suite_Installation_folder\jboss\standalone\svconf\pki\cacerts

     [Linux]
     /opt/fujitsu/ServerViewSuite/jboss/standalone/svconf/pki/cacerts

   - Versions Earlier Than ServerView Operations Manager V6.1

     [Windows]
     ServerView Suite_Installation_folder\jboss\server\serverview\conf\pki\cacerts

[Linux]
/opt/fujitsu/ServerViewSuite/jboss/server/serverview/conf/pki/cacerts

📝 Example
・・

[Windows Manager]

```
>C:\Fujitsu\ROR\SVROR\Manager\runtime\jre6\bin\keytool.exe -list -keystore "C:\Program Files\Fujitsu
\ServerView Suite\jboss\server\serverview\conf\pki\cacerts" <RETURN>
Enter keystore password:

Keystore type: JKS
Keystore provider: SUN

Your keystore contains 1 entry

svs_cms, 2011/10/01, trustedCertEntry,
Certificate fingerprints (MD5): 02:68:56:4C:33:AF:55:34:87:CA:51:FD:BF:66:47:06
```

[Linux Manager]

```
# /opt/FJSVrcvmr/runtime/jre6/bin/keytool -list -keystore /opt/fujitsu/ServerViewSuite/jboss/server/
serverview/conf/pki/cacerts <RETURN>
Enter keystore password:

Keystore type: JKS
Keystore provider: SUN

Your keystore contains 1 entry

svs_cms, 2011/10/01, trustedCertEntry,
Certificate fingerprints (MD5): 02:68:56:4C:33:AF:55:34:87:CA:51:FD:BF:66:47:06
```

・・

2. Check whether the CA certificate of ServerView Operations Manager is imported correctly into the keystore of this product.

   a. Execute the following command:

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

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

   b. 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 "8.10.1.2 Registering Certificates".

   Even if the alias of the certificate of importing by "3.3 importing a Certificate to ServerView SSO Authentication Server" of "Setup Guide CE" or test certificate registered when the manager sets it up is displayed, it is not necessary to register in the keystore of Resource Orchestrator.

   c. Execute the keytool command.

   For the -alias option, specify the "alias" displayed in step b.
   When multiple aliases are displayed as a result of step b, check each of the displayed aliases.

The password for the keystore of Resource Orchestrator is set to "changeit" by default.

Check whether the fingerprints of the certificates displayed in step b and the fingerprints of the certificates displayed in Resource orchestrator match.

📖 Example
・・・

[Windows Manager]

```
>C:\Fujitsu\ROR\SVROR\Manager\runtime\jre6\bin\keytool.exe -list -alias Another_name -keystore "C:
\Fujitsu\ROR\IAPS\JDK6\jre\lib\security\cacerts" <RETURN>
Enter keystore password: changeit
svs_cms, 2012/04/10, trustedCertEntry,
Certificate fingerprints (MD5): 02:68:56:4C:33:AF:55:34:87:CA:51:FD:BF:66:47:06

>C:\Fujitsu\ROR\SVROR\Manager\runtime\jre6\bin\keytool.exe -list -alias Another_name -keystore "C:
\Fujitsu\ROR\SWRBAM\etc\config\ssl\IJINibpmsv\cacerts.jks" <RETURN>
Enter keystore password: changeit
svs_cms, 2012/04/10, trustedCertEntry,
Certificate fingerprints (MD5): 02:68:56:4C:33:AF:55:34:87:CA:51:FD:BF:66:47:06

>C:\Fujitsu\ROR\SVROR\Manager\runtime\jre6\bin\keytool.exe -list -alias Another_name -keystore "C:
\Fujitsu\ROR\SWRBAM\etc\config\ssl\IJINibpmsv\keystore.jks" <RETURN>
Enter keystore password: changeit
svs_cms, 2012/04/10, trustedCertEntry,
Certificate fingerprints (MD5): 02:68:56:4C:33:AF:55:34:87:CA:51:FD:BF:66:47:06
```

[Linux Manager]

```
# /opt/FJSVrcvmr/runtime/jre6/bin/keytool -list -alias Another_name -keystore /opt/FJSVawjbk/
jdk5/jre/lib/security/cacerts <RETURN>
Enter keystore password: changeit
svs_cms, 2012/04/10, trustedCertEntry,
Certificate fingerprints (MD5): 02:68:56:4C:33:AF:55:34:87:CA:51:FD:BF:66:47:06

# /opt/FJSVrcvmr/runtime/jre6/bin/keytool -list -alias Another_name -keystore /opt/FJSVawjbk/
jdk6/jre/lib/security/cacerts <RETURN>
Enter keystore password: changeit
svs_cms, 2012/04/10, trustedCertEntry,
Certificate fingerprints (MD5): 02:68:56:4C:33:AF:55:34:87:CA:51:FD:BF:66:47:06

# /opt/FJSVrcvmr/runtime/jre6/bin/keytool -list -alias Another_name -keystore /etc/opt/FJSVswrbam/
config/ssl/IJINibpmsv/cacerts.jks <RETURN>
Enter keystore password: changeit
svs_cms, 2012/04/10, trustedCertEntry,
Certificate fingerprints (MD5): 02:68:56:4C:33:AF:55:34:87:CA:51:FD:BF:66:47:06

# /opt/FJSVrcvmr/runtime/jre6/bin/keytool -list -alias Another_name -keystore /etc/opt/FJSVswrbam/
config/ssl/IJINibpmsv/keystore.jks <RETURN>
Enter keystore password: changeit
svs_cms, 2012/04/10, trustedCertEntry,
Certificate fingerprints (MD5): 02:68:56:4C:33:AF:55:34:87:CA:51:FD:BF:66:47:06
```

・・・

When the information on the CA certificate is not displayed, or when the fingerprints of credentials are not in agreement, that means that registration of the CA certificate has failed. In this case, register the CA certificate referring to "8.10.1.2 Registering Certificates".

8.10.1.2 Registering Certificates

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

1. Execute the following command:

   rcxadm authctl refreshcert -alias alias <RETURN>

   Specify the alias of the certificate displayed by performing "8.10.1.1 Confirming Certificates" as *alias*.

   When importing two or more certificates to Resource Orchestrator, repeat this procedure for each certificate.

   ### 🅿 Point
   ....
   If the root certificate has been registered in the CA certificate (keystore) of ServerView Operations Manager, import a root certificate to Resource Orchestrator.
   ....

2. Check the difference of the CA certificate.

   Perform "8.10.1.1 Confirming Certificates", and check that the updated certificate is not displayed.

3. Copy the keystore of Resource Orchestrator.

   [Windows Manager]

   - Files to Copy

     Installation_folder\IAPS\JDK6\jre\lib\security\cacerts

   - Copy Destination

     Installation_folder\IAPS\JDK6\jre\lib\security\cacerts.org

   - Files to Copy

     Installation_folder\SWRBAM\etc\config\ssl\IJINibpmsv\cacerts.jks

   - Copy Destination

     Installation_folder\SWRBAM\etc\config\ssl\IJINibpmsv\cacerts.org

   - Files to Copy

     Installation_folder\SWRBAM\etc\config\ssl\IJINibpmsv\keystore.jks

   - Copy Destination

     Installation_folder\SWRBAM\etc\config\ssl\IJINibpmsv\keystore.org

   [Linux Manager]

   - Files to Copy

     /opt/FJSVawjbk/jdk5/jre/lib/security/cacerts

   - Copy Destination

     /opt/FJSVawjbk/jdk5/jre/lib/security/cacerts.org

   - Files to Copy

     /opt/FJSVawjbk/jdk6/jre/lib/security/cacerts

- Copy Destination

  /opt/FJSVawjbk/jdk6/jre/lib/security/cacerts.org

- Files to Copy

  /etc/opt/FJSVswrbam/config/ssl/IJINibpmsv/cacerts.jks

- Copy Destination

  /etc/opt/FJSVswrbam/config/ssl/IJINibpmsv/cacerts.org

- Files to Copy

  /etc/opt/FJSVswrbam/config/ssl/IJINibpmsv/keystore.jks

- Copy Destination

  /etc/opt/FJSVswrbam/config/ssl/IJINibpmsv/keystore.org

🔔 Note

Ensure that the keystore of Resource Orchestrator is copied, as it will be necessary when changing the directory service.

4. Copy the CA Certificate (keystore) of ServerView Operations Manager to the keystore of Resource Orchestrator.

   The CA certificate (keystore) of ServerView Operations Manager is stored in the following location:

   - ServerView Operations Manager V6.1 or later

     [Windows]
     ServerView Suite_Installation_folder\jboss\standalone\svconf\pki\cacerts

     [Linux]
     /opt/fujitsu/ServerViewSuite/jboss/standalone/svconf/pki/cacerts

   - Versions Earlier Than ServerView Operations Manager V6.1

     [Windows]
     ServerView Suite_Installation_folder\jboss\server\serverview\conf\pki\cacerts

     [Linux]
     /opt/fujitsu/ServerViewSuite/jboss/server/serverview/conf/pki/cacerts

🖼 Example

[Windows Manager]

```
>C:\Fujitsu\ROR\SVROR\Manager\runtime\jre6\bin\keytool.exe -importkeystore -srckeystore "C:\Program Files
\Fujitsu\ServerView Suite\jboss\server\serverview\conf\pki\cacerts" -destkeystore "C:\Fujitsu\ROR\IAPS\JDK6\jre\lib
\security\cacerts"<RETURN>

>C:\Fujitsu\ROR\SVROR\Manager\runtime\jre6\bin\keytool.exe -importkeystore -srckeystore "C:\Program Files
\Fujitsu\ServerView Suite\jboss\server\serverview\conf\pki\cacerts" -destkeystore "C:\Fujitsu\ROR\SWRBAM\etc
\config\ssl\IJINibpmsv\cacerts.jks"<RETURN>

>C:\Fujitsu\ROR\SVROR\Manager\runtime\jre6\bin\keytool.exe -importkeystore -srckeystore "C:\Program Files
\Fujitsu\ServerView Suite\jboss\server\serverview\conf\pki\cacerts" -destkeystore "C:\Fujitsu\ROR\SWRBAM\etc
\config\ssl\IJINibpmsv\keystore.jks"<RETURN>
```

[Linux Manager]

```
# /opt/FJSVrcvmr/runtime/jre6/bin/keytool -importkeystore -srckeystore /opt/fujitsu/ServerViewSuite/jboss/server/
serverview/conf/pki/cacerts -destkeystore /opt/FJSVawjbk/jdk5/jre/lib/security/cacerts<RETURN>

# /opt/FJSVrcvmr/runtime/jre6/bin/keytool -importkeystore -srckeystore /opt/fujitsu/ServerViewSuite/jboss/server/
serverview/conf/pki/cacerts -destkeystore /opt/FJSVawjbk/jdk6/jre/lib/security/cacerts<RETURN>

# /opt/FJSVrcvmr/runtime/jre6/bin/keytool -importkeystore -srckeystore /opt/fujitsu/ServerViewSuite/jboss/server/
serverview/conf/pki/cacerts -destkeystore /etc/opt/FJSVswrbam/config/ssl/IJINibpmsv/cacerts.jks<RETURN>

# /opt/FJSVrcvmr/runtime/jre6/bin/keytool -importkeystore -srckeystore /opt/fujitsu/ServerViewSuite/jboss/server/
serverview/conf/pki/cacerts -destkeystore /etc/opt/FJSVswrbam/config/ssl/IJINibpmsv/keystore.jks<RETURN>
```

After executing the command, enter the password.
The password for the keystore of Resource Orchestrator is set to "changeit" by default.

5. The following messages will be displayed when import is successfully completed.

   Check the "*Another name*" section.

```
Enter destination keystore password: changeit
Enter source keystore password: changeit
Entry for Another name successfully imported.
Import command completed: 1 entries successfully imported. 0 entries failed or cancelled.
```

   If it fails in importing, do importing again after the alias is deleted by using the keytool command.

📋 Example

[Windows Manager]

```
>C:\Fujitsu\ROR\SVROR\Manager\runtime\jre6\bin\keytool.exe -delete -alias svs_cms -keystore "C:
\Fujitsu\ROR\SWRBAM\etc\config\ssl\IJINibpmsv\keystore.jks"<RETURN>
```

[Linux Manager]

```
# /opt/FJSVrcvmr/runtime/jre6/bin/keytool -delete -alias svs_cms -keystore /etc/opt/FJSVswrbam/
config/ssl/IJINibpmsv/keystore.jks<RETURN>
```

6. Execute the keytool command, and check if the CA certificate has been correctly imported.

   Perform the Procedure of "8.10.1.1 Confirming Certificates" and check whether the CA certificates have been imported correctly.

7. Import the server certificate to ServerView Operations Manager. For details, refer to "3.3 Importing a Certificate to ServerView SSO Authentication Server" in the "Setup Guide CE".

8.10.1.3 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
auth: serverview
```

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. Configure the correct information.

      - When using Active Directory or ServerView Operations Manager V5.5 or later

        Execute the rcxadm authctl sync command and change the directory service connection information.

      - When using OpenDS provided with ServerView Operations Manager V5.3

        Execute the rcxadm authctl modify command and change the directory service connection information.

      ### 📋 Example

      ┄┄

      ```
      >rcxadm authctl modify -bind "cn=Directory Manager" -passwd admin
      ```

      ┄┄

      Specify the password for the directory server administrator as a passwd option. The OpenDS Directory Manager's predefined password is "admin".

   c. Start the manager.

For details on the rcxadm authctl command, refer to "5.4 rcxadm authctl" in the "Reference Guide (Command/XML) CE".

8.10.2 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 "8.10.1.1 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 "8.10.1.2 Registering Certificates" and register a certificate.

4. Change the directory service connection information.

   - When using Active Directory or ServerView Operations Manager V5.5 or later

     Execute the rcxadm authctl sync command and change the directory service connection information.

- When using OpenDS provided with ServerView Operations Manager V5.3

  Execute the rcxadm authctl modify command and change the directory service connection information.

  ### 📑 Example

  ・・・

