FUJITSU

ServerView Resource Orchestrator V2.2.1

User's Guide

Windows/Linux

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Preface

Purpose

This manual provides an outline of ServerView Resource Orchestrator (hereinafter Resource Orchestrator) and the operations and settings required for setup.

Target Readers

This manual is written for system administrators who will use Resource Orchestrator to operate the infrastructure in private cloud or data center environments, and users of created systems.
When setting up systems, it is assumed that readers have the basic knowledge of ServerView Resource Coordinator VE required to configure the servers, storage, and network devices to be installed.

Organization

This manual consists of five chapters, nine appendices, and a glossary.
Chapters 1 through 5 explain how to use the basic functions provided in Resource Orchestrator.
Appendices A through D provide an explanation of the functions useful for large-scale configuration management.

For infrastructure administrators working in private cloud or data center environments, refer to the appendices according to the configuration.
Users who will perform operation should refer to Chapter 5.

The contents of each chapter are listed below.

Title	Description
Chapter 1 Overview	Provides an overview of Resource Orchestrator.
Chapter 2 Installation and Uninstallation	Explains how to install and uninstall Resource Orchestrator.
Chapter 3 Screen Layout	Provides an overview of the RC console.
Chapter 4 Setup	Explains how to set up Resource Orchestrator.
Chapter 5 L-Servers	Explains the details of L-Server creation and operation.
Appendix A Resource Pools	Provides an overview of resource pools.
Appendix B Resource Folders	Provides an overview of resource folders.
Appendix C Roles and User Groups	Provides an overview of roles and user groups.
Appendix D L-Server Parameter Details	Explains how to configure an L-Server assigned with server, storage, and network specifications without using an L-Server template.
Appendix E Command Reference	Provides an overview of the commands available in Resource Orchestrator.
Appendix F Messages	Explains the messages displayed by Resource Orchestrator.
Appendix G Troubleshooting	Explains how to solve problems and gather troubleshooting data for a technical investigation.
Appendix H XML	Explains the XML used in Resource Orchestrator.
Appendix I Backup and Restoration of Admin Servers	Explains how to back up and restore the admin server.
Glossary	Explains the terms used in this manual. Please refer to it when necessary.

Notational Conventions

The notation in this manual conforms to the following conventions.

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

[Windows]	Sections related to Windows (When not using Hyper-V)
[Linux]	Sections related to Linux
[VMware]	Sections related to VMware
[Hyper-V]	Sections related to Hyper-V
[Windows/Hyper-V]	Sections related to Windows and Hyper-V
[Windows/Linux]	Sections related to Windows and Linux
[Linux/VMware]	Sections related to Linux and VMware
[VM host]	Sections related to Windows Server 2008 with VMware or Hyper-V enabled

- Unless specified otherwise, the blade servers mentioned in this manual refer to PRIMERGY BX servers.
- 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 square brackets ([ ]).
- Button names are shown enclosed by angle 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 "#".

Menus in the RC console

Operations on the RC 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.

Command Examples

The paths used in command examples are abbreviated. When executing commands, do so using the path given in "Name".

Reference Documentation

Functions provided by ServerView Resource Coordinator VE can also be used with Resource Orchestrator. When installing/setting up/operating Resource Orchestrator, please refer to the following manuals included with Resource Orchestrator when necessary:

- ServerView Resource Coordinator VE Installation Guide
- ServerView Resource Coordinator VE Setup Guide
- ServerView Resource Coordinator VE Operation Guide
- ServerView Resource Coordinator VE Command Reference
- ServerView Resource Coordinator VE Messages

Related Manuals

Please refer to the following manuals when necessary:

- When using VMware vSphere(TM) 4
  - vSphere Basic System Administration
- When using NetApp storage
  - Data ONTAP Software Setup Guide
  - Data ONTAP System Administration Guide
  - Data ONTAP Storage Management Guide
  - Data ONTAP Block Access Management Guide for iSCSI and FC

Abbreviations

The following abbreviations are used in this manual:

Abbreviations	Products
Windows	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) 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(R) 7 Professional Windows(R) 7 Ultimate Windows Vista(R) Business Windows Vista(R) Enterprise Windows Vista(R) Ultimate Microsoft(R) Windows(R) XP Professional operating system
Windows Server 2008	Microsoft(R) Windows Server(R) 2008 Standard Microsoft(R) Windows Server(R) 2008 Enterprise Microsoft(R) Windows Server(R) 2008 R2 Standard Microsoft(R) Windows Server(R) 2008 R2 Enterprise Microsoft(R) Windows Server(R) 2008 R2 Datacenter
Windows 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 7	Windows(R) 7 Professional Windows(R) 7 Ultimate
Windows Vista	Windows Vista(R) Business Windows Vista(R) Enterprise Windows Vista(R) Ultimate
Windows XP	Microsoft(R) Windows(R) XP Professional operating system
Linux	Red Hat(R) Enterprise Linux(R) 5 (for x86) Red Hat(R) Enterprise Linux(R) 5 (for Intel64)

Abbreviations	Products
	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) 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) 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 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)
SUSE Linux Enterprise Server	SUSE(R) Linux Enterprise Server 11 for x86 SUSE(R) Linux Enterprise Server 11 for EM64T
ESC	ETERNUS SF Storage Cruiser
MSFC	Microsoft Failover Cluster
SCVMM	System Center Virtual Machine Manager 2008 R2
VMware	VMware vSphere(TM) 4
VIOM	ServerView Virtual-IO Manager
ServerView Agent	ServerView SNMP Agents for MS Windows (32bit-64bit) ServerView Agents Linux ServerView Agents VMware for VMware ESX Server
Excel	Microsoft(R) Office Excel(R) 2007 Microsoft(R) Office Excel(R) 2003 Microsoft(R) Office Excel(R) 2002
Excel 2007	Microsoft(R) Office Excel(R) 2007
Excel 2003	Microsoft(R) Office Excel(R) 2003

Abbreviations	Products
Excel 2002	Microsoft(R) Office Excel(R) 2002
RCVE	ServerView Resource Coordinator VE
Resource Coordinator	Systemwalker Resource Coordinator Systemwalker Resource Coordinator Virtual server Edition

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Chapter 1 Overview

This chapter provides an overview of Resource Orchestrator.

1.1 Features

Resource Orchestrator enables uniform management of private clouds and data center resources (servers, storage, and networks). By managing these resources as resource pools, this dynamic resource management software reduces infrastructure costs and strengthens ICT governance.

This section explains some of the features provided by Resource Orchestrator.

Accelerated Support for Transforming Businesses

Resource Orchestrator enables you to quickly tailor a server (with storage and networks) to your specific needs by managing your ICT resources, such as servers, storage, networks, and images (*1), as resource pools. By simplifying the launch, expansion, or change of business operations, this software accelerates the transformation of businesses.

*1: An image is a copy of the contents of a disk (including the operating system) of a server, which can be deployed to other servers.

Reduced Infrastructure Investment Costs

Resource Orchestrator provides visualization services for servers, storage resources, and network resources, making the state of each of these resources visible to you. This enables you to efficiently utilize all of your resources and effectively plan for the installation of required resources, reducing infrastructure investment costs.

Reduced Infrastructure Operational Costs

Resource Orchestrator provides a template with defined logical specifications (number of CPUs, memory capacity, disk capacity, number of NICs, etc.) for a server with storage and networks. Using this template to standardize the configuration of a system including servers, storage, and networks, offers the following benefits:

- Simplified system configuration.
- Reduced risk of mistakes through the use of proven values for parameter settings when installing an operating system or setting up storage and networks.
- Reduced infrastructure operational costs through a unified configuration for managing versions of security software or backup methods over multiple systems.

Practicing ICT Governance

Resource Orchestrator enables you to perform security management (user role management and access control) regardless of the platform size. Pooled resources can be divided and secured by user, ensuring appropriate governance of ICT.

1.2 Function Overview

The following functions are provided by Resource Orchestrator.

For details on the operational environment for Resource Orchestrator, refer to "1.3 Software Environment" and "1.4 Hardware Environment".

- "1.2.1 Resource Pools"
- "1.2.2 Logical Server (L-Server)"
- "1.2.3 L-Server Configuration"

- "1.2.4 L-Server Template"
- "1.2.5 Resource Visualization"
- "1.2.6 Simplifying Network Settings"
- "1.2.7 Managing Multiple Resources Using Resource Folders"
- "1.2.8 Restricting Access Using Roles and User Groups"
- "1.2.9 Sharing Resources Between Multiple Departments Using Roles and User Groups"
- "1.2.10 Simplifying Storage Settings"

Table 1.1 List of Available Functions

Function	Remarks
Resource Pool	For details, refer to the relevant sections in this manual.
Logical Server (L-Server)	
L-Server Configuration	
L-Server Template	
Resource Visualization	
Simplifying Network Settings	
Managing Multiple Resources Using Resource Folders	
Restricting Access Using Roles and User Groups	
Sharing Resources Between Multiple Departments Using Roles and User Groups	
Simplifying Storage Settings	
Monitoring	For details, refer to the "ServerView Resource Coordinator VE Setup Guide".
Power Operations	
Backup and Restore	
Hardware Maintenance	
Server Switchover	
Cloning	

1.2.1 Resource Pools

A resource pool is a collection of virtual servers, storage, networks, images, and other resources of the same type. The resource pool management function allows you to effectively and efficiently use all resources. The types of resource pools are described below. For details, refer to "Appendix A Resource Pools".

Table 1.2 Resource Pool Types

Resource Pool Types	Overview
VM	A resource pool for storing VM hosts used when creating new servers (VM).
Servers	A resource pool for storing the physical servers used when creating new servers.
Storage	A resource pool for storing virtual storage resources that is capable of dynamic removal of disk resources assigned to servers. The following resources are stored:

Resource Pool Types	Overview
	- For VM A file system for creation of VMs and virtual disks such as VMFS (data store) of VMware - For physical server An original resource used to create LUN such as ETERNUS RAID groups or NetApp aggregates on storage units
Network	A resource pool for storing network resources with a defined network for connecting servers. For details on network resources, refer to "1.2.6 Simplifying Network Settings".
Address	The following resources are stored: - IP address - MAC address (Media Access Control address) - WWN
Image	The following resources are stored: - Cloning images

By using Resource Orchestrator to first register resources to control in a resource pool, a resource can be removed from the resource pool at a user's request and be used to quickly configure a server (with storage and networks). When the server is no longer required, the resource can be reused.

Multiple resource pools can be created depending on operational requirements (hardware type, security, resource management units). If the resources in a resource pool are insufficient, a new resource can be added or a resource can be moved from another resource pool to compensate.

Resource pools offer the following benefits.

Until now, launching or expanding business operations required the purchase of servers, storage, networks and other resources. Furthermore, significant time and effort was spent preparing and organizing such operations. Resource Orchestrator can save you time and effort by enabling you to configure a server simply by removing the required resource from a resource pool. This allows you to effectively plan the organization and operation of your infrastructure environment.

1.2.2 Logical Server (L-Server)

Resource Orchestrator provides a Logical Server (hereinafter L-Server) function which defines logical specifications (number of CPUs, memory capacity, disk capacity, number of NICs, etc.) for servers (with storage and networks).

Resources are assigned to an L-Server according to defined specifications. An L-Server with assigned resources can perform the same operations as a normal server.

To operate the server, L-Server users only need to be aware of the specifications defined for the server, and not the resources assigned to it.

The following advantages are gained by using Resource Orchestrator L-Servers:

- Simple and rapid server configuration

  The ideal server can be configured simply and quickly by automatically assigning resources from resource pools according to the L-Server defined specifications.

- Reduced management costs

  L-Server users do not need to manage the resources assigned to the server. Moreover, resource management is performed by an infrastructure administrator, reducing overall management costs.

- Integrated operation of physical servers and virtual servers

  L-Servers can be created for both physical servers and virtual servers.

After creating L-Servers, operations can be performed without differentiation between physical and virtual servers.

Information

Resources from resource pools can be automatically assigned or specific resources can be manually assigned to an L-Server.