  ```
  >rcxadm authctl modify -bind "cn=Directory Manager" -passwd admin
  ```

  ・・・

  Specify the password for the directory server administrator as a passwd option. The OpenDS Directory Manager's predefined password is "admin".

  For details on the rcxadm authctl command, refer to "5.4 rcxadm authctl" in the "Reference Guide (Command/XML) CE".

If the directory service is OpenDS and the password of the user with administrator rights has been changed,perform the following procedure. It is not necessary if the directory service is Active Directory.

1. Stop the manager.

   Refer to "2.1 Starting and Stopping Managers" for information on how to stop the manager.

2. Issue the command shown below.

   Following the message requesting the user to modify is displayed, specify "3. LDAP administrator DN" and register the password.

   [Windows Manager]

   ```
   Installation_folder\SWRBAM\bin\swrba_regist_password
   ```

   [Linux Manager]

   ```
   /opt/FJSVswrbam/bin/swrba_regist_password
   ```

3. Start the manager.

   Refer to "2.1 Starting and Stopping Managers" for information on how to start the manager.

8.10.3 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 "8.10.1.2 Registering Certificates".

Part 3   Maintenance

Chapter 9 Hardware Maintenance

This chapter explains how to perform hardware maintenance.

9.1 Overview

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

Hardware Maintenance Flow

The flow of maintenance for hardware used to operate an L-Platform is shown below.

Figure 9.1 Flow of Maintenance for L-Platform Hardware
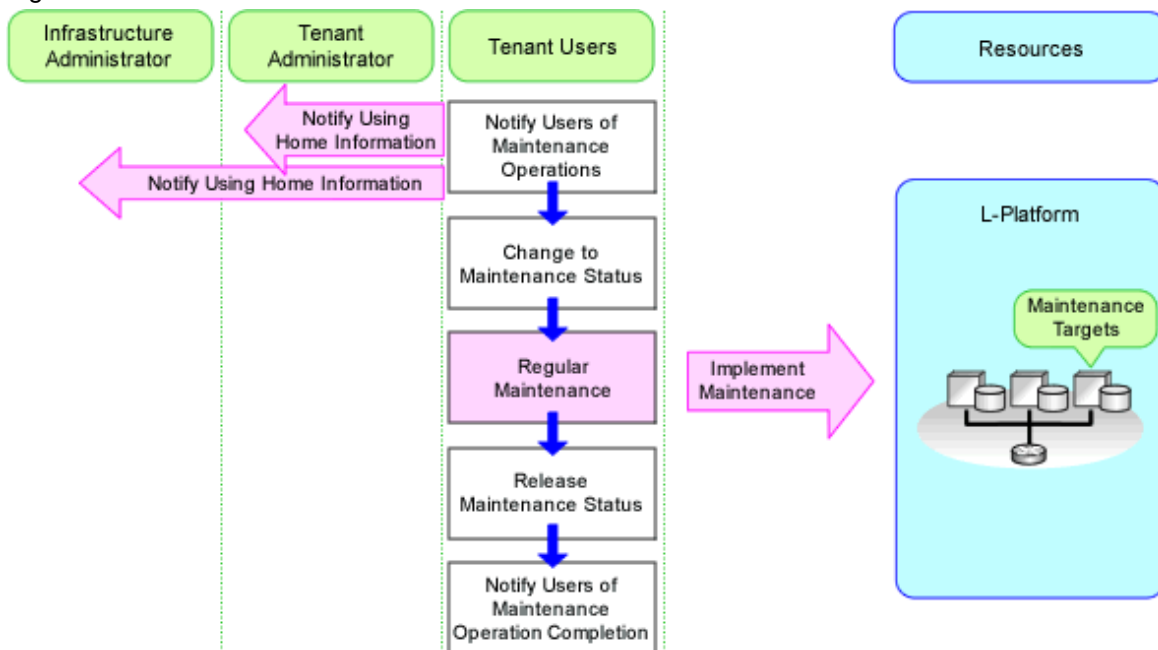
1. Notify Users of Maintenance Operations

   The infrastructure administrator managing hardware devices notifies the tenant administrator and the tenant users that manage or use L-Platforms running on the hardware which is the target of maintenance (regular maintenance or patch application) that maintenance operations will be implemented.

   As one method of notification, Resource Orchestrator provides the function which shows the information by displaying "Information" on the ROR console for tenant administrators or tenant users.

   For details, refer to "3.2 Editing the Home Messages" in the "User's Guide for Infrastructure Administrators CE".

2. Stop Managed Servers

   When using a physical L-Server, the tenant user must stop the managed server.

3. Change to Maintenance Status

   The infrastructure administrator places the resource of the maintenance target into maintenance mode.

   - When the maintenance target is a managed server

     - When using physical L-Servers

       The infrastructure administrator places the physical L-Server into maintenance mode.

       For details on maintenance mode, refer to "Appendix C Maintenance Mode" in the "User's Guide for Infrastructure Administrators (Resource Management) CE".

- For FUJITSU M10

  The infrastructure administrator places the managed servers into maintenance mode.

  Also place the managed servers into maintenance mode when reducing the capacity of the CPU on the system using the Capacity on Demand(CoD) function of FUJITSU M10.

  For details on maintenance mode, refer to "Appendix C Maintenance Mode" in the "User's Guide for Infrastructure Administrators (Resource Management) CE".

- When using a server for which spare servers are not configured

  When using a server for which spare servers are not configured, the infrastructure administrator places the managed server into maintenance mode.

  For details on maintenance mode, refer to "Appendix C Maintenance Mode" in the "User's Guide for Infrastructure Administrators (Resource Management) CE".

- When the maintenance target is a network device

  When the maintenance target is a network device, the infrastructure administrator places the relevant network device into maintenance mode, and excludes it from being the target of monitoring and auto-configuration.

  For details, refer to "22.1 Switchover of Maintenance Mode" in the "User's Guide for Infrastructure Administrators (Resource Management) CE".

4. Implement Regular Maintenance

The infrastructure administrator performs the maintenance operations such as regular maintenance or patch application.

For details on the maintenance of managed servers, refer to the following sections:

- "9.2 Blade Server Maintenance"

- "9.3 Maintenance for Servers Other Than Blade Servers"

- "9.4 For Servers not Using Server Management Software"

For details on the maintenance of network devices, refer to the following section:

- "9.5 Network Device Maintenance"

5. Release Maintenance Status

The infrastructure administrator releases the resource from maintenance mode.

- When the maintenance target is a managed server

  - When using physical L-Servers

    The infrastructure administrator releases the physical L-Servers from maintenance mode.

    For details on maintenance mode, refer to "Appendix C Maintenance Mode" in the "User's Guide for Infrastructure Administrators (Resource Management) CE".

  - For FUJITSU M10

    When replacing or adding server components, if the resources are targets of monitoring, ensure that the information has been updated from the ROR console and then release them from maintenance mode.

    When changing the CPU or memory, check the following:

    - The [Resource List] tab of the orchestration tree
    [CPU Capacity (Unused/Total)] and [Memory Capacity (Unused/Total)] of the [VM Host List]

    - The [Resource Details] tab of the orchestration tree
    [CPU Capacity] and [Memory Capacity] under the [VM Host List] and [Capacity]

    - The [Available Pool] tab of the orchestration tree
    [VM Host List], [CPU Capacity (Unused/Total)], and [Memory Capacity (Unused/Total)]

    The infrastructure administrator releases the managed servers from maintenance mode.

For details on maintenance mode, refer to "Appendix C Maintenance Mode" in the "User's Guide for Infrastructure Administrators (Resource Management) CE".

- When using a server for which spare servers are not configured

When using a server for which spare servers are not configured, the infrastructure administrator releases the managed server from maintenance mode.

For details on maintenance mode, refer to "Appendix C Maintenance Mode" in the "User's Guide for Infrastructure Administrators (Resource Management) CE".

- When the maintenance target is a network device

The infrastructure administrator adds the network device as the target of monitoring or auto-configuration by releasing it from maintenance mode.

For details, refer to "22.1 Switchover of Maintenance Mode" in the "User's Guide for Infrastructure Administrators (Resource Management) CE".

6. Notify Users of Maintenance Operation Completion

The infrastructure administrator notifies tenant administrators and tenant users that manage or use L-Platforms running on the hardware which was the target of maintenance that maintenance operations have been completed.

As one method of notification, Resource Orchestrator provides the function which shows the information by displaying "Information" on the ROR console for tenant administrators or tenant users.

For details, refer to "3.2 Editing the Home Messages" in the "User's Guide for Infrastructure Administrators CE".

Flow of Corrective Actions when Hardware Fails

The flow of corrective actions when hardware fails is as below.

Figure 9.2 Flow of Corrective Actions when Hardware on which an L-Platform Operates Fails
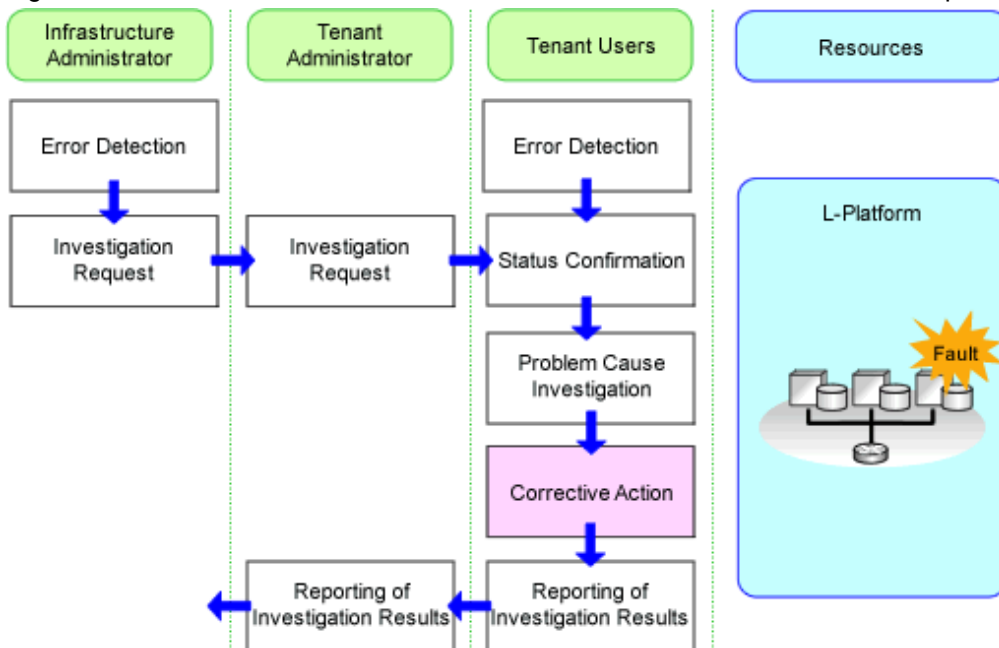
1. Error Detection

Errors are detected at the following timing:

- When operation errors are reported to the tenant user by the user of the application running on the L-Platform

- When hardware errors are detected by the infrastructure administrator or the infrastructure monitor

- When the status of L-Platform resources used on the ROR console change to something other than "normal"

2. Investigation Request

The tenant user requests investigation of the cause of the error by the tenant administrator, based on the information related to detected errors (error details, the name of the resource where the error occurred, the L-Platform name).

The tenant administrator requests investigation of the cause of the error by the infrastructure administrator, based on the information obtained from the tenant user.

3. Status Confirmation

The infrastructure administrator identifies the hardware to which resources are allocated using the obtained information, and confirms their status.

4. Problem Cause Investigation

The infrastructure administrator identifies the cause, by investigating the hardware on which the problem occurred.

5. Corrective Action

The infrastructure administrator takes corrective actions in order to resolve the problems with hardware.

6. Reporting of Investigation Results

The infrastructure administrator reports the results of the investigation, after completing corrective action.

Flow of Hardware Maintenance when a Server Fails

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

Figure 9.3 Flow of Hardware Maintenance when a Server Fails
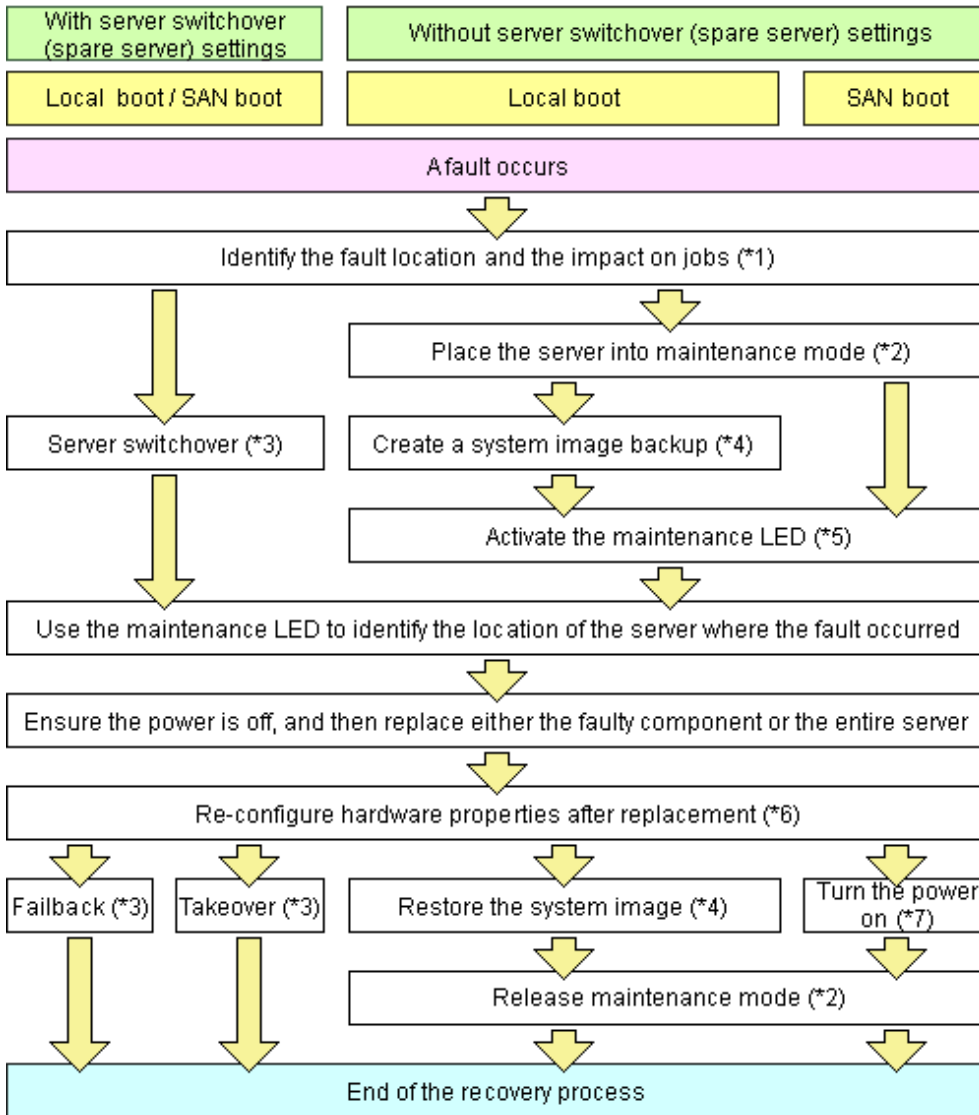
*1: For details on how to identify failures, refer to "11.3 Addressing Resource Failures".

*2: For details on how to configure and release the maintenance mode, refer to "Appendix C Maintenance Mode" in the "User's Guide for Infrastructure Administrators (Resource Management) CE".

*3: For details on server switchover, failback, and takeover, refer to "Chapter 4 Server Switchover" in the "Operation Guide VE".

*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 "9.2.1 Maintenance LED". Please note that maintenance LED operations are only supported for PRIMERGY BX servers.

*6: For details on reconfiguring hardware properties, refer to "9.3.1 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 "9.3.2 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 "9.3.3 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 "9.3.4 Replacing Non-server Hardware".

9.2 Blade Server Maintenance

This section explains the maintenance of blade servers.

9.2.1 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 for Infrastructure Administrators (Resource Management) CE".

🛈 Note
. . . .
- 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 "8.2 Configuring the Server Environment" in the "Design Guide CE".
. . . .

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.

9.2.2 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

- Ensure this operation is performed only after the replacement of one of the following: a server itself, the NIC used for either the admin or public LAN, or the HBA.
  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 9.1 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"

. . . .

9.2.3 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 server switchover, refer to "Chapter 4 Server Switchover" in the "Operation Guide VE".
       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 "8.2 Configuring the Server Environment" in the "Design Guide CE".
       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 "9.2.2 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 server switchover, refer to "4.3 Post-Switchover Operations" in the "Operation Guide VE".

- 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 for Infrastructure Administrators (Resource Management) CE".

    2. Place the Server into VM Maintenance Mode

       When the primary server is VM host, and the VM maintenance mode can be placed, 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 "9.2.1 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 "8.2 Configuring the Server Environment" in the "Design Guide CE".
       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 "9.2.2 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.
     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 for Infrastructure Administrators (Resource Management) CE".

- 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 "9.2.1 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 "8.2 Configuring the Server Environment" in the "Design Guide CE".
     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 "9.2.2 Reconfiguration of Hardware Properties".
     After hardware properties have been reconfigured, the maintenance LED is automatically turned off in the ROR console.

9.2.4 Replacing Server Components

For details on replace server components, refer to "9.3.3 Replacing and Adding Server Components".

9.2.5 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 for PRIMERGY BX900/BX400 LAN switch blades in IBP mode, Converged Fabric mode or 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.

![Note]

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 "5.4.4 Configuring VLANs on LAN Switch Blades" in the "User's Guide for Infrastructure Administrators (Resource Management) CE".
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.

📘 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".
. . . .

9.3 Maintenance for Servers Other Than Blade Servers

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

9.3.1 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.

📙 Note
. . . .
- Ensure this operation is performed only after the replacement of one of the following: a server itself, the NIC used for either the admin or public LAN.
  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.

- 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.

- 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 Server Replacement

- 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 properties for replaced hardware.

  1. Replace the system board or GSPB, and insert the server.

  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.

📓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"
. . . .

9.3.2 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.

. . . .

For Rack Mount and Tower Servers

- Replacing a Server Assigned with Spare Servers

  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 server switchover, refer to "Chapter 4 Server Switchover" in the "Operation Guide VE".
     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 "8.2 Configuring the Server Environment" in the "Design Guide CE".
     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 "9.3.1 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 server switchover, refer to "4.3 Post-Switchover Operations" in the "Operation Guide VE".

- 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 for Infrastructure Administrators (Resource Management) CE".

  2. Place the Server into VM Maintenance Mode

     When the primary server is VM host, and the VM maintenance mode can be placed, 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 "8.2 Configuring the Server Environment" in the "Design Guide CE".
   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 "9.3.1 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.
     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 for Infrastructure
   Administrators (Resource Management) CE".

- 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 "8.2 Configuring the Server Environment" in the "Design Guide CE".
     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 "9.3.1 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 server switchover, refer to "Chapter 4 Server Switchover" in the "Operation Guide VE".
    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 "8.2 Configuring the Server Environment" in the "Design Guide CE".
    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 server switchover, refer to "4.3 Post-Switchover Operations" in the "Operation Guide VE".

    ![Note icon] **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 server switchover, refer to "Chapter 4 Server Switchover" in the "Operation Guide VE".
    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 "8.2 Configuring the Server Environment" in the "Design Guide CE".
    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 server switchover, refer to "4.3 Post-Switchover Operations" in the "Operation Guide VE".

- 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 "8.2 Configuring the Server Environment" in the "Design Guide CE".
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 ESC users 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 ESC users guide.
When the target CA was not deleted in step 1, configure the target CA as a hyphen ("-").

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

No specific action is required in Resource Orchestrator.

For PRIMEQUEST Servers

- Replacing a Server Assigned with Spare Servers

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 server switchover, refer to "Chapter 4 Server Switchover" in the "Operation Guide VE".
The server is automatically powered off after switchover.

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 "8.2 Configuring the Server Environment" in the "Design Guide CE".
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 "9.3.1 Reconfiguration of Hardware Properties".

4. Perform Post-server Switchover Operations

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

- 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 for Infrastructure Administrators (Resource Management) CE".

  2. Place the Server into VM Maintenance Mode

     When the primary server is VM host, and the VM maintenance mode can be placed, 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 "8.2 Configuring the Server Environment" in the "Design Guide CE".
     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 "9.3.1 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 VM maintenance mode is set to the primary server, 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 for Infrastructure Administrators (Resource Management) CE".

- 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 "8.2 Configuring the Server Environment" in the "Design Guide CE".
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 "9.3.1 Reconfiguration of Hardware Properties".

9.3.3 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 "9.3.2 Replacing Servers".
For details, refer to "9.3.2 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 "9.3.2 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 temporally 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 CE".

[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 "9.3.2 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 CE".

- **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 "9.3.2 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.

  ### 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 "9.3.2 Replacing Servers".

- **Replacing an IO Board**

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

- **Replacing Other Server Components**

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

  [Solaris Zones]
  When replacing, adding, or removing a CPU, add the replaced, added, or removed CPU to the resource pool for Solaris Zones, or remove it depending on your environment.

  For details, refer to "C.7 Solaris Zones" in the "Setup Guide CE".

9.3.4 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".

9.4 For Servers not Using Server Management Software

This section explains how to maintain servers not using server management software.

When replacing an entire server, a CPU, or memory, if there are differences in the CPU or memory specifications before and after the replacement, reflect the new CPU and memory specifications of the replaced server in the definition file before reconfiguring hardware information.

- For Virtual L-Servers

  For details on definition files, refer to "C.1.4 Configuration when Creating a Virtual L-Server Using a Server which cannot Use ServerView Agents" in the "Setup Guide CE".

- For Physical L-Servers

  For details on definition files, refer to "B.1.6 Configuration when Creating a Physical L-Server without Specifying a Model Name in the L-Server Template" in the "Setup Guide CE".

In the following cases, reflect the correct value on the definition file before reconfiguring the hardware information.

- When defining the configuration information (CPU core count, CPU clock speed, memory capacity, etc.) of the target server after registering it with Resource Orchestrator

- When modifying the configuration information (CPU core count, CPU clock speed, memory capacity, etc.) of a server that has been registered with Resource Orchestrator, in the definition file

For details on reconfiguring hardware properties, refer to "9.3.1 Reconfiguration of Hardware Properties".

9.5 Network Device Maintenance

This section explains how to maintain network devices that are the target of management in Resource Orchestrator.

9.5.1 Replacement Procedure of Network Devices

This section explains the procedure to replace network devices when it becomes necessary due to failure.

Figure 9.4 Image of Network Device Replacement
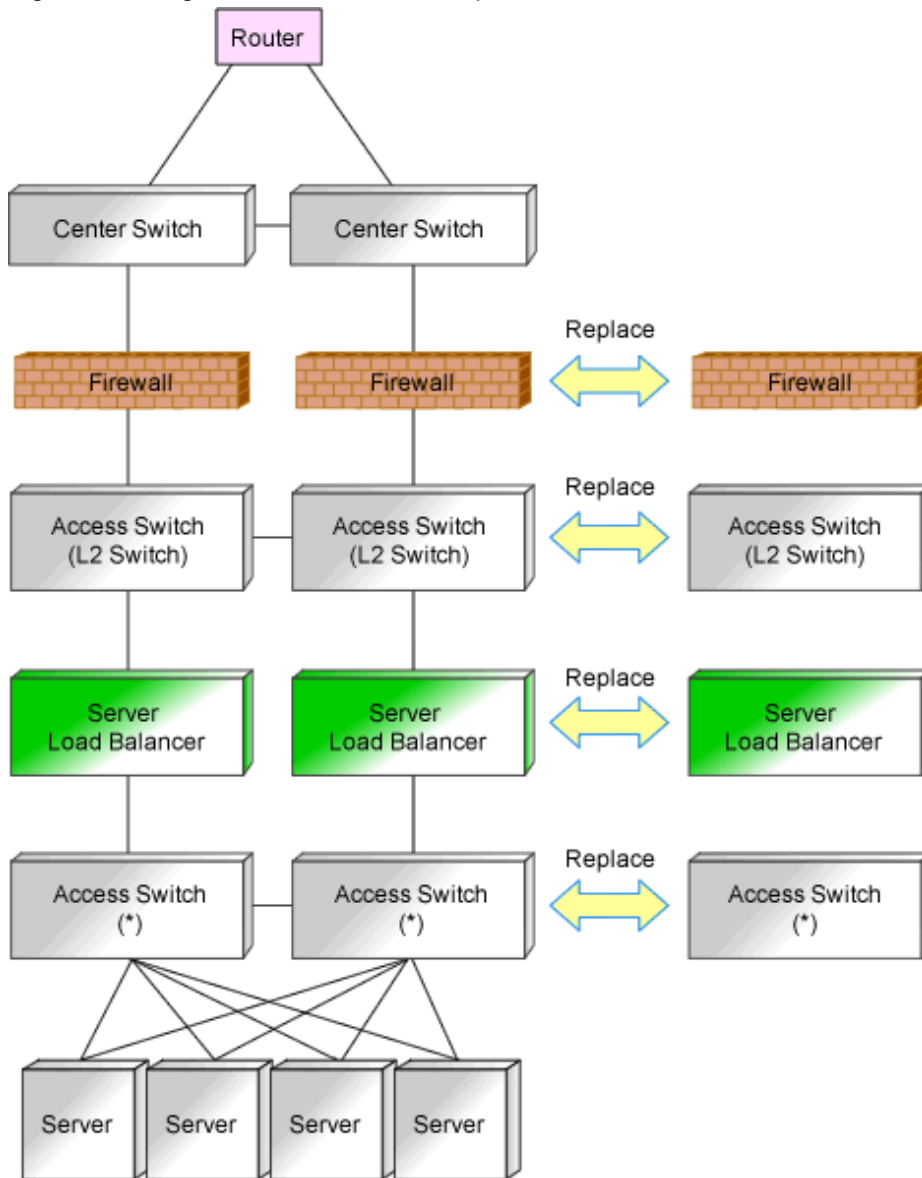
* Note: L2 switches or switches that comprise the Ethernet Fabric.

It is assumed that you perform replacement while continuing operations using the network devices of redundancy configurations of an active and standby switch configuration.

When there is no description, the operations are performed by an infrastructure administrator.

9.5.1.1 When the Device to Replace has Failed

This section explains the replacement procedure when the device to replace has failed.

When the Management Function for Network Device Configuration Files is not Used

1. Announcement of planned maintenance operations.

2. Change the target network device to "maintenance mode".

3. Replace the network devices. (Hardware maintenance person)

4. Restore configuration of replaced network devices following the maintenance procedure for the network device.

5. Release the "maintenance mode" of network devices, when problems with network devices after replacement have been solved.

6. Notification that maintenance operations are complete.

Information

When the replaced network device is a member switch in an Ether fabric configuration (Fujitsu PRIMERGY Converged Fabric Switch Blade (10 Gbps 18/8+2) or Fujitsu Converged Fabric Switch), setting and releasing of maintenance mode is not necessary.

Follow the maintenance procedure for that device.

When the Management Function for Network Device Configuration Files is Used

1. Announcement of planned maintenance operations.

2. Change the target network device to "maintenance mode".

3. Replace the network devices. (Hardware maintenance person)

4. Restore the configuration of the replaced network device using the network device file which was backed up beforehand in accordance with the maintenance procedure of the network device.

   - When performing restoration by logging in to the replaced network device directly

       1. Retrieve the network device file which was backed up beforehand using the rcxadm netdevice cfexport command.

       2. Restore the exported network device file using the maintenance procedure of the network device.

   - When performing restoration using the restoration function of the management function for network device files

       1. Configure the replaced network device definition as necessary for operation management.

       2. Restore the network device file.

Information

   - When the replaced network device is a "Cisco ASA 5500 series", restoration using the rcxadm netdevice cfrestore command is not required.
     Using the function of the "Cisco ASA 5500 series", the same configuration as the device in active state is reflected automatically.
     For details, please refer to the manual of the "Cisco ASA 5500 series".

   - For restoration of network device files, please refer to "10.2.3 Restoration of Network Devices".

   For the maintenance procedures for network devices, refer to the manual of the network device.

5. Back up the current network device files from the network devices with operational status.

   If the content of the backed up device configuration file is up to date, this step is not required.

   If the content is not up to date, take a backup of the network device configuration file using the rcxadm netdevice cfbackup command.

   The date and time of backup can be checked using the rcxadm netdevice cflist command.

6. Check that there are no differences in the definitions that become a problem in the redundancy configurations that use the network device files used in step 4 and the network device configuration file in the network device file backed up in step 5.

   Export each network device configuration file using the rcxadm netdevice cfexport command and check the difference.

   When there is difference that becomes a problem, please resolve difference following the maintenance procedure for network devices.
   For the maintenance procedures for network devices, refer to the manual of the network device.

7. Release the "maintenance mode" of network devices, when problems with network devices after replacement have been solved.

8. Notification that maintenance operations are complete.

When the replaced network device is a member switch in an Ether fabric configuration (Fujitsu PRIMERGY Converged Fabric Switch Blade (10 Gbps 18/8+2) or Fujitsu Converged Fabric Switch), the network device file management function is not used.

Follow the maintenance procedure for that device.

9.5.1.2 When the Device to Replace has not Failed

This section explains the replacement procedure when the network device that is the target of replacement has not failed.

When the Management Function for Network Device Configuration Files is not Used

1. Announcement of planned maintenance operations.

2. Log in the network device directly to check if the target network device of replacement is in active status or standby status.

   When the target network device of replacement is in active status, switch over the device with the standby network device of redundancy configuration, and change the status of target network device for replacement from active status to standby status.

3. Change the target network device to "maintenance mode".

4. Back up the current environment (such as definitions) from the network devices that are switched to "maintenance mode".

5. Replace the network devices. (Hardware maintenance person)

6. Restore the configuration of the replaced network device using the environment backed up in step 4, following the maintenance procedure for the network device.

7. Back up the current definitions from the network devices with operational status.

8. Check that there are no differences in the definitions in the redundancy configurations using environments backed up in step 7 and environment definitions backed up in step 4.

   When there is difference that is a problem, log in to the network device directly after replacement, and resolve the difference.

9. Release the "maintenance mode" of network devices, when problems with network devices after replacement have been solved.

10. Notification that maintenance operations are complete.

- When the replaced network device is a member switch in an Ether fabric configuration (Fujitsu PRIMERGY Converged Fabric Switch Blade (10 Gbps 18/8+2) or Fujitsu Converged Fabric Switch), setting and releasing of maintenance mode is not necessary.
  Follow the maintenance procedure for that device.

- When the replaced network device is a member switch in an Ether fabric configuration (Fujitsu PRIMERGY Converged Fabric Switch Blade (10 Gbps 18/8+2) or Fujitsu Converged Fabric Switch), the network device file management function is not used.
  Follow the maintenance procedure for that device.

When the Management Function for Network Device Configuration Files is Used

1. Announcement of planned maintenance operations.

2. Log in the network device directly to check if the target network device of replacement is in active status or standby status.

   When the target network device of replacement is in active status, switch over the device with the standby network device of redundancy configuration, and change the status of target network device for replacement from active status to standby status.

3. Change the target network device to "maintenance mode".

4. Back up the current network device files from the network devices that have been switched to "maintenance mode".

   If the content of the backed up device configuration file is up to date, this step is not required.

If the content is not up to date, take a backup of the network device configuration file using the rcxadm netdevice cfbackup command.

The date and time of backup can be checked using the rcxadm netdevice cflist command.

5. Replace the network devices. (Hardware maintenance person)

Information

When registering a "Nexus 5000 series" as a network device using the management function for the network device file, check the note of "9.4.8.2 When Using the Network Device File Management Function" in the "Design Guide CE" before executing the restoration in step 6.

6. Restore the configuration of the replaced network device using the network device file which was backed up in step 4, following the maintenance procedure for the network device.

  - When performing restoration by logging in to the replaced network device directly

    1. Export the network device file which was backed up in step 4 with the rcxadm netdevice cfexport command.

    2. Restore the exported network device file using the maintenance procedure of the network device.

  - When performing restoration using the restoration function of the management function for network device files

    1. Configure the replaced network device definition as necessary for operation management.

    2. Restore the network device file.

Information

  - When the replaced network device is a "Cisco ASA 5500 series", restoration using the rcxadm netdevice cfrestore command is not required.
    Using the function of the "Cisco ASA 5500 series", the same configuration as the device in active state is reflected automatically.
    For details, please refer to the manual of the "Cisco ASA 5500 series".

  - For restoration of network device files, please refer to "10.2.3 Restoration of Network Devices".

For the maintenance procedures for network devices, refer to the manual of the network device.

7. Back up the current network device files from the network devices with operational status.

If the content of the backed up device configuration file is up to date, this step is not required.

If the content is not up to date, take a backup of the network device configuration file using the rcxadm netdevice cfbackup command.

The date and time of backup can be checked using the rcxadm netdevice cflist command.

8. Check that there are no differences in the definitions that become a problem in the redundancy configurations that use the network device files used in step 4 and the network device configuration file in the network device file backed up in step 7.

Export each network device configuration file using the rcxadm netdevice cfexport command and check the difference.

When there is difference that becomes a problem, please resolve difference following the maintenance procedure for network devices.
For the maintenance procedures for network devices, refer to the manual of the network device.

9. Release the "maintenance mode" of network devices, when problems with network devices after replacement have been solved.

10. Notification that maintenance operations are complete.

See

  - When checking the configuration of a network device, you may not be able to confirm it from the network device environment file. Check in the manual of the network device if it is possible to check the configuration of the network device from the network device environment file, in advance.

- For details on how to configure and release the maintenance mode, refer to "22.1 Switchover of Maintenance Mode" in the "User's Guide for Infrastructure Administrators (Resource Management) CE".

- For details on the rcxadm netdevice command, refer to "3.8 rcxadm netdevice" in the "Reference Guide (Command/XML) CE".

Note

- Replacement using the same model is a prerequisite when replacing network devices.

- Confirm the following items, using the manuals of network devices, in advance.

  - The replacement procedure when using redundancy configurations

  - The operations for network devices (status check and switchover)

  - Environmental differences which become problems when configuring redundancy configurations

  When the network device file management function is not used, confirm the following item, in the manuals of network devices, in advance.

  - The operations for network devices (backup methods and restore methods)

- When using the network devices of redundancy configurations, replace network devices in the following order.

  1. Replace network devices with standby status

  2. Set the status of the network device before replacement to standby, and replace the device

  When replacing multiple network devices of redundancy configurations simultaneously, perform replacement operations in units of the same redundancy configurations.

- When the network device to replace has failed, step 4 cannot be performed. It is recommended to back up environments regularly in preparation for failures of network devices.

  When performing regular backup of environments, the load of restoration operations after replacement of network devices can be reduced, by using the latest backup environment.

Information

- When the replaced network device is a member switch in an Ether fabric configuration (Fujitsu PRIMERGY Converged Fabric Switch Blade (10 Gbps 18/8+2) or Fujitsu Converged Fabric Switch), setting and releasing of maintenance mode is not necessary. Follow the maintenance procedure for that device.

- When the replaced network device is a member switch in an Ether fabric configuration (Fujitsu PRIMERGY Converged Fabric Switch Blade (10 Gbps 18/8+2) or Fujitsu Converged Fabric Switch), the network device file management function is not used. Follow the maintenance procedure for that device.

9.5.2 Regular Maintenance Procedure of Network Devices

This section explains the procedure of regular maintenance (patch application or firmware update) of network devices.

Use the following procedure when performing maintenance operations while continuing operations using the network devices of redundancy configurations by switching between active and standby.

When there is no description, the following operations are performed by an infrastructure administrator.

1. Announce that regular maintenance operations are being started.

2. Confirm that the network device that is the target of regular maintenance is in standby status, by directly logging in to the network device.

3. Back up the current network device configuration file from the network device with standby status.

   - When the Management Function for Network Device Configuration Files is Used

     If the content of the configuration file is up to date, this step is not required.
     If the content is not up to date, back up the configuration file using the rcxadm netdevice cfbackup command.
     The date and time of backup can be checked using the rcxadm netdevice cflist command.

   - When the Management Function for Network Device Configuration Files is not Used

     Back up the configuration files from network devices.
     For information about the backup method, refer to the network device manuals.

4. Change the target network device in standby status to "maintenance mode".

5. A hardware maintenance person performs the regular maintenance operations for network devices (patch application or firmware update).

6. Back up the current network device configuration files from the network devices with operational status.

   - When the Management Function for Network Device Configuration Files is Used

     If the content of the configuration file is up to date, this step is not required.
     If the content is not up to date, back up the configuration file using the rcxadm netdevice cfbackup command.
     The date and time of backup can be checked using the rcxadm netdevice cflist command.

   - When the Management Function for Network Device Configuration Files is not Used

     Back up the configuration files from network devices.
     For information about the backup method, refer to the network device manuals.

7. Check that there are no differences between the network device configuration files backed up in step 3 and those backed up in step 6.

   - When the Management Function for Network Device Configuration Files is Used

     Export the configuration file using the rcxadm netdevice cfexport command, and check for any differences. When there is difference that is a problem, log in to the network device with standby status, and resolve the difference.

   - When the Management Function for Network Device Configuration Files is not Used

     Export the network device file from the network device and check it for difference. When there is difference that is a problem, log in to the network device with standby status, and resolve the difference.
     For information about how to export, refer to the network device manuals.

   For information about login to network devices, refer to the network device manuals.

8. Release the network device from "maintenance mode", after checking that problems with network devices with standby status have been solved.

9. Switch over the network device in active status that is the target of regular maintenance and the network device of the redundancy configuration which is in standby status.

10. Then change the status of the remaining network device that is the target of regular maintenance from operational status to standby status, and perform steps 3 to 8.

11. Announce that maintenance operations are complete.

See
. . . .
- For details on how to configure and release the maintenance mode, refer to "22.1 Switchover of Maintenance Mode" in the "User's Guide for Infrastructure Administrators (Resource Management) CE".

- For details on the rcxadm netdevice command, refer to "3.8 rcxadm netdevice" in the "Reference Guide (Command/XML) CE".
. . . .

Note

....

- Regular maintenance may not be able to be performed using the described procedure depending on the maintenance details for individual network devices. Before performing regular maintenance operations, ensure you check the information provided from the network device vendors regarding the maintenance operations of network devices.

- Confirm the following items, using the manuals of network devices, in advance.

  - The operations for network devices (status check, switchover and backup methods)

  - Environmental differences which become problems due to redundancy configurations

- When performing regular maintenance for multiple network devices of redundancy configurations simultaneously, perform replacement operations in units of the same redundancy configurations.

....

Information

....

- When the replaced network device is a member switch in an Ether fabric configuration (Fujitsu PRIMERGY Converged Fabric Switch Blade (10 Gbps 18/8+2) or Fujitsu Converged Fabric Switch), setting and releasing of maintenance mode is not necessary.
  Follow the maintenance procedure for that device.

- When the replaced network device is a member switch in an Ether fabric configuration (Fujitsu PRIMERGY Converged Fabric Switch Blade (10 Gbps 18/8+2) or Fujitsu Converged Fabric Switch), the network device file management function is not used.
  Follow the maintenance procedure for that device.

....

9.5.3 Procedure for Addition of Network Devices

This section explains the operation for adding network devices.

9.5.3.1 Adding L2 Switches to Handle Insufficient Numbers of Ports when Adding Servers

This section explains the procedure for addition, assuming a case where it is necessary to add L2 switches, since the LAN ports of the L2 switch to connect to are insufficient when adding servers.

The explanation is mainly about operations related to L2 switches.

When there is no description, the following operations are performed by an infrastructure administrator.

Figure 9.5 Image of L2 Switches to Add
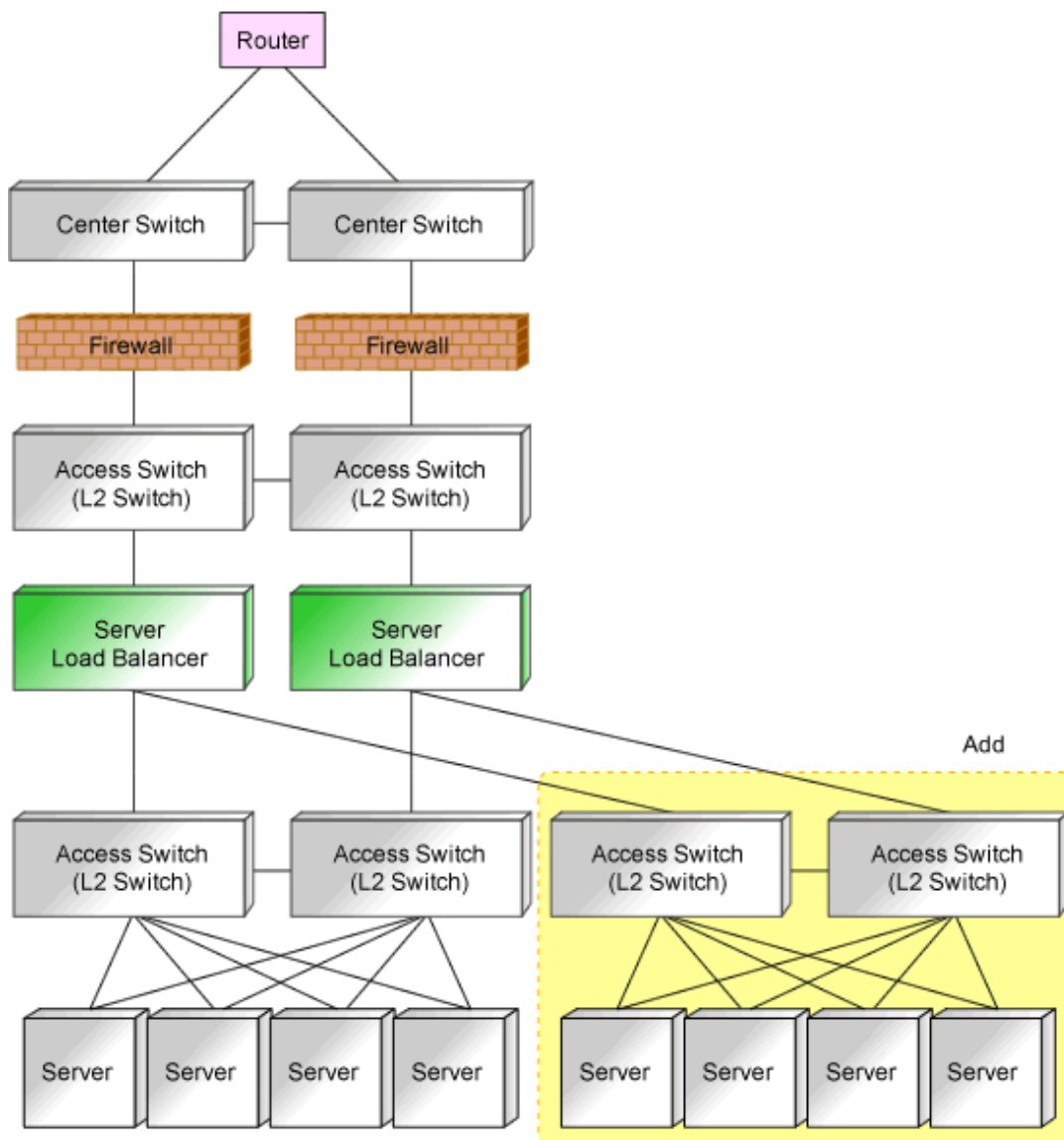
1. Design additional configurations. (Network device administrator)

2. Provide the additional network device information to the infrastructure administrator. (Network device administrator)

   Add a network device in the state where the following operations have been completed.

   - Initial configuration

   - Operation test

   - Integration of the device into a physical network configuration

3. Register the resources of the server.

   It is necessary to register chassis or LAN switch blades for a blade server.

4. Create network configuration information (XML definition) using the acquired network device information.

5. Register an additional L2 switch as a network device.

   Use the rcxadm netdevice create command to register as a network device.

6. When the following applies to the additional network device, create and register rulesets.

    - When adding an L2 switch of a model for which sample scripts are not prepared, or an L2 switch of a model that has not been used in the system until now.

      In this case, it is necessary to create a directory to allocate rulesets to.

    - When using a model for which sample scripts are not prepared, or even when using a model which has been used in the system until now, by configuring definitions using the different rules (scripts)

    - Even when using a model for which sample scripts are prepared, and when using a model with definitions configured using different rules (scripts)

📒 Note

Details of sample scripts may be reviewed and modified. When using rulesets modified from prepared sample scripts, the modified details will be cleared by replacing the modified scripts with the sample scripts, when updating sample scripts.
In order to prevent this type of problem, when creating scripts by referring to sample scripts, create the new rulesets after copying the rulesets of the sample script, and perform necessary modifications.

7. Change all resources using the additional network devices.

    It is necessary to add the information about uplink ports of the added chassis, when adding a blade server.

    Use the rcxadm network modify command to modify a network resource.

8. Register the added server as a resource in the necessary resource pool.

📘 See

- For details on the initial configurations of network devices, refer to "9.2.3 Settings for Managed Network Devices" in the "Design Guide CE".

- For details on how to create network configuration information (XML definition), refer to "15.6 Network Configuration Information" in the "Reference Guide (Command/XML) CE".

- For details on the rcxadm netdevice command, refer to "3.8 rcxadm netdevice" in the "Reference Guide (Command/XML) CE".

- For details on ruleset creation and the registration destinations, refer to "F.3 Creating a Folder for Registering Rulesets" in the "Design Guide CE".

- For details on the rcxadm network command, refer to "3.9 rcxadm network" in the "Reference Guide (Command/XML) CE".

- For details on how to register a resource in a resource pool, refer to "Chapter 19 Resource Operations" in the "User's Guide for Infrastructure Administrators (Resource Management) CE".

9.5.3.2 Adding Firewalls, Server Load Balancers, and L2 Switches for Additional Tenants

This section explains the procedure for addition, assuming a case where it is necessary to add a network device or a server in order to add a tenant.

The explanation is mainly about operations related to firewalls, server load balancers, and L2 switches.

When there is no description, the following operations are performed by an infrastructure administrator.

Figure 9.6 Image of Tenants to Add
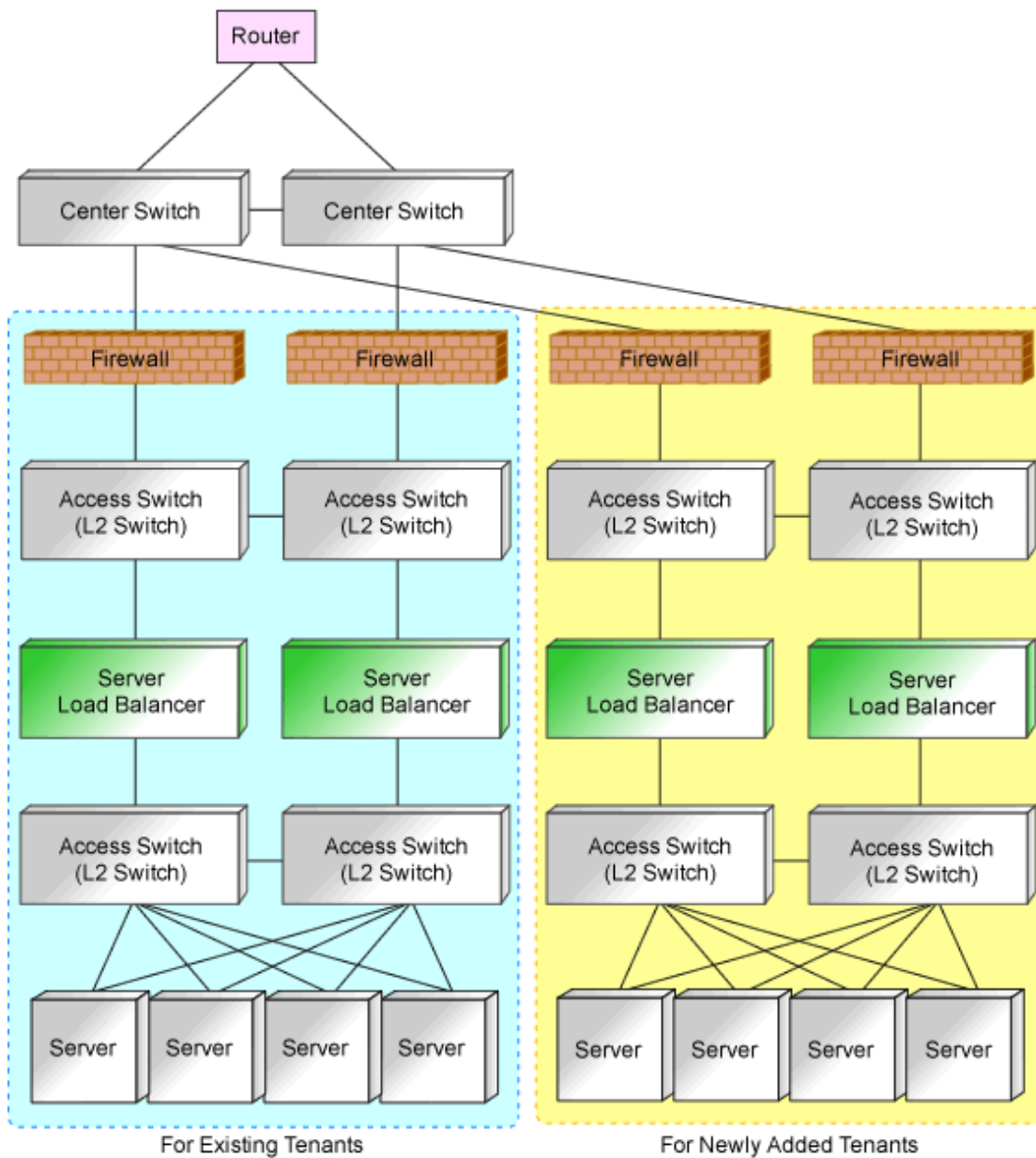
1. Design additional configurations. (Network device administrator)

2. Provide the additional network device information to the infrastructure administrator. (Network device administrator)

    Add a network device in the state where the following operations have been completed.

    - Initial configuration

    - Operation test

    - Integration of the device into a physical network configuration

3. Register the resources of the server.

    It is necessary to register chassis or LAN switch blades for a blade server.

4. Create network configuration information (XML definition) using the acquired network device information.

5. Register the added firewall, server load balancer, and L2 switch as network devices.

   Use the rcxadm netdevice create command to register as a network device.

6. When the following applies to the additional network device, create and register rulesets.

   - When adding a firewall, server load balancer, or L2 switch of a model for which sample scripts are not provided, or those of a model that has not been used in the system until now

     In this case, it is necessary to create a directory to allocate rulesets to.

   - When using a model for which sample scripts are not prepared, or even when using a model which has been used in the system until now, by configuring definitions using the different rules (scripts)

   - Even when using a model for which sample scripts are prepared, and when using a model with definitions configured using different rules (scripts)

Note

Details of sample scripts may be reviewed and modified. When using rulesets modified from prepared sample scripts, the modified details will be cleared by replacing the modified scripts with the sample scripts, when updating sample scripts.
In order to prevent this type of problem, when creating scripts by referring to sample scripts, create the new rulesets after copying the rulesets of the sample script, and perform necessary modifications.

7. Create a tenant and register a tenant administrator.

8. Back up environments using the functions provided by the firewall and server load balancer.

   Backups can be used for restoration when replacing firewalls or server load balancers due to device failure.

   For details on how to back up environments, refer to the manuals of the firewall and server load balancer being used.

9. Register additional servers, firewalls, and server load balancers in a resource pool for tenants as resources.

See

- For details on the initial configurations of network devices, refer to "9.2.3 Settings for Managed Network Devices" in the "Design Guide CE".

- For details on how to create network configuration information (XML definition), refer to "15.6 Network Configuration Information" in the "Reference Guide (Command/XML) CE".

- For details on the rcxadm netdevice command, refer to "3.8 rcxadm netdevice" in the "Reference Guide (Command/XML) CE".

- For details on ruleset creation and the registration destinations, refer to "F.3 Creating a Folder for Registering Rulesets" in the "Design Guide CE".

- For details on how to create a tenant, refer to "11.3 Creating a Tenant" in the "User's Guide for Infrastructure Administrators CE".

- For details on how to register tenant administrators, refer to "Chapter 3 Configuring Users for Infrastructure Administrators" in the "User's Guide for Infrastructure Administrators (Resource Management) CE".

- For details on how to register a resource in a resource pool, refer to "Chapter 19 Resource Operations" in the "User's Guide for Infrastructure Administrators (Resource Management) CE".

9.5.3.3 Adding Switches to an Ethernet Fabric to Handle Insufficient Numbers of Ports when Adding Servers

This section explains the procedure for addition, assuming a case where it is necessary to add switches due to a shortage of LAN ports of the Ethernet fabric to connect to when adding servers.

The explanation is mainly about operations related to the Ethernet fabric.

When there is no description, the following operations are performed by an infrastructure administrator.

Figure 9.7 Image of Ethernet Fabric Switches Addition
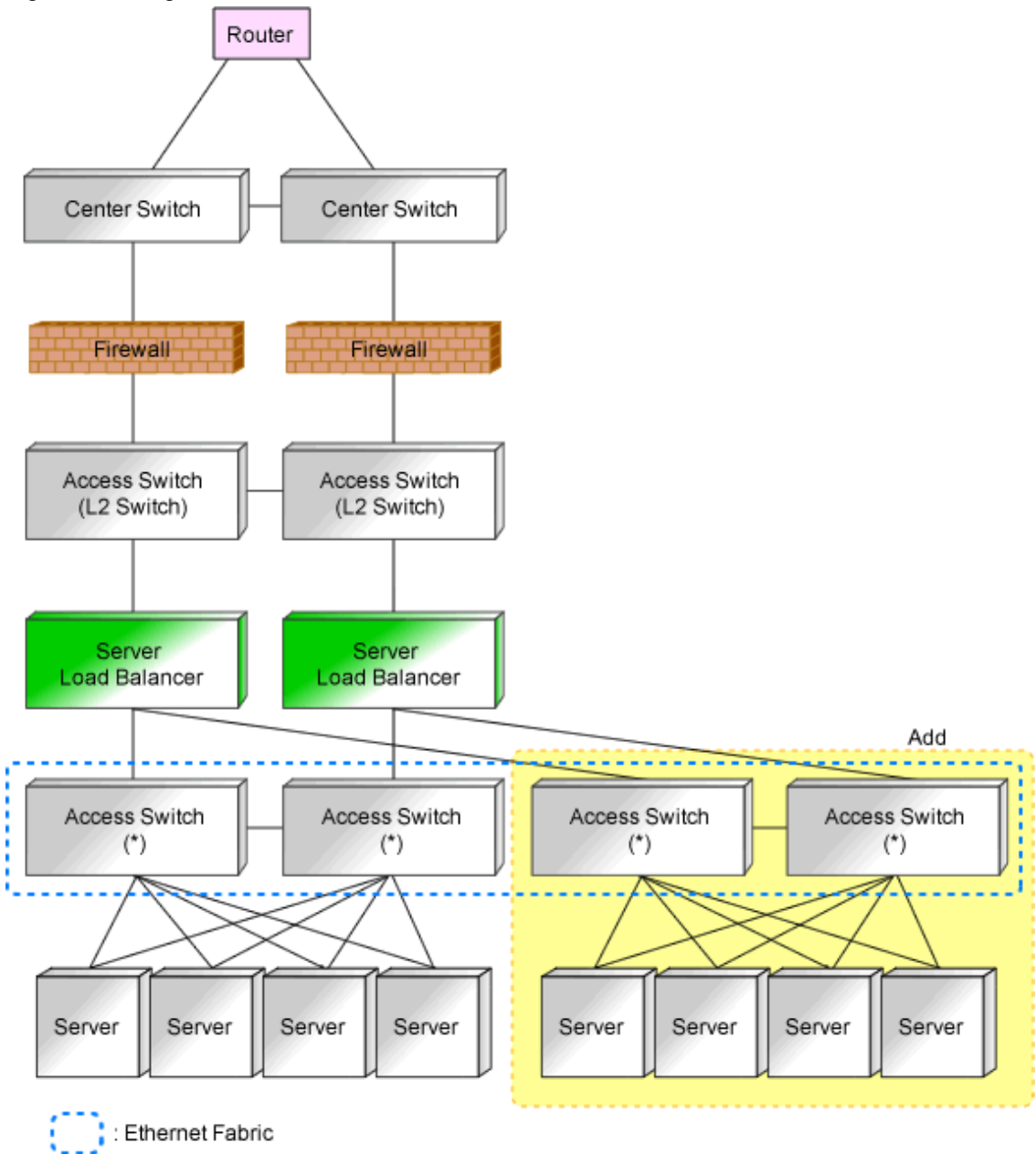
* Note: Switches that comprise the Ethernet Fabric.

1. Design additional configurations. (Network device administrator)

2. Provide an infrastructure administrator with the link information of the server connection port to add to the Ethernet fabric. (Network device administrator)
   Add switches according to the maintenance procedure of the Ethernet fabric.

3. Register the resources of the server.
   For a blade server, it is necessary to register chassis or LAN switch blades.

4. Create network configuration information (XML definition) using the acquired link information of the server connection port.

Information

When the destination server is a blade server, it is not necessary to create the link information.

5. Register the modified network configuration information.
   Use the rcxadm netconfig import command to register network configuration information.

6. Modify all of the network resources which use the added server connection port.
   Use the rcxadm network modify command to modify a network resource.

7. Register the added server as a resource in the necessary resource pool.

9.5.3.4 Adding an Ethernet Fabric for Additional Tenants

This section explains the procedure for addition, assuming a case where it is necessary to add a network device or a server in order to add a tenant.

The explanation is mainly about operations related to the Ethernet fabric.

When there is no description, the following operations are performed by an infrastructure administrator.

Figure 9.8 Image of Tenants to Add

* Note: L2 switches or switches that comprise the Ethernet Fabric.

1. Design additional configurations. (Network device administrator)

2. Provide the additional network device information to the infrastructure administrator. (Network device administrator)
   Add a network device in the state where the following operations have been completed.

   - Initial configuration

   - Operation test

   - Integration of the device into a physical network configuration

3. Register the resources of the server.
   For a blade server, it is necessary to register chassis or LAN switch blades.

4. Create network configuration information (XML definition) using the acquired network device information.

5. Register the created network configuration information.
   Use the rcxadm netconfig import command to register network configuration information.

6. Register the added Ethernet fabric as a network device.
   Use the rcxadm netdevice create command to register as a network device.

7. Create a tenant and register a tenant administrator.

8. When allocating the virtual fabrics to the added tenants, register the network configuration information for the Ethernet Fabric which have been registered as a network device to specify the relations between the virtual fabrics and the tenants.
   Use the rcxadm netconfig import command to register network configuration information.

9. Back up environments using the functions provided by the Ethernet fabric.
   The backup can be used for restoration when replacing Ethernet fabric devices due to failure.
   For details on how to back up environments, refer to the manual of the Ethernet fabric.

See

- For details on how to create network configuration information (XML definition), refer to "15.6 Network Configuration Information" in the "Reference Guide (Command/XML) CE".

- For details on the rcxadm netconfig command, refer to "3.7 rcxadm netconfig" in the "Reference Guide (Command/XML) CE".

- For details on the rcxadm netdevice command, refer to "3.8 rcxadm netdevice" in the "Reference Guide (Command/XML) CE".

9.5.4 Procedure for Addition or Modification of Connection Destinations of Network Devices

This section explains the procedure for adding or modifying destinations for network device connection.

When there is no description, the following operations are performed by an infrastructure administrator.

1. Notify your infrastructure administrator about the addition or modification of the destination for network device connection. (Network device administrator)

2. Create network configuration information (XML definition) using the acquired network device information.

3. Confirm there are no differences besides the link information (under Links tag) regarding the added or modified destinations for connection, by comparing the network configuration information of network devices registered in Resource Orchestrator and the network configuration information created in step 2.

   If there is any difference, check with the system administrator that network device configurations have not been modified, and change the network configuration information if necessary.

   The network configuration information of network devices registered in Resource Orchestrator can be obtained using the rcxadm netconfig export command.

4. Modify the network device by setting the confirmed network configuration information as the input information.

   Use the rcxadm netconfig import command to modify network devices.

5. Confirm from the ROR console that the network device information has changed, and the status is normal.

📖 See
. . . .

- For details on how to create network configuration information (XML definition), refer to "15.6 Network Configuration Information" in the "Reference Guide (Command/XML) CE".

- For details on the rcxadm netconfig command, refer to "3.7 rcxadm netconfig" in the "Reference Guide (Command/XML) CE".

- For details on the rcxadm netdevice command, refer to "3.8 rcxadm netdevice" in the "Reference Guide (Command/XML) CE".

. . . .

9.5.5 Maintenance of Network Devices Placed into Maintenance Mode due to Failure of Automatic Configuration

This section explains how to perform maintenance of network devices that have been placed into maintenance mode due to failure of automatic configuration.

When there is no description, the following operations are performed by an infrastructure administrator.

1. Check the event log to confirm that the network device was placed into "maintenance" mode and its operation status changed to "error" due to a failure of automatic configuration.
   When the network device for which automatic configuration has failed is in a redundant configuration, the event log is output for both the failed device and the redundant device.

2. Identify the network device requiring maintenance and the cause of the failure of automatic configuration.

   a. Identify the target network device according to the message output to the event log in 1.

   b. Check the "error" or "warning" message indicating that automatic configuration for the network device identified at 2-a has failed to identify the cause of the failure.
      This message has been output immediately before the message output to the event log at 1.

3. Announce that the maintenance operation is being started.

4. Directly log in to the target network device and take corrective action according to the cause confirmed in 2.

   a. Investigate the cause of automatic configuration failure and take corrective action.

   b. For the settings of the target network device, if unnecessary or incorrect configuration has been performed due to the failure of automatic configuration, correct the settings.

   c. When the target network device is in a redundant configuration, confirm that there are no problems in setting differences between the individual network devices comprising the redundant configuration.

   d. After completing the corrective action, confirm that the network device is in the normal state.
      For details on how to check the status of network devices, refer to the manual of the target network device.

   If the cause of the automatic configuration failure is a hardware failure, refer to "9.5.1 Replacement Procedure of Network Devices".

5. Release the target network device from maintenance mode.

   If the status monitoring of the target network device cannot detect the normal state when it is released from maintenance mode, failure of release of maintenance mode will be notified.
   Take corrective action according to the notified message, and then perform release of maintenance mode again.

6. Announce that maintenance operations are complete.

9.5.6 Reflecting a Modified Domain Switch Configuration on the Ethernet Fabric

This section explains the procedure for operations when modifying the domain switch configuration of an Ethernet Fabric registered in Resource Orchestrator.

When there is no description, the following operations are performed by an infrastructure administrator.

1. When deleting a switch, modifying the Ethernet Fabric ID, the domain ID, the switch ID or the port type, it is necessary to update the port information of network devices.

   Use the rcxadm netdevice refresh -recreate command to update the port information of network devices.

2. When modifying the links of uplink ports, re-register the link information.

   For details, refer to "Procedure for Addition or Modification of Connection Destinations of Network Devices".

3. When modifying the fabric ID, the domain ID or the switch ID for LAN switch blade PY CB Eth Switch 10/40Gb 18/8+2, it is necessary to update the information of the LAN switch blade by registering it again.

   Delete the registered LAN switch blade after modifying network resource settings for external ports not to use the LAN switch blade.

9.6 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.

9.7 Power Monitoring Device (PDU or UPS) Maintenance

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 10 Backup and Restoration

This chapter describes how to operate the backup and restoration of ServerView Resource Orchestrator Cloud Edition.

10.1 Backup and Restoration of Admin Servers

This section describes how to operate the backup and restoration of the admin server of ServerView Resource Orchestrator Cloud Edition.

Backing up the Admin Server

The two methods of backing up the admin server are shown below.

With either method, backup can be performed by executing one command (the rcxmgrbackup command).

For details on the rcxmgrbackup command, refer to "6.6 rcxmgrbackup" in the "Reference Guide (Command/XML) CE".

- Offline Backup

  The manager of this product is stopped and then resources are backed up. A backup is taken at the following times:

    - When installation of this product has completed

  When using an offline backup, backup of the following resource is not performed:

    - Audit log

    - Network device configuration file

- Online Backup

  Resources are backed up without the manager of this product being stopped. Backing up periodically is recommended for online backups.

  To save time when restoring configuration information at operation, take an online backup if configuration information is to be updated.

  When using an online backup, backup of the following resources is not performed:

    - Dashboard Information

    - Usage Condition Information

    - Audit Logs

    - Application Information

    - Definition File

      - Some L-Platform Management Settings

      - Tenant Management and Account Management Settings

      - Operational Status Server List Settings

      - CMDB Agent Event Log Output Settings

    - Network device configuration file

  Online backup uses the PostgreSQL Point-In-Time Recovery (PITR) mechanism.

  There are two online backup methods, each with a different database collection range, as follows:

    - Base Backup

      Base backup is the backup of the entire database cluster (file group in which database data is recorded). A base backup is taken by executing the rcxmgrbackup -base command.
      Refer to "Base Backup" in "10.1.3 Online Backup of the Admin Server" for details.

    - Differential Backup

      With differential backup, the contents of updates to the database are output to multiple files in 16 MB-sized lots.
      These files are called Write-Ahead Logging (WAL) files.

Usually, for each 16 MB written, the WAL file being written to is switched, and the WAL file for which writing has been completed is saved to the "wal" directory under the backup directory.

Periodically executing the rcxmgrbackup command allows the contents of updates to the database that are recorded in saved WAL files to be maintained for a certain period of time. For example, when the rcxmgrbackup command is executed every hour, the contents of updates performed in the most recent one-hour period will be saved.

Refer to "Differential Backup" in "10.1.3 Online Backup of the Admin Server" for details.

Restoring the Admin Server

Database restoration restores by applying to the base backup the contents of updates to the database in WAL files that have been output after the base backup was taken. The rcxmgrrestore command is used for restoration.

Refer to Section "10.1.4 Restoring the Admin Server" for details.

10.1.1 Mechanism of Backup and Restoration

This section describes the mechanism of backup and restoration, including environment requirements, points to note, and the restart position after restoration, in a system in which this product is installed.

Backup and Restoration Environment Requirements

The following conditions must be satisfied in the environments to be backed up and restored:

- The operating systems match.
  Note that this does not include operating system version differences.

- The host information (host name or IP address) matches.

- The character code systems match.

- The directory services match.

- The product installation folders match.

Points to Note at Backup and Restoration

This section describes the points to note when backup and restoration is being performed.

- Administrator privileges are required in order to execute the commands.

- If, and only if, resources backed up using online backup are to be restored, execute the command that disables a service application for which an application process no longer exists (recoverAllService command).

- Perform backup and restore operations as described below for ServerView Operations Manager, which is mandatory software. Refer to a ServerView Operations Manager manual for details.

  - Backup Operations

    Perform system backup in accordance with admin server system backup operations.

    When a registration or update of user information has occurred, perform backup again.

  - Restoration Operations

    a. Perform restoration of the entire admin server system.

    b. Use the restoration procedure described in this document to perform restoration.

- If systems backed up using offline and online backup are to be restored, perform restoration in the following order:

  1. Restoration of systems backed up using offline backup

  2. Restoration of systems backed up using online backup

- When moving backup resources, move the folder specified in the backup destination as well as all folders and files under that folder.

- Do not delete backup resources during execution of the restore command.

- To delete backup resources, delete the folder specified in the backup destination as well as all folders and files under that folder.

- Backup to the following media cannot be performed using the backup command:

    - Backup to optical disks such as CD-R and DVD-R
      To back up user resources to optical disks, back up once to local disks, and then write to the media.

    - Backup to folders that include spaces.

- Restoration from the following folders cannot be performed using the restore command:

    - Restoration from folders that include spaces.

- When the network device file management function is used, after offline backup is performed, save the following folders and files under those folders.

  [Windows Manager]
  Installation_folder\SVROR\Manager\var\netdevice\

  [Linux Manager]
  /var/opt/FJSVrcvmr/netdevice/

- When the network device file management function is used, before restoration of the admin server is performed, replace the folder saved when backing up with the original folder.

Resources Managed by This Product and Timing of Update

The resource files managed by Resource Orchestrator are as shown below: When an operation described in the timing of update column has been performed, a backup should be made.

Table 10.1 Resources to be Backed Up and Timing of Update

Target Resources	When Backup is Necessary	Necessity of Stopping Managers	Remarks
Certificates	None	Not Required	
Session encryption keys	After password saving (after execution of the rcxlogin -save command)	Not Required	
System images and cloning images	After addition, deletion, and modification of Physical L-Server images	Not Required	Backup of system images and cloning images of virtual L-Servers are performed as a part of virtual machine backup operations. Perform backup operations of virtual machines using the corresponding functions of VM management software.
Configuration definition information	After creation, registration, modification, unregistration, and deletion of L-Servers and resources	Not Required	
Information related to image files	Physical L-Server registration, deletion, movement. usage changes, power operations, conversion, and reversion After the registration and unregistration of VM hosts	Not Required	

Target Resources	When Backup is Necessary	Necessity of Stopping Managers	Remarks
Definition files	Modification of definition files	No (Note)	Note) If the following definition files are to be backed up, the Manager must be stopped and offline backup must be performed. - Some L-Platform management settings - Tenant management and account management settings - Operational status server list settings - CMDB agent event log output settings
Image management information	After rcxadm imagemgr command operations	Not Required	
Metering information	Creation, change, deletion, move, or power operation of an L-Platform or L-Server	Not Required	
Home window announcement information	Announcement change	Yes	
License agreement when users are added	License agreement change	Yes	
Dashboard information	As required	Yes	Because it is updated as needed, stop the Manager and take a backup as required.
Usage condition information	As required	Yes	Because it is updated as needed, stop the Manager and take a backup as required.
Application information	Application to use, modify, or cancel an L-Platform, or approval, assessment, dismissal, or cancellation of application	Yes	
Terms of use or terms of cancellation of L-Platform	Change to terms of use or terms of cancellation	Yes	

Remarks) Capacity Planning data is not included in backups. Export the data to CSV or Excel files by using the Capacity Planning window as necessary.

Disk Space Necessary for the Backup

Disk space necessary for the backup is as follows.

Table 10.2 Resource to be Backed Up and Disk Space Necessary for the Backup

Target Resources	Disk Space Necessary for the Backup
Configuration definition information	The file size of backup files varies depending on the number of resources defined in the configuration definition information. When the number of VM guests is 1000VM, collection information temporarily becomes about 150 MB. It becomes less than 2 MB by compressing it. Please prepare the backup area referring to this size.

Target Resources	Disk Space Necessary for the Backup
System image or cloning image	Every time, when backing up, it is necessary. Therefore, when the backup is executed three times for instance, the capacity of image save area is three times necessary. For the capacity of the image storage area, refer to "2.4.2.7 Dynamic Disk Space" in the "Design Guide VE".
Certificates Session cryptography key Definition files Image management information Home window announcement information License agreement when users are added Terms of use or terms of cancellation of L-Platform	The size of the file backed up changes according to the number of files backed up. Please prepare the backup area referring to this size to need only the area of less than 1 MB even if these 100 files are stored by 10 KB or less any file.
Metering information	[Offline backup] The size increases and decreases to the file backed up in proportion to the increase and decrease at the number of resources of metering objects and the retention period of the metering log. (*) [Online backup] 1 KB (*)
Dashboard information	The size increases and decreases to the file backed up in proportion to the increase and decrease of the number of L-Server templates and the number of tenants. Please prepare the backup area referring to the following formulas when there are 10 L-Server templates defined. When the number of tenants is 100, about 6.6 GB is necessary. disk space = (67.0 + (55.5 number of * tenants)) * 1.2 (MB)
Usage condition information	20 MB
Application information	The size increases and decreases to the file backed up according to the operating environment. Please calculate the total of the amount of disk under the control of the following directories, and prepare the backup area of the amount. [Windows Manager] - *system drive*\SWRBADB (If the directory exists) - *Installation_folder*\SWRBAM - *Installation_folder*\SWOMGR [Linux Manager] - /etc/opt/FJSVswrbam - /var/opt/FJSVswrbam - /var/opt/FJSVJMCMN/etc - /var/opt/FJSVjmcal - /var/opt/FJSVJOBSC - /var/opt/FJSVfwseo/config/JM - /opt/FJSVJOBSC/bin - /etc/mjes - /var/spool/mjes

* Note: The backup of metering information is gathered under the control of the directory specified by the rcxmgrbackup command at an off-line backup, and it is gathered in the area besides the specified directory at an online backup.

Please calculate a necessary amount of disk by backing up metering information referring to the following examples.

"The amount of disk space necessary for the base backup" is necessary for an off-line backup.

It is necessary to total the "Disk space necessary for base backup" and the "Disk space necessary for difference backup" for an online backup.

In the following conditions, the amount of disk of about 12.6 GB is necessary for about 1.3 GB and online backups for an off-line backup.

Table 10.3 Condition Necessary for Backup of Metering Information

Item		Estimated Value
Number of operating L-Platforms		1000
Number of resources per L-Platform	L-Server	1
	Expansion disk	1
	Software	2

Usage status		- The following operations are executed every day
		
		  - Return and deployment of 10 L-Platforms
		
		  - Starting of 1,000 L-Servers when starting operations
		
		  - Stopping of 1,000 L-Servers when finishing operations
		
		- A regular log is acquired every day
		
		- Keep metering logs for one year

Online backup frequency		- Execute monthly base backup (every 30 days) - Execute hourly difference backup.

Table 10.4 Formula for Metering Logs per Day

- Target capacity for metering logs

  - Event Logs for an L-Platform : 2.3 KB/each time (A)

  - Event Logs for other than an L-Platform : 0.6 KB/each time (B)

  - Regular logs : 2.3 * number of L-Platforms (KB) (C)

- Metering logs per day

  (A) * operation number for L-Platforms per day
  + (B) * operation number for other than L-Platforms per day
  + (C) * number of operating L-Platforms

  = 2.3 KB * 20 + 0.6 KB * 2000 + 2.3 KB * 1000
  = 3.5 MB

Table 10.5 Disk Space Necessary for Base Backup

Log of the metering each day * For one year

3.5 MB * 365 = 1.3 GB

Table 10.6 Disk Space Necessary for Difference Backup

Disk space per WAL file: 16 MB

WAL file space frequency until acquiring base backup (30 days): 24 * 30

16 MB * 24 * 30 = 11.3 GB

Table 10.7 Disk Space Necessary for Operation of Online Backup

Disk space necessary for operation of online backup
= Disk space necessary for base backup + Disk space necessary for difference backup
= 1.3 GB + 11.3 GB
= 12.6GB

Storage Destination for Backing Up Resources

This section describes the storage destination for backing up Admin Server resources.

Use the rcxmgrbackup command to specify a storage destination folder, except in the case of metering information.

The folders described in the following table are automatically created in the storage destination folder in order to store the resources. When restoration is to be performed, restoration occurs from the information in the latest folder of each folder. Therefore, even if a folder is deleted due to the disk capacity status, this will not cause a problem because the information in the latest folder will remain.

When the rcxmgrbackup command is used with the -cleanup option specified, all information older than the latest information collected by the command will be deleted.

Table 10.8 Relationship between Backup Method and Data Collected

Folder	Offline Backup	Online Backup (Base Backup)	Online Backup (Differential Backup)
CTMG_OFFyyyymmddhhmmss	Yes	No	No
CTMG_BASEyyyymmddhhmmss	No	Yes	No
CTMGyyyymmddhhmmss	No	No	Yes
CFMGyyyymmddhhmmss	Yes	Yes	Yes
RORyyyymmddhhmmss	Yes	Yes	Yes
RBAyyyymmddhhmmss	Yes	No	No
RORSCW	Yes	Yes	Yes

"yyyymmddhhmmss" is the date and time the command was executed.

🔔 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.

Refer to "10.1.5 Online Backup Settings for Metering" for information on the storage destination for metering.

Standard at Backup and Restore Processing Time

Estimate the time necessary to perform backup and restoration of the admin server referring to the following command processing time.

The command processing time differs according to the operation environment, so check the time necessary in your environment. Base your estimates on the values you obtain from the test.

📖 Example

- Environment

    - CPU : 4CPU

    - Memory Size : 16 GB

- Command processing time

  - offline backup : 3 minutes

  - online backup (base backup) : 2 minutes

  - online backup (differential backup) : 2 minutes

  - restore : 4 minutes

System Restart Point after Restoration

In the system operations flow used by this product, the restart point of the system will vary according to the timing of the backup of resources. Therefore, to ensure that the system can restart from the status it had before backup, operate the system in accordance with whether offline backup or online backup is used for backup, and perform restoration processing in accordance with each backup type.

Figure 10.1 Schedule for Backup and Restoration of Admin Servers (Example)
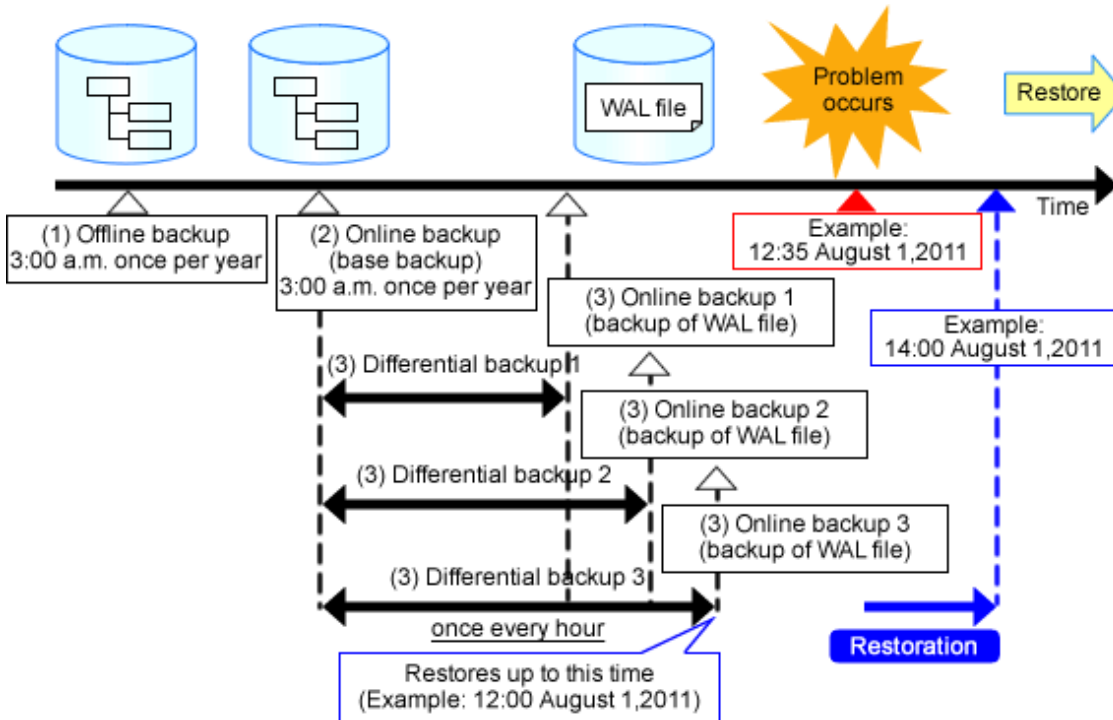
The flow of the preceding diagram is as follows:

1. A problem occurs in the system (Example: Occurs at 12:35 on August 1, 2011)

2. In order to restore the system, restoration is performed on the environment backed up offline and the environment backed up online.

   (Example: Restores at 14:00 on August 1, 2011)

   Refer to "Points to Note at Backup and Restoration" for information on the restoration order.

3. The latest differential backup files are dated (12:00 on August 1, 2011), so the restart point will be from that date and time.

10.1.2 Offline Backup of the Admin Server

Before performing backup, the systems of this product must be stopped.

1. Stop the Manager

2. Back up the Resources of this Product

3. Start the Manager

10.1.2.1 Stopping the Manager

Stop the Manager and check that it is in a stopped state.

Stopping the Manager

Execute the command shown below to stop the Manager.

For details on the command, refer to "5.19 rcxmgrctl" in the "Reference Guide (Command/XML) CE".

[Windows Manager]