1.2.3 L-Server Configuration

By specifying server specifications (number of CPUs, memory capacity, model type, or storage capacity), operating system image, and network connections, Resource Orchestrator quickly configures a practical L-Server using the applicable resources from resource pools.

Resources can be selected from a resource pool by the following two methods:

- Automatic assignment
- User-specified assignment

L-Server specifications can be specified by the following two methods.

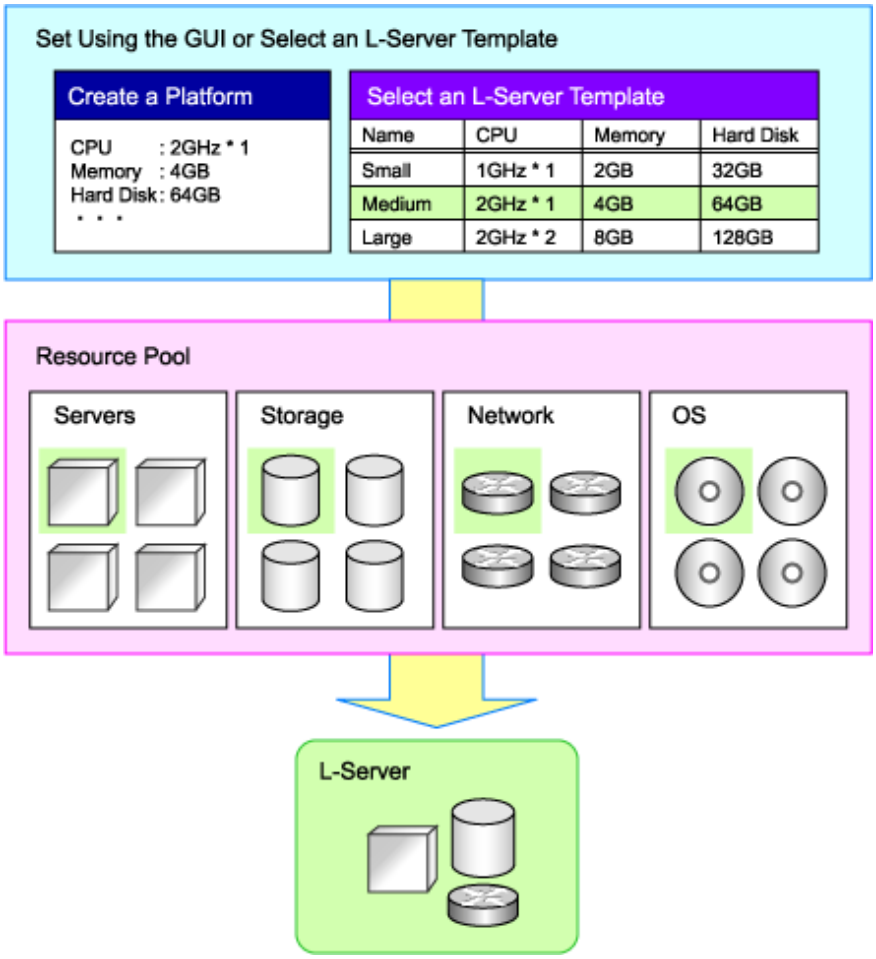
- Selecting an L-Server template (L-Server specifications are pre-defined)
- Manually specifying each L-Server specification

Basic operations, such as startup, shutdown, and delete, can be performed for an L-Server in the same way as a typical server. L-Server users do not require detailed knowledge of the resources assigned to the server in order to operate it.

The following operations can be performed:

- Changing of L-Server configurations
- Moving an L-Server between servers (migration) (When the server type is "Virtual")
- Snapshot (When the server type is "Virtual")
- Backup (When the server type is "Physical")

Figure 1.1 L-Server Configuration Image



1.2.4 L-Server Template

An L-Server template comprises pre-defined specifications (number of CPUs, memory capacity, disk capacity, number of NICs, etc.) for an L-Server.

L-Server templates deliver the following advantages:

- Reduced effort

  By simply selecting an L-Server template, server specifications can be set with ease.
  An L-Server can easily be created by selecting an L-Server template, cloning image, and network connections.

- Standardization

  Creating L-Servers using a standardized L-Server template can reduce configuration errors while also reducing management costs.

L-Server templates can be exported/imported as files in XML format. This enables L-Server templates to be designed separately from the admin server, which allows for standardization between different systems.

A sample L-Server template is provided with Resource Orchestrator. Create your own L-Server template using this sample as a reference.

1.2.5 Resource Visualization

Resource Orchestrator includes the RC console graphical user interface. The RC console comprises the ServerView Resource Coordinator VE RC console with Resource Orchestrator functions (view/operate an L-Server).

The total size of the resources in the resource pool and the free space can be calculated and displayed. The converted number of L-Servers that can be created for each L-Server template can also displayed, in units of the specified L-Server template.
For details on the L-Server conversion view, refer to "A.4 View".

For details on the RC console, refer to "3.1 RC Console".

1.2.6 Simplifying Network Settings

Network resources handled by Resource Orchestrator consist of network definition information used for L-Server connection. Network configurations can be set in advance so that network settings are automated when creating an L-Server.

Network resources are categorized into the following two types:

- Internal network

  Used to connect an L-Server to another L-Server. The following information is retained:

  - VLAN ID for use on the connection path
  - IP address range (optional) to assign to the NIC for a connected L-Server

- External network

  Used to connect an L-Server to an existing network that is not managed by Resource Orchestrator. In addition to internal networks, the following information is retained:

  - Networks managed by Resource Orchestrator, and LAN switch blades for network connection and their ports (hereinafter external connection port)

Automatic VLAN Configuration for Blade Servers

By connecting the NIC for an L-Server to a network resource, the following settings are automatically configured for blade servers.

[Windows/Linux]

- Port VLAN settings for the server blade port of LAN switch blades

[VMware]

- Tagged VLAN and virtual switch settings for the server blade ports of LAN switch blades

[Hyper-V]

- VLAN ID settings on the virtual network adapters of virtual machines

  The automatic creation of virtual networks and automatic configuration of external networks (including the physical network switch) are not supported.

  It is necessary to create the virtual network and configure the external network in advance.

  For details on how to configure networks, refer to "4.2.5 Network Resources".

IP Address Range Auto-Configuration

[Windows/Linux][VMware]
If an IP address range is set for a network resource, the IP address can be automatically set when deploying an image to an L-Server. However, when a Red Hat Enterprise Linux image is specified when creating an L-Server with server type "Physical", the IP address will not be configured automatically.

Manually configure the IP address after the image has been deployed to the L-Server.
If no IP address range is set, the DHCP settings are adopted.

[Hyper-V]
Automatic configuration of IP addresses is not supported.

If an IP address range is set for a network resource, set an IP address manually after deploying an image to an L-Server (Also set an IP address manually on the DNS server). For details on how to confirm IP addresses, refer to the Note of "D.4 [Network] Tab".If an IP address range is not set, manually set an IP address for operation on the DHCP server after deploying an image to an L-Server.

Configuring VLANs automatically on LAN Switch Blades

- switch mode

  Automatic configuration of tagged VLANs and port VLANs are performed.

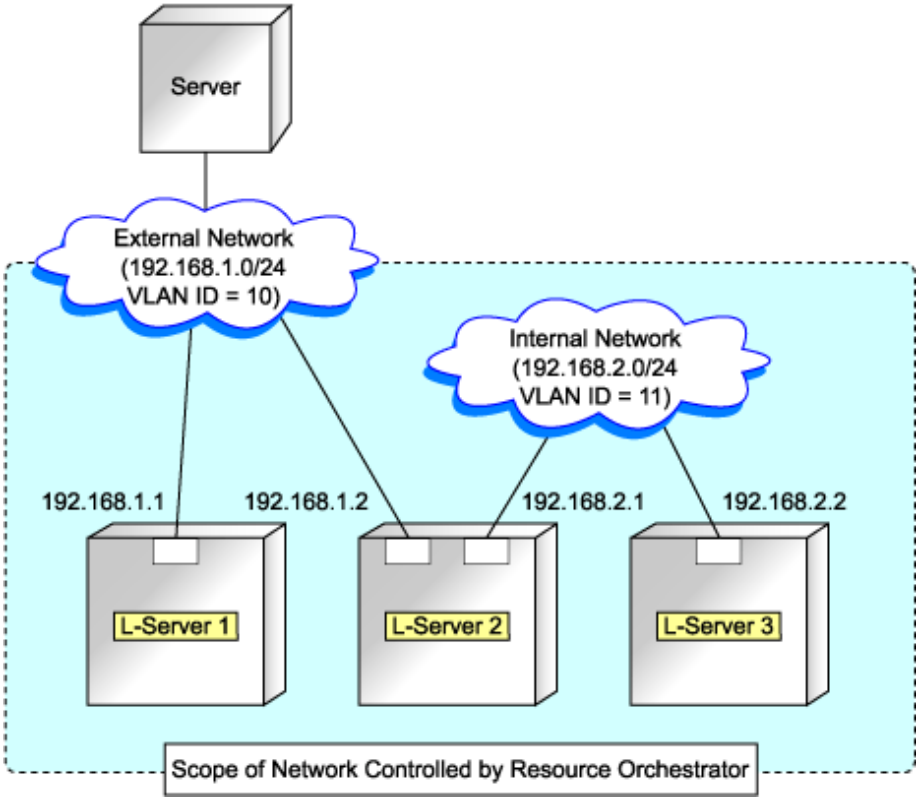
- IBP mode

  Automatic configuration of VLANs is not supported.

Network Resource Connection Image

The image of connection of network resources is as shown below:

Figure 1.2 Network Resource Connection Image



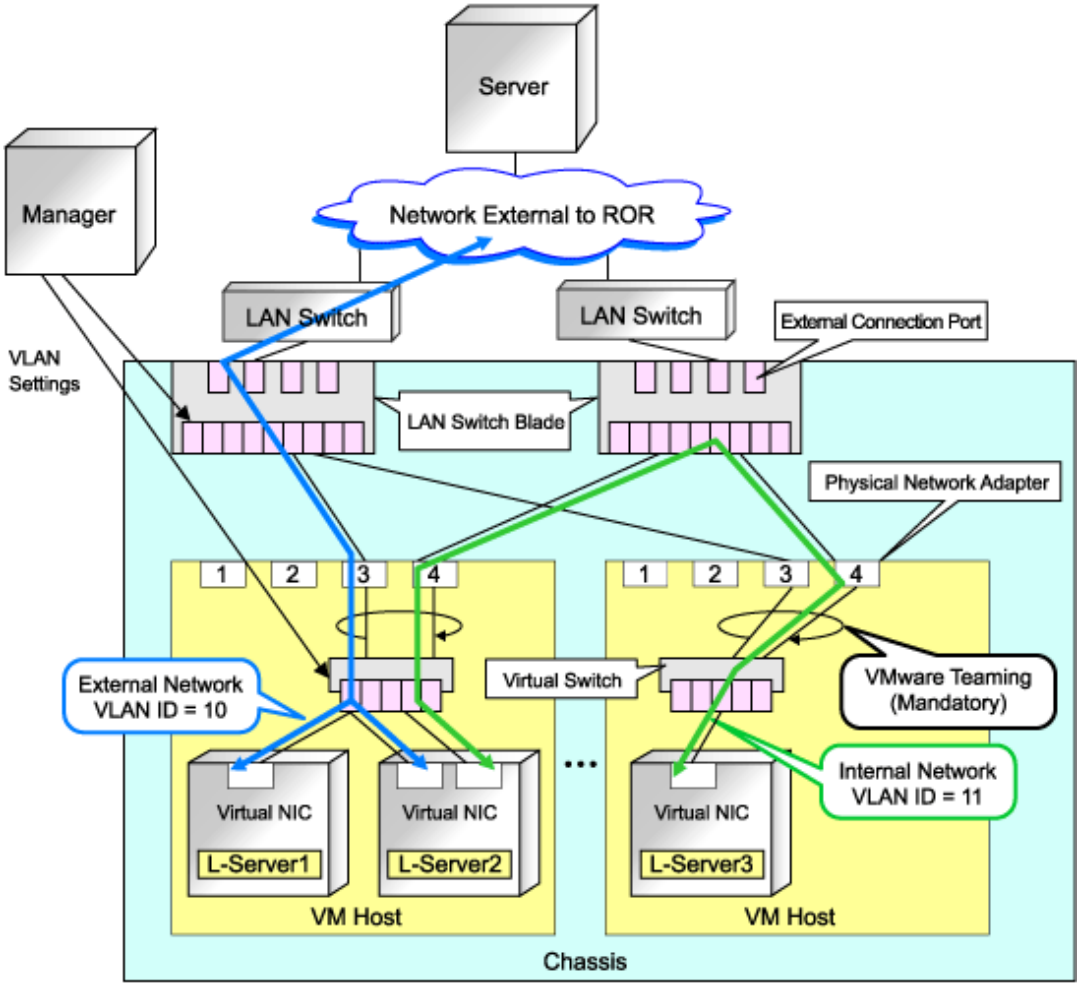
Note

For Hyper-V and rack mount server environments, it is necessary to configure the external connections of the external network manually.

LAN Switch Blade and Virtual Switch Configuration Example Using Network Resources [VMware]

The following is a configuration example of a LAN switch blade and virtual switch configuration using network resources.

Figure 1.3 LAN Switch Blade and Virtual Switch Configuration Using Network Resources [VMware]



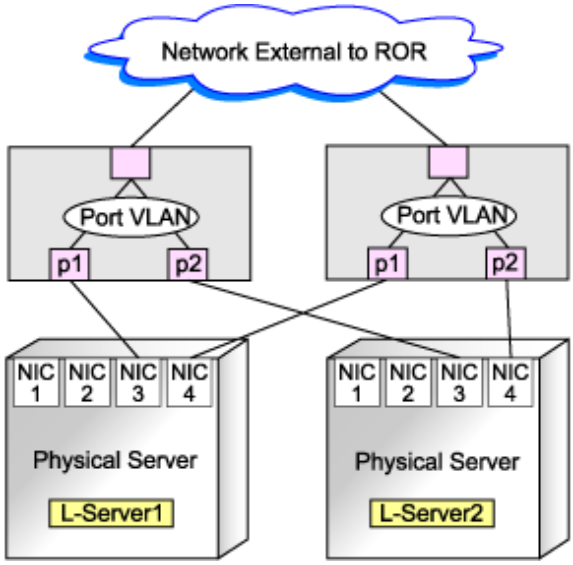
Note

- When network settings have been performed automatically for an L-Server in a VMware environment, redundancy of virtual switches and physical network adapters will be performed using VMware Teaming.
- The LAN switch blade configuration can only be performed in switch mode.

LAN Switch Blade Configuration Example Using Network Resources [Windows/Linux]

The following is a configuration example of LAN switch blades using network resources.

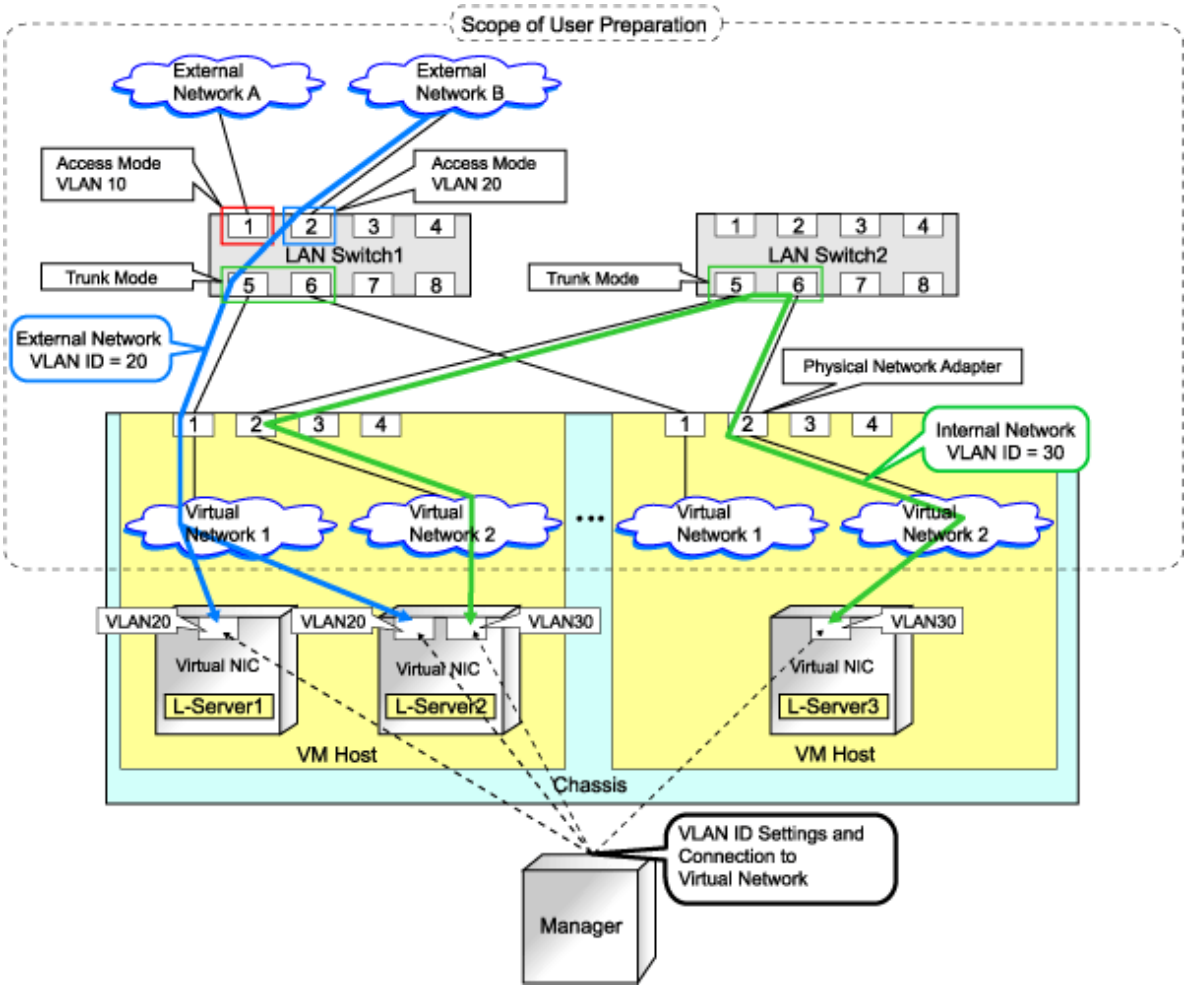
Figure 1.4 LAN Switch Blade Configuration Example Using Network Resources



Virtual NIC Configuration and Connection with Virtual Networks Using Network Resources [Hyper-V]

An example of virtual NIC configuration with virtual networks using network resources is given below:

Figure 1.5 Virtual NIC Configuration and Connection with Virtual Networks Using Network Resources [Hyper-V]



1.2.7 Managing Multiple Resources Using Resource Folders

Resource Orchestrator provides resource folders for managing groups of multiple resources. Resource folders are used when managing a large number of resources or when you want to divide resources according to certain conditions.

There are no conditions for storing resources in resource folders. They can be freely placed as management requires. You can also create hierarchies by storing other resource folders in a resource folder. For details on resource folders, refer to "Appendix B Resource Folders".

Resource folders enable you to do the following:

- Since the number of resources handled at once is reduced, it becomes easier to select resources.
- Resources can be categorized in detail.

1.2.8 Restricting Access Using Roles and User Groups

With Resource Orchestrator, you can restrict the operations that each user can perform and the resources that operations can be performed on. A collection of operations that can be performed is called a "role" and the resource that operations can be performed on is called an "access scope".
By setting a role and access scope for each user, you can restrict their privileges.

Roles are named as follows. For details on the operating privileges for each role, refer to "Table C.1 Operation Scope of Roles" of "C.1 Roles".

Table 1.3 Role Type

Role Type	Role Name
Basic Roles	supervisor (special administrator) admin (administrator) operator (operator) monitor (monitor)
L-Server administrative role	lserver_admin (L-Server administrator) lserver_operator (L-Server operator) lserver_monitor (L-Server monitor)
Infrastructure administrative role	infra_admin (infrastructure administrator) infra_operator (infrastructure operator)

Environments shared by a resource administrator and L-Server users can be operated using basic roles.
Basic roles have the following operating privileges:

Table 1.4 Basic Roles

Role Name	Resource Operations	User Operations
supervisor (special administrator)	All	All users
admin (administrator)	All	Within a user group
operator (operator)	Monitoring, power control, and snapshot only	Change one's own information only
monitor (monitor)	Monitoring only	Change one's own information only

Operating privileges for L-Server administrative roles are limited to the L-Server only. Use this role if you want to assign a separate administrator for L-Server management, in cases such as a cloud operating system where an L-Server is leased.

The lserver_admin (L-Server administrator) role can perform the following operations and supported commands only:

- L-Servers
  - "5.1 Creation Using an L-Server Template"
  - "5.2 Power Operations"
  - "5.3 Modifying an L-Server"
  - "5.4 Deleting an L-Server"

  - "5.5 Snapshots, and Backup and Restoration of L-Servers"
  - "5.7 Changing Physical Server Usage"
- Resource Folders
  - "B.2 Operations"

The lserver_operator (L-Server operator) and lserver_monitor (L-Server monitor) roles can perform operator and monitor operations for the L-Server only.

Infrastructure administrative roles are prohibited from performing operations on an L-Server that is in use.
Use this role if you want to restrict the privileges of the users that manage the infrastructure to prevent the operation of L-Servers being affected by erroneous operations.

The infra_admin (infrastructure administrator) role can only perform monitoring and "5.6 Moving an L-Server Between Servers (Migration)" of L-Servers, but all operations can be performed for other resources.

The infra_operator (infrastructure operator) role can only perform monitoring for L-Servers and power control for other resources.

1.2.9 Sharing Resources Between Multiple Departments Using Roles and User Groups

You may want to share some resources between departments in case of future changes or faults while maintaining the segregation of resources for each department.
In such cases, configuration can be performed simply by creating user groups and sharing roles.

A user group is a function for the batch management of multiple users. By setting a role and access scope for a user group in the same way as for a user, you can set the privileges for all the users that belong to that user group.

Perform the following settings to share resources without combining them:

- Create a user group and resource folder for each department
- Create a resource pool to be shared among departments
- Set the access scope for the user groups corresponding to each department, to the department dedicated resource folder and the shared resource pool

Note that, by default, only the "admin" user group is defined. If you do not specify a user group when creating a user, that user will belong to the "admin" user group.
Since a role and access scope is not set for the "admin" user group, only the roles and access scopes set for the users inside the group are enabled. Therefore, if resources are only being used within a department, there is no need to pay attention to user groups.

For details on roles and user groups, refer to "Appendix C Roles and User Groups".

1.2.10 Simplifying Storage Settings

When creating physical servers, it was difficult to smoothly provide servers as configuration of storage units and the storage network was necessary.

Using the following functions of Resource Orchestrator, servers can be provided smoothly.

- By coordinating VM management software and storage management software, the information of RAID groups and aggregates are automatically detected as virtual storage resources.
- From the detected virtual storage resources, virtual storage meeting L-Server specifications is automatically selected.
- To use storage from an L-Server, configure storage units and a storage network.

Prerequisites When Configuring L-Servers Using Physical Servers

- When using a physical server as an L-Server, it is necessary that connection using HBA address rename or VIOM is supported. For details on connection using HBA address rename or VIOM, refer to the defining the storage environment and configuring the storage environment sections of the "ServerView Resource Coordinator VE Setup Guide".