```
>Installation_folder\SVROR\Manager\bin\rcxmgrctl stop <RETURN>
```

[Linux Manager]

```
# /opt/FJSVrcvmr/bin/rcxmgrctl stop <RETURN>
```

Checking the Status of the Services of This Product

Check that the Manager and services of this product are stopped.

For details on how to check, refer to "2.1 Starting and Stopping Managers".

10.1.2.2 Backing Up the Resources of this Product

Back up the resources of this product. Execute the command shown below.

For details on the command, refer to "6.6 rcxmgrbackup" in the "Reference Guide (Command/XML) CE".

[Windows Manager]

```
>Installation_folder\SVROR\Manager\bin\rcxmgrbackup -dir directory [-cleanup] <RETURN>
```

[Linux Manager]

```
# /opt/FJSVrcvmr/bin/rcxmgrbackup -dir directory [-cleanup] <RETURN>
```

When the network device file management function is used, save the following folders and files under those folders.

[Windows Manager]

```
>Installation_folder\SVROR\Manager\var\netdevice\
```

[Linux Manager]

```
# /var/opt/FJSVrcvmr/netdevice/
```

10.1.2.3 Starting the Manager

Execute the command shown below to start the Manager.

For details on the command, refer to "5.19 rcxmgrctl" in the "Reference Guide (Command/XML) CE".

[Windows Manager]

```
> Installation_folder\SVROR\Manager\bin\rcxmgrctl start <RETURN>
```

[Linux Manager]

```
# /opt/FJSVrcvmr/bin/rcxmgrctl start <RETURN>
```

Saving Image Management Information

Check the following image management information, the number of stored snapshot generations and the image file storage folder:

- Number of Stored Snapshot Generations

- Image File Storage Folder

    Execute the following command to set the number of stored snapshot generations and the image storage folder information to a standard output, by redirecting the information to a file, and then saving it.

    [Windows Manager]

    ```
    > Installation_folder\SVROR\Manager\bin\rcxadm imagemgr info > file <RETURN>
    ```

    [Linux Manager]

    ```
    # /opt/FJSVrcvmr/bin/rcxadm imagemgr info > file <RETURN>
    ```

Parameter

    file

        Specify the name of the file for output.

For details on the rcxadm imagemgr command, refer to "5.9 rcxadm imagemgr" in the "Reference Guide (Command/XML) CE".

10.1.3 Online Backup of the Admin Server

This section describes online backup of the admin server.

When using online backup of the admin server, the PostgreSQL Point-In-Time Recovery (PITR) mechanism is used in the backup of the metering database.

When using PITR backup and restoration, the following two resource types are backed up and restored:

- Base Backup

    The entire database cluster (file group in which database data is recorded) is backed up.

- WAL File

    Write-Ahead Log (WAL) files are files in which the contents of updates to the database are recorded.

Backup of the two preceding resource types is taken when the commands for the two corresponding backup methods (base backup and differential backup) are executed.

Resources that are backed up and restored using PITR are stored in the directory that has been specified in the settings file, regardless of the storage destination specified when the command was executed. Refer to "10.1.5 Online Backup Settings for Metering" for information on how to set this.

Each of the backup methods for performing online backup of the admin server is described below.

Base Backup

Base backup is the backup of the entire database cluster (file group in which database data is recorded).

Execute the command shown below.

For details on the command, refer to "6.6 rcxmgrbackup" in the "Reference Guide (Command/XML) CE".

[Windows Manager]

```
>Installation_folder\SVROR\Manager\bin\rcxmgrbackup -dir directory -base [-cleanup] <RETURN>
```

[Linux Manager]

```
# /opt/FJSVrcvmr/bin/rcxmgrbackup -dir directory -base [-cleanup] <RETURN>
```

The backup command may not end normally at times, so do not perform the following operations:

- Forced end using Ctrl+C during execution of the backup command

- Stopping the Manager during execution of the backup command

If the operations listed above have been performed, the following action will be required, depending on the status:

Execute the command shown below the next time and any subsequent times the base backup does not end normally.

When this command is executed, base backup will end normally.

For details on the command, refer to "13.3 ctmg_resetbackuperror (Recover Base Backup Error)" in the "Reference Guide (Command/XML) CE".

```
<Installation_folder>\RCXCTMG\bin\ctmg_resetbackuperror.bat
```

The processing result is output as standard output.
The contents and meaning of the processing result are shown in the table below.

Processing Result	Return Value	Message
Normal end	0	Successfully reset the base-backup error.
Error	Other than 0	Failed to reset the base-backup error.

- If starting of the Manager fails

  When operations continue after a while without the command mentioned above (ctmg_resetbackuperror) being executed, and then the Manager is stopped, subsequent starts of the Manager may fail. If this happens, an error message will be output to the database log files, as follows:

  - Database Log Files

    ```
    Installation_folder\RCXCTMG\Charging\log\psql-nn.log (*)
    ```

    * Note: The "nn" part is a 2-digit numeral indicating the day on which the log was output.

  - Error Message

    Example: If the access control database failed to start

    ```
    LOG: could not open file "pg_xlog/xxxxxxxx" (log file 0, segment xx): No such file or directory
    (*)
    LOG: invalid checkpoint record
    PANIC: could not locate required checkpoint record
    HINT: If you are not restoring from a backup, try removing the file
    "C:/Fujitsu/ROR/RCXCTMG/Charging/pgsql/data/backup_label".
    ```

    * Note: The "xxxxxxxx" and "xx" parts of the log are undefined.

    In a case like this, delete the file shown below. When this file is deleted, start of the Manager will end normally. When this file is deleted, start of the Manager will end normally.

    ```
    Installation_folder\RCXCTMG\Charging\pgsql\data\backup_label
    ```

Differential Backup

With differential backup, the contents of updates to the database are output to multiple files in 16 MB-sized lots.

These files are called Write-Ahead Logging (WAL) files.

Usually, for each 16 MB written, the WAL file being written to is switched, and the WAL file for which writing has been completed is saved to the "wal" directory under the backup directory.

Execute the rcxmgrbackup command.

Periodically executing the rcxmgrbackup command allows the contents of updates to the database that are recorded in saved WAL files to be maintained for a certain period of time. For example, when the rcxmgrbackup command is executed every hour, the contents of updates performed in the most recent one-hour period will be saved.

For details on the command, refer to "6.6 rcxmgrbackup" in the "Reference Guide (Command/XML) CE".

[Windows Manager]

```
>Installation_folder\SVROR\Manager\bin\rcxmgrbackup -dir directory [-cleanup] <RETURN>
```

[Linux Manager]

```
# /opt/FJSVrcvmr/bin/rcxmgrbackup -dir directory [-cleanup] <RETURN>
```

10.1.3.1 Items to be Determined Before Periodic Execution

The following items must be determined before periodic execution is implemented.

Items	What to Decide
Frequency and timing of base backup	Determine the frequency of base backup. Example: 3:00 a.m. on the 1st of every month
Frequency and timing of differential backup	Determine the frequency of differential backup. Example: Once per hour
Location of backup	Determine the location of the backup. Setting a disk other than the disk that installed the product is recommended. In addition, sufficient capacity is required to be able to store the backup file.

Refer to "10.1.5 Online Backup Settings for Metering" for information on how to set the backup destination.

10.1.3.2 Settings for Periodic Execution of Backup

The following two settings are required in order to perform periodic execution of backup:

- Settings for periodic execution of base backup

- Setting for periodic execution of WAL file save

📖 Note

. . . .

- If this procedure has been used to start batch files using the Task Scheduler, a command prompt is displayed while the batch files are being executed. Do not close this command prompt.

- When an error occurs at periodic execution of online backup, a message with the error code 67198 will be output to the log files. If the occurrence of errors is being monitored, use software for monitoring the log files to monitor this error message. For details on the error message, refer to "Message number 67198" in "Messages".

. . . .

Settings for Periodic Execution of Base Backup

Specify settings so that a base backup is taken periodically.
Use Windows Task Scheduler as a mechanism for periodically executing commands. Refer to "Windows Help" for information on how to set the Task Scheduler.

This section describes an example of a setup procedure for implementing a backup at 3:00 a.m. on the 1st of every month.

1. From the Windows [Start] menu, select [Administrative Tools]-[Task Scheduler] to start the Task Scheduler.

2. To manage tasks hierarchically, use the following procedure to create a folder:

    a. In the Task Scheduler menu, after selecting Task Scheduler Library, select [Actions]-[New Folder], and then enter any folder name in the dialog box that is displayed and click <OK>.

    b. Selecting the created folder and then creating another folder by selecting [Actions]-[New Folder] from the Task Scheduler menu allows a further hierarchical level to be added.

🅿 Point
. . . .

Creating a folder in Task Manager allows tasks to be managed hierarchically. In cases such as where multiple tasks are to be registered, creating a folder allows task management to be performed efficiently.
. . . .

3. From the Task Scheduler menu, select Actions >> Create Basic Task to display the Create Basic Task Wizard.

🅿 Point
. . . .

When a subsequent operation is performed after any folder is selected, the task will be registered under that folder. If a folder is not selected, the task will be registered in the Task Scheduler Library.
. . . .

4. In the [Name] field, enter a task name (for example, "Monthly backup") and click <Next>.

5. Select "Monthly" as the task trigger and click the Next button.

6. In the [Start] field, set the date and time at which periodic backup is to start.
Example: Set a date of the "1st" of the following month and "3:00:00".

7. In the [Months] field, select the "Select all months" checkbox.

8. In the [Days] field, select the "1" checkbox.

9. Click <Next>.

10. Select "Start a program" as the task action and click <Next>.

11. Click <Browse> and in the [Program/script] field, set the batch files for base backup.

📝 Example
. . . .

C:\work\backupall.bat

```
@echo off
echo "Resource Manager Cloud Edition Resources backup Start"
call "{Installation_folder}\SVROR\Manager\bin\rcxmgrbackup" -directory {storage destination
folder}  -base
echo "Resource Manager Cloud Edition Resources backup End"
```

- For details on the rcxmgrbackup command, refer to "6.6 rcxmgrbackup" in the "Reference Guide (Command/XML) CE".
. . . .

12. In the [Add arguments (optional)] field, set a character string to be used for outputting the command output to log files.

Example: >>F:\backup\backupall.log 2>&1

13. Click <Next>.

14. Check the task settings, and if they are correct, click <Finish>.

Settings for Periodic Execution of Differential Backup

Specify settings so that a differential backup is taken periodically.

This section describes an example of a setup procedure for saving a differential backup every hour.

When using the Create Basic Task Wizard, execution for a time interval shorter than one day cannot be set, so once the task has been registered for a different frequency, change the properties.

1. From the Windows [Start] menu, select [Administrative Tools]-[Task Scheduler] to start the Task Scheduler.

2. To manage tasks hierarchically, use the following procedure to create a folder:

   a. From the Task Scheduler menu, after selecting Task Scheduler Library, select [Actions]-[New Folder], and then enter a folder name in the dialog box that is displayed and click the <OK> button.

   b. Selecting the created folder and then creating another folder by selecting [Actions]-[New Folder] from the Task Scheduler menu allows a further hierarchical level to be added.

P Point

Creating a folder in Task Manager allows tasks to be managed hierarchically. In cases such as where multiple tasks are to be registered, creating a folder allows task management to be performed efficiently.

3. From the Task Scheduler menu, select [Actions]-[Create Basic Task] to display the Create Basic Task Wizard.

P Point

When a subsequent operation is performed after any folder is selected, the task will be registered under that folder. If a folder is not selected, the task will be registered in the Task Scheduler Library.

4. In the [Name] field, enter a task name (for example, "Periodic WAL switching") and click the Next button.

5. Select Daily as the task trigger and click the Next button.

6. In the Start field, set the date and time at which online backup (WAL) is to start.
   Example: Set the date of the following day and "0:00:00".

7. In the [Recur every] field, set 1 day (set by default).

8. Click <Next>.

9. Select "Start a program" as the task action and click <Next>.

10. Click the <Browse> button and in the [Program/script] field, set the batch files for online backup (WAL).

Example

C:\work\hourlybackup.bat

```
@echo off
echo "Resource Manager Cloud Edition Resources backup Start"
call "{Installation_folder}\SVROR\Manager\bin\rcxmgrbackup" -dir {storage destination folder}
echo "Resource Manager Cloud Edition Resources backup End"
```

   - For details on the rcxmgrbackup command, refer to "6.6 rcxmgrbackup" in the "Reference Guide (Command/XML) CE".

11. In the [Add arguments (optional)] field, set a character string to be used for outputting the command output to log files.

    Example: >>F:\backup\backupall.log 2>&1

12. Click <Next>.

13. Check the task settings, and if they are correct, click <Finish>.

14. Select the registered task from the task list, and select [Action]-[Properties] to open the Properties dialog.

15. Open the Triggers tab, select the existing trigger, and click the Edit button.

16. Check the [task every:] checkbox in [Advanced settings], and select "1 hour" (set by default).

17. For the [for a duration of], select "1 day" (set by default).

18. Click the OK button.

10.1.4 Restoring the Admin Server

This chapter describes how to restore resources that have been backed up.

1. Stop the manager

2. Restore the resources of the Manager

3. Start the manager

4. Update backup information of network device files

5. Update the configuration information in the operational status information

10.1.4.1 Stopping the Manager

Execute the command shown below to stop the Manager.

For details on the command, refer to "5.19 rcxmgrctl" in the "Reference Guide (Command/XML) CE".

[Windows Manager]

```
>Installation_folder\SVROR\Manager\bin\rcxmgrctl stop <RETURN>
```

[Linux Manager]

```
# /opt/FJSVrcvmr/bin/rcxmgrctl stop <RETURN>
```

10.1.4.2 Restoring the Resources of This Product

Restore the resources of this product. Execute the command shown below.

For details on the command, refer to "6.7 rcxmgrrestore" in the "Reference Guide (Command/XML) CE".

[Windows Manager]

```
>Installation_folder\SVROR\Manager\bin\rcxmgrrestore -dir directory <RETURN>
```

[Linux Manager]

```
# /opt/FJSVrcvmr/bin/rcxmgrrestore -dir directory <RETURN>
```

When the network device file management function is used, and the folder is saved according to procedure in "10.1.2.2 Backing Up the Resources of this Product", replace the following folder with the saved information.

[Windows Manager]

```
>Installation_folder\SVROR\Manager\var\netdevice\
```

[Linux Manager]

```
# /var/opt/FJSVrcvmr/netdevice/
```

10.1.4.3 Starting the Manager

Execute the command shown below to start the Manager.

For details on the command, refer to "5.19 rcxmgrctl" in the "Reference Guide (Command/XML) CE".

```
>Installation_folder\SVROR\Manager\bin\rcxmgrctl start <RETURN>
```

[Linux Manager]

```
# /opt/FJSVrcvmr/bin/rcxmgrctl start <RETURN>
```

10.1.4.4 Restoring Image Management Information

If the following image management information that was saved at backup has been changed, reset it:

For details on the command, refer to "5.9 rcxadm imagemgr" in the "Reference Guide (Command/XML) CE".

- Number of stored snapshot generations

[Windows Manager]

In *value*, specify the number of stored generations that were saved at backup.

```
>Installation_folder\SVROR\Manager\bin\rcxadm imagemgr set -attr vm.snapshot.maxversion=value
<RETURN>
```

[Linux Manager]

```
# /opt/FJSVrcvmr/bin/rcxadm imagemgr set -attr vm.snapshot.maxversion=value <RETURN>
```

10.1.4.5 Updating Backup Information of Network Device Files

When backup of network device files was executed after backing up the admin server, the backup information of network device file will be lost when the admin server is restored.

Please update backup information of the admin server by executing the following command after restoring the admin server.

For details on how to use the command, refer to "3.8 rcxadm netdevice" in the "Reference Guide (Command/XML) CE".

[Windows Manager]

```
>Installation_folder\SVROR\Manager\bin\rcxadm netdevice cfbackup -name name -type type <RETURN>
```

[Linux Manager]

```
# /opt/FJSVrcvmr/bin/rcxadm netdevice cfbackup -name name -type type <RETURN>
```

10.1.4.6 Disabling L-Platform Applications

Disable an L-Platform application for which an application process no longer exists, if online backup of the admin server has been performed.

For details on the command, refer to "10.9 recoverAllService (Disable L-Platform Application)" in the "Reference Guide (Command/XML) CE".

[Windows Manager]

```
>Installation_folder\RCXCTMG\MyPortal\bin\recoverAllService.bat <RETURN>
```

[Linux Manager]

```
# /opt/FJSVctmyp/bin/recoverAllService.sh <RETURN>
```

10.1.4.7 Updating the Configuration Information in the Operational Status Information

Execute the following command to update the configuration for the operational status information:

For details on the command, refer to "13.1 cmdbrefresh (Refresh Configuration Information of System Condition)" in the "Reference Guide (Command/XML) CE".