- For L-Server SAN storage paths, multipath (two paths) is supported.
- Configurations with more than three HBA ports on managed servers are not supported.
- L-Server supports SAN boot configuration.
- In the case of blade servers, only configurations where FC cards are mounted in expansion slot 1 are supported.
- In the case of blade servers, please do not set the following parameters during setup of VIOM.
  - WWN Address Range
  - MAC Address Range

Regarding Storage Configuration

- Resource Orchestrator manages a single SAN environment. Multiple SAN environments are not supported.
- Storage cannot be used as cluster shared disks.
- A single storage unit can be connected to an L-Server.

Table 1.5 Location of System Disks and Data Disks

Configuration	System Disk	Data Disk
1	SAN storage	SAN storage

For details on required VM management software and storage management software, refer to "1.3.2.2 Required Software".

For details on supported storage units and Fibre Channel switches, refer to "1.4 Hardware Environment".

For details on configuration of storage networks and storage configuration, refer to "1.5 System Configuration".

For details on storage environment settings, refer to "1.8 Required Storage Unit Environment and Configuration When Using Storage Units from an L-Server on a Physical Server".

1.3 Software Environment

Resource Orchestrator is composed of the following CD-ROM:

- ServerView Resource Orchestrator (Windows Edition/Linux Edition)

1.3.1 Software Organization

Resource Orchestrator is composed of the following software.

Software	Function Overview
ServerView Resource Orchestrator V2.2.1 Manager (hereinafter manager)	- Used to control managed servers and neighboring network devices - Manages resource pools and L-Servers - Operates on the admin server
ServerView Resource Orchestrator V2.2.1 Agent (hereinafter agent)	- Performs pre-configuration during deployment, monitors operating servers, and controls backup and cloning - Operates on managed servers

1.3.2 Software Requirements

This section explains the software requirements for installation of Resource Orchestrator.

1.3.2.1 Basic Software

The basic software listed below is required when using Resource Orchestrator.

Software	Basic Software	Remarks
Manager [Windows]	Microsoft(R) Windows Server(R) 2008 Standard (x86, x64) Microsoft(R) Windows Server(R) 2008 Enterprise (x86, x64) Microsoft(R) Windows Server(R) 2008 R2 Standard Microsoft(R) Windows Server(R) 2008 R2 Enterprise Microsoft(R) Windows Server(R) 2008 R2 Datacenter	The Server Core installation option is not supported.
	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	SP2 or later supported.
Manager [Linux]	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) 5.4 (for x86) Red Hat(R) Enterprise Linux(R) 5.4 (for Intel64)	In the event that there are required pieces of software, such as driver kits and update kits, prepare them. For information about required software, refer to the manual of the server or the Linux installation guide.
Agent [Windows]	Microsoft(R) Windows Server(R) 2008 Standard (x86, x64) Microsoft(R) Windows Server(R) 2008 Enterprise (x86, x64) Microsoft(R) Windows Server(R) 2008 R2 Standard Microsoft(R) Windows Server(R) 2008 R2 Enterprise Microsoft(R) Windows Server(R) 2008 R2 Datacenter	The Server Core installation option is not supported.
	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	SP2 or later supported.
Agent [Linux]	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) 5.4 (for x86) Red Hat(R) Enterprise Linux(R) 5.4 (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) 5.2 (for x86) Red Hat(R) Enterprise Linux(R) 5.2 (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 (for x86) Red Hat(R) Enterprise Linux(R) 5 (for Intel64) SUSE(R) Linux Enterprise Server 11 for x86 SUSE(R) Linux Enterprise Server 11 for EM64T	In the event that there are required pieces of software, such as driver kits and update kits, prepare them. For information about required software, refer to the manual of the server or the Linux installation guide.
Agent [VMware]	VMware vSphere(TM) 4	Install Resource Orchestrator on the VMware ESX host.
Agent [Hyper-V]	Microsoft(R) Windows Server(R) 2008 R2 Enterprise Microsoft(R) Windows Server(R) 2008 R2 Datacenter	The Server Core installation option is not supported. Turn ON the Hyper-V role. Add MSFC. Only Windows managers are supported.

Note

Installation will fail when a Resource Orchestrator agent is installed on an unsupported OS.

[Hyper-V]
When using Hyper-V on managed servers, the only supported OS of the admin server is Windows.

The operating system parameters can be set when deploying the image. For details on the parameters that can be set, refer to "D.5 [OS] Tab".

[VMware] [Hyper-V]
Depending on the server virtualization software used, some restrictions may apply to the operating systems that parameters can be set for and the prerequisites for performing the settings. For details, refer to the server virtualization software manual.

Basic software (OS) that can be used on an L-Server is limited to software supported by the server virtualization software.
The image to deploy can be specified when creating an L-Server. Image deployment for Resource Orchestrator uses the following functions of the server virtualization software:

Server Virtualization Software	Function
VMware vSphere(TM) 4	Template, guest OS customization
Microsoft(R) System Center Virtual Machine Manager 2008 R2	Template, guest OS operating system profile

Use of some functions used in the server virtualization software for Resource Orchestrator at the same time with this product is not supported. Please do not use these functions.

Server Virtualization Software	Functions with no Support of Combined Use
VMware vSphere(TM) 4	VMware Storage VMotion
Microsoft(R) System Center Virtual Machine Manager 2008 R2	- Movement of storage areas - Movement changing the virtual machine storage destination

[Hyper-V]
VMware ESX can be managed by SCVMM using VMware vCenter Server. In Resource Orchestrator, VMware ESX cannot be managed through SCVMM. When managing VMware ESX in the above configuration, register VMware vCenter Server in Resource Orchestrator.

Note

- If an L-Server is created with a specified Windows image, when deploying the image use Sysprep, provided by Microsoft, to re-configure the properties unique to the server. By executing Sysprep, the user information and OS setting information are reset.
  For details on Sysprep, refer to the information provided by Microsoft.
- If stopping or restarting of the manager is performed during execution of Sysprep, the operation being executed will be performed after the manager is started.
  Until the process being executed is completed, do not operate the target resource.
- When using MAC license authentication for activation of Windows Server 2008 images, Sysprep can be executed a maximum of three times. Since Sysprep is executed when creating L-Server with images specified or when collecting cloning images, collection of cloning images and creation of L-Servers with images specified cannot be performed more than four times. Therefore it is recommended not to collect cloning images from L-Servers which have had cloning images deployed, but to collect them from a dedicated master server. When customization of a guest OS is performed using the template function in VMware or when the template is created using SCVMM, Sysprep is executed and the number is included in the count.

[Windows] [VMware]

- If an L-Server is created with a Windows image specified, use Sysprep to set the server specific information again, when starting for the first time after creating the L-Server. After startup and resetting the server specific information, it is recommended that you log off once, otherwise when the L-Server console is opened from the server virtualization software management window you will be logged on with Administrator status.

- Note the following points when collecting cloning images from an L-Server that was created using a cloning image.
  - As L-Servers which has not been used even once after creation do not have server specific information set, creation of L-Servers using cloning images collected from an L-Server may fail. When collecting cloning images, set the server specific information on L-Server, after starting the target L-Server.

It is not necessary to install Resource Orchestrator on admin clients, but the following basic software is required.

Basic Software (OS)	Remarks
Microsoft(R) Windows(R) 7 Professional Microsoft(R) Windows(R) 7 Ultimate	-
Microsoft(R) Windows Vista(R) Business Microsoft(R) Windows Vista(R) Enterprise Microsoft(R) Windows Vista(R) Ultimate	SP1 or later supported.
Microsoft(R) Windows(R) XP Professional operating system	SP3 or later supported.
Microsoft(R) Windows Server(R) 2008 Standard (x86, x64) Microsoft(R) Windows Server(R) 2008 Enterprise (x86, x64) Microsoft(R) Windows Server(R) 2008 R2 Standard Microsoft(R) Windows Server(R) 2008 R2 Enterprise Microsoft(R) Windows Server(R) 2008 R2 Datacenter	The Server Core installation option is not supported.
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	SP2 or later supported.

The software listed below is required when using Resource Orchestrator.

Software	Basic Software (OS)	Patch ID/Bundle Update
Manager [Windows]	None	-
Manager [Linux]	Red Hat(R) Enterprise Linux(R) 5 (for x86)	Bundle Update U09031 (5.3 compatible)
	Red Hat(R) Enterprise Linux(R) 5 (for Intel64)	Bundle Update U09031 (5.3 compatible)
Agent [VMware]	None	-
Agent [Hyper-V]	None	-

1.3.2.2 Required Software

The software listed below is required when using Resource Orchestrator.

Software	Required Software	Version	Remarks
Manager [Windows]	ServerView Operations Manager for Windows (*1) (previously ServerView Console for Windows)	V4.20.25 or later	Refer to "See Installation of Related ServerView Products". When using VIOM, refer to the VIOM manual and use a supported version of ServerView Operations Manager.
	Microsoft(R) LAN Manager module	-	Necessary when using backup and restore, or cloning. Obtain it from the Microsoft FTP site. (*2)

Software	Required Software	Version	Remarks
	BACS or Intel PROSet or PRIMECLUSTER GLS for Windows	-	Necessary when performing redundancy of the admin LAN for admin servers.
	ServerView RAID (*1)	-	Necessary when a RAID is composed of local disks (*3).
	ServerView Virtual-IO Manager	2.1 or later	Necessary when using VIOM's Virtual I/O.
	VMware vCenter Server (previously VMware VirtualCenter)	4.0	[VMware] Necessary for management of VM guests and VM hosts. Can be placed on the same admin server as the manager or on another server.
	SNMP Trap Service	-	-
	DHCP Server (Standard OS service)	-	Necessary when managing a managed server within a separate subnet to the admin server.
	Microsoft(R) System Center Virtual Machine Manager 2008 R2	-	[Hyper-V] Necessary for management of VM guests and VM hosts. Can be placed on the same admin server as the manager or on another server. Multiple library servers can be configured. Configure control settings for a maximum of six sessions, referring to "SCVMM Server MaxShellPerUser Settings [Hyper-V]".
	Windows PowerShell	2.0	[Hyper-V] Necessary for management of VM guests and VM hosts.
	ETERNUS SF Storage Cruiser Manager	14.2 or later	Necessary when connecting an ETERNUS LUN with an L-Server operating on the physical server. Install on the same admin server as the manager.
Manager [Linux]	ServerView Operations Manager for Linux	V4.81.05 or later	Refer to "See Installation of Related ServerView Products".
	Microsoft(R) LAN Manager module	-	Necessary when using backup and restore, or cloning. Obtain it from the Microsoft FTP site. (*2)
	PRIMECLUSTER Enterprise Edition	4.3A00 or later	When an admin server is in a cluster configuration, one of the following software is

Software	Required Software	Version	Remarks
	PRIMECLUSTER HA Server	4.3A00 or later	necessary. The supported standby cluster type is 1:1 hot standby.
	PRIMECLUSTER GLS	-	Necessary when performing redundancy of the admin LAN for admin servers.
	VMware vCenter Server (previously VMware VirtualCenter)	4.0	Necessary for management of VM guest and VM host.
	net-snmp package	-	Included in operating system installation media.
	ETERNUS SF Storage Cruiser Manager	14.2 or later	Necessary when connecting an ETERNUS LUN with an L-Server operating on the physical server. Install on the same admin server as the manager.
Agent [Windows]	ServerView Agent for Windows (*1)	V4.50.05 or later	-
	"setupcl.exe" module "sysprep.exe" module	-	Necessary when using backup and restore, or cloning. Refer to the Microsoft web site and obtain the latest modules. (*4) When using Windows Server 2008, the modules are already configured in the OS so there is no need to obtain new modules.
	BACS or Intel PROSet or PRIMECLUSTER GLS for Windows (*1)	-	Necessary when performing redundancy of the admin LAN and public LAN for managed servers.
	ServerView RAID (*1)	-	Necessary when a RAID is composed of local disks (*3).
	ETERNUS Multipath Driver	V2.0L10 or later	Necessary for multipath connections between servers and ETERNUS storage units. Versions differ depending on OS and storage types. Refer to ETERNUS Multipath Driver support information.
	Data ONTAP DSM	3.2R1 or later	Necessary for connection between servers and NetApp storage units. Versions differ depending on OS and storage types. Refer to Data ONTAP DSM support information.