```
>Installation folder\SWRBAM\CMDB\FJSVcmdbm\bin\cmdbrefresh.exe -a -q <RETURN>
```

[Linux Manager]

```
# /opt/FJSVcmdbm/bin/cmdbrefresh.sh -a -q <RETURN>
```

10.1.5 Online Backup Settings for Metering

Backup resources that use the PostgreSQL point-in-time recovery (PITR) mechanism (metering resources), which are among the resources that are obtained in online backup of the admin server, are stored in the directory that has been specified in the settings file, regardless of the storage destination specified by the command.

This section describes how to change the backup destination directory for the online backup of metering resources.
To change the backup destination directory, the files and items in the table shown below must be changed.

File to be Changed	File Name	Item to be Changed
Operational settings file for the database	postgresql.conf	WAL save directory
Operational settings file for online backup	ctmgbackup.properties	WAL save directory
		Backup directory

Stopping the Manager

Stop the manager.

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

Changing the Backup Destination Directory

This section describes how to change the backup destination directory, based on the example shown below.

[Windows Manager]

Directory	Type	Directory Path
Backup directory	Before change	C:\Fujitsu\ROR\RCXCTMG\backup\data
	After change	D:\basebackup
WAL save directory	Before change	C:\Fujitsu\ROR\RCXCTMG\backup\wal
	After change	E:\walbackup

[Linux Manager]

Directory	Type	Directory Path
Backup directory	Before change	/var/opt/FJSVctchg/backup/data
	After change	/basebackup
WAL save directory	Before change	/var/opt/FJSVctchg/backup/wal
	After change	/walbackup

1. Create a new backup directory.

    [Windows Manager]

    ```
    > D: <RETURN>
    > cd \ <RETURN>
    > mkdir basebackup\Charging <RETURN>
    > E: <RETURN>
    > cd \ <RETURN>
    > mkdir walbackup\Charging <RETURN>
    ```

    [Linux Manager]

    ```
    # mkdir /basebackup <RETURN>
    # mkdir /walbackup <RETURN>
    ```

2. Set access privileges for users connected with the database, for the directory.

    [Windows Manager]

    ```
    >cacls D:\basebackup\Charging /T /E /G rcxctdbchg:F <RETURN>
    >cacls E:\walbackup\Charging /T /E /G rcxctdbchg:F <RETURN>
    ```

    [Linux Manager]

    ```
    # chown -R rcxctdbdhg:rcxctdbchg /basebackup <RETURN>
    # chown -R rcxctdbdhg:rcxctdbchg /walbackup <RETURN>
    ```

3. Copy (move) files from the existing directory to the new directory.

    [Windows Manager]

    ```
    >xcopy c:\Fujitsu\ROR\RCXCTMG\backup\data\* D:\basebackup\ /E /H /K /X <RETURN>
    >xcopy c:\Fujitsu\ROR\RCXCTMG\backup\wal\* E:\walbackup\ /E /H /K /X <RETURN>
    ```

    [Linux Manager]

    ```
    # cp -pR /var/opt/FJSVctchg/backup/data/* /basebackup/. <RETURN>
    # cp -pR /var/opt/FJSVctchg/backup/wal/* /walbackup/. <RETURN>
    ```

4. Modify the operational settings file for the database.

    Change the settings for the following operational settings file for each database cluster:

    [Windows Manager]

    ```
    Installation_folder\RCXCTMG\Charging\pgsql\data\postgresql.conf
    ```

    Change as follows:

    -   Setting before Change

    ```
    archive_command = 'copy "%p" "C:\\Fujitsu\\ROR\\RCXCTMG\\backup\\wal\\Charging\\%f"'     #
    command to use to archive a logfile segment
    ```

    -   Setting after Change

    ```
    archive_command = 'copy "%p" "E:\\walbackup\\Charging\\%f"'    # command to use to archive a
    logfile segment
    ```

    P Point
    . . . .

    Use "\\" as a delimiter.
    . . . .

    [Linux Manager]

```
/var/opt/FJSVctchg/pgsql/data/postgresql.conf
```

- Setting before Change

```
archive_command = 'cp "%p" "/var/opt/FJSVctchg/backup/wal/%f"' # command to use to archive a
logfile segment
```

- Setting after Change

```
archive_command = 'copy "%p" "E:\\walbackup\\Charging\\%f"'    # command to use to archive a
logfile segment
```

P Point

. . . .

Use "/" as a delimiter.

. . . .

5. Modify the operational settings file for the online backup.

Open the following file:

[Windows Manager]

```
Installation_folder\RCXCTMG\bin\conf\ctmgbackup.properties
```

Change as follows:

- Setting before Change

```
BASE_BACKUP_DIR=C:/Fujitsu/ROR/RCXCTMG/backup/data
WAL_ARCHIVE_DIR=C:/Fujitsu/ROR/RCXCTMG//backup/wal
```

- Setting after Change

```
BASE_BACKUP_DIR=D:/basebackup
WAL_ARCHIVE_DIR=E:/walbackup
```

P Point

. . . .

Use "/" as a delimiter.

. . . .

[Linux Manager]

```
/opt/FJSVctmg/bin/conf/ctmgbackup.properties
```

Change as follows:

- Setting before Change

```
BASE_BACKUP_DIR=/var/opt/FJSVctchg/backup/data
WAL_ARCHIVE_DIR=/var/opt/FJSVctchg/backup/wal
```

- Setting after Change

```
BASE_BACKUP_DIR=/basebackup
WAL_ARCHIVE_DIR=/walbackup
```

P Point

. . . .

Use "/" as a delimiter.

. . . .

Starting the Manager

Start the manager.

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

10.2 Backup and Restoration of Network Devices

This section describes how to perform the backup and restoration of network devices.

10.2.1 Mechanism of Backup and Restoration

By backing up network device configuration files, restoration of network device configurations can be done quickly when network devices are replaced due to failures.

Up to 5 generations of network device configuration files can be backed up and saved If the number of saved generations exceeds 5 generations, older generations will be deleted, starting with the oldest generation.

Only 1 generation of network device environment files can be backed up and saved. If backup is performed, the saved network device environment file will be deleted automatically.

This product supports the backup and restoration of network device configuration files for the following network devices.

Table 10.9 Network Devices that are Supported by Device Configuration File Management

Hardware		Network Device Configuration File	Environment File
Fujitsu	SR-X series	config1 config2	None
	IPCOM EX series (*)	running-config.cli startup-config.cli	ipcomenv-*host_name-firmware_version_number-time*.tgz host_name: Target IPCOM EX series host name firmware_version_number: current firmware version number time: The time when backup was performed Example: ipcomenv-ipcom-E20L10NF0001B01-20120802-103845.tgz
	NS Appliance	running-config.cli startup-config.cli	nsappliance-*IP_address*.tgz Example: nsappliance-192.168.1.1.tgz
Cisco	Catalyst series (*)	running-config startup-config	None
	ASA5500 series (*)	running-config startup-config	None
	Nexus 5000 series	running-config startup-config	None
F5 Networks	BIG-IP Local Traffic Manager series	config.scf	environment.ucs

*: For details on the target network devices, refer to "Table 2.75 Supported Network Devices" in "2.5 Hardware Environment" in the "Design Guide CE".

10.2.2 Backup of Network Devices

Whether to back up the network device file is decided based on the "CONFIG_BACKUP" parameter in unm_mon.rcxprop file.

Backup is performed in the following cases.

- When performing automatic configuration of network devices

- When executing the rcxadm netdevice cfbackup command specifying the network device

P Point

. . . .

When performing the following operation to manage the newest file for the network device, be sure to back up the file for configuration of the network device in the rcxadm netdevice cfbackup command.

- When the file for configuration of the network device has been updated, the configuration of management information has been changed, or the server certificate updated, log in to network device directly

. . . .

The backup is stored in the network device file storage area of the ROR admin server.

When backing up the network device file, the backup method differs according to the specifications of network devices.

- When the network device has an ftp server function

When backup is performed, network connection to the specified device is made directly, and the backup performed.

- When the network device does not have an ftp server function

When backup is performed, the backup will be performed over the external ftp server defined using the rcxadm netconfig command in advance.

See

. . . .

- For details on the rcxadm netdevice command, refer to "3.8 rcxadm netdevice" in the "Reference Guide (Command/XML) CE".

- For details on the rcxadm netconfig command, refer to "3.7 rcxadm netconfig" in the "Reference Guide (Command/XML) CE".

- For details on the unm_mon.rcxprop file, refer to "9.4.8.3 Network Device Management Function Definition File" in the "Design Guide CE".

. . . .

10.2.3 Restoration of Network Devices

Restoration is performed in the following cases.

- When executing rcxadm netdevice cfrestore

This section describes the restoration procedure o++f backup network device files.

When the Backed Up Network Device File is a "network device configuration file" or "network device environment file"

Restore the backup network device file using the rcxadm netdevice cfrestore command.

When the Backed Up Network Device Files are both the "network device configuration file" and the "network device environment file".

1. Confirm the newer backup date by displaying the backup dates of the newest "network device configuration file" and "network device environment file" using the rcxadm netdevice cflist command.

2. Perform restoration by either restoration procedure according to the confirmed backup date.

   - When the backup date of the latest "network device configuration file" is newer

      a. Restore the "network device environment file" using the rcxadm netdevice cfrestore command.

      b. Restore the "network device configuration file" using the rcxadm netdevice cfrestore command.

   - When the backup date of the "network device environment file" is newer

      a. Restore only the "network device environment file" using the rcxadm netdevice cfrestore command.

![See icon] **See**

. . . .

For details on the rcxadm netdevice command, refer to "3.8 rcxadm netdevice" in the "Reference Guide (Command/XML) CE".

. . . .

Part 4   Monitoring

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

  Resource Orchestrator can centrally monitor the configuration and status of servers and other managed resources (Chassis, servers, L2 switches, LAN switch blades, network devices, physical OSs, VM hosts and guests, power monitoring devices, etc.) directly from the ROR console.
  When a hardware problem occurs on a server, affected guest operating systems can be easily detected.

  ### 🛑 Note
  ....
  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 blade	Yes	Yes
Network device	Yes	No
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
Server	Server Physical OS VM host (*1) VM guest (*1)	ServerView Agents (*2) Server management unit Server virtualization software
LAN switch blade	LAN switch blade	LAN switch blade Server management unit (*3)
Network device	L2 switch Ethernet fabric Firewall Server load balancer	L2 switch Ethernet fabric Firewall Server load balancer
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
	Server
	Physical OS
	VM host
	Guest domain of OVM for SPARC registered as a VM host
	VM guest
	LAN switch blade L2 switch
	Ethernet Fabric
	Firewall
	Server load balancer
	Integrated network device
	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
None	normal	Normal	No action is necessary
⚠	warning	Warning An error has occurred but the resource can still be used.	Action must be taken
⚠	unknown	Unknown The status of the resource cannot be obtained. (*1, *2)	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 VM guest is in "unknown" status, check the operation status of the VM host on which the VM guest is running.

*2: When a network device is in "unknown" status, check the physical connection between the network device and admin LAN as well as the operation status of the network device.

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 do not be obtained from LAN switch blade using SNMP. Therefore, "unknown" status cannot be detected.

. . . .

Table 11.5 Physical Server Icons

Icon	Meaning
	Spare server
	Maintenance mode server

Table 11.6 OS Icons
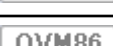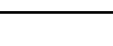
Icon (Tree)	Icon (List)	Meaning
	Windows	Windows OS
	Linux	Linux OS
Solaris	Solaris	Solaris OS
VM	VMware	VMware host OS
	Windows	Hyper-V host OS
	Xen	Citrix XenServer host OS
	Xen	Linux Xen host OS
KVM	KVM	KVM host OS
Solaris	Solaris	Solaris Zone host OS
OVM SPARC	OVM SPARC	OVM for SPARC host OS
OVM86	OVM86	Host OS of OVM for x86

Table 11.7 Relations between Network Device Unit Status and Maintenance Mode (An Example of the Ethernet Fabric)

Unit Status	Maintenance Mode (active)	Maintenance Mode (maintenance)
normal		
warning		
unknown		
error	-: (Not supported)	

- 116 -

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 switch blades, "error" and "fatal" are not displayed.
  Only "warning", "normal", or "unknown" are displayed.

- For network devices, "normal", "warning", "unknown", or "error" is 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 for Infrastructure Administrators (Resource Management) CE".

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 server switchover, refer to "4.2 Switchover" in the "Operation Guide VE".

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 "9.3.2 Replacing Servers".

5. Perform Post-recovery Verification

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

11.4 Monitoring Networks

This section explains detecting changes in states of network devices which are being monitored to perform automatic network settings for them.

Network monitoring of this product involves alive monitoring, state monitoring, and SNMP trap monitoring of network devices.

For monitoring errors such as port trouble of network devices, please use network management software.

An infrastructure administrator recognizes changing state of a network device in any of the following cases.

- Report of an error from another administrator or user

- Detection of change in state when checking the system using the ROR console

    - The event logs showing a change in the statuses of ports of network devices are output.
    If a port status change on a registered network device is detected, the message number 22784 will be output.
    If the port status is "down" or "unknown" and that change was not caused by the infrastructure administrator, it indicates a problem with the network device. Check the network device.

    - Status icons of resources on the network device tree are changed to a status other than normal

- Detection of changes in state by software for network management

An infrastructure administrator checks the status of the network device and takes corrective action if the problem can be solved.

If the problem cannot be solved by the infrastructure administrator, notification of the following information is sent to the network device administrator, requesting solving of the problem.

- Network device name on which the change in state occurred

- Network device status

- Phenomenon noticed when receiving requests for confirmation from another administrator or user

11.4.1 Identification of Error Locations

This section explains how to identify the network device on which an error has occurred.

11.4.1.1 When Notified of an Error by a Tenant Administrator or Tenant User

Use the following procedure to determine the location of the problem.

1. Confirm the network device status using the ROR console.

    - If event logs showing a change in the statuses of ports of network devices are not output.
    If a port status change on a registered network device is detected, the message number 22784 will be output.
    If the port status is "down" or "unknown" and that change was not caused by the infrastructure administrator, it may indicate a problem with the network device.

    - If status icons of resources on the network device tree have not changed to a status other than normal

2. When there is a network device on which a change in state has occurred, check if the device is the network device used for an L-Platform for which notification has been received.
When a change in state occurs on a network device which is not used for the L-Platform for which notification has been received, refer to "11.4.1.2 When a Change in State is Detected during Status Confirmation Using the ROR Console".

    - When the network device on which the change in state has occurred is a firewall or a server load balancer

        a. In the orchestration tree, select the L-Platform providing services for which notification of an error has been received from another administrator or user.

        b. Select the [Resource List] tab of the Main Panel.

c. Confirm [Use Resource] of [Firewall List].

When the status of a used resource is something other than "(normal)", and the name is the same as the network device confirmed in step 1 on which the change in state has occurred, the error will be identified as having occurred on the network device (firewall).

Additionally, confirm the status of the specified firewall.

For details on how to confirm the status of the firewall, refer to "11.4.2 Firewall Status Confirmation".

d. Confirm [Use Resource] of the [Server Load Balancer List].

When the status of a used resource is something other than "(normal)", and the name is the same as the network device confirmed in step 1 on which the change in state has occurred, the error will be identified as having occurred on the network device (server load balancer).

Additionally, confirm the status of the specified server load balancer.

For details on how to confirm the status of the server load balancer, refer to "11.4.3 Server Load Balancer Status Confirmation".

- When the network device on which a change in state occurs is something other than a firewall and a server load balancer

a. Confirm the name of the network resource.

The name of the network resource can be confirmed in the items of the displayed results of the rcxadm netdevice show command (AllocatedResources[Network]). Specify the name of the network device confirmed in step 1 for the name of the network device name for the name option.

b. Select the L-Platform from the orchestration tree.

c. Select the L-Server under the L-Platform.

d. Select the [Resource Details] tab of the Main Panel.

e. Confirm [Network Resource] of [Network Information]. When the network device name is the same as the name confirmed in a., the error on the network device (L2 switch or Ethernet fabric) can be identified on the specified network device that was confirmed in a.

Additionally, confirm the status of the specified L2 switch or Ethernet fabric.

For details on the confirmation procedure, refer to "11.4.4 L2 Switch Status Confirmation" or "11.4.5 Status Confirmation of Other Network Devices".

When there is no network device on which a change in state has occurred, one of the following errors may have occurred.

- The wrong access control rules have been applied to the firewall, and passing of communication packet data is being rejected

Use the following procedure to confirm the status of the firewall.

a. Identify the firewall used for the notified L-Platform.

For details on how to specify the firewall, refer to "When the network device on which the change in state has occurred is a firewall or a server load balancer".

b. Confirm the status of the firewall.
For details on how to confirm the status of the firewall, refer to "11.4.2 Firewall Status Confirmation".

- An error occurred in a network device that is managed using Resource Orchestrator

Request investigation from the network device administrator from the following point of view.

- If an error has occurred on a network device connecting to the network device used for the L-Platform.

- If an error has occurred on a network device on the communication route to the L-Platform

The network device administrator must confirm the network device status, using the following procedure.

a. Log in directly to a network device other than the L-Platform.

b. Confirm the status of the network device.

11.4.1.2 When a Change in State is Detected during Status Confirmation Using the ROR Console

When a change in state is detected during status confirmation using the ROR console, it can be determined that an error might have occurred on the network device which has indicated a change in state (a firewall, a server load balancer, an L2 switch, or an Ethernet fabric).

- When the network device on which the change in state has occurred is a firewall

  Confirm the status of the firewall.
  For details on how to confirm the status of the firewall, refer to "11.4.2 Firewall Status Confirmation".

- When the network device on which the change in state has occurred is a server load balancer

  Confirm the status of the server load balancer.
  For details on how to confirm the status of the server load balancer, refer to "11.4.3 Server Load Balancer Status Confirmation".

- When the network device on which the change in state has occurred is an L2 switch

  Check the status of the L2 switch.
  For details on how to confirm the L2 switch status, refer to "11.4.4 L2 Switch Status Confirmation".

- When the network device on which the change in state has occurred is an Ethernet fabric

  Confirm the status of the Ethernet fabric.
  For details on the confirmation procedure, refer to "11.4.5 Status Confirmation of Other Network Devices".

11.4.2 Firewall Status Confirmation

This section explains the confirmation procedure of firewall status.

11.4.2.1 When an L-Platform Using a Firewall is Identified

Use the following procedure to confirm the status of the firewall.

1. In the orchestration tree, select the network device of a firewall under the L-Platform.

2. Select the [Resource Details] tab, and click the link of [Preserved resource] of [Network Device] of [Basic Information of Network Device].

   The [Resource Details] tab of the network device is displayed.

3. Confirm the displayed detailed information.

   When the target network device is in a redundant configuration, confirm both the devices are in active status and standby status.

   - When there is a link of [Launch Network Device Web UI] in [Hardware Details]

     a. Click the link and start the firewall management screen.

     b. Check the event log, status (interface, system condition, and operation status), whether communication packets can pass from the started management window, and the error detected by the firewall.

- When there is no link of [Launch Network Device Web UI] in [Hardware Details]

Confirm the following information displayed in the Main Panel.

Basic Information - Device Status

The status of the firewall is displayed.
When the status is something other than "normal", it indicates that an error might have occurred.

Port Information - Link Status

The port status of the firewall is displayed.
When the status is something other than "up", unless changed intentionally by the infrastructure administrator, it indicates that a port error might have occurred.

Additionally, check the status (system condition and operation status) and whether communication packets can pass by logging in to the firewall directly, and check the error detected by the firewall.

4. Confirm the status of the firewall.

- When passing of communication packets is rejected by a firewall or an event log is output

The infrastructure administrator must confirm if the following items using auto-configuration are correct.

- Scripts for configurations

- Parameter files

- Configuration files for interfaces

- When it is possible that the hardware has failed, in cases where the firewall device status is "unknown" or the link status is "down", unless changed intentionally by the infrastructure administrator.

The infrastructure administrator must request confirmation the status from the administrator of the network device, in cases where firewall hardware has not failed. The network device administrator should request a hardware maintenance person to take corrective action when hardware has failed.

5. Take corrective action based on the results of checked scripts and files.

- When there are no errors in the scripts or files checked in step 4.

Request confirmation from a tenant administrator or tenant user that there are no errors in the parameters taken over during the L-Platform update.

- When there are errors in the scripts or files checked in step 4.

The infrastructure administrator will log in to the firewall directly, delete the failed configuration (such as rejection of communication packets), and modify error scripts or files.

6. Take corrective action based on the results of parameter checks.

- When there are no errors in the parameters taken over during the L-Platform update

Confirm with the administrator of the network device that the firewall configuration has not been modified, since an unexpected definition modification may have been made.

- When there are errors in the parameters taken over during the L-Platform update

The infrastructure administrator will log in to the firewall directly and delete the failed configuration (such as rejection of communication packets).

7. Take corrective action based on the check results if definitions have been modified.

- When the network device administrator has not modified the configuration

Extract the firewall definitions and check the content. When inappropriate settings have been configured, log in to the firewall directly, and modify the definitions.

- When a network device administrator has modified the configuration

Check if the configuration modification is necessary.

- When the configuration modification is not necessary

  The infrastructure administrator must log in to the firewall directly, and delete or modify the problem-causing configuration (such as rejection of communication packets).

- When configuration modifications were necessary based on the system operation policy

  Review if the details of scripts, parameter files, and interface configuration files are based on the operation policy.

11.4.2.2 When a Change in Firewall Status is Detected during Status Confirmation Using the ROR Console

Use the following procedure to confirm the status of the firewall.

1. Select the network device of firewall on which the change in state has occurred from the network device tree.

2. Select the [Resource Details] tab.

3. Confirm the status of the firewall.

4. Identify the L-Platform in use.

   a. Confirm the name of the firewall allocated using auto-configuration by checking the items in displayed results of the rcxadm netdevice show command (AllocatedResources[Firewall]).

   b. Confirm the name of the L-Platform using the firewall by checking the items in displayed results of the rcxadm firewall show command (L-Platform Name). Specify the firewall name confirmed in a. as the firewall name to be specified for the name option.

5. Confirmation procedure after this, refer to the operation after step 3 of "11.4.2.1 When an L-Platform Using a Firewall is Identified".

See
. . . .
- For details on firewall operations (login, status confirmation, definition extraction, definition modification), refer to the manuals of firewalls.

- For details on the rcxadm netdevice command, refer to "3.8 rcxadm netdevice" in the "Reference Guide (Command/XML) CE".

- For details on the rcxadm firewall command, refer to "3.4 rcxadm firewall" in the "Reference Guide (Command/XML) CE".
. . . .

11.4.3 Server Load Balancer Status Confirmation

This section explains the confirmation procedure of server load balancer status.

11.4.3.1 When an L-Platform Using a Server Load Balancer is Identified

Use the following procedure to confirm the status of server load balancers.

1. In the orchestration tree, select the network device of a server load balancer under the L-Platform.

2. Select the [Resource Details] tab, and click the link for [Preserved resource] of [Network Device] of [Basic Information of Network Device].

   The [Resource Details] tab of the network device is displayed.

3. Confirm the displayed detailed information.

   When the target network device is in a redundant configuration, confirm both the devices are in active status and standby status.

   - When there is a link for [Launch Network Device Web UI] in [Hardware Details]

     a. Click the link and start the server load balancer management screen.

      b. Check the event log and status (interface, system condition, and operation status) from the started management window, and check the error detected by the server load balancer.

- When there is no link for [Launch Network Device Web UI] in [Hardware Details]

Confirm the following information displayed in the Main Panel.

Basic Information - Device Status

The status of the server load balancer is displayed.
When the status is something other than "normal", unless changed intentionally by the infrastructure administrator, it indicates that an error might have occurred.

Port Information - Link Status

The port status of the server load balancer is displayed.
When the status is something other than "up", unless changed intentionally by the infrastructure administrator, it indicates that a port error might have occurred.

Additionally, check the status (system condition and operation status) by logging in to the server load balancer directly, and check the error detected by the server load balancer.

4. Confirm the status of the server load balancer.

- When server load balancing is not performed as expected or an event log is output

The infrastructure administrator must confirm if the following items using auto-configuration are correct.

- Scripts for configurations

- Parameter files

- Configuration files for interfaces

Further, confirm that the server to be load balanced is operating normally because the problem may be due to an error in the server.

- It is possible that the hardware has failed, in cases where the server load balancer device status is "unknown" or the link status is "down", unless changed intentionally by the infrastructure administrator.

The infrastructure administrator should request confirmation of the status from the administrator of the network device, to check if the server load balancer has failed. The network device administrator should request a hardware maintenance person to take corrective action when hardware has failed.

5. Take corrective action based on the results of checked scripts and files.

- When there are no errors in the scripts or files checked in step 4.

Request confirmation from a tenant administrator or tenant user that there are no errors in the parameters taken over during the L-Platform update.

- When there are errors in the scripts or files checked in step 4.

The infrastructure administrator should log in to the server load balancer directly, delete the failed configuration (such as load balancing rules), and modify any scripts or files containing errors.

6. Take corrective action based on the results of parameter checks.

- When there are no errors in the parameters taken over during the L-Platform update

Confirm with the administrator of the network device that the server load balancer configuration has not been modified, since an unexpected modification may have been made to the definition.

- When there are errors in the parameters taken over during the L-Platform update

The infrastructure administrator should log in to the server load balancer directly, and delete the failed configuration (such as load balancing rules).

7. Take corrective action based on the check results if definitions have been modified.

   - When the network device administrator has not modified the configuration

     Extract the server load balancer definitions and check the content. When inappropriate settings have been configured, log in to the server load balancer directly, and modify the definitions.

   - When a network device administrator has modified the configuration

     Check if the configuration modification is necessary.

      - When the configuration modification is not necessary

        The infrastructure administrator should log in to the server load balancer directly, and delete or modify the problem-causing configuration (such as load balancing rules).

      - When configuration modifications were necessary based on the system operation policy

        Review if the details of scripts, parameter files, and interface configuration files are based on the operation policy.

11.4.3.2 When an L-Platform Using a Server Load Balancer is Identified

Use the following procedure to confirm the status of server load balancers.

1. Select the network device of the server load balancer on which an error has occurred from the network device tree.

2. Select the [Resource Details] tab.

3. Confirm the status of the server load balancer.

4. Identify the L-Platform in use.

   a. Confirm the name of the server load balancer allocated using auto-configuration by checking the items displayed in the results for the rcxadm netdevice show command (AllocatedResources[SLB]).

   b. Confirm the name of the L-Platform using the server load balancer by checking the items in results displayed for the rcxadm slb show command (L-Platform Name). Specify the server load balancer name confirmed in a. as the server load balancer name to be specified for the name option.

5. For the confirmation procedure after this, refer to the operation after step 3 of "11.4.3.1 When an L-Platform Using a Server Load Balancer is Identified".

See
. . . .

- For details on server load balancer operations (login, status confirmation, definition extraction, definition modification, etc.), refer to the manuals of server load balancers.

- For details on the rcxadm netdevice command, refer to "3.8 rcxadm netdevice" in the "Reference Guide (Command/XML) CE".

- For details on the rcxadm slb command, refer to "3.12 rcxadm slb" in the "Reference Guide (Command/XML) CE".
. . . .

11.4.4 L2 Switch Status Confirmation

This section explains the confirmation procedure of L2 switch status.

Use the following procedure to confirm the status of the L2 switch.

1. Select the network device on which the status icon has changed from normal to another using the network device tree.

2. Select the [Resource Details] tab.

3. Confirm the displayed detailed information.

   - When there is a link of [Launch Network Device Web UI] in [Hardware Details]

      a. Click the link and start the L2 switch management screen.

      b. Confirm event logs or status from the started management window, and check the error detected by the L2 switch.

- When there is no link of [Launch Network Device Web UI] in [Hardware Details]

  Confirm the following information displayed in the Main Panel.

  Basic Information - Device Status

  The status of the L2 switch is displayed.
  When the status is something other than "normal", it indicates that an error might have occurred.

  Port Information - Link Status

  The status of the port of the L2 switch is displayed.
  When the status is something other than "up", unless changed intentionally by the infrastructure administrator, it indicates that a port error might have occurred.

4. Take corrective action based on the results of L2 switch status checks.

   - When an error is detected on an L2 switch or an event log is output

   The infrastructure administrator must confirm if the specifications of configuration scripts or parameter files used in auto-configuration are correct.

   - It is possible that the hardware has failed, in cases where the L2 switch device status is "unknown" or the link status is "down", unless changed intentionally by the infrastructure administrator.

   The infrastructure administrator must request confirmation of the status of the L2 switch from the network device administrator. The network device administrator should request a hardware maintenance person to take corrective action when hardware has failed.

5. Take corrective action based on the results of checked scripts and files.

   - When there are no errors in the scripts or settings in files checked in step 4.

   Confirm with the administrator of the network device that the L2 switch configuration has not been modified, since an unexpected definition modification may have been made.

   - When there are errors in the scripts or settings in files checked in step 4.

   The infrastructure administrator will log in to the L2 switch directly, delete the failed configurations, and modify error scripts or files.

6. Take corrective action based on the check results if definitions have been modified.

   - When the network device administrator has not modified the configuration

   Extract the L2 switch definitions and check the content. When inappropriate settings have been configured, log in to the L2 switch directly, and modify the definitions.

   - When a network device administrator has modified the configuration

   Check that the configuration modification is necessary.

     - When the configuration modification is not necessary

     The infrastructure administrator must log in to the L2 switch directly, and delete or modify the problem-causing configuration.

     - When configuration modifications were necessary based on the system operation policy

     Review if the details of scripts and parameter files are based on the operation policy.

See
. . . .

For details on L2 switch operations (login, status confirmation. definition extraction, definition modification), refer to the manuals of L2 switches.

. . . .

11.4.5 Status Confirmation of Other Network Devices

This section explains the confirmation procedure for other network devices.

Use the following procedure to check the statuses of other network devices.

1. Log in to the network device directly.

2. Confirm the status using the network device functions.

See
. . . .
For details on the operations (such as login and status confirmation) on the network devices, refer to the manuals of network devices.
. . . .

11.5 Monitoring Storage

This section explains how to monitor storage.

The following is possible when monitoring storage.

- Display of virtual storage resource and disk resource information

- Monitoring of storage unit errors

  Use of storage management software to monitor storage.

  - For ETERNUS storage

    Refer to the "ETERNUS SF Storage Cruiser User's Guide" and the "ETERNUS SF Storage Cruiser Message Guide".

  - For EMC CLARiiON storage or EMC VNX storage

    Refer to the "EMC Navisphere Manager Administrator's Guide".

  - For EMC Symmetrix DMX storage and EMC Symmetrix VMAX storage

    Refer to the "EMC Navisphere Manager Administrator's Guide".

  - For NetApp storage

    Refer to the "Data ONTAP Storage Management Guide".

  - For Storage Server that operates FalconStor NSS

    Refer to the "FalconStor CDP/NSS ADMINISTRATION GUIDE".

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 " θ ", this factor is expressed as "cos θ ").

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 "13.1 Exporting Power Consumption Data" in the "User's Guide for Infrastructure Administrators (Resource Management) CE".

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 "13.2 Displaying Power Consumption Data Graphs" in the "User's Guide for Infrastructure Administrators (Resource Management) CE".

Chapter 13 Monitoring Resource Pools (Dashboard)

This chapter explains how to monitor resource pools.

Use the [Dashboard (Pool Conditions)] tab of the ROR console to monitor the usage status of resource pools allocated to tenants and resource pools of overall systems.

For details on the [Dashboard (Pool Conditions)] tab, refer to "Chapter 4 Dashboard (Pool Conditions)" in the "User's Guide for Infrastructure Administrators CE".

Chapter 14 Monitoring L-Platforms

This chapter explains how to monitor L-Platforms.

The operation status of L-Servers can be monitored from the [Dashboard (System Conditions)] tab on the ROR console.

For details on the [Dashboard (System Conditions)] tab, refer to "Chapter 5 Dashboard (System Conditions)" in the "User's Guide for Infrastructure Administrators CE".

Chapter 15 Accounting

This chapter explains the accounting.

15.1 Overview

This section explains an overview of the accounting.

This function provides the basis to usage charge corresponding to the L-Platforms used by each tenant.

The accounting includes following functions.

Manage accounting information of L-Platform templates

Add, modify, or delete the accounting information of L-Platform templates. Based on the accounting information, usage fee (the estimated price) of L-Platform templates can be displayed on the **L-Platform management** window, etc. Usage charges can also be viewed in the usage charge window.
The database where the accounting information of L-Platform templates is stored is called the product master.

Note

Usage fee (the estimated price) for the L-Platform template will be displayed provided that settings for the estimated price display function are enabled. Refer to "8.7.1 Display Function Settings for Estimated Price" for information on settings for the estimated price display function.

Usage charge calculation

Usage charges are calculated based on the amount that the L-Platform is used and the charge information. The calculated usage charge is sent to the email address specified in the tenant management window of the ROR console. The usage charge is also stored in the usage charge database.

Viewing usage charges

Usage charges can be viewed in the ROR console. If necessary, the usage charge information can also be downloaded as a file.

Operation image

The operation image of accounting is shown below.
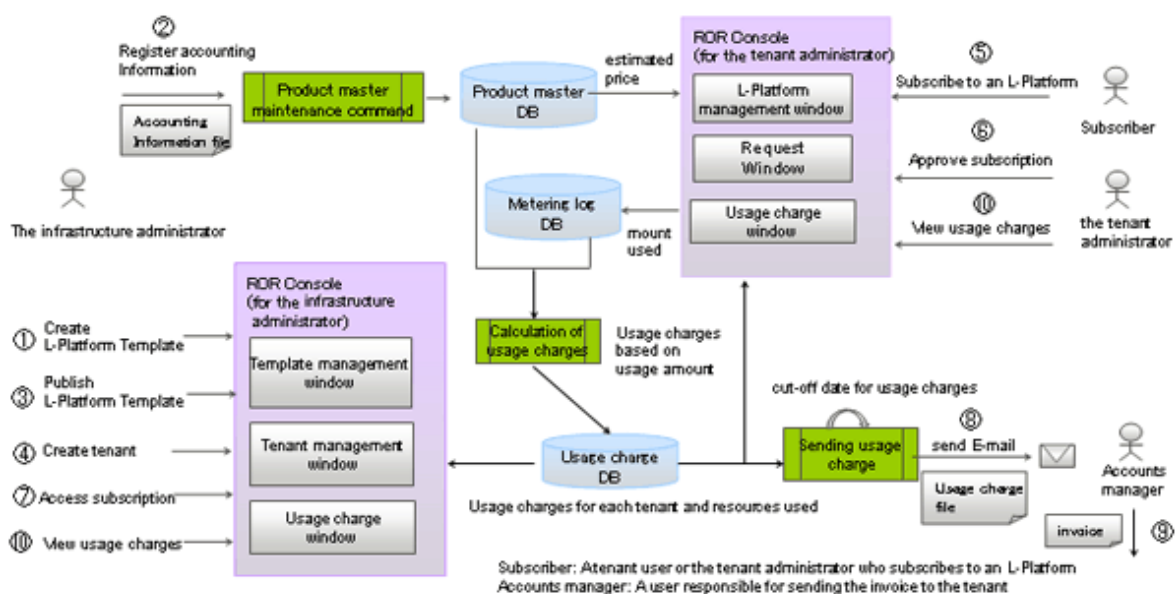
[Management and operation of accounting information by the infrastructure administrator]

1. The infrastructure administrator registers L-Platform template information using the **L-Platform management** window of the ROR Console.

2. The infrastructure administrator registers the accounting information using the product master maintenance command. Refer to "15.3 Operate Accounting Information" for information on how to operate the accounting information.

3. The infrastructure administrator publishes the L-Platform template.

[Create tenant]

4. The infrastructure administrator creates tenants.
Set the cut-off date for the calculation of usage charges and the email address to send them to as necessary.

[Operation in the tenant]

5. The subscriber references the usage fee (the estimated price) of the L-Platform templates displayed on the **L-Platform management** window, and subscribes to the L-Platform.

6. The tenant administrator references to the usage fee (the estimated price) of the L-Platform templates displayed in the Request on the ROR Console, then approves or rejects the subscription.

7. The infrastructure administrator views the monthly estimated charges for L-Platform templates displayed in the Request in the ROR console and assesses the L-Platform subscriptions.

[Invoice for usage charges]

8. The accounts manager receives the usage charge file.
Usage charges are automatically calculated based on the amount that each L-Platform is used and the charge information, then stored in the usage charge database. The usage charges for the previous month are confirmed the day after the cut-off date, and then sent as a usage charge file to the email address.

9. The accounts manager views the usage charge file, creates the invoice, and then sends it to the tenant.

[View usage charges]

10. The infrastructure administrator and the tenant administrator can view the confirmed usage charges. If necessary, the usage charge information can also be downloaded as a file.

Information

Metering logs are records of L-Platform operation in the tenants.
A metering log contains information about the operations, such as tenant, L-Platform, operation contents, and time.
Usage charges are calculated based on the amount that each L-Platform has used, which is gathered from metering logs and charge information. Refer to "Appendix B Metering Log for details.
The accounts manager may edit the usage charge file to create the invoice, to provide a discount on unit price in the charge information or to compensate for hardware failures, for example.

15.2 Manage Accounting Information

This section explains how to manage the accounting information. The accounting information is managed in the product master.

The accounting information of product master is managed using the product master maintenance command. The product master maintenance command provides the following functions.

- Register the accounting information of an L-Platform template on the product master

- Output the accounting information of an L-Platform template that is registered on the product master to the accounting information file

Refer to "11.4 productmaintain (Product Master Maintenance)" in the "Reference Guide (Command/XML) CE" for information on the product master maintenance command.

Information

Usage fee (the estimated price) of L-Platform templates will be displayed when the following operations are performed by registering the accounting information.

- L-Platform subscription from the **L-Platform management** window

- Modifying L-Platform templates

- Approving application list from the ROR Console

- Assessment from the ROR Console

Note

Usage fee (the estimated price) for the L-Platform template will be displayed provided that settings for the estimated price display function are enabled. Refer to "8.7.1 Display Function Settings for Estimated Price" for information on settings for the estimated price display function.

15.2.1 Information Maintained by Product Master

The accounting information can be set to the product master as products for each element type (category) that consists of the L-Platform.

The categories that can be set as products are shown below. Note that the unit prices can be specified by yearly, monthly, or hourly.

Category	Explanation
CPU	Unit price per CPU (*1).
CPU clock	Unit price per CPU clock of 0.1GHz (*1).
Memory capacity	Unit price per memory capacity of 0.1GB.
Virtual L-Server	Unit price per virtual L-Server. Set the unit price based on software, etc. Do not include the price for CPU, CPU clock memory, and system disk in the specified value.
Physical L-Server	Unit price per physical L-Server. Set the unit price based on backup and software, etc. Do not include the price for CPU, CPU clock, memory, and system disk in the specified value. Note that the usage fee (the estimated price) displayed on the **L-Platform management** window may differ from actual price. (*2)
System disk capacity	Unit price per disk capacity of 0.1GB of system disk. (*4)
Data disk capacity	Unit price per disk capacity of 0.1GB of data disk. (*3) (*4)
Template	Unit price per L-Platform template. Set the unit price based on firewall cost, network resources (network line, global IP, segment, NIC) usage cost, and system SE cost, etc. Do not include the price for virtual server or virtual disk in the specified value.
Snapshot	Unit price per disk capacity of 0.1GB of the disk from which snapshots are created.(*5)

*1: The price per CPU allocated as usage fee (the estimated price) is the sum of "Unit price per CPU" and "Unit price per CPU clock * CPU clock".

Example) An example price calculation is shown below assuming following conditions.

[Conditions]

- CPU Clock: $0.10/0.1GHz

- CPU: $0.80/unit

[Example calculation]

- Price for a CPU of 3.2GHz: $0.10 * 32 + $0.80 = $4.00

- Price for two CPUs each of 1.0GHz: ($0.10 * 10 + $0.80) * 2 = $3.60

*2: When a physical L-Server is to be newly deployed, estimated price for the CPU performance and memory capacity will be calculated according to the values entered on the **L-Platform management** window. The physical L-Server that is actually deployed will have performance that is closest to the value that was entered on the **L-Platform management** window. Accordingly, estimated price displayed may differ to the actual price. For physical L-Servers that have already been deployed, estimated price will be calculated based on the actual CPU performance and memory capacity.

*3: Estimated price for data disk capacity are added according to disk capacity usage for each storage pool, with no differentiation between extension disks and existing disks. Note also that if the same existing disk is attached to multiple L-Servers at this time, calculations for the existing disk capacity will be added together in accordance with the number of L-Servers to which the disk is attached. Resource allocation methods differ between extension disks and existing disks. For this reason, the storage pool used for an existing disk should not be the same as one used for an extension disk. For operations that use separate storage pools, charges for the existing disk can be calculated using the following two methods:

- If charging according to the total capacity of an existing disk attached to L-Server(s):
  In the storage pool, set the amount to be charged (in units of 0.1GB) when attaching an existing disk to an L-Server. If the same existing disk is attached to multiple different L-Servers at this time, the disk capacity will be added together for the total number of attached L-Servers and charged accordingly.

- If charging by the available existing disk from the L-Platform:
  Rather than setting the price for the existing disk defined by the storage pool, perform settings instead to include the usage charge for the available existing disk in the price for the L-Platform template.

*4: The unit price for the system disk capacity and the data disk capacity is set based on the storage pool. If [Auto-Select] is specified for the storage pool in the **L-Platform management** window, calculations for estimated charges will be displayed based on a unit price of 0 for disk capacity. Usage charge calculations will be based on the unit price for the storage pool on which the disk was created.

*5: The unit price for snapshots is set based on the storage pools. The charges for snapshots are calculated based on the disk capacity of the virtual disk included with the virtual L-Server on the place where the snapshot was created and the storage pool.
If the storage pool for the system disk is different from the data disk of the virtual L-Server, then the charges for the snapshot will be calculated based on the disk capacity and unit price for each of those storage pools.

📌 Note

Snapshot information is used when the system administrator applies the following urgent patches and enables the snapshot with the application procedure:

[Windows Manager]

- T007688WP-02

[Linux Manager]

- T007687LP-02

Refer to update information files for information on the application procedure.

📘 Point

L-Platform operation when reconfiguration is not permitted

L-Servers and others will be allocated using the system configuration defined in the template if the L-Platform template reconfiguration is not permitted in the operation. In this case, only the prices for the templates need to be set and the prices for the L-Servers need not.

About Setting Prices

- In the Solaris container, although it is possible to allocate more CPU and memory to the non-global zone than is installed in the host operating system, if the CPU load and memory usage in each non-global zone increase, the allocated CPU function and memory

capacity may become unusable.

In order to not exceed the capacity physically held by the host operating system when creating a non-global zone, it is possible to ensure the functionality of the allocated amount in the non-global zone by allocating CPU and memory.

However, if used for development environments or if non-global zones which exceed the physical CPU and physical memory are created, it is not possible to ensure the allocated amount of functionality. If CPU and memory are made the subject of charges in environments where the allocated functionality cannot be ensured, consider setting the CPU and memory unit prices at lower prices than normal.

- As it may not be possible to ensure the functionality of allocated amounts of CPU and memory if overcommit is enabled in cases such as where L-Platform import from related L-Servers is performed using VMware and Hyper-V as virtual software, give some consideration to price settings.

· ·

The usage fee (the estimated price) displayed on the **L-Platform management** window and others is calculated as follows.

L-Platform price   template＋vertual L-Server＋physical L-Server＋system disk＋data disk ＝ monthly charges (approximate)
　　　　　　　　$2.00　　　　$47.23　　　　$101.95　　　　$8.06　　　　　$8.06　　　　　　$167.00

Template

Template ID	Name	Unit price	Unit	Amount of usage Unit	Monthly price
template-1	Service1	$2.00	/month		$2.00

Virtual L-Servers

Image name	Name	Unit price	Unit	Amount of usage Unit	Monthly price
image-1	EcoServer	$0.012	/hour		$8.64

VM pool name
/VMPool-1

CPU

	Name	Unit price	Unit	Amount of usage Unit	Monthly price
CPU accounting	Xeon5110	$0.01	/hour		$7.20
Clock accounting	Xeon5110	$0.0014	/0.1GHz hour	1 GHz	$10.08
		Price per CPU			$17.28
		Number of CPUs		2	$34.56

Memory

	Name	Unit price	Unit	Amount of usage Unit	Monthly price
	Memory1	$0.00028	/0.1GBhour	2 GB	$4.03

		Price per virtual L-Server			$47.23
		Number of virtual L-Servers		1	$47.23

The above calculation is repeated according to the number of virtual L-Servers.

Pyhsical L-Servers

Image name	Name	Unit price	Unit	Amount of usage Unit	Monthly price
image-2	ProServer	$0.020	/hour		$14.40

Server pool name
/ServerPool-1

CPU

	Name	Unit price	Unit	Amount of usage Unit	Monthly price
CPU accounting	XeonX7550	$0.03	/hour		$21.60
Clock accounting	XeonX7550	$0.0028	/0.1GHz hour	1 GHz	$20.16
		Price per CPU			$41.76
		Number of CPUs		2	$83.52

Memory

	Name	Unit price	Unit	Amount of usage Unit	Monthly price
	Memory2	$0.00028	/0.1GBhour	2 GB	$4.03

		Price per pyhsical L-Server			$101.95
		Number of pyhsical L-Servers		1	$101.95

The above calculation is repeated according to the number of pyhsical L-Servers.

System disks

Strage pool name	Name	Unit price	Unit	Amount of usage Unit	Monthly price
/StragePool-2	RAID	$0.000056	/0.1GBhour	20 GB	$8.06

The above calculation is repeated according to the number of system disks.

Data disks

Strage pool name	Name	Unit price	Unit	Amount of usage Unit	Monthly price
/StragePool-2	RAID	$0.000056	/0.1GBhour	20 GB	$8.06

The above calculation is repeated according to the number of data disks.