Software	Required Software	Version	Remarks
Agent [Linux]	ServerView Agent for Linux (*1)	V4.90.14 or later	-
	ServerView RAID (*1)	-	Necessary when a RAID is composed of local disks (*3).
	ETERNUS Multipath Driver	V2.0L02 or later	Necessary for multipath connections between servers and ETERNUS storage units. Versions differ depending on OS and storage types. Refer to ETERNUS Multipath Driver support information.
Agent [Red Hat Enterprise Linux]	PRIMECLUSTER GLS (*1)	4.2A00 or later	Necessary when performing redundancy of the admin LAN and public LAN for managed servers. When performing cloning, settings for redundancy of the public LAN are configured automatically. For details on settings for redundancy of the public LAN, refer to the information in "Network Parameter Auto-Configuration for Cloning Images" in the "ServerView Resource Coordinator VE Setup Guide".
Agent [VMware]	ServerView Agent for VMware (*1)	V4.30-20 or later	-
	ServerView RAID (*1)	-	Necessary when a RAID is composed of local disks (*3).

*1: Necessary when using PRIMERGY series servers.
When installing managers in cluster environments, installation on both the primary and secondary nodes is necessary.
*2: Obtain it from the following Microsoft FTP site.

Microsoft FTP site

URL: ftp://ftp.microsoft.com/bussys/clients/msclient/dsk3-1.exe (As of November 2010)

*3: A local disk refers either to a server's internal disk, or to one stored in a storage blade.
*4: The necessary files vary depending on the CPU architecture (x86, x64) of the target system, and the OS version. Check the Microsoft web site for the modules to obtain.

Microsoft web site

URL(x86): http://www.microsoft.com/downloads/details.aspx?familyid=93F20BB1-97AA-4356-8B43-9584B7E72556&displaylang=en (As of November 2010)

URL(x64): http://www.microsoft.com/downloads/details.aspx?familyid=C2684C95-6864-4091-BC9A-52AEC5491AF7&displaylang=en (As of November 2010)

After obtaining the latest version of module, place it in a work folder (such as C:\temp) of the system for installation and execute it.
For details on execution, refer to "Software Preparation and Checks" in the "ServerView Resource Coordinator VE Installation

Guide".
The module is not necessary after installation of agents.

The following software is necessary for admin clients.

Required Software	Version	Remarks
Microsoft(R) Internet Explorer	7 8	-
Java(TM) 2 Runtime Environment Standard Edition	(*1)	Necessary for displaying the management window of ServerView Operations Manager or the VM management console, on admin clients.
VMware vSphere(TM) Client	4.0	Necessary on admin clients when using the functions for coordinating with VMware or the VM management software on managed servers. [VMware]
Hyper-V Manager	-	Necessary on admin clients when using the functions for coordinating with Hyper-V on managed servers. Operation on Windows XP and Windows 2003 are not supported. [Hyper-V]
Microsoft(R) System Center Virtual Machine Manager 2008 R2 VMM management console	-	Necessary on admin clients when using the functions for coordinating with VM management software. [Hyper-V]
ETERNUS SF Storage Cruiser clients	14.2 or later	Necessary when checking the detailed information of storage using the admin client. Operation on Windows 2003 x64 Edition is not supported.

*1: To display the management window of ServerView Operations Manager, please refer to the ServerView Operations Manager manual.

To display the VM management console, version 1.5 or later is necessary.

See

Installation of Related ServerView Products

There are advisory notes regarding the installation of ServerView Operations Manager.

For details on advisory notes, refer to the specific description of the settings for ServerView Operations Manager for Windows in the "ServerView Resource Coordinator VE Installation Guide".

SCVMM Server MaxShellPerUser Settings [Hyper-V]

Resource Orchestrator controls SCVMM using PowerShell Web Services for Management (hereinafter WS-Management).

With standard Windows settings, the maximum number of processes which can start shell operations per user (MaxShellsPerUser) is set to five. For Resource Orchestrator, it is necessary to change settings to enable a maximum of six sessions.

Since WS-Management is used for Windows administrator tools as well as Resource Orchestrator, set a number six or larger than MaxShellsPerUser, giving consideration to operating needs.

Change the MaxShellsPerUser settings using the following procedure:

1. Execute Windows PowerShell as an administrator.
2. Change the current directory using the Set-Location commandlet.

   ```
   PS> Set-Location -Path WSMan:\localhost\Shell <RETURN>
   ```

3. Check the current MaxShellsPerUser configuration information using the Get-ChildItem commandlet.

   The content displayed in MaxShellsPerUser is the current setting.

```
PS WSMan:\localhost\Shell> Get-ChildItem <RETURN>
```

Example

```
PS WSMan:\localhost\Shell> Get-ChildItem
WSManConfig: Microsoft.WSMan.Management\WSMan::localhost\Shell

Name                    Value           Type
----                    -----           ----
AllowRemoteShellAccess  true            System.String
IdleTimeout             180000          System.String
MaxConcurrentUsers      5               System.String
MaxShellRunTime         2147483647      System.String
MaxProcessesPerShell    15              System.String
MaxMemoryPerShellMB     150             System.String
MaxShellsPerUser        5               System.String
```

4. Configure MaxShellsPerUser using the Set-Item commandlet.

Example

When setting MaxShellsPerUser 10

```
PS WSMan:\localhost\Shell> Set-Item .\MaxShellsPerUser 10 <RETURN>
```

1.3.2.3 Exclusive Software

Resource Orchestrator cannot be used in combination with Resource Coordinator or the following products.

Software	Product Name
Manager [Windows]	ServerView Deployment Manager
	ServerView Installation Manager (*1)
Manager [Linux]	Server System Manager
Agent [Windows/Hyper-V]	Server System Manager
	ServerView Deployment Manager (*2)
Agent [Linux]	Server System Manager
	ServerView Deployment Manager (*2)
Agent [VMware]	ServerView Deployment Manager (*2)

*1: As managers of this product include PXE server, use in combination with the PXE server required for remote installation of ServerView Installation Manager is not possible.
*2: ServerView Deployment manager can be installed after Resource Coordinator has been installed. For details on the installation method, refer to the "ServerView Resource Coordinator VE Installation Guide".

Note

- The admin server of Resource Orchestrator can manage the ServerView Resource Coordinator VE V2.2 agent. In such cases, the agent can be used within the function range for ServerView Resource Coordinator VE.
- The same resource cannot be managed by the Resource Orchestrator admin server and the ServerView Resource Coordinator VE admin server.

- Resource Orchestrator managers contain some functions of DHCP servers and PXE servers. Therefore, do not place products or services with other DHCP server or PXE server functions on the admin LAN.

  Examples of Products Including DHCP Servers and PXE Servers

  - The Windows Server 2003 "Remote Installation Service", and the Windows Server 2008/Windows Server 2003 "Windows Deployment Service"
  - ADS (Automated Deployment Services) of Windows Server 2003
  - Boot Information Negotiation Layer(BINLSVC)
  - ServerView Deployment Manager (*1)
  - ServerStart (when using the remote installation function)

  *1: As PXE server is included, the use of some functions is restricted when it is used on the same admin LAN as ServerView Resource Orchestrator. For details, refer to the "ServerView Resource Coordinator VE Setup Guide".

[Windows]

- Depending on the Windows Server domain type, the available functions differ as indicated in the table below.

  Table 1.6 Function Restrictions Based on Domain Type

Domain Type	Backup and Restore	Cloning	Server Switchover Using Backup and Restore
Domain controller	No	No	No
Member server (*1)	Yes (*2)	Yes (*2, *3)	Yes (*2, *4)
Workgroup	Yes	Yes	Yes

  Yes: Use possible.
  No: Use not possible.
  *1: Member servers of Windows NT domains or Active Directory.
  *2: After performing operations it is necessary to join Windows NT domains or Active Directory again.
  *3: Before obtaining cloning images, make sure that the server is not a member of a Windows NT domain or Active Directory.
  *4: When switchover has been performed using Auto-Recovery, join Windows NT domains or Active Directory again before starting operations.

  [Windows/Linux]

- Contact Fujitsu technical staff for information about ServerView Deployment Manager.

1.3.2.4 Static Disk Space

For new installations of Resource Orchestrator, the following static disk space is required. The amount of disk space may vary slightly depending on the environment in question.

Table 1.7 Static Disk Space

Software	Folder	Disk Capacity (Unit: MB)
Manager [Windows]	*Installation_folder* (*1)	800
Manager [Linux]	/opt	570
	/etc/opt	4
	/var/opt	120
Agent [Windows/Hyper-V]	*Installation_folder* (*1)	100
Agent [Linux]	/opt	90
	/etc/opt	5

Software	Folder	Disk Capacity (Unit: MB)
	/var/opt	5
Agent [VMware]	/opt	90
	/etc/opt	5
	/var/opt	5

*1: The installation folder name specified when this software is installed.

1.3.2.5 Dynamic Disk Space

When using Resource Orchestrator, the following disk space is required for each folder, in addition to static disk space. For details on each item, refer to the dynamic disk space section in the "ServerView Resource Coordinator VE Installation Guide".

Table 1.8 Dynamic Disk Space

Software	Folder	Disk Capacity (Unit: MB)
Manager [Windows]	*Installation_folder* (*1)	2400 + *Number_of_managed_servers* * 4
		Environmental_data_storage_area
	Image_file_storage_folder (*2)	*Image_file_storage_area* (*3)
Manager [Linux]	/etc	2
	/var/opt	2400 + *Number_of_managed_servers* * 4
		Environmental_data_storage_area
	Image_file_storage_directory (*2)	*Image_file_storage_area* (*3)
Agent [Windows/Hyper-V]	*Installation_folder* (*1)	60
Agent [Linux]	/etc	1
	/var/opt	1
Agent [VMware]	/etc	1
	/var/opt	1
HBA address rename setup service [Windows]	*Installation_folder* (*1)	60
HBA address rename setup service [Linux]	/etc	1
	/var/opt	60

*1: The installation folder name specified when this software is installed.
*2: The name of the storage folder (directory) specified for image files when this software is installed.
*3: The image storage area when using cloning images for cloning of physical servers using RCVE.

1.3.2.6 Memory size

The memory size listed below is required when using Resource Orchestrator.

Table 1.9 Memory Size

Software	Memory Size (Unit: MB)
Manager [Windows]	3072
Manager [Linux]	3072
Agent [Windows/Hyper-V]	32

Software	Memory Size (Unit: MB)
Agent [Linux]	32
Agent [VMware]	32

1.4 Hardware Environment

The hardware conditions described in the table below must be met when using Resource Orchestrator.

Table 1.10 Required Hardware

Software	Hardware	Remarks
Manager	PRIMERGY BX series servers PRIMERGY RX series servers PRIMERGY TX series servers	The CPU must be a multi-core CPU. 4 GB or more of memory is necessary.
Agent	PRIMERGY BX620 S5 PRIMERGY BX620 S4 PRIMERGY BX920 S2 PRIMERGY BX920 S1 PRIMERGY BX922 S2 PRIMERGY RX100 S6 PRIMERGY RX100 S5 PRIMERGY RX200 S5 PRIMERGY RX200 S4 PRIMERGY RX300 S6 PRIMERGY RX300 S5 PRIMERGY RX300 S4 PRIMERGY RX600 S4 PRIMERGY TX150 S7 PRIMERGY TX150 S6 PRIMERGY TX200 S5 PRIMERGY TX300 S6 PRIMERGY TX300 S5 PRIMERGY TX300 S4 PRIMEQUEST 1000 series servers Other PC servers	When using servers other than the PRIMERGY BX series, it is necessary to mount an IPMI-compatible (*1) server management unit (*2). When the server type is "Physical", PRIMERGY TX series and PRIMEQUEST 1000 series servers cannot be used.

*1: Supports IPMI2.0.
*2: This usually indicates a BMC (Baseboard Management Controller).
For PRIMERGY, it is called iRMC(integrated Remote Management Controller).