```
L-Platform usage fee (the estimated price) = monthly template price + monthly price for all L-Server
                   + monthly price for all system disks + monthly price for all data disks

 Template monthly price = template unit price * monthly amount conversion
 Virtual L-Server monthly price = image unit price * monthly amount conversion
                   +(CPU unit price * monthly amount conversion
                    + CPU clock unit price * CPU clocks * monthly amount conversion) * number of CPUs
                    + memory unit price * amount of memory * monthly amount conversion
 Physical L-Server monthly price = image unit price * monthly amount conversion
                   +(CPU unit price * monthly amount conversion
                    + CPU clock unit price * CPU clocks * monthly amount conversion) * number of CPUs
                    + memory unit price * amount of memory * monthly amount conversion
 System disk monthly price = system disk unit price * amount of disk * monthly amount conversion
 Data disk monthly price = data disk unit price * amount of disk * monthly amount conversion
```

```
Estimated charges for snapshots
  Estimated charges for snapshots on the system disk = snapshot unit price * system disk capacity *
monthly amount conversion
  Estimated charges for snapshots on the data disk = snapshot unit price * data disk capacity * monthly
amount conversion
```

- If the price is hourly basis, usage fee (the estimated price) is calculated for 24 hours * 30 days.
- If the price is yearly basis, usage fee (the estimated price) is twelfth of that price.
- Usage fee (the estimated price) is rounded to nearest hundredths of dollar (cent) when displayed.
- Estimated charges for an L-Platform are displayed when an application is made to use an L-Platform, or when its configuration is changed.
- Estimated charges for a snapshot are displayed when a snapshot of a virtual server is taken and when the snapshot is referenced.

15.2.2 Accounting Information File Format

The accounting information of L-Platform templates is written to the accounting information file. The format of accounting information file is as follows.

- Character code is UTF-8.

- Each column is separated by a comma.

- Comments cannot be written.

- Character string data are enclosed by double quotations. When the double quotation is a character in a character string, enter two double quotations to escape it.

- When a double quotation is set in a character string that is enclosed with double quotations, the single double quotation will be ignored.

Example

When the following string is entered in the accounting information file, the value will be "aaaaa"a".

```
"aaaaa""a"
```

When the following string is entered in the accounting information file, the value will be "aaaaaa".

```
"aaa"aaa"
```

Columns represented in an accounting information file are shown below.

No	Name	Omit	Explanation
1	Product ID	No	Specify ID that identifies the product. Register one product for each resource identifier. Specify 16 or less characters using alphanumeric characters, _(underline), or -(hyphen).
2	Priority	No	Specify the priority in a product. Multiple unit prices can be specified in a product, and the unit price with larger value has higher priority. (*1) The same priority cannot be set to the same product. Specify the numerical value from 0 to 999.
3	Start of applicable date	No	Specify start of applicable date. Format: *YYYY-MM-DD*T*hh:mm:ss.SSSZ* Example) Use 2012-04-01T00:00:00.000+0900 for the date and time 12:00A.M. and 00.000 seconds on April 1, 2012 in time zone UTC+9:00
4	End of applicable date	Yes	Specify end of applicable date. Format: *YYYY-MM-DD*T*hh:mm:ss.SSSZ* Example) Use 2013-03-31T23:59:59.999+0900 for the date and time 11:59 P.M. and 59.999 seconds on March 31, 2013 in time zone UTC+9:00 Specify the date prior to the start of applicable date.
5	Category code	No	Specify the product category using following codes. - cpu: CPU - cpu clock: CPU clock - memory: memory capacity - vm: virtual L-Server - pm: physical L-Server - sys_disk: system disk capacity - disk: extension disk capacity - snapshot: snapshot - template: template
6	Resource identifier	No	Specify information to identify the accounting target resource with 128 or less alphanumeric characters. Resource identifiers vary by the category. (*2) - cpu, cpu_clock, memory: VM pool name or sever pool name - vm: virtual L-Server image name - pm: physical L-Server image name - sys_disk: storage pool name - disk: storage pool name - snapshot: storage pool name - template: template ID

No	Name	Omit	Explanation
7	Unit code	No	Specify accounting unit using following codes. - year: yearly - month: monthly - hour: hourly
8	Unit price	No	Specify unit price. Specify 11 or less digits for the integer portion and 4 or less digit for the fractional portion. Specify the fractional currency unit (ex. cent) as 1 for U.S. dollar, euro, or Singapore dollar. Specify the currency unit as 1 for Japanese yen. (*3) Example) Specify 23 if the setting value is $0.23. Specify 23 if the setting value is ¥23.
9	Product name	No	Specify the name to distinguish the products using 128 or less characters.
10	Description	Yes	Specify the description of the product using 1024 or less characters. A comma that follows the name must be entered even when the specification is omitted. Example) ...,Unit price,"Product name",

*1: An example of description is shown below assuming following settings.

- Example of the setting for product ID "ME-0001"

	Product ID	Priority	Unit price	Start of applicable date	End of applicable date
Data A	ME-0001	0	$2.00	2012-01-01T00:00:00.000+0900	None
Data B	ME-0001	1	$1.00	2012-08-01T00:00:00.000+0900	2012-08-31T23:59:59.999+0900

- The unit price for product ID "ME-0001" is $2.00 on 2011-07-01 because only data A is applied.

- The unit price for product ID "ME-0001" is $1.00 on 2011-08-15 because data B has higher priority even though both data A and data B are in the applicable period.

- An example description of accounting information file

```
"ME-0001",0,"2012-01-01T00:00:00.000+0900",,"memory","/VMPool","month",200,"Standard
memory","Standard memory"
"ME-0001",1,"2012-08-01T00:00:00.000+0900","2012-08-31T23:59:59.999+0900","memory","/
VMPool","month",100,"Standard memory(Campaign)","Standard memory(Campaign)"
```

*2: The value of the resource identifier can be obtained from the value of the corresponding XML tag of the template information list that is output in XML format by using the template information list display command. Refer to "9.12 cfmg_listtemplate (Displaying Template Information List)" in the "Reference Guide (Command/XML) CE" for information on how to use the template information list display command.
The resource identifier for each category code and the corresponding template information (XML tag) are shown below.

- Resource identifiers and corresponding template information (XML tag)

Category code	Resource identifier	Template information (XML tag)
template	Template ID	<template><id>
vm	Virtual L-Server image name	<image><imageName>
pm	Physical L-Server image name	<image><imageName>

Category code	Resource identifier	Template information (XML tag)
cpu	VM pool name or sever pool name	\<server>\<pool>
cpu_clock	VM pool name or sever pool name	\<server>\<pool>
memory	VM pool name or sever pool name	\<server>\<pool>
sys_disk	Storage pool name	\<server>\<storagePool>
disk	Storage pool name	\<vdisk>\<storagePool>
snapshot	Storage pool name	\<server>\<storagePool> and \<vdisk>\<storagePool>

Specify VM pool name, sever pool name and storage pool name in the format that start with / (slash).

If the VM pool name, sever pool name or storage pool name are omitted, they are output to the template information as \<pool /> or \<storagePool />, respectively. In this case, refer to the resource pool and perform settings on the ROR Console **Resource** tab. Refer to the "User's Guide for Infrastructure Administrators (Resource Management) CE" for information on the ROR Console **Resource** tab.

*3: The currency unit can be changed according to the currency unit setting. Specify the value multiplied by 10 raised to the power of the number of decimal places for the unit price in the accounting information file.

Example:

- Specify 1 as the unit price of currency unit 1 if the currency unit has no decimal places.

- Specify 100 as the unit price of currency unit 1.00 if the currency unit has two decimal places.

Refer to "8.7.2 Currency Information Settings" for information on how to set the currency unit.

An example description of template information and corresponding accounting information is shown below.

- Example of template information

```xml
<?xml version="1.0" encoding="Windows-31J"?>
<templates>
    <template>
        <id>templateId1</id>
        ...
        <servers>
            <server>
                <pool>/VMHostPool</pool>
                <storagePool>/StoragePool</storagePool>
                ...
                <vdisks>
                  <vdisk>
                     ...
                     <storagePool>/StoragePool2</storagePool>
                     ...
                  </vdisk>
                </vdisks>
                <image>
                    <imageName>image1</imageName>
                    ...
                </image>
            </server>
        </servers>
    </template>
</templates>
```

- Example description of accounting information file

```
"TP-0001",0,"2012-01-01T00:00:00.000+0900",,"template","templateId1","month",1000,"Web/DB
Windows Server 2008 R2 Standard","Service Windows Server 2008 R2 Standard"
"VM-0001",0,"2012-01-01T00:00:00.000+0900",,"vm","image1","month",500,"Windows Server 2008 R2
Standard","VM Windows Server 2008 R2 Standard"
"CP-0001",0,"2012-01-01T00:00:00.000+0900",,"cpu","/VMHostPool","month",100,"Xeon5110","Xeon5110"
"CL-0001",0,"2012-01-01T00:00:00.000+0900",,"cpu_clock","/VMHostPool","month",
50,"Xeon5110","Xeon5110"
"ME-0001",0,"2012-01-01T00:00:00.000+0900",,"memory","/VMHostPool","month",200,"Standard
memory","Standard memory"
"DI-0001",0,"2012-01-01T00:00:00.000+0900",,"disk","/StoragePool2","month",10,"normal
disk","normal disk"
"SD-0001",0,"2012-01-01T00:00:00.000+0900",,"sys_disk","/StoragePool","month",10,"normal
disk","normal disk"
"SS-0001",0,"2012-01-01T00:00:00.000+0900",,"snapshot","/StoragePool","hour",0.1,"snapshot
disk","snapshot disk"
"SS-0002",0,"2012-01-01T00:00:00.000+0900",,"snapshot","/StoragePool2","hour",0.1,"snapshot
disk2","snapshot disk2"
```

📘 Note

⋯⋯

- The accounting information will not be deleted from the product master automatically even after the end of applicable date. Reference to "15.3.3 Delete Accounting Information" to delete unnecessary accounting information.

- If the end of applicable date is specified, prepare other accounting information of the same product ID without specifying the end of applicable date.

- If the overcommit function is enabled, the category codes cpu_clock and memory will be calculated by default as CPU reserve performance and memory reserve capacity, respectively, and usage fee (the estimated price) will be displayed on the **L-Platform management** window.
  Refer to "8.7.1 Display Function Settings for Estimated Price" for information on charge settings when the overcommit function is enabled.

⋯⋯

15.3 Operate Accounting Information

This section explains how to operate the accounting information.
The operation for the accounting information consists of registration, modification, deleting, and reference.

Resister accounting information

Register the accounting information when newly created L-Platform templates are enabled.
The accounting information is set to the elements of L-Platform templates that are created. After finishing registration of the accounting information, enable the L-Platform templates.
It is also possible to register accounting information for L-Servers that were imported into the system using the L-Server import command.
Refer to "15.3.1 Register Accounting Information" for information on how to register the accounting information.

Modify accounting information

Modify the accounting information of the L-Platform templates that are already enabled. This corresponds to the case of setting limited time price for campaign or raising the price, for example.
The price is modified to the accounting information of the L-Platform templates registered on the product master.
It is also possible to modify accounting information for L-Servers that were imported into the system.
Refer to "15.3.2 Modify Accounting Information" for information on how to modify the accounting information.

Delete accounting information

Delete the accounting information if the following conditions are met.

- The L-Platform templates are disabled.

- The log that shows the usage result of the corresponding L-Platform templates does not exist in the metering log.

Refer to "15.3.3 Delete Accounting Information" for information on how to delete the accounting information. Refer also to "Appendix B Metering Log" for information on the metering log.

Reference accounting information

Reference the accounting information registered on the product master when calculating the accounting. Refer to "15.3.4 Reference Accounting Information" for information on how to reference the accounting information.

15.3.1 Register Accounting Information

Methods for registering accounting information differ for L-Platform templates and L-Servers that were imported into the system.

Register Accounting Information of L-Platform template

Create new L-Platform templates, and set the accounting information to the elements of the L-Platform template that was created. After finishing the registration of the accounting information, enable the L-Platform templates.
Follow the procedure below to register the accounting information.

1. Register new L-Platform templates.
    Refer to "8.3.1 Creating New L-Platform Template" in the "User's Guide for Infrastructure Administrators CE" for information on how to register L-Platform templates.

2. Obtain a list of the template information registered.
    Refer to "9.12 cfmg_listtemplate (Displaying Template Information List)" in the "Reference Guide (Command/XML) CE" for information on how to obtain the template information list.

3. Execute the output function of the product master maintenance command.
    The accounting information of the L-Platform templates registered on the product master will be output to the specified accounting information file by executing the output function of the product master maintenance command. Refer to "11.4 productmaintain (Product Master Maintenance)" in the "Reference Guide (Command/XML) CE" for information on the output function of the product master maintenance command.
    This operation is unnecessary for the initial registration. Create a new accounting information file from step 4.

4. Add the accounting information of the L-Platform templates to the output accounting information file based on the template information list.
    Specify a date prior to the L-Platform template enabled date as the start of applicable date in the accounting information to be added. Omit the end of applicable date. Refer to "15.2.2 Accounting Information File Format" for information on the accounting information file format.

    Example)

	Product ID	Priority	Unit price	Start of applicable date	End of applicable date
Data A	ID001	0	$2.00	2012-01-01T00:00:00.000+0900	None

5. Notify the tenant of the contents of the newly enabled L-Platform templates (L-Platform template name, summary of the L-Platform template, usage fee (the estimated price), start of applicable date, etc.).

6. Execute the register function of the product master maintenance command.
    Specify the accounting information file updated, and execute the product master maintenance command. Refer to "11.4 productmaintain (Product Master Maintenance)" in the "Reference Guide (Command/XML) CE" for information on the register function of the product master maintenance command.

7. Enable the L-Platform template.
    Enable the L-Platform template on the start of applicable date. Refer to "8.3.5 Publishing and Hiding L-Platform Template" in the "User's Guide for Infrastructure Administrators CE" for information on how to enable the L-Platform templates.

Registering Accounting Information for L-Servers imported into the System

Use the following procedures to import an L-Server into the system and register accounting information for the imported L-Server.

1. Use the L-Server import command to import the L-Server into the system.
   Refer to "10.4 cfmg_importlserver (Import L-Server)" in the "Reference Guide (Command/XML) CE" for information on how to use the L-Server import command.

   ### 📌 Note

   -

   - If the <VM pool name> option is omitted when executing the L-Server import command, it will not be possible to register accounting information for the CPU, CPU clock or memory capacity.

   - If the <storage pool name> option is omitted when executing the L-Server import command, it will not be possible to register accounting information for system disk, data disk, and snapshot of the L-Server.

   - When an L-Server that has a snapshot is imported, it is not possible to register charge information for the snapshot collected before import. It is also not possible to output metering logs or tally usage charges for the snapshot collected before import.

   -

2. Obtain the template information list that was automatically generated by the L-Server import command. The template information list can be obtained using the template information list display command. Refer to "9.12 cfmg_listtemplate (Displaying Template Information List)" in the "Reference Guide (Command/XML) CE" for information on how to use the template information list display command.

3.

   ### 🅿 Point

   -

   Check the following tags to distinguish between automatically generated templates:

   - Template ID (<template><id>): The template ID output when the L-Server import command is executed.

   - L-Server name (<template><description>): The L-Server name specified when the L-Server import command is executed.

   -

4. Execute the output function of the product master maintenance command.
   The accounting information of the L-Platform templates registered on the product master will be output to the specified accounting information file by executing the output function of the product master maintenance command. Refer to "11.4 productmaintain (Product Master Maintenance)" in the "Reference Guide (Command/XML) CE" for information on the output function of the product master maintenance command.
   This operation is unnecessary for the initial registration. Create a new accounting information file from step 4.

5. Add the accounting information to the output accounting information file based on the template information list.
   When applying a start date for the accounting information to be added, specify a date/time prior to the date/time that the L-Server import command was executed. Omit the end of applicable date. Refer to "15.2.2 Accounting Information File Format" for information on the accounting information file format.

   Example)

	Product ID	Priority	Unit price	Start of applicable date	End of applicable date
Data A	ID001	0	$2.00	2012-01-01T00:00:00.000+0900	None

6. Execute the register function of the product master maintenance command.
   Specify the accounting information file updated, and execute the product master maintenance command. Refer to "11.4 productmaintain (Product Master Maintenance)" in the "Reference Guide (Command/XML) CE" for information on the register function of the product master maintenance command.

15.3.2 Modify Accounting Information

Modify the accounting information of the L-Platform templates that are already enabled. This corresponds to the case of raising the price or setting limited time price for campaign.
It is also possible to modify accounting information for L-Servers imported into the system.
Follow the procedures below to modify accounting information for either L-Platform templates registered in the product master or L-Servers imported into the system.

1. Execute the output function of the product master maintenance command.

   The accounting information of the L-Platform templates registered on the product master will be output to the specified accounting information file by executing the output function of the product master maintenance command. Refer to "11.4 productmaintain (Product Master Maintenance)" in the "Reference Guide (Command/XML) CE" for information on the output function of the product master maintenance command.

2. Modify the price, or specify the time period of the output accounting information file.

   An example of the modification of the accounting information file is shown below. Specify future date to the modification date.

   a. Add the modified unit price data newly to change the unit price of the product that is already registered on the product master.
      Example) Modify the unit price of the product whose product ID is "ID001" to $2.10 from 2012-08-01.

   Before modification:

	Product ID	Priority	Unit price	Start of applicable date	End of applicable date
Data A	ID001	0	$2.00	2012-01-01T00:00:00.000+0900	None

   After modification:

	Product ID	Priority	Unit price	Start of applicable date	End of applicable date
Data A	ID001	0	$2.00	2012-01-01T00:00:00.000+0900	**2012-07-31T23:59:59.999+0900**
Data B	ID001	**1**	**$2.10**	**2012-08-01T00:00:00.000+0900**	**None**

   Set as follows for existing data A.
   - End of applicable date: Modify to the date just before the modification date.
   Set as follows for new data B.
   - Priority: Higher priority than the existing data A
   - Unit price: New unit price
   - Start of applicable date: Modification date
   - End of applicable date: Omit

   b. Add new data for the specific time period if a limited time price such as campaign price is to be registered.
      Example) Halve the price in the period between 2012-08-01 and 2012-08-31.

   Before modification:

	Product ID	Priority	Unit price	Start of applicable date	End of applicable date
Data A	ID001	0	$2.00	2012-01-01T00:00:00.000+0900	None

   After modification:

	Product ID	Priority	Unit price	Start of applicable date	End of applicable date
Data A	ID001	0	$2.00	2012-01-01T00:00:00.000+0900	None
Data B	ID001	**1**	**$1.00**	**2012-08-01T00:00:00.000+0900**	**2012-08-31T23:59:59.999+0900**

   Do not modify existing data A.
   Set as follows for new data B.
   - Priority: Higher priority than the existing data A
   - Unit price: New unit price
   - Start of applicable date: Start date of the period
   - End of applicable date: End date of the period

   Refer to "15.2.2 Accounting Information File Format" for information on the accounting information file format.

3. Notify the tenant of the contents of the modified L-Platform templates (L-Platform template name, usage fee (the estimated price), start of applicable date, etc.).

4. Execute the register function of the product master maintenance command.
Specify the accounting information file updated, and execute the product master maintenance command. Refer to "11.4 productmaintain (Product Master Maintenance)" in the "Reference Guide (Command/XML) CE" for information on the register function of the product master maintenance command.

📒 **Note**

・・

- If the applicable start date is not set to a future date and time, modify the charge information after the system has stopped. If system operation is not stopped, the pre-modification amounts may be displayed for the estimated charges and usage charges.

- The displayed price does not change for the subscription from saved specifications if the specifications are saved before modifying the price. Notify the tenant of the cautions that the price will not be the price displayed on the **L-Platform management** window but be the modified price after the modification date.

・・

15.3.3 Delete Accounting Information

Delete the accounting information if the accounting calculation becomes unnecessary for the L-Platform templates or the L-Server imported into the system.
The accounting information becomes unnecessary if the following conditions are met.

- The L-Platform templates are disabled.

- The log that shows the usage result of the corresponding L-Platform templates or L-Server imported into the system does not exist in the metering log.

Follow the procedure below from disabling the L-Platform templates to deleting the accounting information.

Begin from "Check Metering Log" for L-Servers imported into the system.

Refer to "Appendix B Metering Log" for information on the metering log.

Disable L-Platform templates

1. Notify to the tenant about the contents of the L-Platform templates to be disabled (L-Platform template name, usage fee (the estimated price), start of applicable date, etc.).

2. Disable the L-Platform templates on the date that was notified.
Disable the L-Platform templates using the template management window of the ROR Console. Refer to "8.3.5 Publishing and Hiding L-Platform Template" in the "User's Guide for Infrastructure Administrators CE" for information on the setting for disabling the L-Platform template.

Check Metering Log

1. Check that the log that shows the usage result of the corresponding L-Platform templates does not exist in the metering log.
Output the metering log by the output metering logs command to check that no resource identifiers corresponding to the category code of that accounting information and no information for the item ID corresponding to that exists in the metering log.

The correspondence relationships between category codes and resource identifiers in the accounting information and item IDs in the metering log are shown below.
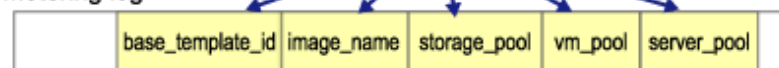
Accounting information		Metering log
Category code	Resource identifier	Item ID
cpu	VM pool name	vm_pool
	Server pool name	server_pool
cpu_clock	VM pool name	vm_pool
	Server pool name	server_pool
memory	VM pool name	vm_pool
	Server pool name	server_pool
vm	Image name	image_name
pm	Image name	image_name
sys_disk	Storage pool name	storage_pool
disk	Storage pool name	storage_pool
snapshot	Storage pool name	storage_pool
template	Template ID	base_template_id

Delete accounting information

1. Execute the output function of the product master maintenance command.
   The accounting information of the L-Platform templates registered on the product master will be output to the specified accounting information file by executing the output function of the product master maintenance command. Refer to "11.4 productmaintain (Product Master Maintenance)" in the "Reference Guide (Command/XML) CE" for information on the output function of the product master maintenance command.

2. Delete accounting information that becomes unnecessary from the output accounting information file.

3. Execute the register function of the product master maintenance command.
   Specify the accounting information file updated, and execute the product master maintenance command. Refer to "11.4 productmaintain (Product Master Maintenance)" in the "Reference Guide (Command/XML) CE" for information on the register function of the product master maintenance command.

15.3.4 Reference Accounting Information

Follow the procedure below to reference the accounting information registered on the product master.

1. Execute the output function of the product master maintenance command.
   The accounting information of the L-Platform templates registered on the product master will be output to the specified accounting information file by executing the output function of the product master maintenance command. Refer to "11.4 productmaintain (Product Master Maintenance)" in the "Reference Guide (Command/XML) CE" for information on the output function of the product master maintenance command.

2. Reference the output accounting information file.
   Reference the accounting information file that was output by the output function of the product master maintenance command. Refer to "15.2.2 Accounting Information File Format" for information on the accounting information file format.

15.4 Calculation of Usage charges

This section explains how to calculate usage charges.

Refer to "Appendix B Metering Log" for information on the metering log, which is the information upon which the calculation of usage charges is based.

15.4.1 Overview of Usage charge Calculation

When a user subscribes to or unsubscribes from an L-Platform, or performs operations such as starting or stopping an L-Server, these are recorded as operation logs in the metering log.

Resource (L-Platform, L-Server, etc.) usage time is then aggregated from this operation log. Usage charges are calculated for each L-Platform based on the aggregated usage time, the amount of resources used, and the unit price in the charge information. The monthly usage charges are confirmed the day after the cut-off date set for the tenants, and then sent to the email address.

15.4.2 Resource Usage Times

Resource usage times include the time deployed and the time operated. These are aggregated based on the information in the metering log. Deployment time is the time between when the resource is deployed and when it is terminated. Operating time is the time between when the resource is started and when it is stopped.

Usage time is aggregated according to the following rules:

Usage time under one hour (in minutes)

Each day's usage time is aggregated as minutes.

Rounding

Times are rounded off to the nearest minute. Times 30 seconds and over are counted as 1 minute. Times less than 30 seconds are counted as 0 minutes.

The following shows an example of an L-Server deployed time and operated time.
This example shows when an L-Server is added at 7:00, started at 7:40, stopped at 18:20, and then deleted at 19:00.
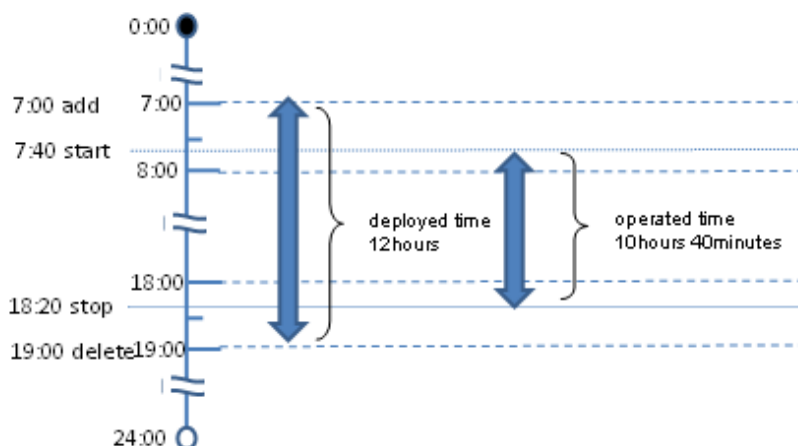
15.4.3 How to Charge for Resources

Resources can be charged by a fixed rate or by the amount used. With fixed charging, the usage charges are charged according to a fixed fee rather than the usage time of the resources. With charging by the amount used, the usage charges are charged according to the usage time of the resources.
Unit codes for the charge information are used when charging. Fixed charging is used when either year or month is specified as the unit code. Charging by amount is used when hour is specified as the unit code.
The following table shows the relationships between the unit code specified in the charge information, the charging method, and the calculation of a month's usage charges:

Unit codes	charging method	Usage charges for one month
year	Fixed charging	Unit price / 12 (months)
month	Fixed charging	Unit price
hour	Charge by amount	Unit price / 60 (minutes) x usage time (minutes) x amount used

. . . .

The unit price, unit code, and 1 month's usage charges for each resource specified in the charge information are displayed as usage charge information for each month from the ROR console **Accounting** tab to **Usage Charge Detail** window.

Refer to "12.3 Usage Charge Detail" in the "User's Guide for Infrastructure Administrators CE" for information about the **Usage Charge Detail** window. Also, tenant administrators can refer to the same information. Refer to "11.2 Usage Charge Detail" in the "User's Guide for Tenant Administrators CE" for information about the **Usage Charge Detail** window viewable by tenant administrators.

. . . .

15.4.4 Resource Usage Amounts and Times

If charging by amount is to be used for resources, the usage charge is determined by the amount of resources used and the time they are used for.

The following table shows the relationship between the product categories for each resource, the amount of resources used, and the usage time:

Resource	Product category	Resource usage amount	Usage time
L-Platform	Template	Total number of deployed L-Platforms	L-Platform deployment time
L-Server	- Virtual L-Server - Physical L-Server	Total number of deployed L-Servers	L-Server deployment time
CPU	CPU	CPU number	Operating time of the L-Server
	CPU clock	Use one of the following: - CPU performance (GHz) - CPU reserved performance (GHz) (*)	
Memory	Memory capacity	Use one of the following: - Memory (GB) - Memory reserved (GB) (*)	Operating time of the L-Server
System disk	System disk capacity	Disk size (GB)	L-Server deployment time
Data disk	Data disk capacity	Disk size (GB)	Disk deployment time
Snapshot	Snapshot	Disk size (GB)	Snapshot deployment time

* Note: This is the default value when overcommit is enabled on the virtual L-Server. These can be changed by changing the settings.

. . . .

Usage Charges for physical L-Servers.

The calculation of Usage Charges for the CPU, CPU clock, and memory capacity of the physical L-Server are calculated using the values input into the **L-Platform management** window (input value). Also, a server that is close to the input value in the specified server pool will be deployed as the physical L-Server. For that reason, if charging for the physical L-Server, perform operations such as preparing multiple physical L-Servers that are close to the input value in the server pool.

CPU usage charges

The usage charge for the CPU is calculated based on the CPU and the CPU clock. The calculation formula is as follows:

(CPU unit price / 60 (minutes) + CPU clock unit price / 60 (minutes) x CPU clock count / 0.1) x CPU count x usage time

. . . .

15.4.5 Example of Usage charge Calculation

Here we will describe an example of calculation, using an L-Platform with the configuration shown below.

Configuration
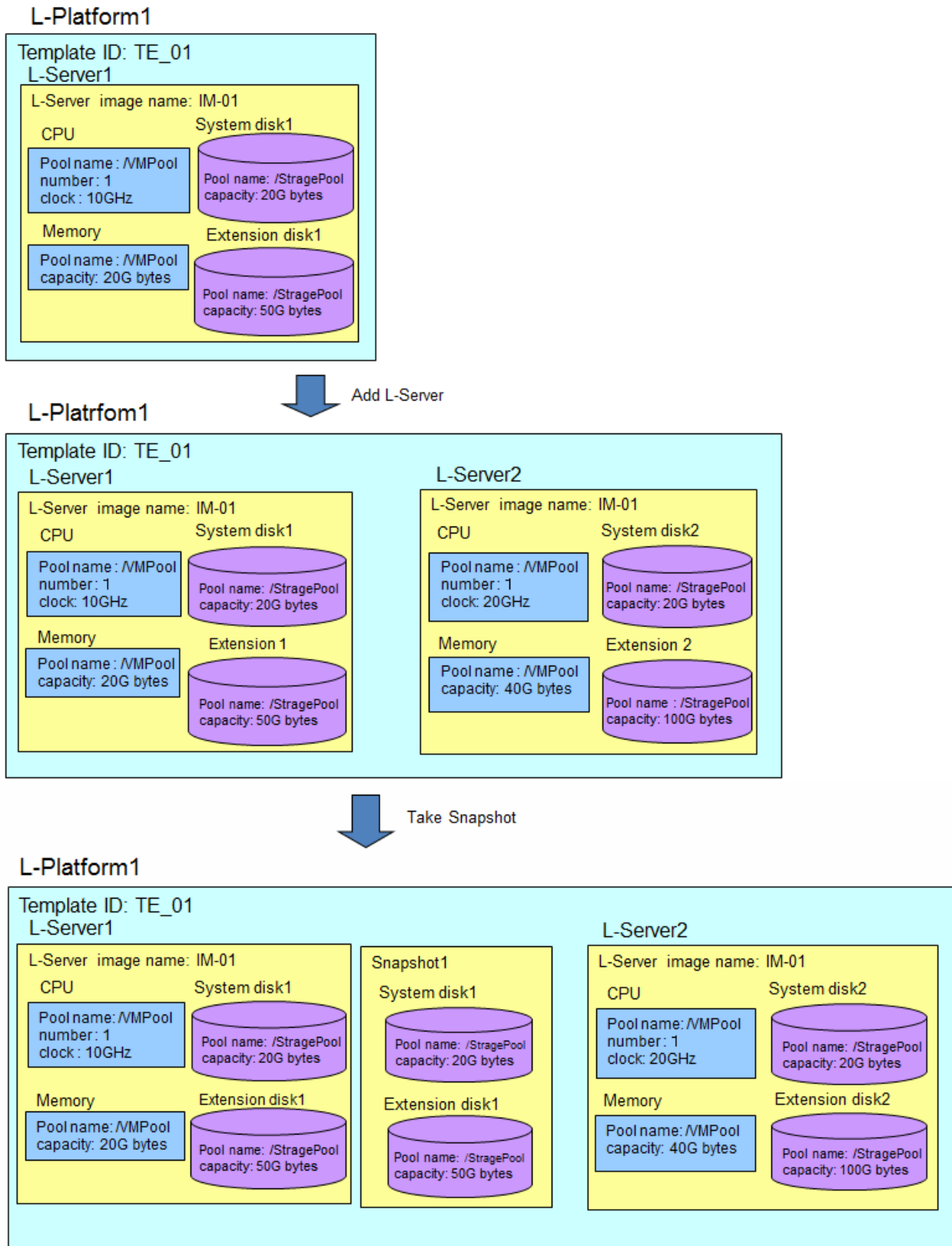
Charge information

The charge information is as follows:

Resource	Resource identifier	Unit codes	Unit price
template	TE_01	month	$2.00
vm	IM_01	hour	$0.10
cpu	/VMPool	hour	$0.001
cpu_clock	/VMPool	hour	$0.002
memory	/VMPool	hour	$0.001
sys_disk	/StoragePool	hour	$0.001
disk	/StoragePool	hour	$0.002
snapshot	/StoragePool	hour	$0.001

Operation

Operations on the L-Platform are as follows:

Date/time	Operation
2012-07-01 10:10:00	Deploy L-Platform 1
2012-07-01 10:11:00	Start L-Server 1
2012-07-02 18:10:00	Stop L-Server 1
2012-07-02 18:11:00	Add L-Server 2
2012-07-02 18:12:00	Take 1 snapshot of L-Server 1
2012-07-02 18:13:00	Start L-Server 1
2012-07-02 18:14:00	Start L-Server 2
2012-07-05 18:00:00	Stop L-Server 1 and L-Server 2
2012-07-05 18:01:00	Terminate L-Platform 1

Usage time

The usage time for is resource is as follows:

Resource	Deployed time	Running time
L-Platform1	103 hours 51 minutes (6231 minutes)	-
L-Server1	103 hours 51 minutes (6231 minutes)	103 hours 46 minutes (6226 minutes)
L-Server2	71 hours 50 minutes (4310 minutes)	71 hours 46 minutes (4306 minutes)
system disk 1	103 hours 51 minutes (6231 minutes)	
system disk2	71 hours 50 minutes (4310 minutes)	
Extension disk 1	103 hours 51 minutes (6231 minutes)	-
Extension disk 2	71 hours 50 minutes (4310 minutes)	-
Snapshot	71 hours 49 minutes (4309 minutes)	

Usage charges

The usage charges for L-Platform 1 are as follows:

L-Platform1 usage charges

	Template	+	L-Server1	+	L-Server2	=	Usage charges
	$2.00		$226.89		$222.71		$451.60

Template

	Template ID	Unit price	Unit	Usage mount	Unit	Usage time	Monthly charge
	TE_01	$2.00	/month	1			$2.00

L-Server1

	Image name	Unit price	Unit	Usage mount	Unit	Usage time	Monthly charge
	IM_01	$0.10	/hour	1		6231	$10.39

CPU

	VM pool name	Unit price	Unit	Usage mount	Unit	Usage time	Monthly charge
CPU	/VMPool	$0.001	/hour			6226	$0.10
CPU clock	/VMPool	$0.002	/0.1GHz hour	10	GHz	6226	$20.75
		Usage charge per 1CPU					$20.86
		Usage charge for CPU		1			$20.86

Memory

	VM pool name	Unit price	Unit	Usage mount	Unit	Usage time	Monthly charge
	/VMPool	$0.001	/0.1GB hour	20	GB	6226	$20.75

System disk1

	Strage pool name	Unit price	Unit	Usage mount	Unit	Usage time	Monthly charge
	/StoragePool	$0.001	/0.1GB hour	20	GB	6231	$20.77

Extension disk1

	Strage pool name	Unit price	Unit	Usage mount	Unit	Usage time	Monthly charge
	/StoragePool	$0.002	/0.1GB hour	50	GB	6231	$103.85

Snapshot1

	Strage pool name	Unit price	Unit	Usage mount	Unit	Usage time	Monthly charge
	/StoragePool	$0.001	/0.1GB hour	70	GB	4309	$50.27

Monthly usage charge for L-Server1	$226.89

L-Server2

	Image name	Unit price	Unit	Usage mount	Unit	Usage time	Monthly charge
	IM_01	$0.10	/hour	1		4310	$7.18

CPU

	VM pool name	Unit price	Unit	Usage mount	Unit	Usage time	Monthly charge
CPU	/VMPool	$0.001	/hour			4306	$0.07
CPU clock	/VMPool	$0.002	/0.1GHz hour	20	GHz	4306	$28.71
		Usage charge per 1CPU					$28.78
		Usage charge for CPU		1			$28.78

Memory

	VM pool name	Unit price	Unit	Usage mount	Unit	Usage time	Monthly charge
	/VMPool	$0.001	/0.1GB hour	40	GB	4306	$28.71

System disk2

	Strage pool name	Unit price	Unit	Usage mount	Unit	Usage time	Monthly charge
	/StoragePool	$0.001	/0.1GB hour	20	GB	4310	$14.37

Extension disk2

	Strage pool name	Unit price	Unit	Usage mount	Unit	Usage time	Monthly charge
	/StoragePool	$0.002	/0.1GB hour	100	GB	4310	$143.67

Monthly usage charge for L-Server2	$222.71

P Point

Fractions in usage charges

When the calculations of usage charge produce a figure that includes fractions less than the lowest unit in the currency, the remainder is rounded off.

L-Platform transfers

When an L-Platform is moved, the usage charges for resources charged by amount are divided between the departure tenant and destination tenant, according to the amounts used. When resources are charged by a fixed amount, the departure tenant is billed.

15.4.6 Sending Usage charges

The usage charges for the previous month confirmed the day after the cut-off date are attached as a usage charge file and sent to the email address. The usage charge file is a zip file combining the usage charge list file and the usage charge detail file.

The detail of this file is as follows:

File	File name	Description
Usage charges file	*YYYYMM_tenant_name[_date_deleted]*.zip	File of usage charges for the tenant in zip format. *YYYYMM* is the date of the cut-off. "*_date_deleted*' is added when the tenant has already been deleted.
Usage charge list file	*YYYYMM_tenant_name[_date_deleted]*.csv	File in CSV format showing the tenant's previous month's usage charges plus the usage charges by the L-Platform they own. *YYYYMM* is the date of the cut-off. "*_date_deleted*' is added when the tenant has already been deleted.
Usage charge detail file	*YYYYMM_L-PlatformID*.csv	File in CSV format showing the breakdown of usage charges for each L-Platform. *YYYYMM* is the date of the cut-off.

P Point

Size of the usage charges file

The size of usage charge files depends on the number of L-Platforms deployed for the tenant and the configuration used. For example, if 200 L-Platforms including two L-Servers are deployed, the file size is about 160 Kb.

15.4.6.1 Usage Charge List File

The usage charge list file is a file in CSV format showing the tenant's previous month's usage charges plus the usage charges by the L-Platform they own.
The output items are as follows:

Item	Description
TenantName	This is the tenant name. (*1)
TenantDisplayName	This is the display name. Note (*1)
TenantDeletedDate	This is the date and time the tenant was deleted. Output only if the tenant has already been deleted. Empty string is output if this has not been deleted. Format: *YYYY-MM-DD HH:mm:ss.SSS* (*1) Example:2013-03-31 23:59:59.999

Item	Description
Date	This is the cut-off date. Format: *YYYY-MM* (*1) Example:2013-03
TotalChargeAmount	Total value of the usage charge for the tenant. The amounts are values, so they are not enclosed with double-quotes ("). Format:ZZZZZZZZZZZZ9 (*2) Example:800
FileVersion	This is the version of the file. Fixed as 1.0.
LplatformId	This is the L-Platform ID. (*1)
LplatformName	This is the L-Platform name. (*1)
LplatformDeletedDate	Date that the L-Platform was returned. Output only if the L-Platform has already been returned. Empty string is output if this has not been returned. Format: *YYYY-MM-DD HH:mm:ss.SSS* (*1) Example:2013-03-31 23:59:59.999
ChargeAmount	The amount of usage charges for each L-Platform. The amounts are values, so they are not enclosed with double-quotes ("). Format:ZZZZZZZZZZZZ9 (*2) Example:1000

*1: Data enclosed with double-quotes (").
*2: The amount is shown only, without the currency symbol.

The following is an example of file output:

```
#TenantName,TenantDisplayName,TenantDeletedDate,Date,TotalChargeAmount,FileVersion,LplatformId,Lplat
formName,LplatformDeletedDate,ChargeAmount
"TNT00001","tenant01","2012-02-01 09:30:40.001","2012-02",1800,"1.0","","","",
"","","","",,"","TNT00001-LPlatform01","template-TNT00001-LPlatform01","2012-01-10 09:30:40.001",
1000
"","","","",,"","TNT00001-LPlatform02","template-TNT00001-LPlatform02","",800
```

15.4.6.2 Usage charge Detail File

The usage charge detail file is a file in CSV format showing the breakdown of usage charges for each L-Platform.
The output items are as follows:

Item	Description
TenantName	This is the tenant name. (*1)
TenantDisplayName	This is the display name. Note (*1)
TenantDeletedDate	This is the date and time the tenant was deleted. Output only if the tenant has already been deleted. Empty string is output if this has not been deleted. Format: *YYYY-MM-DD HH:mm:ss.SSS* (*1) Example:2013-03-31 23:59:59.999
LplatformId	This is the L-Platform ID. (*1)
LplatformName	This is the L-Platform name. (*1)
LplatformDeletedDate	Date that the L-Platform was returned. Output only if the L-Platform has already been returned. Empty string is output if this has not been returned.

Item	Description
	Format: *YYYY-MM-DD HH:mm:ss.SSS* (*1) Example:2013-03-31 23:59:59.999
Date	This is the cut-off date. Format: *YYYY-MM* (*1) Example:2013-03
ChargeAmount	The amount of usage charges for each L-Platform. The amounts are values, so they are not enclosed with double-quotes ("). Format:ZZZZZZZZZZZZ9 (*1) Example:1000
FileVersion	This is the version of the file. Fixed as 1.0.
ItemColumn1	This is a breakdown (item 1). The template name, virtual L-Server name, or physical L-Server name is output.
ItemColumn2	This is a breakdown (item 2). The category of the resource. Empty string is output if this is for an L-Platform template, virtual L-Server, or physical L-Server.
ItemColumn3	This is a breakdown (item 3). The image name or resource identifier is output. (*1)
ItemColumn4	This is a breakdown (item 4). This is the unit corresponding to the unit price. A hyphen (-) is output if this is for an L-Platform template, virtual L-Server, or physical L-Server.
UnitPrice	This is the unit price. (*1)
UsedFrequency	This is the usage time. (*1)
ItemAmount	This is a breakdown of the amounts. Format:ZZZZZZZZZZZZ9 (*2) Example:50

*1: Data enclosed with double-quotes (").
*2: The amount is shown only, without the currency symbol.

The following is an example of file output:

```
#TenantName,TenantDisplayName,TenantDeletedDate,LplatformId,LplatformName,LplatformDeleteDate,Date,C
hargeAmount,FileVersion,ItemColumn1,ItemColumn2,ItemColumn3,ItemColumn4,UnitPrice,UsedFrequency,Item
Amount
"TNT00001","tenant01","2012-02-01 09:30:40.001","TNT00002-LPlatform01","template-TNT00002-
LPlatform01","2012-02-01 09:30:40.001","2012-02",1000,"1.0","","","","","","",
"","","","","","","",,"","Template","","TE_01","-","\200.0000/month","1 month",200
"","","","","","","",,"","Virtual server(vserverA)","","image001","-","\1.2000/h","5h",6
"","","","","","","",,"","Virtual server(vserverA)","CPU","/VMPool","1core,10GHz","\1.6667,\0.5560/
h","18h",26
"","","","","","","",,"","Virtual server(vserverA)","Memory capacity","/VMPool","10GB","\20.0000/
h","18h",360
"","","","","","","",,"","Virtual server(vserverA)","Disk Capacity(system disk)","/
StragePool","10GB","\8.0000/h","18h",144
"","","","","","","",,"","Virtual server(vserverA)","Disk Capacity(DISK1)","/
StragePool","10GB","\8.7500/h","18h",158
"","","","","","","",,"","Virtual server(vserverA)","Disk Capacity(DISK2)","/
StragePool","10GB","\8.7500/h","18h",158
"","","","","","","",,"","Virtual server(vserverA)","snapshot","-","-","-","-","-"
"","","","","","","",,"","Virtual server(vserverA)","snapshot001","/
StragePool","20GB","\0.0100/0.1GB-h","2h",4
"","","","","","","",,"","Virtual server(vserverA)","snapshot001","/
StragePool2","10GB","\0.0100/0.1GB-h","2h",2
"","","","","","","",,"","Virtual server(vserverB)","","image003","-","\1.2000/h","5h",6
```

```
"","","","","","","",,"","Virtual server(vserverB)","CPU","/VMPool","1core,10GHz","\1.6667,\0.5560/
h","18h",26
"","","","","","","",,"","Virtual server(vserverB)","Memory capacity","/VMPool","10GB","\20.0000/
h","18h",360
"","","","","","","",,"","Virtual server(vserverB)","Disk Capacity(system disk)","/
StragePool","10GB","\8.0000/h","18h",144
"","","","","","","",,"","Virtual server(vserverB)","Disk(DISK1)","/StragePool","10GB","\8.7500/
h","18h",158
"","","","","","","",,"","Virtual server(vserverB)","Disk(DISK2)","/StragePool2","10GB","\9.0000/
h","2h",18
"","","","","","","",,"","Virtual server(vserverB)","Snapshot","-","-","-","-","-"
"","","","","","","",,"","Virtual server(vserverB)","snapshot002","/
StragePool","20GB","\0.0100/0.1GB-h","2h",4
"","","","","","","",,"","Virtual server(vserverB)","snapshot002","/
StragePool2","10GB","\0.0100/0.1GB-h","2h",2
"","","","","","","",,"","Virtual server(vserverB)","snapshot003","/
StragePool","20GB","\0.0100/0.1GB-h","18h",36
"","","","","","","",,"","Virtual server(vserverB)","snapshot003","/
StragePool2","10GB","\0.0100/0.1GB-h","18h",18
"","","","","","","",,"","Physical server(pserverA)","","image002","-","\1.2000/h","5h",6
"","","","","","","",,"","Physical server(pserverA)","CPU","/ServerPool","1core,
10GHz","\1.6667,\0.5560/h","18h",26
"","","","","","","",,"","Physical server(pserverA)","Memory capacity","/
ServerPool","10GB","\20.0000/h","18h",360
"","","","","","","",,"","Physical server(pserverA)","Disk Capacity(system disk)","/
StragePool","10GB","\8.0000/h","18h",144
"","","","","","","",,"","Physical server(pserverA)","Disk Capacity","/StragePool2","10GB","\9.0000/
h","2h",18
"","","","","","","",,"","Physical server(pserverA)","Disk Capacity","/StragePool3","10GB","\9.7230/
h","6h",59
```

Chapter 16 Monitoring Logs

This chapter explains how to monitor logs.

16.1 Operation Logs

This section explains the operation logs of Resource Orchestrator.

📖 **Note**

. . . .

- Operation logs should be used by only infrastructure administrators or administrators, as all user operations of Resource Orchestrator can be viewed.

- Displaying resource names arranged in hierarchies is not supported.

. . . .

16.1.1 Overview

Provides the functions to record user operations as operation logs in Resource Orchestrator.

Using this function, administrators can monitor the following information:

- Time events were recorded in the operation logs

- User ID

- User group name

- IP address

- Status

- Resource name

- Operations

The operation logs are output in the following formats:

```
Date  User  Group  IP          Progress  Resource  Event
----- ----- ------ ----------- --------- --------- -------
```

Element Name	Description	Remarks
Date	Time events were recorded in the operation logs	The time events recorded in the operation logs are output in the local time. If daylight savings time (a regulation of time in summer) is set on the operating system, the time events are output in daylight savings time. Time events are output in the following format: YYYY-MM-DD HH:MM:SS.XXX
User	User ID	The user ID of the logged in user is output. When a special administrator uses the command, a hyphen ("-") is output.
Group	User group name	The name of the user group name the logged in user belongs to is output. When the logged in user does not belong to a user group, a hyphen ("-") is output.
IP	IP address	The IP addresses of the connected clients are output.
Progress	Status	Starting and stopping of operations, and errors are output. The following statuses are output: - Start of operations

Element Name	Description	Remarks
		Starting(*Operation_identifier*)
		- End of operations
		Completed(*Operation_identifier*)
		- Errors during operations
		Error(*Operation_identifier*)
Resource	Resource name	A resource name and a resource identifier are output in the following format: - "Resource identifier(*Resource_name*)"
Event	Operations	The parameters received by the manager are output. For the information that will be output, refer to "16.1.4 Scope of Operations Recorded in Operation Logs".

Note

- A hyphen ("-") may be output for an operation identifier.

- For operations involving multiple resources, the same resource name as the one displayed in the Recent Operations on the ROR console and the event log is output in "Resource".

Example

Output the latest 1 day's worth of data.

For details on operations for operation logs, refer to "5.13 rcxadm logctl" in the "Reference Guide (Command/XML) CE".
For the information that will be output, refer to "16.1.4 Scope of Operations Recorded in Operation Logs".

```
>rcxadm logctl list -latest -duration 1D <RETURN>
Date                    User   Group  IP              Progress                Resource                    Event
----------------------  -----  ------ --------------  ----------------------  ----------------------
--------------------
2011-03-10 21:15:00.390  -      -      10.20.30.53     Starting(BX620-1_21)    BX620-1_473(snap)
l_servers create
2011-03-10 21:15:06.250  -      -      10.20.30.53     Error(BX620-1_21)       BX620-1_473(snap)
l_servers create
2011-03-10 21:26:05.953  -      -      10.20.30.73     Starting(BX620-1_25)    BX620-1_510(snap)
l_servers create
2011-03-10 21:29:21.150  -      -      10.20.30.73     Completed(BX620-1_25)   BX620-1_510(snap)
l_servers create
2011-03-10 23:15:39.750  admin  -      10.20.30.53     Starting(BX620-1_35)    BX620-1_510(snap)
server_images snapshot
2011-03-10 23:15:46.781  admin  -      10.20.30.53     Completed(BX620-1_35)   BX620-1_510(snap)
server_images snapshot
2011-03-10 23:16:23.625  admin  -      10.20.30.53     Starting(BX620-1_36)    BX620-1_510(snap)
server_images restore
2011-03-10 23:16:28.484  admin  -      10.20.30.53     Completed(BX620-1_36)   BX620-1_510(snap)
server_images restore
2011-03-10 23:17:00.859  admin  -      10.20.30.53     Starting(BX620-1_37)    BX620-1_510(snap)
server_images destroy
2011-03-10 23:17:04.718  admin  -      10.20.30.53     Completed(BX620-1_37)   BX620-1_510(snap)
server_images destroy
2011-03-10 23:19:25.734  admin  -      10.20.30.53     Starting(BX620-1_38)    BX620-1_744(image_test)
server_images create
2011-03-10 23:27:29.640  admin  -      10.20.30.53     Completed(BX620-1_38)   BX620-1_744(image_test)
server_images create
```

```
2011-03-10 23:42:37.171  admin   -       10.20.30.53     Starting(BX620-1_40)    BX620-1_578(image_test)
server_images destroy
2011-03-10 23:42:47.460  admin   -       10.20.30.53     Completed(BX620-1_40)   BX620-1_578(image_test)
server_images destroy
2011-03-10 23:51:06.620  userA  groupA   127.0.0.1       Starting(BX620-1_41)    BX620-1_806(LS_RT_A001)
l_servers create
2011-03-10 23:53:06.437  userA  groupA   127.0.0.1       Completed(BX620-1_41)   BX620-1_806(LS_RT_A001)
l_servers create
2011-03-10 23:53:39.265  userA  groupA   127.0.0.1       Starting(BX620-1_42)    BX620-1_806(LS_RT_A001)
l_servers start
2011-03-10 23:54:26.640  userA  groupA   127.0.0.1       Completed(BX620-1_42)   BX620-1_806(LS_RT_A001)
l_servers start
2011-03-10 23:54:45.531  userA  groupA   127.0.0.1       Starting(BX620-1_43)    BX620-1_806(LS_RT_A001)
l_servers restart
2011-03-10 23:55:26.859  userA  groupA   127.0.0.1       Completed(BX620-1_43)   BX620-1_806(LS_RT_A001)
l_servers restart
2011-03-10 23:55:48.953  userA  groupA   127.0.0.1       Starting(BX620-1_44)    BX620-1_806(LS_RT_A001)
l_servers stop
2011-03-10 23:56:26.390  userA  groupA   127.0.0.1       Completed(BX620-1_44)   BX620-1_806(LS_RT_A001)
l_servers stop
2011-03-10 23:57:11.968  userA  groupA   127.0.0.1       Starting(BX620-1_46)    BX620-1_806(LS_RT_A001)
l_servers attach
2011-03-10 23:58:21.359  userA  groupA   127.0.0.1       Completed(BX620-1_46)   BX620-1_806(LS_RT_A001)
l_servers attach
2011-03-10 23:58:35.620  userA  groupA   127.0.0.1       Starting(BX620-1_47)    BX620-1_806(LS_RT_A001)
l_servers detach
2011-03-10 23:59:23.343  userA  groupA   127.0.0.1       Completed(BX620-1_47)   BX620-1_806(LS_RT_A001)
l_servers detach
2011-03-10 23:59:40.265  userA  groupA   127.0.0.1       Starting(BX620-1_48)    BX620-1_806(LS_RT_A001)
l_servers migrate
2011-03-11 00:00:53.984  userA  groupA   127.0.0.1       Completed(BX620-1_48)   BX620-1_806(LS_RT_A001)
l_servers migrate
2011-03-11 00:01:09.296  userA  groupA   127.0.0.1       Starting(BX620-1_50)    BX620-1_806(LS_RT_A001)
l_servers update
2011-03-11 00:02:58.125  userA  groupA   127.0.0.1       Completed(BX620-1_50)   BX620-1_806(LS_RT_A001)
l_servers update
2011-03-11 00:04:42.640  userA  groupA   127.0.0.1       Starting(BX620-1_57)    BX620-1_806(LS_RT_A001)
l_servers destroy
2011-03-11 00:05:22.921  userA  groupA   127.0.0.1       Completed(BX620-1_57)   BX620-1_806(LS_RT_A001)
l_servers destroy
2011-03-11 00:35:44.250  userA  groupA   127.0.0.1       Starting(BX620-1_117)   BX620-1_954(LS_RT_A001)
folders move_resource
2011-03-11 00:35:44.625  userA  groupA   127.0.0.1       Completed(BX620-1_117)  BX620-1_954(LS_RT_A001)
folders move_resource
2011-03-11 01:04:34.880  admin   -       10.20.30.53     Starting(BX620-1_570)   BX620-1_2193(master-52)
l_servers convert
2011-03-11 01:04:36.650  admin   -       10.20.30.53     Completed(BX620-1_570)  BX620-1_2193(master-52)
l_servers convert
2011-03-11 01:05:05.568  admin   -       10.20.30.53     Starting(BX620-1_571)   BX620-1_2193(master-52)
l_servers revert
2011-03-11 01:05:06.451  admin   -       10.20.30.53     Completed(BX620-1_571)  BX620-1_2193(master-52)
l_servers revert
```

Note

The starting point (Starting) of recording for each operation is when the operation is displayed in the Recent Operations on the ROR console.

16.1.2 Usage Method

This section explains the methods for configuring and operating operation logs.

Perform the following procedure:

1. Disk space estimation

   Infrastructure administrator (infra_admin) estimates the disk size to use for storing operation logs.

   Estimate the amount of disk space using the following formula, and then decide the number of days to retain operation logs.

   > {(*Number_of_operations_of_the_resource_in_1_day*) * (*Number_of_target_resources*) * 1(KB)} * (*retention_period*)

   ### 📑 Example

   ⋅⋅⋅

   Disk space when estimating that the retention period is 180 days (by default), the target resource is operated 4 times, and the number of target resources is 256

Retention period	Necessary Disk Space	Formula
180 days worth	Approx. 185 MB	4 * 256 * 1 * 180 = 184320 (KB)

   ⋅⋅⋅

2. Check the settings in the [Date and Time properties] dialog of the operating system

   Check whether the following tabs of the OS are configured correctly. If the settings are incorrect, set them correctly.

   - [Date and Time] tab

   - [Time Zone] tab

   - [Internet Time(or the Network Time Protocol)] tab

3. Configure the retention period of operation logs

   Execute the rcxadm logctl set command, to configure the retention period for operation logs.
   For details on the rcxadm logctl set command, refer to "5.13 rcxadm logctl" in the "Reference Guide (Command/XML) CE".

4. Start recording of the operation log

   Execute the rcxadm logctl start command to start recording the operation log.
   When the rcxadm logctl start command is executed, the operation logs will be recorded for the configured retention period from the date recording of operation logs is started.
   Days when no events occur, or days when recording is not possible due to the manager being stopped are not counted as dates for recording.

   ### 📙 Note

   ⋅⋅⋅

   - When the settings of the OS [Date and Time Properties] dialog have been changed after starting the recording of operation logs

     It may not be possible to correctly display or delete the operation logs.

   - When changing the settings of the OS [Date and Time Properties] dialog after starting the recording of operation logs

     Refer to "16.1.3 Retention".

   - When a Cloud Edition license has been registered

     When starting the manager, recording of operation logs is started automatically.

   ⋅⋅⋅

16.1.3 Retention

This section explains the retention of operation logs.

- Periodic deletion

  Due to extended periods of operation or modification of retention periods, operation logs which have exceeded a certain retention period are periodically deleted.

  The timing of deletion (based on retention period checks) is set to take place as the first operation after the date changes.

Note

. . . .

- The recording period is the retention period + 1. After periodic deletion is performed, the recording period will be equal to the retention period.

- Periodic deletion is executed when the next recording is started (the first recording after the date changes), and operation logs will be deleted in chronological order.

. . . .

- Deletion

  Users can delete unnecessary operation logs by defining a retention period.

- Backup and Restore

  Use the following procedure for backup and restoration of operation logs.

  - Backup

    1. Confirm the "retention folder" for the operation logs.

    2. Stop recording operation logs.

    3. Back up the "retention folder" confirmed in step 1.

    4. Start recording operation logs.

  - Restore

    1. Confirm the "retention folder" for the operation logs.

    2. Stop recording operation logs.

    3. Restore the backed-up folder into the "retention folder" confirmed in step 1.

    4. Start recording operation logs.

- Modification of the settings in the [Date and Time properties] dialog after starting the recording of operation logs

  Use the following procedure to make changes.

    1. Stop recording operation logs.

    2. Display the operation logs and back up the necessary portions from the records.

    3. Confirm the "retention folder" for the operation logs.

    4. Empty the "retention folder" by moving all files in the "retention folder" checked in step 3 to a new location.

    5. Modify the settings in the [Date and Time properties] dialog.

    6. Start recording operation logs.

For details on operations for operation logs, refer to "5.13 rcxadm logctl" in the "Reference Guide (Command/XML) CE".

Note

. . . .

- Once recording operations are stopped, user operations are not recorded until the recording of logs is started again.

- Performing this procedure resets the recording period of operation logs to 0.

16.1.4 Scope of Operations Recorded in Operation Logs

The scope of operations recorded in operation logs and the character strings displayed in the Event column are as indicated below.

Table 16.1 Scope of Operations

Resource Type	Action	Strings Displayed in the Event Column
L-Server	Creation	l_servers create
	Deletion	l_servers destroy
	Modification	l_servers update
	Powering on	l_servers start
	Powering off	l_servers stop
	Restarting	l_servers restart
	Disk addition	l_servers attach
	Disk detachment	l_servers detach
	Folder migration	folders move resource
	Migration	l_servers migrate
	Physical L-Server configuration	l_servers set_attrs
	Transmission of network information to physical L-Servers	l_servers setup
	Conversion	l_servers convert
	Reversion	l_servers revert
Image	Creation	server_images create
	Deletion	server_images destroy
	Restore	server_images restore
	Snapshot collection	server_images snapshot
L-Platform	Creation	l_platforms create
	Deletion	l_platforms destroy
	Modification	l_platforms update
Tenant	Create	tenants create
	Deletion	tenants destroy
	Modification	tenants update
Resource Folders	Creation	folders create
	Deletion	folders destroy
	Modification	folders update

16.2 Audit Logs

This section explains audit logs.
By looking up audit logs, it is possible to find out *who* performed *what* operation *when*.

16.2.1 Configuration Management Audit Log

This section explains the configuration management audit log.

The file name, file size, and number of generations of the audit log are shown below:

Log name	Description	File size	Number of generations
vsys_audit_log	Audit logs are output to this log.	10 MB	10 generations (*)

* Note: If the number of saved generations exceeds 10 generations, old generations will be deleted, starting with the oldest generation.

The file size and the number of generations to be saved can be changed. Refer to "Procedure for changing the size of the file" and "Procedure for changing the number of generations to be saved" for details.

With default settings, audit logs will be held for approximately 50 days if 10 people use this product for approximately one hour per day per person. If necessary, back up audit logs at appropriate intervals according to the usage frequency. The names of the files to be backed up are shown below:

```
vsys_audit_log.[n] (where "n" is the generation number)
Example: To back up three generations' worth of files, the names of the files to be backed up are as
follows:
- vsys_audit_log.1
- vsys_audit_log.2
- vsys_audit_log.3
```

Output Destination

The log output destinations are shown below:

[Windows Manager]

Output folder	Output destination file
Installation_folder\RCXCFMG\logs	vsys_audit_log.[n] (n is the number of generations)

[Linux Manager]

Output folder	Output destination file
/var/opt/FJSVcfmg/logs	vsys_audit_log.[n] (n is the number of generations)

Output format

Audit logs are CSV files where the following items are output in the following order:

Output format
<date/time when the operation was performed>,<user ID>,<organization ID>,<operation ID>,<parameters>,<operation result>

Item	Description
date/time when the operation was performed	*YYYY-MM-DD HH:MM:SS.sss* (local time).
user ID	The user ID of the user that executed the operation.
organization ID	The organization ID of the user that executed the operation.
operation type	A string indicating the content of the operation. (*)
parameters	The parameters specified by the request.

Item	Description
operation result	"SUCCESS" if the operation was successful and "FAILURE" if the operation failed.

* Note: The operation types are as follows:

Operation type	Description
AccessControl#evaluate	Checking access permissions.
AccessControl#getAuthority	Obtaining information about resource operation privileges for a user.
DeployMaster#delete	Deleting configuration information.
DeployMaster#getDetail	Obtaining detailed configuration information.
DeployMaster#getSaveList	Obtaining a list of configuration information.
DeployMaster#getTemplate	Obtaining a deployment master from an L-Platform template.
DeployMaster#save	Saving configuration information.
DeployMaster#setStatus	Setting the status of configuration information.
Event#notify	Notifying events that occurred on a server. With the current version, changes to the power status, migration, reconfiguring, pool information, events are notified.
EventLog#getList	Obtaining a list of event logs.
Images#changeShow	Changing whether images are displayed.
Images#getDetail	Obtaining detailed image information.
Images#getList	Obtaining a list of images registered.
Images#getServerType	Obtaining a list of L-Server Templates.
Images#register	Registering image information with this product.
Images#search	Searching image information.
Images#unregister	Deregistering image information from this product.
Images#update	Updating image information.
Network#addCategory	Registering a network resource type.
Network#deleteCategory	Deleting a network resource type.
Network#getCategoryList	Obtaining a list of network types.
Network#getList	Obtaining a list of networks.
Network#getRulesetList	Obtaining a list of rulesets.
Network#detailRuleset	Obtaining detailed ruleset information.
Parameters#delete	Deleting parameter information.
Parameters#getDetail	Obtaining detailed parameter information.
Parameters#getList	Obtaining a list of parameter information.
Parameters#set	Registering or updating parameter information.
Softwares#create	Registering software information.
Softwares#delete	Deleting software information.
Softwares#getDetail	Obtaining detailed software information.
Softwares#getList	Obtaining a list of software.
Softwares#update	Updating software information.
Templates#changeShow	Changing the settings as to whether L-Platform templates can be displayed.
Templates#deletePublic	Deleting L-Platform templates.

Operation type	Description
Templates#getDetail	Obtaining detailed L-Platform template information.
Templates#importPublic	Registering L-Platform template information.
Templates#search	Searching an L-Platform template.
Templates#updatePublic	Updating templates
VDisk#getList	Obtaining a list of existing disks.
VServer#addPatch	Registering patch information.
VServer#attach	Adding an expansion disk.
VServer#backup	Creating a snapshot.
VServer#cancelError	Releasing the error status of snapshots or restorations.
VServer#changeSpec	Changing server performance.
VServer#cloning	Collecting a cloning image from a deployed server.
VServer#create	Adding a server.
VServer#deletePatch	Deleting patch information.
VServer#detach	Deleting an expansion disk.
VServer#getBackupList	Obtaining a list of snapshots.
VServer#getInitPW	Obtaining the initial password for a server.
VServer#release	Returning a server.
VServer#removeBackup	Deleting a snapshot.
VServer#restore	Restoring a server.
VServer#search	Obtaining server information.
VServer#start	Starting a server.
VServer#stop	Stopping a server.
VSYS#addNetwork	Adding a segment to an L-Platform.
VSYS#changeOrg	Changing a user ID or organization ID for an L-Platform.
VSYS#convertFolder	Converting a system deployed with Systemwalker Software Configuration Manager V14.1 to an L-Platform for this product.
VSYS#delete	Deleting an L-Platform from just the resource window after deleting failed, etc.
VSYS#deleteLServer	Deleting a server included in an L-Platform from the L-Platform.
VSYS#deleteNetwork	Deleting a segment from an L-Platform.
VSYS#deploy	Deploying an L-Platform.
VSYS#flowCancel	Canceling the application to deploy an L-Platform or change a configuration.
VSYS#flowCancelRetry	Canceling the flow for saving a configuration and then making another application.
VSYS#flowDeploy	Deploying an L-Platform. (For flows: no operation after authorization.)
VSYS#flowEnableDeploy	Deploying an L-Platform. (For flows: operation to perform after authorization.)
VSYS#flowEnableRelease	Returning all L-Platforms as a batch. (For flows: operation to perform after authorization.)
VSYS#flowEnableUpdate	Reconfiguring an L-Platform. (For flows: operation to perform after authorization.)
VSYS#flowError	Executing post-processing when an error has occurred with an application flow for deploying an L-Platform or changing a configuration.
VSYS#flowForward	Applying to deploy an L-Platform or change a configuration.

Operation type	Description
VSYS#flowRejectApplication	Rejecting deployment application.
VSYS#flowRelease	Returning all L-Platforms as a batch. (For flows: no operation after authorization.)
VSYS#flowReleaseApplication	Applying to return an L-Platform.
VSYS#flowReleaseForward	Setting the status of a return application to "forwarding complete".
VSYS#flowSaveCancel	Canceling the application to deploy an L-Platform or change a configuration.
VSYS#flowUpdate	Reconfiguring an L-Platform. (For flows: no operation after authorization.)
VSYS#getConfigurations	Obtaining configuration information.
VSYS#getCurrency	Obtaining product currency information.
VSYS#getDetail	Obtaining detailed information for an L-Platform.
VSYS#getHostnameCounter	Obtaining a list of host name serial number counters.
VSYS#getList	Obtaining a list of L-Platforms.
VSYS#getLoginDate	Obtaining the date/time when the user logged in to the L-Platform Manager View.
VSYS#getOperationLNetDevResult	Obtaining the operation logs for the server load balancer.
VSYS#getPoolList	Obtaining a list of resource pools for ServerView Resource Orchestrator.
VSYS#getTask	Obtaining task information.
VSYS#getTenantList	Obtaining a list of tenants.
VSYS#importLServer	Importing an L-Server under resource management to an L-Platform.
VSYS#lock	Locking an L-Platform.
VSYS#operateLNetDev	Executing server load balancer operations.
VSYS#recoverDisk	Recovering a disk.
VSYS#recoverNet	Recovering a network segment.
VSYS#recoverNic	Recovering an NIC.
VSYS#recoverServer	Recovering a server.
VSYS#recoverSystem	Recovering an L-Platform.
VSYS#release	Returning all L-Platforms as a batch.
VSYS#resetHostnameCounter	Resetting the host name serial number counter.
VSYS#setChangeInfo	Recovering an L-Platform name, server name, or server specification.
VSYS#setDisplayStatus	Changing the status of an L-Platform.
VSYS#setLoginDate	Updating the date/time when the user logged in to L-Platform Manager View.
VSYS#setRecoverInfo	Recovering a resource ID or disk number.
VSYS#setServerStatus	Recovering the status of a server.
VSYS#setUndeploy	Changing the status of an L-Platform, server or disk to "undeployed".
VSYS#start	Starting the servers in an L-Platform as a batch.
VSYS#startServers	Starting the servers for multiple tenants as a batch.
VSYS#stop	Stopping the servers in an L-Platform as a batch.
VSYS#stopServers	Stopping the servers for multiple tenants as a batch.
VSYS#syncServerStatus	Synchronizing server power statuses in a batch.
VSYS#syncSpec	Synchronizing server performance information with the actual state.
VSYS#unlock	Unlocking an L-Platform.

Operation type	Description
VSYS#update	Reconfiguring an L-Platform.
VSYS#updateLNetDev	Updating the parameters for the firewall and server load balancer.
VSYS#updateRemarks	Changing the L-Platform remarks column input values after deploying.

Procedure for changing output destination

Use the following procedure to change the audit log output destination.

1. Rewrite the settings file.

   The following table shows the settings file and the location to change:

   [Windows Manager]

Log name	Settings file	Location to change (one location)
vsys_audit_log	*Installation_folder*\RCXCFMG\config\vsys_log4j.xml	<param name="File" value="C:\ProgramData\Fujitsu\SystemwalkerCF-MG\logs\vsys_audit_log" />

   [Linux Manager]

Log name	Settings file	Location to change (one location)
vsys_audit_log	/etc/opt/FJSVcfmg/config/vsys_log4j.xml	<param name="File" value="/var/opt/FJSVcfmg/logs/vsys_audit_log" />

2. Restart the manager.
   Refer to "2.1 Starting and Stopping Managers" for information on how to Restart the manager.

Procedure for changing the size of the file

Use the following procedure to change the audit log file size.

1. Rewrite the settings file.

   The location to change is shown below:

   [Windows Manager]

Log name	Settings file	Location to change (one location)
vsys_audit_log	*Installation_folder*\RCXCFMG\config\vsys_log4j.xml	Change the underlined part of the <param name="MaxFileSize" value="10MB" /> element under the <appender name="auditfileout" class="org.apache.log4j.RollingFileAppender"> element to the desired value. Example: value="100MB" (to change the size of the audit log file to 100 MB)

   [Linux Manager]

Log name	Settings file	Location to change (one location)
vsys_audit_log	/etc/opt/FJSVcfmg/config/vsys_log4j.xml	Change the underlined part of the <param name="MaxFileSize" value="10MB" /> element under the <appender name="auditfileout" class="org.apache.log4j.RollingFileAppender"> element to the desired value.

Log name	Settings file	Location to change (one location)
		Example: value="100MB" (to change the size of the audit log file to 100 MB)

2. Restart the manager.
   Refer to "2.1 Starting and Stopping Managers" for information on how to Restart the manager.

Procedure for changing the number of generations to be saved

Use the following procedure to change the number of audit log generations to be saved.

1. Rewrite the settings file.

   The location to change is shown below:

   [Windows Manager]

Log name	Settings file	Location to change (one location)
vsys_audit_log	*Installation_folder*\RCXCFMG\config\vsys_log4j.xml	Change the underlined part of the <param name="MaxBackupIndex" value="9" / /> element under the <appender name="auditfileout" class="org.apache.log4j.RollingFileAppender"> element to the desired value. Example: value="100" (to change the number of audit log generations to 100)

   [Linux Manager]

Log name	Settings file	Location to change (one location)
vsys_audit_log	/etc/opt/FJSVcfmg/config/vsys_log4j.xml	Change the underlined part of the <param name="MaxBackupIndex" value="9" / /> element under the <appender name="auditfileout" class="org.apache.log4j.RollingFileAppender"> element to the desired value. Example: value="100" (to change the number of audit log generations to 100)

2. Restart the manager.
   Refer to "2.1 Starting and Stopping Managers" for information on how to Restart the manager.

16.2.2 Audit Logs of Output by the Tenant Management, Accounting, Access Control and System Condition

This section explains audit logs of output by the tenant management, accounting, access control and system condition functions.

P Point

. . . .

- If L-Platform Management is operated, audit logs will be output to Configuration Manager. Refer to "16.2.1 Configuration Management Audit Log" for details.

- Audit logs relating to the registration, modification or deletion of infrastructure administrators, infrastructure operators, infrastructure monitors, administrators, operators and/or monitors can be checked in the OpenDS access log.
  The storage locations and file names of OpenDS access logs are as follows.

[Windows Manager]

OpenDS_Installation_folder\opends\logs\access

[Linux Manager]

```
/opt/fujitsu/ServerViewSuite/opends/logs/access
```

Refer to the OpenDS website for details on OpenDS access logs.

```
URL: https://docs.opends.org/2.2/page/DefAccessLog (As of February2012)
```

Output format

Audit logs are CSV files where the following items are output in the following order:

Output format
operation date/time,user ID,tenant name,operation type,operation information,operation result

Item	Description
operation date/time	The date/time when the operation was performed. The date/time is output using the following format: *YYYY-MM-DD HH:MM:SS.sss* (local time)
user ID	The user ID of the user that performed the operation. Fixed as ctmgadm for command operations.
tenant name	The tenant name of the user that executed the operation. Fixed as ctmgadm for the infrastructure administratrative role or multiple roles users.
operation type	The type of the operation performed. Refer to "Operation types and operation information" for details.
operation information	Detailed information for the operation type. Refer to "Operation types and operation information" for details.
operation result	The result of the operation performed. One of the following values is output: SUCCESS: When the operation was successful FAILURE: When the operation failed

Output files

Audit logs are output to the following files:

Function	Output file
Tenant management (GUI operations from the ROR Console)	[Windows Manager] *Installation_folder*\RCXCTMG\SecurityManagement\log\ctsec_audit_a.log [Linux Manager] /var/opt/FJSVctsec/log/ctsec_audit_a.log
Tenant management (creating users from the ROR Console: Provisional account registration method)	[Windows Manager] *Installation_folder*\RCXCTMG\SecurityManagement\log\ctsec_audit_s.log [Linux Manager] /var/opt/FJSVctsec/log/ctsec_audit_s.log
Accounting	[Windows Manager] *Installation_folder*\RCXCTMG\Charging\log\ctchg_audit.log [Linux Manager] /var/opt/FJSVctchg/log/ctchg_audit.log

Function	Output file
Accounting (GUI operations from the ROR Console)	[Windows Manager] *Installation_folder*\RCXCTMG\Charging\log\charging_audit.log [Linux Manager] /var/opt/FJSVctchg/log/charging_audit.log
Accounting (Published API operation)	[Windows Manager] *Installation_folder*\RCXCTMG\Charging\log\accounting_audit.log [Linux Manager /var/opt/FJSVctchg/log/accounting_audit.log
Access Control	[Windows Manager] *Installation_folder*\RCXCTMG\SecurityManagement\log\ctac_audit.log [Linux Manager] /var/opt/FJSVctsec/log/ctac_audit.log
System condition	[Windows Manager] *Installation_folder*\SWRBAM\CMDB\FJSVcmdbm\var\log\audit\uigui\cmdb_audit.log [Linux Manager] /opt/FJSVcmdbm/var/log/audit/uigui/cmdb_audit.log

Procedure for changing the file size and the number of generations held

By default, audit log files are rotated when they reach 10 MB.
To change the maximum size of audit log files or the maximum number of generations held, perform the following procedure:

1. Stop the manager.
   Refer to "2.1 Starting and Stopping Managers" for information on how to stop the manager.

2. Edit the appropriate items in the following definition files:

   - Definition files

Function	Definition file
Tenant management (GUI operations from the ROR Console)	[Windows Manager] *Installation_folder*\RCXCTMG\conf\auditsecalog4j.xml [Linux Manager] /etc/opt/FJSVctmg/conf/auditsecalog4j.xml
Tenant management (creating users from the ROR Console: Provisional account registration method)	[Windows Manager] *Installation_folder*\RCXCTMG\conf\auditsecslog4j.xml [Linux Manager] /etc/opt/FJSVctmg/conf/auditsecslog4j.xml
Accounting	[Windows Manager] *Installation_folder*\RCXCTMG\conf\auditchglog4j.xml [Linux Manager] /etc/opt/FJSVctmg/conf/auditchglog4j.xml

Function	Definition file
Accounting (GUI operations from the ROR Console)	[Windows Manager] *Installation_ folder*\RCXCTMG\conf\auditchgguilog4j.xml [Linux Manager] /etc/opt/FJSVctmg/conf/auditchgguilog4j.xml
Accounting (Published API operation)	[Windows Manager] *Installation_ folder*\RCXCTMG\conf\auditacntlog4j.xml [Linux Manager] /etc/opt/FJSVctmg/conf/auditacntlog4j.xml
Access Control	[Windows Manager] *Installation_folder*\RCXCTMG\conf\auditaclog4j.xml [Linux Manager] /etc/opt/FJSVctmg/conf/auditaclog4j.xml
System condition	[Windows Manager] *Installation_folder*\SWRBAM\CMDB\FJSVcmdbm\CMDBConsole\WEB-INF\classes\log4j.properties [Linux Manager] /opt/FJSVcmdbm/CMDBConsole/WEB-INF/classes\log4j.properties

- Setting items

Setting item	Description
MaxFileSize	This item sets the maximum size of audit log files. The file size can be specified using a combination of an integer greater than 0 and a unit (KB, MB or GB). (*1), (*2) Example: <param name="MaxFileSize" value="500KB"/>
MaxBackupIndex	This item sets the maximum number of generations of the audit log file. An integer greater than 0 can be specified. (*1) Example: <param name="MaxBackupIndex" value="50"/>

*1: Do not specify decimal fractions. Also, do not leave a blank space.

*2: Do not specify a maximum file size that is larger than the size of the disk. Conversely, do not set values that are too small for the maximum file size, or else the logs will be overwritten frequently.

3. Start the manager.
   Refer to "2.1 Starting and Stopping Managers" for information on how to start the manager.

Operation types and operation information

The following table shows the operation types and operation information that are output to audit logs:

Function	Operation type	Content	Operation information (*1)
Tenant management (GUI operations from the ROR Console)	registUser	Notify user registration	"mail=""xxx@com"""
	createUser	Create users	"userid=""*<user ID of the user created>*""&mail=""xxx@com""&lastname=""*<last name>*""&firstname=""*<first name>*""&auth=""tenant_admin|tenant_operator|tenant_monitor|tenant_user""&explanation=""xxxx""&corporatename=""fujitsu""&emergencymail=""yyy@com""&emergencytel=""0000"""

Function	Operation type	Content	Operation information (*1)
			(only if the infrastructure administrator performed or the tenant administrator performed by the direct registration method)
	deleteUser	Delete users	"userid=""*<user ID of the user deleted>*"""
	updateUser	Update user information	"userid=""*<user ID of the user updated>*""&mail=""xxx@com""&lastname=""*<last name>*""&firstname=""*<first name>*""&auth=""infra_admin|infra_operator|administrator|monitor|operator|tenant_admin|tenant_operator|tenant_monitor|tenant_user""&explanation=""xxxx""&corporatename=""fujitsu""&emergencymail=""yyy@com""&emergencytel=""0000"""
	listUser	Get a list of user information	None.
	moveUser	Relocate users	"userid=""*<user ID of the user that has been relocated>*""&oldorgid=""*<name of the original tenant>*""&neworgid="" *name of the tenant to which the user has been relocated*""
	updatePassword	Update passwords	"userid=""*<user ID of the user whose password has been updated>*""

	createOrg (*2) (*3)	Create a tenant	- With default setting
			"orgid=""<tenant name of the tenant that has been updated>""&orgname=""<tenant name>""&mail=""xxx@com""&globalpool=""<global pool that has been set>"""
			
			  - With calculation of Usage Charges, following items will be added to output
			&cutoffdate =""< Cutoff date>""&accountingmail=""<email address where usage charges are sent>""
			
			  - With tenant of unique application process, following items will be added to output
			&applicationprocess=""workflow.policy=default|custom,workflow.subscribe=infra-tenant|infra|tenant,workflow.reconfigure=infra-tenant|infra|tenant ,workflow.unsubscribe=infra-tenant|infra|tenant""

	deleteOrg (*3)	Delete tenants	"orgid=""*<tenant name of the tenant that has been deleted>*"""

	updateOrg (*2) (*3)	Update tenant information	- With default setting
			"orgid=""<tenant name of the tenant that has been updated>""&orgname=""<tenant name>""&mail=""xxx@com""&globalpool=""<global pool that has been set>"""
			
			  - With calculation of Usage Charges, following items will be added to output
			&cutoffdate =""< Cutoff date>""&accountingmail=""<email address where usage charges are sent>""
			
			  - With tenant of unique application process, following items will be added to output
			&applicationprocess=""workflow.policy=default|custom,workflow.subscribe=infra-tenant|infra|

Function	Operation type	Content	Operation information (*1)
			tenant,workflow.reconfigure=infra-tenant|infra|tenant ,workflow.unsubscribe=infra-tenant|infra|tenant""
	listOrg	Get a list of tenant information	None.
Tenant management (creating users from the ROR Console: Provisional account registration method)	createUser	Create users	"userid=""*\<user ID of the user created\>*""&mail=""xxx@com""&lastname=""*\<last name\>*""&firstname=""*\<first name\>*"""&auth=""tenant_user""&explanation=""xxxx""&corporatename=""fujitsu""&emergencymail=""yyy@com""&emergencytel=""0000"""
Accounting	updatePMaster	Update product master	None.
	listPMaster	Get a list of product master	None.
	updateMlogSch	Update periodic log schedule settings	"use=""yes|no""&time=""*\<time of output of periodic log\>*""&type=""*\<frequency of output of periodic log\>*""&day=""*\<day of output of periodic log\>*"""
	listMlogSch	Get a list of periodic log schedule settings	"use=""yes|no""&time=""*\<time of output of periodic log\>*""&type=""*frequency of output of periodic log*""&day=""*\<day of output of periodic log\>*"""
	listMeteringlog	Get a list of metering logs	"start=""*\<start date of the acquisition period\>*""&end=""*\<end date of the acquisition period\>*""&type=""event|period"""
	deleteMlog	Delete metering logs	"retention=""*\<log entry retention period\>*"""
	getCurrencyUnit	Obtain currency unit settings	None
	updateCurrencyUnit	Update currency unit settings	"currencycode=""*currency code*"""
	resetCurrencyUnit	Initialize currency unit settings	None
Accounting (GUI operations from the ROR Console)	listLplatformCharge	Get a list of usage charge for each L-Platform	None.
	getDetailCharge	Get a breakdown of L-Platform usage charges	None.
	listTenantCharge	Get a list of usage charge for each tenant	None.
	listLplatformChargeByTenant	Get a list of usage charge for each L-Platform under the specified tenant	None.

Function	Operation type	Content	Operation information (*1)
	downloadFile	File download	"target=""LplatformChargeList|DetailCharge|TenantChargeList| LplatformChargeListByTenant"""
Accounting (Published API operation)	getResourceUsage	Get resource usage	None.
	getUsagePoint	Get usage frequency	None.
	registerUsagePoint	Register usage frequency (*4)	"date=""*<date of data registered>*(*5)""&id=""*<L-Platform ID>*""&name=""*<L-Platform name>*""&tenantname=""*<tenant name of managed tenant>*""&tenantdeletedate=""*<date when managed tenant was deleted>*(*6)"""
	getDailyCharge	Get daily usage charges	None.
	registerDailyCharge	Register daily usage charges (*4)	"date=""*<date of data registered>*""&id=""L-Platform ID""&name=""*<L-Platform name>*""&tenantname=""*<tenant name of managed tenant>*""&tenantdeletedate=""*<date when managed tenant was deleted>*"""
	getMonthlyCharge	Get usage charges	None.
	registerMonthlyCharge	Register monthly usage charges (*4)	"date=""*<date of data registered>*""&id=""L-Platform ID""&name=""*<L-Platform name>*""&tenantname=""*<tenant name of managed tenant>*""&tenantdeletedate=""*<date when managed tenant was deleted>*"""
	getTenants	Get tenant information	None.
Access Control	updateAuthority	Access authority modifications	"roleid=""*<role name of modification target>*"" &actionid=""*<action ID of modification target>*"" &permission=""*<allow/deny status of specified action>*""" (The above information will be output as follows: one information item when a role name is specified, or if a file is specified, the number of information items will match the number of action IDs.)
System condition (*4)	dispUsageStatus	Display usage condition	None.

*1: If a value is not set for an item, """" is output.
An example is shown below.

```
... &globalpool="""".. .
```

*2: If multiple global pools have been set, the global pools are output separated by commas.
An example is shown below.

```
...&globalpool=""/AddressPool,/ImagePool""...
```

*3: For the operation result of createOrg, deleteOrg, or updateOrg, the processing result will be output. Use the operation log (resource operation) to check the actual processing result. Refer to "16.1 Operation Logs" for information on how to check the operation log (resource operation).

*4: Multiple lines may be output each time there is a registration operation.

*5: Output is in the format *yyyy-MM-dd* (for example, April 1, 2012 is output as 2012-04-01).

*6: Output is in the format *yyyy-MM-dd*T*HH:mm:ss.SSSZ* (for example, 12:00 A.M. and 00.000 seconds on April 1, 2012 in time zone UTC+9:00 is output as 2012-04-01T00:00:00.000+0900).

*7: Audit logs for usage condition are output only when operations are performed from the ROR Console.

16.2.3 Application Process Audit Log

This section explains the application process audit log.

Usage

To obtain the process instance audit log for the application process, execute the get process instance audit information command.

```
Installation_folder\SWRBAM\bin\swrba_audit
```

The process instance audit information that can be obtained will be the process instance information that was complete after the command was executed the previous time.

Privilege Required/Execution Environment

[Windows Manager]

- Administrator privileges are required. If the operating system is Windows Server 2008 or later, execute as the administrator.

- This command can be executed on the admin server.

[Linux Manager]

- System administrator (superuser) privileges are required.

- This command can be executed on the admin server.

Output files

The following table shows the file name, file size, and generations of the audit log:

Log name	Description	File size	Number of generations
swrba_audit.log	Audit logs are output.	10 MB	10 (*)

* Note:

- The trigger for the generation switchover is when the file exceeds 10MB.
  If the file size does not reach 10 MB, the log continues to be output to the same file even if the swrba_audit command is executed multiple times.

- Once 10 generations (100 MB) is exceeded, the oldest file (swrba_audit9.log) is deleted.

Destination

The table below shows the log output destination.

[Windows Manager]

Output folder	Output destination files
Installation_folder\SWRBAM\var\audit	swrba_audit.log.[n] (n is the generation)

[Linux Manager]

Output folder	Output destination files
/opt/FJSVswrbam/var/audit	swrba_audit.log.[n] (n is the generation)

Output format

The audit log is a CSV format file. The following items are output in the following order.
One item of process instance information is displayed as one record.

```
"Process instance start time","Process instance starter","Process instance name","Process instance
state","Process instance end time","Activity name","Task execution date/time","Person
responsible","Status","Task process",...,"Result of application"
```

Item	Description
Process instance start time	Time when the application was executed
Process instance starter	User ID of applicant
Process instance name	Process instance name L-PlatformSubscription_xxx,L-PlatformChange_xxx,L-PlatformUnsubscription_xxx
State of process instance	State of process instance closed: Closed
Process instance end time	Time that the process instance ended *yyyy-mm-dd hh:mm:ss.sss*
Activity name	Activity name Application,Approve,Assess,Pending state,Cancel
Task execution date/time	The date/time the task was executed
Person responsible	User ID of the user that executed the task
Status	Shows the state of task COMPLETED: Completed
Task process	Button name executed by the activity: Application: Apply - Approve: 0:Approve or 1:Reject - Assess: 0:Accept or 1:Dismiss - Pending state : 0:Cancel - Cancel: 0:Cancel
Result of application	Result of application: - Accepted: When [Accept] is executed for an assessment task - Approved: When [Approve] is executed for an approval task (when ApproverOnly) - Rejected: When [Reject] is executed for an approval task - Dismissed: When [Dismiss] is executed for an assessment task - Canceled: When [Cancel] is executed for a cancellation task - Canceled: When [Cancel] is executed for a pending task

Output example

The example below shows the output of the audit information for the process instance with the name "L-Platform usage application_100".

```
"2012-04-11 17:03:53.580","tenant_user001","L-PlatformSubscription_100","closed","2012-04-11
17:04:25.471","Application","2012-04-11
17:03:56.111","tenant_user001","COMPLETED","Apply","Approve","2012-04-11
17:04:15.908","tenant_admin001","COMPLETED","0:Approve","Assess","2012-04-11
17:04:21.346","infra_admin001","COMPLETED","0:Accept","Accepted"
```

Using an operating system feature such as Task Scheduler (Windows Manager) or cron (Linux Manager), configure the settings so that the get process instance audit information command is executed at fixed intervals so that an audit log of process instances can be obtained between command executions.

16.3 Operation Logs (Activity)

This section explains operation logs.

Operation logs are used as maintenance information when investigating and dealing with errors.

16.3.1 Operation Logs for Accounting

The following table shows the files where operation logs used for maintenance information accounting are output:

Copy the files described below to collect maintenance information.

[Windows Manager]

Type	Destination of files output	Description
Operation log	*Installation_folder*\RCXCTMG\Charging\log\accounting_calc_mail.log (*1)	The results of sending the usage charge file are output. (*2)

*1: This log file is 5 MB in size and holds 5 generations.
*2: Refer to "Chapter 9 Messages Starting with ctact" in the "Messages" for information on the execution result that is output.

[Linux Manager]

Type	Destination of files output	Description
Operation log	/var/opt/FJSVctchg/log/accounting_calc_mail.log (*1)	The results of sending the usage charge file are output. (*2)

*1: This log file is 5 MB in size and holds 5 generations.
*2: Refer to "Chapter 9 Messages Starting with ctact" in the "Messages" for information on the execution result that is output.

16.4 Investigation Logs

This section explains investigation logs.

Investigation logs are used as maintenance information when investigating and dealing with errors.

16.4.1 Investigation Logs on Admin Servers

The investigation logs on Admin Servers are classified into the following types:

Log name	Description	File size	Number of generations
vsys_trace_log	Trace logs for the management of L-Platform template and L-Platform are output to this log.	10MB	10 generations (*)
vsys_batch_log	Trace logs for the batch processing section of the management of L-Platform template and L-Platform are output to this log.		
myportal_trace.log	Trace logs for the Manager View are output to this log.		
cfmg_api_log	Logs for the CFMG APIs are output to this log.		

Log name	Description	File size	Number of generations
Event log	Information such as errors that occur while the Manager View is being used is output to this log. Refer to "Chapter 20 Messages Starting with VSYS" in the "Messages" for information on event logs.	-	-

* Note: If this number is exceeded, old generations will be deleted, starting with the oldest generation.

Output Destination

The log output destinations are shown below:

[Windows Manager]

Output folder	Output destination file
Installation_folder\RCXCFMG\logs	vsys_trace_log, vsys_batch_log, cfmg_api_log
Installation_folder\RCXCTMG\MyPortal\log	myportal_trace.log

[Linux Manager]

Output destination directory	Output destination file
/var/opt/FJSVcfmg/logs	vsys_trace_log, vsys_batch_log, cfmg_api_log
/var/opt/FJSVctmyp/log	myportal_trace.log

Output format

Output format
<date/time> <log level> <message ID> <message text>

Item	Description	
date/time	*yyyy-mm-dd hh:mm:ss,sss*	
log level	One of the following:	
	info	Information level message
	warn	Warning level message
	error	Error level message
	fatal	Fatal level message
message ID (*)	Prefix and message number: - The prefix for myportal_trace.log is "MGRV". - The prefix for cfmg_api_log is "PAPI". - The prefix for all other logs is "VSYS".	
message text (*)	Message content	

* Note: Refer to the '"Messages" for information on the message ID and message text.

Procedure for changing the investigation output destination

Use the following procedure to change the output destination for investigation logs.

1. Rewrite the settings files corresponding to each log.

   The following table shows the settings file and the location to change:

   [Windows Manager]

Log name	Settings file	Location to change (one location)
vsys_trace_log	*Installation_folder*\RCXCFMG\config\vsys_log4j.xml	\<param name="File" value="C:\ProgramData\Fujitsu\SystemwalkerCF-MG\logs\vsys_trace_log" />
vsys_batch_log	*Installation_folder*\RCXCFMG\config\batch_log4j.xml	\<param name="File" value="C:\ProgramData\Fujitsu\SystemwalkerCF-MG\logs\vsys_batch_log" />
myportal_trace.log	*Installation_folder*\RCXCTMG\MyPortal\config\managerview_log4j.xml	\<param name="file" value=" C:/Fujitsu/ROR/RCXCTMG/MyPortal/log/myportal_trace.log" />
cfmg_api_log	*Installation_folder*\RCXCFMG\config\api_log4j.xml	\<param name="file" value="C:\ProgramData\Fujitsu\SystemwalkerCF-MG\logs\cfmg_api_log" />

   [Linux Manager]

Log name	Settings file	Location to change (one location)
vsys_trace_log	/etc/opt/FJSVcfmg/config/vsys_log4j.xml	\<param name="File" value="/var/opt/FJSVcfmg/logs/vsys_trace_log" />
vsys_batch_log	/etc/opt/FJSVcfmg/config/batch_log4j.xml	\<param name="File" value="/var/opt/FJSVcfmg/logs/vsys_batch_log" />
myportal_trace.log	/etc/opt/FJSVctmyp/config/managerview_log4j.xml	\<param name="file" value="/var/opt/FJSVctmyp/log/myportal_trace.log" />
cfmg_api_log	/etc/opt/FJSVcfmg/config/api_log4j.xml	\<param name="File" value="/var/opt/FJSVcfmg/logs/cfmg_api_log" />

2. Restart the manager.
   Refer to "2.1 Starting and Stopping Managers" for information on how to Restart the manager.

Part 5 High Availability and Disaster Recovery

Chapter 17 High Availability of Managed Resources

This chapter explains failover.

17.1 High Availability of Managed Resources

This section explains how to realize high availability of managed resources.

The methods of environment creation and operation for enabling higher availability of managed resources vary depending on resources involved.

- Servers

  Refer to "17.1.1 High Availability of L-Servers".

- Blade Chassis

  Refer to "17.1.2 Blade Chassis High Availability".

- Storage Chassis

  Refer to "17.1.3 High Availability for Storage Chassis".

17.1.1 High Availability of L-Servers

This section explains high availability for L-Servers.

Regardless of the server type, select the [HA] checkbox on the [Server] tab to perform redundancy settings when creating an L-Server.

- For physical L-Servers

  Select the [HA] checkbox to enable the selection of the pool of a spare server.

  The server pool of the spare server that the physical server will use for automatic switchover is registered in can be specified.

  For details on the [Server] tab, refer to "16.2.2 [Server] Tab" in the "User's Guide for Infrastructure Administrators (Resource Management) CE".
  For the details on conditions for switchover to spare servers, refer to "9.3 Server Switchover Conditions" in the "Setup Guide VE".

- For virtual L-Servers

  Settings differ according to the server virtualization software being used.

  Refer to "16.3.2 [Server] Tab" in the "User's Guide for Infrastructure Administrators (Resource Management) CE".

Checks of Spare Server Models and Configurations

The L-Server definition and spare server configuration are checked when configuring server redundancy during creation or modification of a physical L-Server.

Confirmation is performed on the following items of an L-Server definition and spare server configuration:

- Server Model

  Check if there is a server compatible with the L-Server definition in the specified server pool.

  The compatibility of server models is evaluated by the definition file for checks on spare server models and configurations.

  The definition file is created when installing managers.

  When installing a new compatible server model, update the definition file by adding the server model.

  In the following cases, the same server model of physical server as the server specified in the L-Server definition is selected.

    - When there is no definition file

    - When there is an error in definitions

- Number of NICs

Check the number of NICs mounted on a compatible server and L-Server.

A server is considered as a server satisfying the conditions, in the following cases:

- The number of NICs mounted on the compatible server is the same as the number in the L-Server definition

- The number is more than the number in the L-Server definition

Selection of Suitable Spare Servers

When the [Use a low spec server] checkbox is not selected, a spare server is automatically set.

Based on the following conditions, an L-Server definition is compared to physical L-Servers existing in the specified resource pool as a spare server:

- When specifying the model name on creation of a physical L-Server

    - If the "model name" is the same or compatible

    - Number of NICs

- If CPUs and memories are specified when specifying a physical L-Server

    - CPU core count

    - CPU clock speed

    - Memory capacity

    - Number of NICs

Configurations are not checked.

A server that satisfies or exceeds all conditions and has the nearest specifications to the L-Server definition is selected.

When the [Use a low spec server] checkbox is selected, physical servers with models matching that in the L-Server definition are selected as spare servers.

For details, refer to "B.9 Methods for Selecting Physical Servers Automatically" in the "Setup Guide CE".

Modification of Checks on Spare Server Models and Configurations

The switchover policy and the definition of server model compatibility can be modified.

Although the definition file is deployed when installing managers, a server model with a matching L-Server definition and physical server model is selected as a spare server in the following cases:

- When there is no definition file

- When there is an error in definitions

When the [Use a low spec server] checkbox is selected, physical servers with models matching that in the L-Server definition are selected as spare servers.

The definition file for checks on spare server models and configurations is stored in the following location.

Location of the Definition File

[Windows Manager]
Installation_folder\SVROR\Manager\etc\customize_data

[Linux Manager]
/etc/opt/FJSVrcvmr/customize_data

Definition File Name

spare_server_config.rcxprop

Definition File Format

For the definition file, write each line in the following format:

```
Key = Value
```

When adding comments, start with a number sign ("#").

Definition File Items

Specify the following items in a definition file.

Table 17.1 List of Items Specified in Definition Files for Checking Spare Server Models and Configurations

Item	Key	Value	Remarks
Policy of Switchover	OVERALL_POLICY	skip	Configure the check policy of the L-Server definition for the whole system and the spare server configuration.
		warning	- skip Omits the check of whether there is a server that satisfies the spare server conditions. Even if a server pool that does not satisfy the conditions is selected, creation and modification of an L-Server are performed without checking.
		error	- warning Server pools without servers that satisfy the spare server conditions are also displayed. When a server pool that does not satisfy the conditions is selected, a warning message is displayed during creation and modification of an L-Server, checking whether to continue the operation. - error Server pools without servers that satisfy the spare server conditions are not displayed. Therefore, a server pool that does not satisfy the spare server conditions cannot be selected. Server switchover is not possible when the destination cannot be found while performing the switchover, even if the check has been made in advance.
Compatibility of Server Model (*)	SPARE_SVR_COMPAT*X* (*X* is a number from 0 - 255)	["*modelA*","*modelB*"]	Define compatible server models as a group. When checking the L-Server definition and the spare server configuration, the server models in the same group are the target of switchover. Examples of server models are as below. - BX920 S1 - BX920 S2

* Note: The value of SPARE_SVR_COMPAT is changeable. Server switchover may fail depending on the combination of changed values, such as when a server with no compatibility is set as a spare server.

Example Definition File

```
# Spare server check configuration

# Spare server check logic's policy: skip | warning
```

```
| error
OVERALL_POLICY=skip

# Server model compatibility list
SPARE_SVR_COMPAT0=["BX920 S1", "BX920 S2"]
```

17.1.2 Blade Chassis High Availability

This section explains high availability for when operating L-Servers on blade servers.

When the server is a physical L-Server for a blade server, this function which enables restarting of L-Servers, by manually switching over servers to spare servers when there are blade servers are specified as spare servers on other chassis.

Prerequisites

For details on prerequisites for high availability of blade chassis, refer to "7.1 Blade Chassis High Availability Design" in the "Design Guide CE".

Installation

This section explains the preparations for configuration of server switchover.

Use the following procedure for configuration:

1. Register a server in a spare blade chassis in the server pool.

   Perform one of the following steps:

   - Register a server in a spare blade chassis in the server pool

   - Register a server in a spare chassis in the server pool for a spare server

2. Create an L-Server.

   For details, refer to "16.1 Creation Using an L-Server Template" or "16.2 Creation of Physical L-Servers Using Parameters" in the "User's Guide for Infrastructure Administrators (Resource Management) CE".

   In this case, perform redundancy for the L-Server.

   On the [Server] tab of the [Create an L-Server] dialog, set the following items.

   - Check the [HA] checkbox.

   - When the server in the chassis was registered in the spare server pool in step 1, specify the spare server pool.

Operations

This section explains how to perform switchover of L-Servers.

Use the following procedure to perform switchover of L-Servers:

1. A chassis error is detected.

   If the following events occur, determine whether to perform chassis switchover regarding the event as the chassis failure.

   - When both management blades cannot be accessed because of a management blade failure

   - Communication with the admin LAN is not possible

   - When communication is not possible because there is trouble with the LAN switches that connect with the admin LAN

2. Check the chassis on which the L-Server for which an error was detected.

   Execute the rcxadm chassis show command to check.
   For details on the rcxadm chassis show command, refer to "3.2 rcxadm chassis" in the "Reference Guide (Command/XML) CE".

3. Check if the status of the L-Server that is the source for switchover is stop.

If the status of the L-Server is not stop, stop the L-Server.

The L-Server cannot be stopped, as the management blade cannot be accessed. Stop the L-Server on the managed server, using the console of managed server.

Note
. . . .

If switchover is performed while an L-Server in a chassis that has trouble is still operating, there is a possibility that another instance of the L-Server will be started and its disks damaged. Ensure the L-Server is stopped.
. . . .

4. Place the server into maintenance mode.

For details on how to place servers into maintenance mode, refer to "Appendix C Maintenance Mode" in the "User's Guide for Infrastructure Administrators (Resource Management) CE".

Execute the rcxadm server command from the command line.
For details on the rcxadm server command, refer to "3.11 rcxadm server" in the "Reference Guide (Command/XML) CE".

5. Start the L-Server.

Start the L-Server on the switchover destination server.
For details on how to start an L-Server, refer to "17.1.1 Starting an L-Server" in the "User's Guide for Infrastructure Administrators (Resource Management) CE".

6. Release the server that has been switched to from maintenance mode.

For details on how to release servers from maintenance mode, refer to "Appendix C Maintenance Mode" in the "User's Guide for Infrastructure Administrators (Resource Management) CE".

Execute the rcxadm server command from the command line.
For details on the rcxadm server command, refer to "3.11 rcxadm server" in the "Reference Guide (Command/XML) CE".

Restoration

This section explains restoration.

Use the following procedure for restoration:

1. If a management blade has failed, replace it with new one. If an admin LAN or switches fail, replace them. After that, initialize the management blade. To initialize the management blade, select "controlled by VIOM" in the management window of the management blade. After performing the configuration to forcibly reset the local VIOM settings on the displayed screen, restart the management board. In either case, if any concerns arise, contact Fujitsu technical staff.

2. Mount a blade on the chassis.

3. After unregistering the restored chassis using the ROR console, register the chassis again.

4. After powering on the server in the restored chassis from the server resource tree, forcibly power off the server.

After restoring the blade chassis, use the following procedure to relocate the L-Server.

1. Stop an L-Server.

For details on how to stop an L-Server, refer to "17.1.2 Stopping an L-Server" in the "User's Guide for Infrastructure Administrators (Resource Management) CE".

2. Perform modification of the physical server to use.

In the [Modify an L-Server] dialog, specify the restored server for [Physical server].

For details on how to modify the physical server to use, refer to "17.2.1 Modifying Specifications" in the "User's Guide for Infrastructure Administrators (Resource Management) CE".

3. Start the L-Server.

    For details on how to start an L-Server, refer to "17.1.1 Starting an L-Server" in the "User's Guide for Infrastructure Administrators (Resource Management) CE".

17.1.3 High Availability for Storage Chassis

This section explains high availability of storage chassis connected to physical L-Servers.

If performing replication between two storage units of LUNs used by a physical L-Server, quick restoration of physical L-Servers is possible, even when storage units have failed.

This section explains the switchover of disks used by physical L-Servers, between two storage units on which replication of LUNs is managed by a single manager.

- When performing switchover of physical L-Servers and disks used by physical L-Servers in a Disaster Recovery environment, refer to "Chapter 18 Disaster Recovery".

    Figure 17.1 Switchover of Operating or Standby Status of Storage
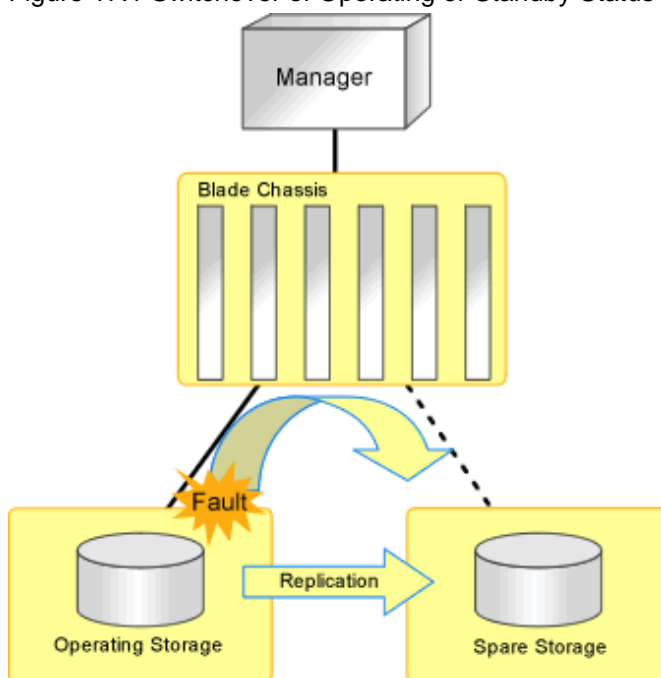
- When the disk resource is created using dynamic LUN mirroring, refer to "When Using Dynamic LUN Mirroring".

Prerequisites

For details on prerequisites for high availability of storage chassis, refer to "7.2 Storage Chassis High Availability Design" in the "Design Guide CE".

Replication of Storage Unit LUNs

- For ETERNUS

    Define the LUN replication using ETERNUS SF AdvancedCopy Manager.

- For EMC CLARiiON

    Define the LUN replication using the MirrorView function.

- For EMC Symmetrix DMX storage and EMC Symmetrix VMAX storage

    Define the device replication using the SRDF function.

Replication Definition Files

The replication definition file must be created in advance. In the replication definition file, describe the relationship between the operating storage and the standby storage for replication.

The format of the replication definition file is as follows:

> *IP_address_of_operating_storage_unit,Operating_volume_identifier,IP_address_of_standby_storage_unit,Standby_volume_identifier*

Configure the definition file using a unique combination of an IP address for an operating or standby storage unit, and an identifier for an operating or standby volume. When the information overlaps in the replication definition file, an error will occur when creating a failover or a failback script.

- For ETERNUS

   The relationship for replication can be checked using ETERNUS SF AdvancedCopy Manager.

   Specify the IP address of a storage unit for the storage identifier. Check the IP address of a storage using the rcxadm storage list command.

   For details on volume identifiers, check them from ETERNUS SF AdvancedCopy Manager. Volume identifiers are written in hexadecimal format without zero suppression.

   Example

   ```
   192.168.1.24,0x0001,192.168.2.25,0x00
   05
   192.168.1.24,0x0002,192.168.2.25,0x00
   06
   192.168.3.25,0x0001,192.168.4.26,0x00
   05
   ```

   Information

   When replicating using the Copy Control Module of ETERNUS SF AdvancedCopyManager, a replication definition file can be created.

   For details on the rcxrepdef command, refer to "5.22 rcxrepdef" in the "Reference Guide (Command/XML) CE".

- For EMC CLARiiON

   The relationship for replication can be checked using the MirrorView function.

   Specify an IP address for the storage identifier. Check the IP address, using the rcxadm storage list command.

   For details on volume identifiers, check them using the MirrorView function. Volume identifiers are written in hexadecimal format without zero suppression.

   Example

   ```
   192.168.1.24,0x0001,192.168.2.25,0x000
   5
   192.168.1.24,0x0002,192.168.2.25,0x000
   6
   192.168.3.25,0x0001,192.168.4.26,0x000
   5
   ```

- For EMC Symmetrix DMX storage and EMC Symmetrix VMAX storage

The relationship for replication can be checked using the SRDF function.

Specify SymmID for the storage identifier. Check SymmID, using the rcxadm storage list command.

Specify a device for the volume identifier. Check the device, using the SRDF function. Volume identifiers are written in hexadecimal format without zero suppression.

Example