The following hardware is required for admin clients:

Software	Hardware	Remarks
Client	Personal computers PRIMERGY RX series servers PRIMERGY BX series servers PRIMERGY TX series servers Other PC servers	-

When connecting storage units that can be connected to the physical servers of L-Servers, the following storage units can be used:

Table 1.11 Storage Units which can be Connected with L-Servers on Physical Servers

Hardware	Remarks
ETERNUS DX8000 series ETERNUS DX400 series ETERNUS DX90	-

Hardware	Remarks
ETERNUS DX80 ETERNUS DX60 ETERNUS8000 series	
ETERNUS4000 series	Model 80 and model 100 are not supported.
ETERNUS2000 series	-
NetApp FAS6000 series NetApp FAS3100 series NetApp FAS2000 series NetApp V6000 series NetApp V3100 series	Data ONTAP 7.3.3 or later (8.x.x is not supported)

When using storage management software, do not change or delete the content set for storage units by Resource Orchestrator. Insufficient disk space does not cause any problems for RAID group or aggregate creation.

When connecting storage units that can be connected to the physical servers of L-Servers, the following Fibre Channel switches can be used:

Table 1.12 Fibre Channel Switches which can be used when Connecting NetApp Storage with L-Servers on Physical Servers and ETERNUS Storage

Hardware	Remarks
Brocade series ETERNUS SN200 series PRIMERGY BX600 Fibre Channel switch blades PRIMERGY BX900 Fibre Channel switch blades	-

The following LAN switch blades are available when using the simplifying network settings:

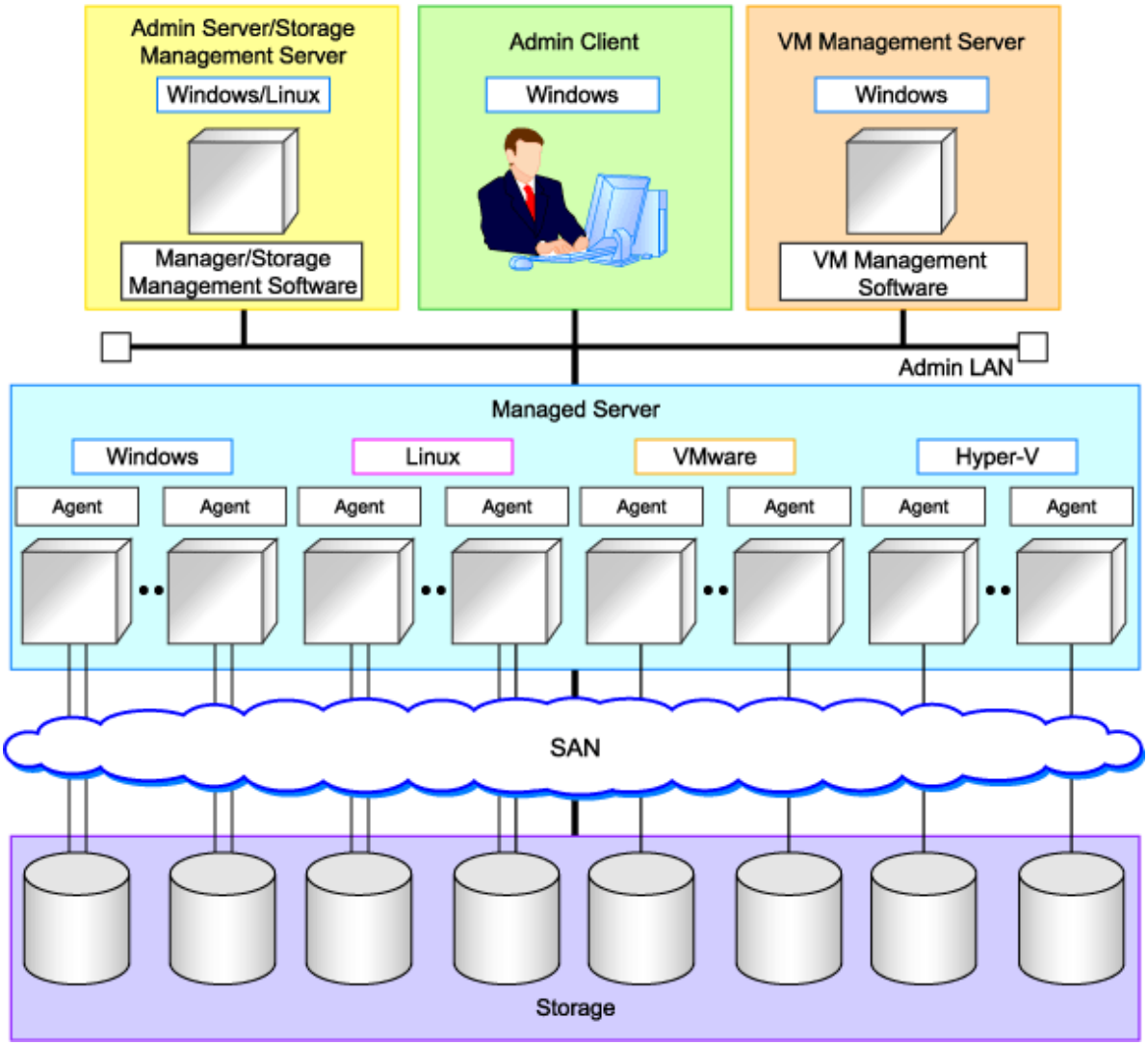
Table 1.13 LAN Switch Blades Available when Using the Simplifying Network Settings Function

Hardware	Remarks
PRIMERGY BX900 series servers and LAN switch blades PG-SW111 PG-SW112	-
PRIMERGY BX600 series servers and LAN switch blades PG-SW107 PG-SW104	-

1.5 System Configuration

This section provides an example of a Resource Orchestrator system configuration.

Figure 1.6 Example of System Configuration



Admin Server

The admin server is a server used to manage several managed servers.
The admin server operates in a Windows or Linux environment.
The Resource Orchestrator manager should be installed on the admin server. The admin server can be made redundant by using clustering software. The admin client can operate on the same machine as the admin server.
The Resource Orchestrator agent cannot be installed on the admin server to monitor and manage the admin server itself.

Note

[Hyper-V]
When using Hyper-V on managed servers, the only supported OS of the admin server is Windows.

Managed Server

A managed server is a server used for operational purposes. It is managed by the admin server.
Install agents on managed servers.
In server virtualization environments, the agent should only be installed on the VM host.

Admin Client

Admin clients are terminals used to connect to the admin server, which can be used to monitor and control the configuration and status of the entire system.
Admin clients should run in a Windows environment.

Storage Management Server

A server on which storage management software (such as ETERNUS SF Storage Cruiser) which manages multiple storage units has been installed. Please make it the same machine as the admin server.
Note that resources for both the admin and storage management software servers are required when operating the servers together.

VM Management Server

A server on which VM management software (such as VMware vCenter Server or System Center Virtual Machine Manager) to integrate multiple server virtualization softwares has been installed. The VM management server can operate on the same machine as the admin server.
Note that resources for both the admin and VM management servers are required when operating the servers together.

Admin LAN

The admin LAN is the LAN used by the admin server to control managed servers and storage.
The admin LAN is set up separately from the public LAN used by applications on managed servers.
Using network redundancy software on the server enables redundancy for the admin LAN or the public LAN. Manually configure network redundancy software.

When using an L-Server with the server type "Physical", the physical network adapter numbers available for the admin LAN are as below.

- When not performing redundancy, "1" is available
- When performing redundancy, "1" and "2" are available

1.6 Managed Resources

Resource Orchestrator can be used to manage the resources described in the table below.

For details on management of chassis, servers, VM hosts, VM management software, and LAN switches, refer to the system design and initial setup section of the "ServerView Resource Coordinator VE Setup Guide".

Table 1.14 Managed Resources

resource	Description
Chassis	A chassis is an enclosure used to house server blades. It can monitor the status of servers, display their properties, and control their power states.
Physical server	This is a general term for any physical server. This term is used to distinguish physical servers from virtual servers that are created using server virtualization software such as VMware or Hyper-V. Registering an unused physical server with Resource Orchestrator enables it to be used for L-Server creation. VM hosts and physical OS's running on physical servers can be detected and registered as managed resources by Resource Orchestrator.
VM host	This refers to the server virtualization software running on a server to operate a virtual machine. For example, Windows Server 2008 R2 or VMware ESX for VMware with Hyper-V roles added. VM hosts can be managed by monitoring their statuses, displaying their properties, and performing operations such as HBA address rename and server switchover. When a VM host is registered, any VM guests on the VM host are automatically detected and displayed.

resource	Description
VM management software	This software manages multiple server virtualization software. For example, vCenter Server for VMware, and SCVMM for Hyper-V. VM management software can be integrated (registered) into Resource Orchestrator to enable the use of functions for VM guests.
LAN switch	This term encompasses both the network switches that are mounted in a blade server chassis (LAN switch blades), and the external LAN switches that are directly connected to them. Resource Orchestrator can monitor LAN switch blade statuses, display their properties, and manage their VLAN configurations. LAN switch blades and external LAN switches can be displayed in a comprehensive Network Map.
VM guest	This refers to the operating system running on a virtual machine. Resource Orchestrator can monitor VM guest statuses, display their properties, and control their power states. In addition to the ServerView Resource Coordinator VE functions, new VM guests and snapshots can be created as L-Servers.
Virtual switch	This is a virtual LAN switch used to manage a VM guest network on the VM host. In Hyper-V it represents the concept of virtual networks. It supports virtual switches, which are standard Hyper-V virtual network and VMware functions. The VMware vNetwork Distributed Switch and Cisco Nexus 1000V virtual switches are not supported.
Disk resource	This refers to a disk resource assigned to a server. For ETERNUS storage this is a LUN, for NetApp storage it is a FlexVol, and for VM guests it is a virtual disk.
Storage resource	This refers to a resource that can dynamically remove a disk resource. Examples include RAID groups, aggregates and file systems for creating VM (VMFS (data store) of VMware, etc.).
Storage management software	Software to manage and integrate one or multiple storage units. For NetApp storage, this is Data ONTAP. Integration (registration) with Resource Orchestrator enables the use of functions for storage.
Network resource	This refers to a resource that defines network information for use by an L-Server. By connecting the NIC for an L-Server to a network resource, the physical and virtual network switches are configured, enabling the L-Server to communicate. If an IP address range is set for a network resource, the IP address can be automatically set when deploying an image to an L-Server. For details, refer to "1.2.6 Simplifying Network Settings".

1.7 Resource Orchestrator Setup Procedure

The setup procedure for Resource Orchestrator is outlined below.

For details on the following items of setup preparations, refer to the system design and initial setup section of the "ServerView Resource Coordinator VE Setup Guide".

- Pre-setup Preparations
  - Decide the server environment
  - Decide the network environment
  - Decide the storage environment
  - Decide the power monitoring environment
  - Configure the server environment
  - Configure the network environment
  - Configure the storage environment (*1)
  - Configure the power monitoring environment

*1: For details on storage environment settings, refer to "1.8 Required Storage Unit Environment and Configuration When Using Storage Units from an L-Server on a Physical Server".

- Installation
  - Install the manager
  - Install agents

  For details on installation, refer to "Chapter 2 Installation and Uninstallation".

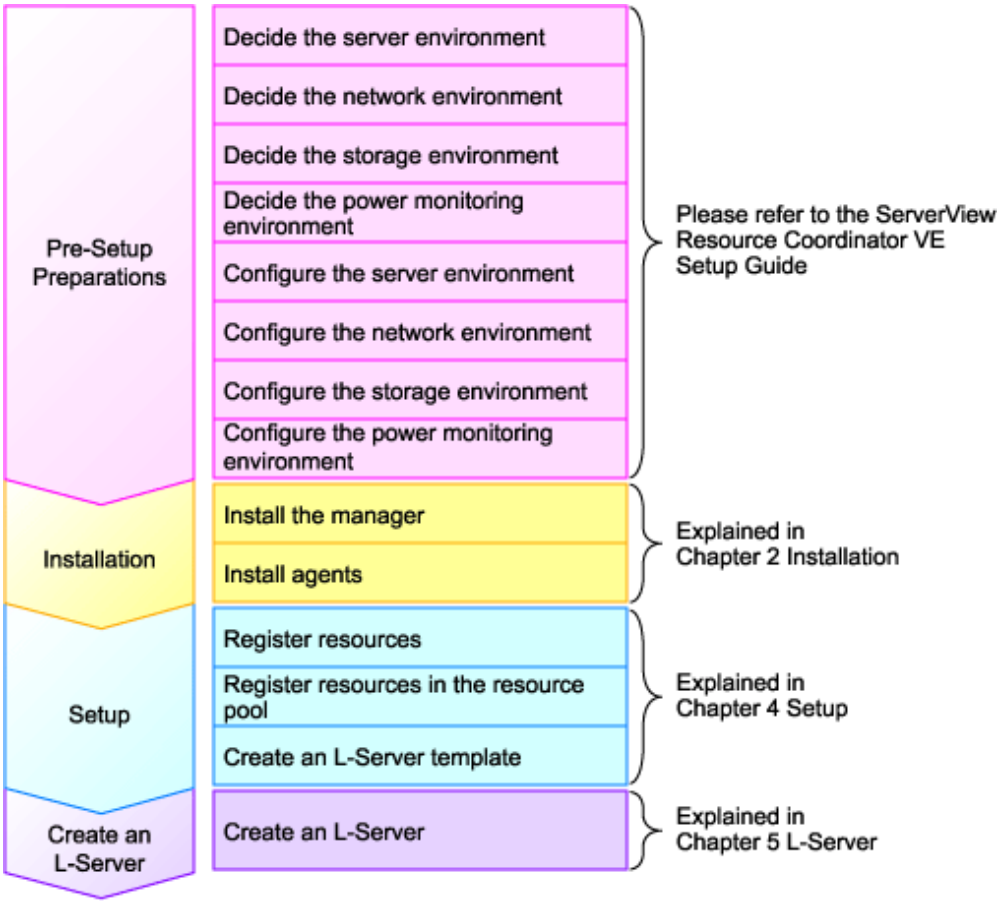
- Setup
  - Register resources
  - Register resources in the resource pool
  - Create an L-Server template

  For details on how to set up Resource Orchestrator, refer to "Chapter 4 Setup".

- Create an L-Server

  For details on how to create an L-Server, refer to "Chapter 5 L-Servers".

Figure 1.7 Resource Orchestrator Setup Procedure



1.8 Required Storage Unit Environment and Configuration When Using Storage Units from an L-Server on a Physical Server

This section explains details on the necessary configuration when using storage units from L-Server on physical servers.

The storage configurations supported by Resource Orchestrator are as follow:

Table 1.15 Supported Storage Configurations

Configuration	System Disk	Data Disk
1	SAN storage	SAN storage

The settings necessary when using storage units are performed using the following flow.

1. Storage Unit Configuration

   For details on how to use ETERNUS storage, refer to "1.8.1.1 ETERNUS Storage".

   For details on how to use the NetApp FAS series/V series, refer to "1.8.1.2 NetApp FAS series/V series".

2. Fibre Channel Switch Configuration

   For details on how to connect ETERNUS storage to Fibre Channel switches, refer to "1.8.2.1 When Connecting ETERNUS Storage to Fibre Channel Switches".

   For details on how to connect NetApp storage to Fibre Channel switches, refer to "1.8.2.2 When Connecting NetApp Storage to Fibre Channel Switches".

1.8.1 Storage Unit Configuration

This section explains how to configure storage units.

1.8.1.1 ETERNUS Storage

Resource Orchestrator manages only ETERNUS registered on ESC. Register the target ETERNUS on ESC.

For details on how to register to ESC, refer to the ESC manual.

Note

- Definition of ETERNUS hot spares or RAID groups is not possible in Resource Orchestrator. Define hot spares and RAID groups using ETERNUSmgr or other software.
- Resource Orchestrator supports access path settings on the FC-CA ports of ETERNUS connected using Fabric connections. It is necessary to select Fabric connection in the settings of the connection method of ETERNUS FC-CA ports.
- Resource Orchestrator uses ETERNUS host affinity to enable recognition of LUNs by servers. Therefore, for affinity mode settings of ETERNUS FC-CA ports, "ON" must be selected.

1.8.1.2 NetApp FAS series/V series

Use the following procedure to configure NetApp FAS series/V series settings:

1. Initial configuration

   Set the password of the Data ONTAP root account (using more than one character) and the admin IP address of Data ONTAP, referring to the "Data ONTAP Software Setup Guide" manual.

   Note

   - Resource Orchestrator uses the NetApp FAS series/V series which is not registered on storage management software such as DataFabric Manager.
   - Only one admin IP address can be registered for the NetApp FAS series/ V series on Resource Orchestrator.

2. Configuration of SSL

   Configure SSL, referring to the "Data ONTAP System Administration Guide" manual.

   Execute the following command on the Data ONTAP that is to be managed:

   ```
   >options tls.enable on <RETURN>
   ```

3. Creating aggregates

   Create more than one aggregate, referring to the "Data ONTAP Storage Management Guide" manual.

   Set any desired number when subdividing the management, such as when managing by users.

   Aggregates can be added later.

4. Fibre Channel Connection Environment Settings

   Configure the following settings, referring to the "Data ONTAP Block Access Management Guide for iSCSI and FC" manual.

   - Configure the license settings of the Fibre Channel service.
   - Confirm the port settings, and configure the FC port for connection with the managed server as the target port.

5. Creation of portset

   Refer to the "Data ONTAP Block Access Management Guide for iSCSI and FC" manual, and create more than one portset which combines FC ports used for access to the L-Server disk.

   Up to two port numbers can be set up per portset.

   When using NetApp storage with multiple controllers, create it combining the FC ports of the different controllers.

   Use the following name for the portset name:

   ```
   rcx-portset_NN_(*1)
   ```

   *1: For *NN*, specify a number from 00 - 99

   Note

   - For the FC port to register in a portset, specify an FC port which is not registered in another portset.
   - Specify the FC port the Fibre Channel cable was connected to.
   - No portset other than the rcx-portset*NN* is used.

1.8.2 Fibre Channel Switch Settings

This section explains how to configure Fibre Channel switches.

1.8.2.1 When Connecting ETERNUS Storage to Fibre Channel Switches

When disconnecting a disk from an ETERNUS RAID group, configure one-to-one WWPN zoning for the Fibre Channel switch registered on ESC. Therefore, it is necessary to register the Fibre Channel switch connected to ETERNUS and all Fibre Channel switches connected to it using a cascade connection on ESC.

For details on how to register to ESC, refer to the ESC manual.

Zoning settings may not have been configured for Fibre Channel switches. When zoning is not configured, ensure that temporary zoning is configured, since there is a chance that one-to-one WWPN zoning settings cannot be configured. For details on how to perform configuration, refer to the ESC manual.

1.8.2.2 When Connecting NetApp Storage to Fibre Channel Switches

In Resource Orchestrator, when disconnecting disks from NetApp aggregates, configuration of Fibre Channel switches connected to NetApp is not performed.

It is necessary to configure one-to-one WWPN zoning for Fibre Channel switches in advance.

It is necessary to define zoning combining the fibre channel switch combining the HBA Port WWPN value based on the WWN provided by the I/O Virtualization Option and the FC port WWPN value defined in the NetApp portset used in Resource Orchestrator. For details on the configuration method, refer to the manual of the fibre channel switch.

Fibre Channel Switch Zoning Settings

Set zoning combining the WWPN value of HBA Port1 and the WWPN value of defined FC port first in portset, and combining the WWPN value of HBA Port2 and the WWPN value of defined FC port second in portset.

In the following conditions, an example command for an ETERNUS SN200 is as follows:

Conditions

- WWN value provided by the I/O Virtualization Option :"20:00:00:17:42:51:00:0x"
- WWPN value of HBA Port1 :"21:00:00:17:42:51:00:0x"
- WWPN value of HBA Port2 :"22:00:00:17:42:51:00:0x"
- Definition of the NetApp storage portset (rcx-portset01) :"0a,0b"
- WWPN value of FC port(0a) for NetApp storage :"50:0a:09:81:88:bc:43:dc"
- WWPN value of FC port(0b) for NetApp storage :"50:0a:09:82:88:bc:43:dc"

Example Command

```
zoneCreate "f2020_a_0","50:0a:09:81:88:bc:43:dc;21:00:00:17:42:51:00:00"
zoneCreate "f2020_b_0","50:0a:09:82:88:bc:43:dc;22:00:00:17:42:51:00:00"
...
zoneCreate "f2020_a_f","50:0a:09:81:88:bc:43:dc;21:01:00:17:43:50:00:0f"
zoneCreate "f2020_b_f","50:0a:09:82:88:bc:43:dc;22:01:00:17:43:50:00:0f"
cfgCreate "ror_cfg","f2020_a_0;f2020_b_0;~~;f2020_a_f;f2020_b_f"
cfgEnable "ror_cfg"
cfgSave
```

Chapter 2 Installation and Uninstallation

This chapter explains the installation and uninstallation of ServerView Resource Orchestrator.

2.1 Installing the Manager

This section explains installation of the manager.

Pre-Installation Preparation and Checks

Confirm the following prior to installing the manager:

- Exclusive Software Checks

  Check that the software listed in "1.3.2.3 Exclusive Software" and the manager of Resource Orchestrator have not been installed on the system.

- Required Software Preparation and Checks

  Check that the software listed in "1.3.2.2 Required Software" has been installed on the system. If it has not been installed, install it before continuing.

  For ESC, perform Fibre Channel switch settings in advance.

- Installation Folder and Available Disk Space Check

  Decide the installation folder for Resource Orchestrator.
  Note that folders on removable disks cannot be specified.
  Check that there are no files or folders in the installation folder.
  Check that the necessary disk space can be secured on the drive for installation.
  For the amount of disk space necessary for Resource Orchestrator, refer to "1.3.2.4 Static Disk Space" and "1.3.2.5 Dynamic Disk Space".

- Port Number

  When Resource Orchestrator is installed, the port numbers used by it will automatically be set in the services file of the system. So usually, there is no need to pay attention to port numbers.

  If the port numbers used by Resource Orchestrator are being used for other applications, a message indicating that the numbers are in use is displayed, and installation will stop.
  In that case, describe the entries for the port numbers used by Resource Orchestrator in the services file using numbers not used by other software, and then start the installer. The eight port numbers are as indicated below.

Example

```
# service name  port number/protocol name
Nfdomain      23457/tcp
Nfagent       23458/tcp
Rcxmgr        23460/tcp
Rcxweb        23461/tcp
Rcxtask       23462/tcp
rcxmongrel1   23463/tcp
rcxmongrel2   23464/tcp
rcxdb         23465/tcp
```

For details on port numbers, refer to the system design and initial setup and port list sections in the "ServerView Resource Coordinator VE Setup Guide". For details on how to use NetApp storage, give permission for the following connections to operate Resource Orchestrator.

Function Overview	Source				Destination				Protocols
	Servers	Services	Ports	Modification	Servers	Services	Ports	Modification	
NetApp storage	Admin Server	-	Inconstant	-	Data ONTAP	-	443	Impossible	tcp

- User account for administrative users of Resource Orchestrator

  Decide the user account name and password for administrative users of Resource Orchestrator.
  For details on user accounts, refer to the notes given in the "ServerView Resource Coordinator VE Operation Guide".

- Check the admin LAN of the admin server and the status of the NIC

  Decide the network (IP addresses) to be used for the admin LAN of the admin server.
  Check that the NIC used for communication with the admin LAN is enabled.
  For details on the admin LAN, refer to the setup preparation information in the "ServerView Resource Coordinator VE Setup Guide".

Note

Nullifying Firewall Settings for Ports to be used by Resource Orchestrator

When installing Resource Orchestrator on systems with active firewalls, in order to enable the manager to communicate with agents correctly, disable the firewall settings for the port numbers to be used for communication.