```
000192601264,0001,000192601265,0005
000192601264,0002,000192601265,0006
000192601274,0001,000192601275,0005
```

When Performing Switchover from Operating to Standby (Failover)

This section explains the procedure to perform switchover from operating storage units to standby storage units.

1. Create the replication definition file.

   For details on replication definition files, refer to "Replication Definition Files".

2. Create the following scripts by executing the rcxstorage -failover command.

   - failover script

   - Physical L-Server stopping script

   - Physical L-Server startup script

   For details on the rcxstorage command, refer to "5.23 rcxstorage" in the "Reference Guide (Command/XML) CE".

   - Create these scripts in units of operating storage.

   - These scripts are created based on the configuration information at the time which the command is executed. When changing configurations, create these scripts again.

   - Execute the rcxstorage command with the -failover option, when an operating and a standby storage unit are displayed in the storage tree. The script can be created as long as the operating storage unit is displayed in the storage tree, even if it has failed.

Note

These scripts cannot be created when the operation target storage unit is not displayed in the storage tree.

3. Execute the physical L-Server stopping script on the server where the manager is being operated. This operation stops the physical L-Server targeted by the failover script. To forcibly stop the server without shutting down the operating system running on the L-Server, specify the -force option when executing the physical L-Server stopping script.

   If an error occurs during execution of the script, contact Fujitsu technical staff.

Note

Physical L-Servers are stopped in the order of the entries in the physical L-Server stopping script. When specification of the order of stopping physical L-Servers is necessary, edit the physical L-Server stopping script.

4. Delete the zoning combining the WWPN of the HBA of the physical L-Server and the WWPN of the port of the operating storage from the Fibre Channel switch. For ETERNUS storage, this step is not necessary, as the zoning for Fibre Channel switch will be deleted by Resource Orchestrator when the failover script is executed.

5. If the replication function for storage is in operation, stop it.

6. Execute the failover script on the server where the manager is being operated.

   If an error occurs during execution of the script, contact Fujitsu technical staff.

7. To access the standby storage, add the zoning combining the WWPN of the HBA of the physical L-Server and the WWPN of the port of the standby storage to the Fibre Channel switch. For ETERNUS storage, this step is not necessary, as the zoning for Fibre Channel switch will be added by Resource Orchestrator when the failover script is executed.

8. When perform reading or writing for the LUN of the standby storage, modify the settings of replication if necessary.

9. Execute the physical L-Server startup script on the server where the manager is being operated. This operation starts the physical L-Server.

   If an error occurs during execution of the script, contact Fujitsu technical staff.

Note

Physical L-Servers are started in the order of the entries in the physical L-Server startup script. When the specification of the order of starting physical L-Servers is necessary, edit the physical L-Server startup script.

10. When operating an L-Platform, use the cfmg_syncdiskinfo command to reflect the information for switched disks on the L-Platform configuration information.

    [Windows Manager]

    >*Installation_folder***RCXCFMG\bin\cfmg_syncdiskinfo** <RETURN>

    [Linux Manager]

    # **/opt/FJSVcfmg/bin/cfmg_syncdiskinfo** <RETURN>

    For details on the cfmg_syncdiskinfo command, refer to "10.7 cfmg_syncdiskinfo (Synchronize Disk Information)" in the "Reference Guide (Command/XML) CE".

When Performing Switchover from Standby to Operating (Failback)

This section explains the procedure for performing switchover from standby storage units to operating storage units.

1. Request repair of the operating storage units.

2. Using storage management software, restore the logical configuration (RAID, LUN) of an operating storage unit.

3. Using storage management software, check the LUN masking definition and LUN mapping definition of the operating storage unit. If the definitions relating to the WWPN of the HBA of the physical L-Server remain, delete them.

Information

When the storage is ETERNUS, delete the affinity group for the LUN of the operating storage unit

4. By modifying the settings of the replication function, perform replication of the storage unit from the operating to the standby, then wait until the status of the LUNs of the operating and standby storage become equivalent.

5. Prepare the replication definition file.

   Use the same replication definition file as that for failover. When changing the configuration after executing the failover script, correct the replication definition file.

6. Create the following scripts by executing the rcxstorage -failback command.

   - failback script

   - Physical L-Server stopping script

   - Physical L-Server startup script

For details on the rcxstorage command, refer to "5.23 rcxstorage" in the "Reference Guide (Command/XML) CE".

- Create these scripts in units of operating storage.

- These scripts can be created after executing the failover script and performing switchover to the standby storage unit.

- These scripts are created based on the configuration information at the time which the command is executed. When changing configurations, create these scripts again.

- Execute the rcxstorage command with the -failback option, when an operating and a standby storage unit are displayed in the storage tree. These scripts cannot be created when the operation target storage unit is not displayed in the storage tree.

7. Execute the physical L-Server stopping script on the server where the manager is being operated. This operation stops the physical L-Server targeted by the failback script. To forcibly stop the server without shutting down the operating system running on the L-Server, specify the -force option when executing the physical L-Server stopping script.

If an error occurs during execution of the script, contact Fujitsu technical staff.

📝 Note
. . . .
Physical L-Servers are stopped in the order of the entries in the physical L-Server stopping script. When specification of the order of stopping physical L-Servers is necessary, edit the physical L-Server stopping script.
. . . .

8. Delete the zoning combining the WWPN of the HBA of the physical L-Server and the WWPN of the port of the standby storage from the Fibre Channel switch. For ETERNUS storage, this step is not necessary, as the zoning for Fibre Channel switch will be deleted by Resource Orchestrator when the failback script is executed.

9. Stop the storage replication function.

10. Execute the failback script on the server where the manager is being operated.

If an error occurs during execution of the script, contact Fujitsu technical staff.

11. To access the operating storage, add the zoning combining the WWPN of the HBA of the physical L-Server and the WWPN of the port of the operating storage to the Fibre Channel switch. For ETERNUS storage, this step is not necessary, as the zoning for Fibre Channel switch will be added by Resource Orchestrator when the failback script is executed.

12. By modifying the settings of the replication function, perform replication of the storage unit from the standby to the operating, then wait until the status of the LUNs of the standby and operating storage become equivalent.

13. Execute the physical L-Server startup script on the server where the manager is being operated. This operation starts the physical L-Server.

If an error occurs during execution of the script, contact Fujitsu technical staff.

📝 Note
. . . .
Physical L-Servers are started in the order of the entries in the physical L-Server startup script. When the specification of the order of starting physical L-Servers is necessary, edit the physical L-Server startup script.
. . . .

14. When operating an L-Platform, use the cfmg_syncdiskinfo command to reflect the information for switched disks on the L-Platform configuration information.

[Windows Manager]

```
>Installation_folder\RCXCFMG\bin\cfmg_syncdiskinfo <RETURN>
```

[Linux Manager]

```
# /opt/FJSVcfmg/bin/cfmg_syncdiskinfo <RETURN>
```

For details on the cfmg_syncdiskinfo command, refer to "10.7 cfmg_syncdiskinfo (Synchronize Disk Information)" in the "Reference Guide (Command/XML) CE".

When Using Dynamic LUN Mirroring

This document explains some changes and points to note when using dynamic LUN mirroring.

Prerequisites

Refer to "7.2 Storage Chassis High Availability Design" in the "Design Guide CE".

Replication of Storage Unit LUNs

If disk resources are automatically generated from virtual storage, replication may be automatically set depending on the settings in the mirroring definition file. Replication settings use REC for CCM (machine-to-machine copying, transfer mode: Stack mode), so copy groups or pairs are automatically generated. The name of the generated copy group will be the value entered in the mirroring definition file.

Replication Definition Files

When replication using CCM is set, a replication definition file can be generated by executing the rcxrepdef command.

For details on the rcxrepdef command, refer to "5.22 rcxrepdef" in the "Reference Guide (Command/XML) CE".

When Performing Switchover from Operating to Standby (Failover)

The procedure for switchover is the same as that for when a LUN is created in the storage unit beforehand.

Note

The disk resources created using dynamic LUN mirroring are not deleted when failover to the standby node occurs.

Information

Start to copy using REC (transfer mode: Stack mode) for CCM for the dynamic LUN mirroring. Stop the replication function using the procedure described in step 5 in the same way as follows:

1. Use the acec suspend command by specifying the -force option to forcibly suspend the REC session.

2. Use the acec change command to change the REC transfer mode to Through mode.

3. Suspend the REC session using the acec cancel command. In this case, do not specify the -force option.

When Performing Switchover from Standby to Operating (Failback)

The procedure for switchover is the same as that for when a LUN is created in the storage unit beforehand.

17.2 High Availability for Admin Servers

This section explains high availability of managers.

For details on prerequisites, refer to "7.3 Admin Server High Availability Design" in the "Design Guide CE".

Manager High Availability in Windows Guest Environments in Hyper-V environments

- Install an operating system and configure a domain controller on the domain controller server.

- Perform installation and configuration of the admin server.

  The following operations are necessary:

  - Primary Node

    - Connection with shared storage

    - Configure BIOS

    - Install Hyper-V roles

- Install and configure EMC Solutions Enabler (when used)

- Add a failover clustering function

- Create a Hyper-V virtual network

- Create clusters

- Prepare virtual machines

- Register virtual machines in clusters

- Install and configure storage management software

- Install and configure VM management software

- Install and configure ServerView Operations Manager and ServerView Virtual-IO Manager

- Install the Resource Orchestrator manager

- Setup Resource Orchestrator

- Secondary Node

- Connection with shared storage

- Configure BIOS

- Install Hyper-V roles

- Install and configure EMC Solutions Enabler (when used)

- Add a failover clustering function

- Create a Hyper-V virtual network

For details on the following items, refer to the Hyper-V manual.

- Install Hyper-V Roles

- Add a Failover Clustering Function

- Create a Hyper-V Virtual Network

- Create Clusters

- Prepare Virtual Machines

- Register Virtual Machines in Clusters

- Operation

When an error occurs on a VM guest, the operation will continue if the VM guest is switched over.

Note

- When performing configuration, modification, or deletion of managed server environments, such as L-Server creation, if an error occurs on VM guest, the operation may fail.

  In this case, part of the environment of the managed server may be created. Perform the operation again after deleting created environments.

- When performing L-Server creation or ETERNUS configuration information modification using ETERNUS, if an error occurs on a VM guest, ETERNUS may not be able to return from the status of processing to normal status. In this case, to restore, forcibly log on from ETERNUSmgr, then log off. In the case of ETERNUS DX60/DX80/DX90, contact Fujitsu technical staff. For details on how to restore ETERNUS, refer to the ETERNUS manual.

Manager Cluster Operation in Windows and Linux Environments

The settings and deletion operations described below are required for cluster operation.

For details on the settings for cluster operation and the procedure for deletion, refer to "Appendix D Manager Cluster Operation Settings and Deletion" in the "Setup Guide VE".

- Settings

    - Primary Node

        - Create cluster resources

        - Copy dynamic disk files

        - Perform link settings for folders on the shared disk

        - Set folder and file access rights

        - Set access rights for the Resource Orchestrator database

        - Change the IP address set for the manager's admin LAN

        - Register service resources

        - Start the cluster service

    - Secondary Node

        - Perform link settings for folders on the shared disk

        - Set access rights for the Resource Orchestrator database

        - Change the IP address set for the manager's admin LAN

        - Start the cluster service

- Deletion

    - Primary Node

        - Stop the cluster service

        - Delete service resources

        - Uninstall the manager

    - Secondary Node

        - Uninstall the manager

        - Delete shared disk files

        - Delete cluster resources

🕮 **Note**

. . . .

- If switchover of an admin server occurs while L-Servers are operating, the operation being performed may fail.

    If you were creating or registering resources, delete unnecessary resources and then perform the operation again.

- When performing L-Server creation or ETERNUS configuration information modification using ETERNUS, if an error occurs on an admin server, ETERNUS may not be able to return from the status of processing to normal status. In this case, to restore, forcibly log on from ETERNUSmgr, then log off. In the case of ETERNUS DX60/DX80/DX90, contact Fujitsu technical staff. For details on how to restore ETERNUS, refer to the ETERNUS manual.

. . . .

Chapter 18 Disaster Recovery

This chapter provides information on Disaster Recovery for the admin server where Resource Orchestrator manager operates.

Resource Orchestrator provides simple and highly reliable Disaster Recovery, through exporting and importing the following information that Resource Orchestrator manager handles:

- L-Platform Templates

- L-Platform Configuration Information

- Resource Information

- Accounting Information

- Metering Logs

For details, refer to "DR Option Instruction".

Appendix A Notes on Operating ServerView Resource Orchestrator

This appendix provides important reminders for the operation of Resource Orchestrator.

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 details on how to delete a server, refer to "9.2 Deleting Managed Servers" in the "User's Guide for Infrastructure Administrators (Resource Management) CE".

- 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.

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_folder\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.	true

Parameter	Meaning	Initial Value

	- When restarting
	
	  Specify "true".
	
	 - When not restarting
	
	  Specify "false".	

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

When executing multiple operations simultaneously, the upper limit is set for the number of simultaneous operations.

The upper limit of the number of simultaneous operations can be changed depending on the usage environment. To change the configuration, edit the following definition file.
When there is no definition file, create one.

Placeholder for the Definition File

[Windows Manager]
Installation_folder\SVROR\Manager\etc\customize_data

[Linux Manager]
/etc/opt/FJSVrcvmr/customize_data

Definition File Name

rcx_base.rcxprop

Format of the Definition File

Describe the definition file in individual lines as below:

Key = *Value*

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 default value is "30". For basic mode, the default value is "5".

Item	Key	Value	Remarks
			Operates by default, when there are no definition files.

Example Definition File

An example definition file is indicated below. 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. Change TASK_WORKER_COUNT values for rcx_base.rcxprop files.

        When 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. Change the TASK_WORKER_COUNT values for rcx_base.rcxprop files on the shared disk. When there is no rcx_base.rcxprop file, create one.

        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 of the admin server on the primary node or the secondary node.

    3. Change the TASK_WORKER_COUNT values for rcx_base.rcxprop files in the shared disk.

        When there is no rcx_base.rcxprop file, create one.

        Destination_to_mount_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".

Note

. . . .

Advisory Notes for Basic Mode

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 CE", and then add memory if necessary.

Table A.3 Increased Memory Use with Multiple Operations

Multiplicity	Increase in Memory Use (Unit: MB)
5	-

Multiplicity	Increase in Memory Use (Unit: MB)
6 - 14	1080 + (*Multiplicity* * 40)
15 - 30	2104 + (*Multiplicity* * 40)

Appendix B Metering Log

This chapter explains the metering log.

Metering logs is saved in the database as Information based on bill calculations so that fees can be charged based on the resources that have been used by tenants. The Output metering log command is used to output metering logs to metering log files.
Refer to "11.2 ctchg_getmeterlog (Output Metering Logs)" in the "Reference Guide (Command/XML) CE" for information on the Output metering log command.

See
. . . .

Refer to "Chapter 15 Accounting" for information on the overview of the accounting, the accounting information and the calculation of usage charges.
. . . .

B.1 Types of Metering Logs

There are two types of metering logs: event logs and periodic logs.

Each of these types of logs is explained below:

Event logs

Event logs are logs that are output when the status of a resource has changed, such as when an L-Platform is created or canceled or when an L-Server is started or stopped. An event log records resource attribute information such as the date and time at which the event occurred, event type, information for identifying the resource, and allocation amount.

The following table shows the timing at which event logs will be output:

Event	Event identifier	Timing of event	Resource
Adding	ADD	When a resource is added and when the resource is actually secured	- L-Platform - L-Server - Disk - L-Platform template (*1) - Software (*2) - Snapshot
Changing	CHANGE	When a resource is changed	
Deleting	DELETE	When a resource deletion is requested If an approval workflow is enabled, when an approval or assessment is performed	
Starting	START	When starting a resource is complete	- L-Server
Stopping	STOP	When stopping a resource is requested	

*1: The event log for L-Platform template is output for tenant-specific templates. The event log is not output for global templates. The CHANGE log will be output if the template name is changed. If only other basic information and configuration information are changed, the CHANGE log will not be output.

*2: The event log for software will be output based on the software information that has been registered in the image information of the L-Server. The timing of software addition or deletion events is synchronized with L-Server addition or deletion events, respectively.

Periodic logs

Periodic logs are logs that show the periodic operational status of resources.

The following table shows the timing at which periodic logs will be output:

Event	Event identifier	Timing of event	Resource
Period	PERIOD	Every day at 0:00 (default) (*1)	- L-Platform - L-Server

Event	Event identifier	Timing of event	Resource
			- Disk - L-Platform template (*2) - Software - Snapshot

*1: If the timing of output of the periodic log is to be changed, overwrite the metering log operational settings file and then execute the Change periodic log schedule settings command.

Refer to "8.7.3 Metering Log Settings" for information on the metering log operational settings file and refer to "11.1 ctchg_chgschedule (Change Periodic Log Schedule Settings)" in the "Reference Guide (Command/XML) CE" for the Change periodic log schedule settings command.

*2: The periodic log for L-Platform template is output for tenant-specific templates. The periodic log is not output for global templates.

Note

'Create' processing for periodic logs and 'delete' processing for metering logs are implemented periodically.

The processing results of 'create' processing for periodic logs and 'delete' processing for metering logs will be output to the following files as operation logs:

- 'Create' processing for periodic logs

  [Windows Manager]

  ```
  <installation_foldert>\RCXCTMG\Charging\log\metering_period.log
  ```

  [Linux Manager]

  ```
  /var/opt/FJSVctchg/log/metering_period.log
  ```

- 'Delete' processing for metering logs

  [Windows Manager]

  ```
  <installation_foldert>\RCXCTMG\Charging\log\metering_log_db_delete.log
  ```

  [Linux Manager]

  ```
  /var/opt/FJSVctchg/log/metering_log_db_delete.log
  ```

Refer to "Chapter 14 Messages Starting with meter" in the "Messages" to check whether processing is operating normally. Check 'create' processing for periodic logs every day at 0:00 or at least 5 minutes after the changed time. 'Delete' processing for metering logs is implemented at 0:35 every day, so check at that time or later.

B.2 Output Contents of Metering Logs

The contents that are output to metering logs will vary according to the resource.

The following tables show the log contents that are output in common for all resources as well as the log contents that are output for each resource:

Common

Item ID	Output for each event						Item name	Description
	ADD	CHAN GE	DELET E	START	STOP	PERIO D		
version	Yes	Yes	Yes	Yes	Yes	Yes	Version	Fixed at 2.0

Item ID	Output for each event						Item name	Description
	ADD	CHAN GE	DELET E	START	STOP	PERIO D		
event_time	Yes	Yes	Yes	Yes	Yes	Yes	Time event occurred	String *YYYY-MM-DDThh:mm:ss.SSSZ* Example: Use 2012-04-01T00:00:00.000+ 0900 for the date and time 12:00 A.M. and 00.000 seconds on April 1, 2012 in time zone UTC+9:00
event	Yes	Yes	Yes	Yes	Yes	Yes	Event	ADD: Deploy CHANGE: Change DELETE: Delete START: Start STOP: Stop PERIOD: Period
resource_type	Yes	Yes	Yes	Yes	Yes	Yes	Configured resource type	vsys: L-Platform vserver: Virtual L-Server pserver: Physical L-Server vdisk: Expansion disk template: L-Platform template software: Software snapshot: Snapshot

Yes: Output; No: Not output

L-Platform

In addition to the common items output, the following items will be output:

Item ID	Output for each event				Item name	Description
	ADD	CHANGE	DELETE	PERIOD		
org_id	Yes	Yes	Yes	Yes	Tenant name	ASCII: 1 to 32 characters Name of the tenant
user_id	Yes	Yes	Yes	Yes	User account	ASCII: 1 to 32 characters User that owns the L-Platform
vsys_id	Yes	Yes	Yes	Yes	L-Platform ID	ASCII: 1 to 32 characters ID identifying the L-Platform
system_name	Yes	Yes	No	Yes	L-Platform name	UTF-8: 1 to 256 characters Name of the L-Platform (comment)
base_template_id	Yes	Yes	No	Yes	L-Platform template ID	ASCII: 1 to 32 characters Template ID of the L-Platform creation source

Yes: Output; No: Not output

Virtual L-Server

In addition to the common items output, the following items will be output:

Item ID	Output for each event						Item name	Description
	ADD	CHAN GE	DELE TE	STAR T	STOP	PERIO D		
org_id	Yes	Yes	Yes	Yes	Yes	Yes	Tenant name	ASCII: 1 to 32 characters Name of the tenant
user_id	Yes	Yes	Yes	Yes	Yes	Yes	User account	ASCII: 1 to 32 characters User that owns the L-Platform
vsys_id	Yes	Yes	Yes	Yes	Yes	Yes	L-Platform ID	ASCII: 1 to 32 characters ID identifying the L-Platform
server_id	Yes	Yes	Yes	Yes	Yes	Yes	L-Server ID	ASCII: 1 to 64 characters ID identifying the L-Server
system_name	Yes	Yes	No	No	No	Yes	L-Platform name	UTF-8: 1 to 256 characters Name of the L-Platform (comment)
server_name	Yes	Yes	No	No	No	Yes	L-Server name	UTF-8: 1 to 256 characters Name of the L-Server (comment)
image_name	Yes	Yes	No	Yes	Yes	Yes	Image name	ASCII: 1 to 32 characters
vm_pool	Yes	Yes	No	No	No	Yes	VM pool name	Variable-length string (unlimited)
cpu_num	Yes	Yes	No	No	No	Yes	Number of CPUs	1 to 999999
cpu_input_num	Yes	Yes	No	No	No	Yes	Value entered for number of CPUs	1 to 999999
cpu_perf	Yes	Yes	No	No	No	Yes	CPU performance	1 to 999999 (Unit: 0.1 GHz) Maximum 99999.9 GHz
cpu_input_perf	Yes	Yes	No	No	No	Yes	Value entered for CPU performance	1 to 999999 (Unit: 0.1 GHz) Maximum 99999.9 GHz
cpu_reserve	Yes	Yes	No	No	No	Yes	Reserve value of CPU performance	0 to 999999 (Unit: 0.1 GHz) Maximum 99999.9 GHz
memory_size	Yes	Yes	No	No	No	Yes	Memory capacity	1 to 999999 (Unit: 0.1 GB) Maximum 99999.9 GB
memory_reserve	Yes	Yes	No	No	No	Yes	Reserve value of memory capacity	0 to 999999 (Unit: 0.1 GB) Maximum 99999.9 GB
storage_pool	Yes	Yes	No	No	No	Yes	Storage pool name	Variable-length string (unlimited)
disk_size	Yes	Yes	No	No	No	Yes	System disk size	1 to 999999 (Unit: 0.1 GB) Maximum 99999.9 GB
server_template_n ame	Yes	Yes	No	No	No	Yes	L-Server template name	ASCII: 1 to 32 characters
status	No	No	No	No	No	Yes	Status	RUNNING: Active STOPPED: Stopped

Yes: Output; No: Not output

Physical L-Server

In addition to the common items output, the following items will be output:

Item ID	Output for each event						Item name	Description
	ADD	CHAN GE	DELET E	START	STOP	PERIO D		
org_id	Yes	Yes	Yes	Yes	Yes	Yes	Tenant name	ASCII: 1 to 32 characters Name of the tenant
user_id	Yes	Yes	Yes	Yes	Yes	Yes	User account	ASCII: 1 to 32 characters User that owns the L-Platform
vsys_id	Yes	Yes	Yes	Yes	Yes	Yes	L-Platform ID	ASCII: 1 to 32 characters ID identifying the L-Platform
server_id	Yes	Yes	Yes	Yes	Yes	Yes	L-Server ID	ASCII: 1 to 64 characters ID identifying the L-Server
system_name	Yes	Yes	No	No	No	Yes	L-Platform name	UTF-8: 1 to 256 characters Name of the L-Platform (comment)
server_name	Yes	Yes	No	No	No	Yes	L-Server name	UTF-8: 1 to 256 characters Name of the L-Server (comment)
image_name	Yes	Yes	No	Yes	Yes	Yes	Image name	ASCII: 1 to 32 characters
server_pool	Yes	Yes	No	No	No	Yes	Server pool name	Variable-length string (unlimited)
cpu_num	Yes	Yes	No	No	No	Yes	Value entered for number of CPUs	1 to 999999
cpu_input_nu m	Yes	Yes	No	No	No	Yes	Value entered for number of CPUs	1 to 999999
cpu_perf	Yes	Yes	No	No	No	Yes	Value entered for CPU performance	1 to 999999 (Unit: 0.1 GHz) Maximum 99999.9 GHz
cpu_input_per f	Yes	Yes	No	No	No	Yes	Value entered for CPU performance	1 to 999999 (Unit: 0.1 GHz) Maximum 99999.9 GHz
memory_size	Yes	Yes	No	No	No	Yes	Value entered for memory capacity	1 to 999999 (Unit: 0.1 GB) Maximum 99999.9 GB
memory_input _size	Yes	Yes	No	No	No	Yes	Value entered for memory capacity	1 to 999999 (Unit: 0.1 GB) Maximum 99999.9 GB
storage_pool	Yes	Yes	No	No	No	Yes	Storage pool name	Variable-length string (unlimited)
disk_size	Yes	Yes	No	No	No	Yes	System disk size	1 to 999999 (Unit: 0.1 GB) Maximum 99999.9 GB
server_templat e_name	Yes	Yes	No	No	No	Yes	L-Server template ID	ASCII: 1 to 32 characters

Item ID	Output for each event						Item name	Description
	ADD	CHANGE	DELETE	START	STOP	PERIOD		
status	No	No	No	No	No	Yes	Status	RUNNING: Active STOPPED: Stopped

Yes: Output; No: Not output

Disk

In addition to the common items output, the following items will be output:

Item ID	Output for each event				Item name	Description
	ADD	CHANGE	DELETE	PERIOD		
org_id	Yes	Yes	Yes	Yes	Tenant name	ASCII: 1 to 32 characters Name of the tenant
user_id	Yes	Yes	Yes	Yes	User account	ASCII: 1 to 32 characters User that owns the L-Platform
vsys_id	Yes	Yes	Yes	Yes	L-Platform ID	ASCII: 1 to 32 characters ID identifying the L-Platform
server_id	Yes	Yes	Yes	Yes	L-Server ID	ASCII: 1 to 32 characters ID identifying the L-Server
disk_id	Yes	Yes	Yes	Yes	Disk ID	ASCII: 1 to 32 characters ID identifying the disk
system_name	Yes	Yes	No	Yes	L-Platform name	UTF-8: 1 to 256 characters Name of the L-Platform (comment)
disk_name	Yes	Yes	No	Yes	Disk name	UTF-8: 1 to 256 characters Name of the disk
storage_pool	Yes	Yes	No	Yes	Storage pool name	Variable-length string (unlimited)
disk_size	Yes	Yes	No	Yes	Disk size	1 to 999999 (Unit: 0.1 GB) Maximum 99999.9 GB

Yes: Output; No: Not output

Snapshot

In addition to the common items output, the following items will be output:

Item ID	Output for each event				Item name	Description
	ADD	CHANGE	DELETE	PERIOD		
org_id	Yes	Yes	Yes	Yes	Tenant name	ASCII: 1 to 32 characters Name of the tenant
user_id	Yes	Yes	Yes	Yes	User account	ASCII: 1 to 32 characters User that owns the L-Platform
vsys_id	Yes	Yes	Yes	Yes	L-Platform ID	ASCII: 1 to 32 characters ID identifying the L-Platform

Item ID	Output for each event				Item name	Description
	ADD	CHANGE	DELETE	PERIOD		
server_id	Yes	Yes	Yes	Yes	L-Server ID	ASCII: 1 to 32 characters ID identifying the L-Server
disk_id	Yes	Yes	No	Yes	Disk ID	ASCII: 1 to 32 characters ID identifying the disk Blank for the system disk or the disk ID for the data disk
image_id	Yes	Yes	Yes	Yes	Snapshot ID	ASCII: 1 to 256 characters ID identifying the snapshot
system_name	Yes	Yes	No	Yes	L-Platform name	UTF-8: 1 to 256 characters L-Platform name (comment)
storage_pool	Yes	Yes	No	Yes	Storage pool name	Variable-length string (limitless)
disk_size	Yes	Yes	No	Yes	Disk size	1 to 999999 (unit=0.1GB) Max. 99999.9GB

Yes: Output; No: Not output

*1: CHANGE is output when the L-Platform tenant is reassigned, the owner changes, or when the L-Server (storage) is migrated.

*2: In addition to when a snapshot is explicitly deleted, DELETE will be output when the maximum number of saved snapshots is reached and automatically deleted as a new snapshot is created, and when an L-Server containing snapshots is deleted. Note that for snapshot delete events, one record will be output for each snapshot ID even if there are multiple data disks.

L-Platform template

In addition to the common items output, the following items will be output:

Item ID	Output for each event				Item name	Description
	ADD	CHANGE	DELETE	PERIOD		
org_id	Yes	Yes	Yes	Yes	Tenant name	ASCII: 1 to 32 characters Name of the tenant
user_id	Yes	Yes	Yes	Yes	User account	ASCII: 1 to 32 characters User that owns the L-Platform
template_id	Yes	Yes	Yes	Yes	L-Platform template ID	ASCII: 1 to 32 characters ID identifying the L-Platform template
template_name	Yes	Yes	No	Yes	L-Platform template name	UTF-8: 1 to 256 characters Name of the L-Platform template

Yes: Output; No: Not output

Software

In addition to the common items output, the following items will be output:

Item ID	Output for each event				Item name	Description
	ADD	CHANGE	DELETE	PERIOD		
org_id	Yes	Yes	Yes	Yes	Tenant name	ASCII: 1 to 32 characters Name of the tenant
user_id	Yes	Yes	Yes	Yes	User account	ASCII: 1 to 32 characters User that owns the L-Platform
vsys_id	Yes	Yes	Yes	Yes	L-Platform ID	ASCII: 1 to 32 characters ID identifying the L-Platform
server_id	Yes	Yes	Yes	Yes	L-Server ID	ASCII: 1 to 32 characters ID identifying the L-Server
software_id	Yes	Yes	Yes	Yes	Software ID	ASCII: 1 to 32 characters ID identifying the software
system_name	Yes	Yes	No	Yes	L-Platform name	UTF-8: 1 to 256 characters Name of the L-Platform (comment)

Yes: Output; No: Not output

B.3 Formats of Metering Log Files

Metering logs are output to CSV format files or XML format files.

Use the opions of the Output metering log command to specify the format in which metering logs are to be output. Refer to "11.2 ctchg_getmeterlog (Output Metering Logs)" in the "Reference Guide (Command/XML) CE" for information on the Output metering log command.

This section explains each of the file formats.

CSV format files

The format of CSV format files is as follows:

- The item ID is output with a one-byte hash (#) sign added to the first character of the first row.

- Items are output with commas used as delimiters between each item.

- String data is output enclosed by double quotation marks and numeric data is output as it is.

- If an item is not output using string data, "" is output.

- If an item is not output using numeric data, nothing is output. (A comma is output immediately after the previous item.)

- For a Reserved item, "" is output.

The order of the items that are output to a CSV format file is as follows:

No.	Item ID	Item name	Data type
1	version	Version	Numeric
2	event_time	Time of event	String
3	Reserved		
4	vsys_id	L-Platform ID	String
5	org_id	Tenant name	String
6	event	Event	String
7	resource_type	Configured resource type	String
8	status	Status	String

No.	Item ID	Item name	Data type
9	user_id	User account	String
10	server_id	L-Server ID	String
11	disk_id	Disk ID	String
12	software_id	Software ID	String
13	system_name	L-Platform name	String
14	server_name	L-Server name	String
15	disk_name	Disk name	String
16	template_id	Template ID	String
17	image_id	Snapshot ID	String
18	base_template_id	Used template ID	String
19	image_name	Image name	String
20	storage_pool	Storage pool name	String
21	disk_size	Disk size	Numeric
22	vm_pool	VM pool name	String
23	cpu_num	Number of CPUs	Numeric
24	cpu_perf	CPU performance	Numeric
25	memory_size	Memory capacity	Numeric
26	cpu_reserve	Reserve value of CPU performance	Numeric
27	memory_reserve	Reserve value of memory capacity	Numeric
28	server_template_name	L-Server template name	String
29	server_pool	Server pool name	String
30	cpu_input_num	Value entered for number of CPUs	Numeric
31	cpu_input_perf	Value entered for CPU frequency	Numeric
32	memory_input_size	Value entered for memory capacity	Numeric
33	template_name	Template name	String

An output example of a CSV format file is shown below:

```
#version,event_time,Reserved,vsys_id,org_id,event,resource_type,status,user_id,server_id,disk_id,sof
tware_id,system_name,
server_name,disk_name,template_id,
image_id,base_template_id,image_name,storage_pool,disk_size,vm_pool,cpu_num,cpu_perf,
memory_size,cpu_reserve,memory_reserve,server_template_name,server_pool,cpu_input_num,cpu_input_perf
,memory_input_size,
template_name
2.0,"2011-07-02T00:00:00.000+0900","","vsysId001","orgId001","ADD","pserver","","userId001","serverI
d001","","","systemName001","ServerName001","","","","","imageName001","/StoragePool001",100,"",
1,3,6,,,serverTemplateName001,serverPool001,2,5,8,
2.0,"2011-08-08T10:20:10.000+0900","","","orgId001","PERIOD","template","","userId001","","","","",","
","","id001","","","","",,"",,,,,,,,,,,name001
2.0,"2011-07-03T00:00:00.000+0900","","vsysId001","orgId001","PERIOD","snapshot","","userId001","ser
verId001","","","systemName001","","","","imageId0001","","","/StoragePool002",100,"",,,,,,,,,,,,,
```

```
2.0,"2011-07-03T00:00:00.000+0900","","vsysId001","orgId001","PERIOD","snapshot","","userId001","ser
verId001","diskId001","","systemName001","","","","imageId0001","","","/StoragePool002",
200,"",,,,,,,,,,,
2.0,"2011-08-08T10:20:10.000+0900","","vsysId001","orgId001","PERIOD","software","","userId001","ser
verId001","","softwareId001","systemName001","","","","","","","",,"",,,,,,,,,,,
2.0,"2011-08-08T10:20:10.000+0900","","vsysId001","orgId001","PERIOD","vserver","RUNNING","userId001
","serverId001","","","systemName001","serverName002","","","","","imageName002","/StoragePool002",
100,"/VMPool001",2,30,60,10,50,serverType001,,,,,
2.0,"2011-08-08T10:20:10.000+0900","","vsysId001","orgId001","PERIOD","vdisk","","userId001","server
Id001","diskId001","","systemName001","","diskName001","","","","","/StoragePool002",
200,"",,,,,,,,,,,
2.0,"2011-08-08T10:20:10.000+0900","","vsysId001","orgId001","PERIOD","vsys","","userId001","","","""
,"systemName001","","","","","baseTemplateId001","","","",,"",,,,,,,,,,,
```

XML format files

The format of XML format files is as follows:

```
<?xml version="1.0" encoding="UTF-8"?>
<meterlog>
  <entry><Item ID>Value</Item ID>...</entry>
  <entry><Item ID>Value</Item ID>...</entry>
  ...
</meterlog>
```

- The first row of the CSV format corresponds to the <entry> element.

- The first column of the CSV format corresponds to the <Item ID> element.

- If an item is not output, the <Item ID> tag itself is not output.

An output example of an XML format file is shown below:

```
<?xml version="1.0" encoding="UTF-8"?>
<meterlog>
    <entry>
        <version>2.0</version>
        <event_time>2011-07-02T00:00:00.000+0900</event_time>
        <vsys_id>vsysId001</vsys_id>
        <org_id>orgId001</org_id>
        <event>ADD</event>
        <resource_type>pserver</resource_type>
        <user_id>userId001</user_id>
        <server_id>serverId001</server_id>
        <system_name>systemName001</system_name>
        <server_name>serverName001</server_name>
        <image_name>image001</image_name>
        <storage_pool>storagePool001</storage_pool>
        <disk_size>1</disk_size>
        <cpu_num>1</cpu_num>
        <cpu_perf>3</cpu_perf>
        <memory_size>6</memory_size>
        <server_template_name>serverTemplateName001</server_template_name>
        <server_pool>serverPool001</server_pool>
        <cpu_input_num>2</cpu_input_num>
        <cpu_input_perf>5</cpu_input_perf>
        <memory_input_size>8</memory_input_size>
    </entry>
    <entry>
        ...
    </entry>
     ...
</meterlog>
```

Point

- If a change of tenant has been performed for an L-Platform, an event log with CHANGE as the event will be output.

- If snapshot restore has been performed, an event log with CHANGE as the event will be output even if there was no change.

- At execution of the Import L-Server command of the L-Platform Management function, the following event log will be output:

  - If a stopped L-Server has been imported
    Event log with ADD as the event

  - If an active L-Server has been imported
    Event log with ADD and START as the events

Note

- An event indicating a stop of an L-Server (STOP) occurs for a stop or a forced stop of an L-Server. The forced stop of an L-Server can be performed even if the L-Server has a stopped status (STOPPED). Therefore, take into account that even if an L-Server has a stopped status, an event indicating a stop of the L-Server (STOP) may exist.

- When starting virtual L-Servers using RHEL-KVM as server virtualization software, the amount of memory used by L-Servers is set to the upper limit first, and then it is reduced to the value specified to L-Servers by the RHEL-KVM management application. Therefore metering logs will be output in the following order if a RHEL-KVM L-Server is started.

  1. L-Server starting (START)

  2. L-Server changing (CHANGE) : Memory capacity = The upper limit

  3. L-Server changing (CHANGE) : The upper limit > Memory capacity > The value specified to the L-Server (*)

  4. L-Server changing (CHANGE) : Memory capacity = The value specified to the L-Server

   * Note: The changing log 3. may not be output sometimes.

  Refer to "C.6.10 Overcommit" in the "Setup Guide CE" for the RHEL-KVM memory amount.

B.4 Deleting Metering Logs

Metering logs are periodically deleted from the database.

Delete processing is implemented every day at 0:35 and the logs for which the log entry retention period that was set in the metering operational settings file has passed will be deleted.
When metering logs are deleted, accounting can no longer be calculated, so set the log entry retention period so that only the metering logs for which accounting calculations are complete will be deleted.

Refer to "8.7.3 Metering Log Settings" for information on the metering log operational settings file.