For the port numbers used by Resource Orchestrator and required software, refer to the port number list in the "ServerView Resource Coordinator VE Setup Guide" and the ESC manual.
However, when port numbers have been changed during installation of Resource Orchestrator, change the port number settings according to the "ServerView Resource Coordinator VE Setup Guide".

Installation

Install the manager. The installation procedure is the same as for ServerView Resource Coordinator VE.
For details on how to install the manager, refer to the information about manager installation in the "ServerView Resource Coordinator VE Installation Guide".

Manager Cluster Operation

Managers can be operated in cluster systems with Resource Orchestrator.
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 the manager cluster operation settings and deletion section in the ServerView Resource Coordinator VE Installation Guide.

When copying dynamic disk files (Primary node) also copy the following folders.

[Windows]
Installation_folder\Manager\etc\customize_data

[Linux]
/etc/opt/FJSVrcvmr/customize_data

For details, refer to the "ServerView Resource Coordinator VE Installation Guide".

- Settings
  - Create cluster resources (Primary node)
  - Copy dynamic disk files (Primary node)
  - Perform link settings for folders on the shared disk (Primary node)
  - Set folder and file access rights (Primary node)
  - Set access rights for the Resource Orchestrator database (Primary node)

  - Change the IP address set for the manager's admin LAN (Primary node)
  - Perform link settings for folders on the shared disk (Secondary node)
  - Set access rights for the Resource Orchestrator database (Secondary node)
  - Change the IP address set for the manager's admin LAN (Secondary node)
  - Register service resources (Primary node)
  - Start the cluster service (Primary node)
  - Start the cluster service (Secondary node)
- Deletion
  - Stop the cluster service (Primary node)
  - Delete service resources (Primary node)
  - Uninstall the Manager
  - Delete shared disk files (Secondary node)
  - Delete cluster resources (Secondary node)

2.2 Installing the Agent

This section explains the procedure for agent installation. If agents of ServerView Resource Coordinator VE have been installed, refer to "1.3.1 Software Organization".

When creating multiple L-Servers, with "physical" as the server type, by using cloning, it is possible to copy the OS installed on one L-Server, updates, Resource Orchestrator agents, and common software between servers to other L-Servers.

For details, refer to "5.1.1 Manual OS Installation".

Pre-Installation Preparation and Checks

Confirm the following prior to installing the agent:

- Exclusive Software Checks

  Check that the software listed in "1.3.2.3 Exclusive Software" and the agent of Resource Orchestrator have not been installed on the system.

- Required Software Checks

  Check that the software listed in "1.3.2.2 Required Software" has been installed on the system. If it has not been installed, install it before continuing.

- Installation Folder and Available Disk Space Check

  Decide the installation folder for Resource Orchestrator.
  Note that folders on removable disks cannot be specified.
  Check that there are no files or folders in the installation folder.
  Check that the necessary disk space can be secured on the drive for installation.
  For the amount of disk space necessary for Resource Orchestrator, refer to "1.3.2.4 Static Disk Space" and "1.3.2.5 Dynamic Disk Space".

- Port Number

  When Resource Orchestrator is installed, the port numbers used by it will automatically be set in the services file of the system. So usually, there is no need to pay attention to port numbers.
  If the port numbers used by Resource Orchestrator are being used for other applications, a message indicating that the numbers are in use is displayed, and installation will stop.
  In that case, describe the entries for the port numbers used by Resource Orchestrator in the services file using numbers not used by other software, and then start the installer.
  For details on port numbers, refer to the information about setup in the ServerView Resource Coordinator VE Setup Guide.

- Checking the Admin LAN and NIC Status

  Decide the network (IP addresses) to be used for the admin LAN.
  Check that the NIC used for communication with the admin LAN is enabled.
  For details on the admin LAN, refer to the setup preparation information in the "ServerView Resource Coordinator VE Setup Guide".

Installation

Install the agent. The installation procedure is the same as for ServerView Resource Coordinator VE.
For details on how to install the agent, refer to the "ServerView Resource Coordinator VE Installation Guide".

Note

Nullifying Firewall Settings for Ports to be used by Resource Orchestrator

When installing Resource Orchestrator on systems with active firewalls, in order to enable the manager to communicate with agents correctly, disable the firewall settings for the port numbers to be used for communication.

For the port numbers used by Resource Orchestrator and required software, refer to the port number list in the "ServerView Resource Coordinator VE Setup Guide".
However, when port numbers have been changed during installation of Resource Orchestrator, change the port number settings according to the "ServerView Resource Coordinator VE Setup Guide".

2.3 Uninstalling the Manager

The uninstallation of managers is explained in the following sections.

Pre-uninstallation Advisory Notes

- Check L-Servers, system images, and cloning images

  When L-Servers created using Resource Orchestrator and the storage folder for system images and cloning images collected using Resource Orchestrator have not been changed from the default values, all collected system images and cloning images will be deleted.

  If the images are necessary, before uninstalling Resource Orchestrator back up (copy) the folder below to another folder.

  [Windows]
  Installation_folder\ScwPro\depot

  [Linux]
  /var/opt/FJSV-scwdeploysv/depot

- Back up (copy) certificates

  When operating managers in cluster environments, back up (copy) certificates before performing uninstallation.

  Manager certificates are stored in the following folders:

  [Windows]
  Drive_name:\RCoordinator\certificate

  [Linux]
  Mount_point_of_the_shared_disk/RCoordinator/

Uninstallation

Uninstall the manager.
For details on how to uninstall the manager, refer to the information about manager uninstallation in the "ServerView Resource Coordinator VE Installation Guide". Replace "ServerView Resource Coordinator VE Manager" with "ServerView Resource Orchestrator Manager".

Note

[Windows]
After uninstallation, the *installation_folder* (default: C:\Program Files\Resource Orchestrator) will remain. When the folder is unnecessary, delete it manually.

When uninstalling, certificates are backed up in the following folders. When installing a manager again and using the same certificates, save the backed up certificates in the following folders.

- *Installation_folder*\back\site\certificate
- *Installation_folder*\back\domain\certificate

When the certificates backed up during uninstallation are unnecessary, delete them manually.

2.4 Uninstalling the Agent

Uninstall the agent.

For details on how to uninstall the agent, refer to the information about agent uninstallation in the "ServerView Resource Coordinator VE Installation Guide". Replace "ServerView Resource Coordinator VE Agent" with "ServerView Resource Orchestrator Agent".

Chapter 3 Screen Layout

This chapter provides an overview of the RC console.

Resource Orchestrator includes two graphical user interfaces: the RC console and BladeViewer.

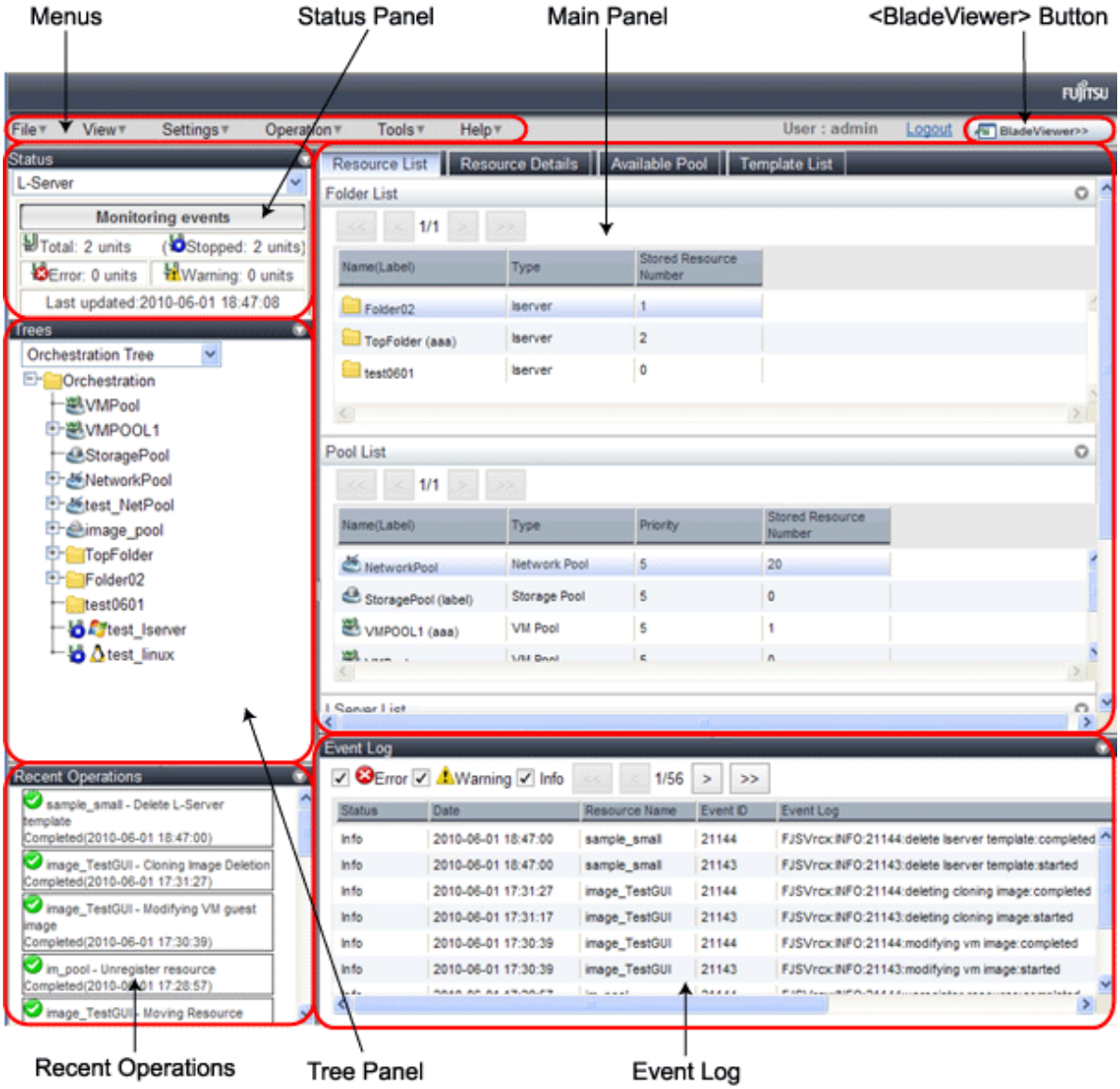
For details on how to open and close the RC console, refer to the notes on the RC Console in the "ServerView Resource Coordinator VE Setup Guide".

For details on BladeViewer, refer to the note on BladeViewer in the "ServerView Resource Coordinator VE Operation Guide".

3.1 RC Console

This section explains how the RC console is organized.

Figure 3.1 RC Console



Menus

Operations can be performed either from the menu bar or popup menus.
The menus provided on the menu bar of the RC console in addition to the ServerView Resource Coordinator VE menus are listed in the table below.

For details regarding the menus not listed below, refer to the screen explanation in the "ServerView Resource Coordinator VE Setup Guide".

Table 3.1 Menu Item List

Menu bar	Menu	Submenu	Function
File	L-Server template	Import	Imports an L-Server template.
		Export	Exports an L-Server template.
Settings	Pool	Register	Registers a resource in the selected resource pool.
		Deregister	Deregisters the selected resource from a resource pool.
	Create	Folder	Creates a resource folder in the server tree or orchestration tree.
		Pool	Creates a resource pool in the orchestration tree.
		L-Server	Creates an L-Server.
		Network Resource	Creates a network resource.
	Move to another folder	-	Moves a resource pool, resource folder, or a resource to another resource folder.
	Move to another pool	-	Moves a resource to another resource pool.
Operations	Snapshot	Collect	Collects a snapshot of the L-Server.
		Restore	Restores a snapshot to the L-Server.
		Deleting a Snapshot	Deletes a snapshot.

Status Panel

The Status Panel displays the status of managed servers. The status of both physical servers and L-Servers can be displayed. The properties displayed for physical servers and L-Servers can be switched from the drop-down menu.
Only the L-Server status is displayed for the following users:

- Users with a role that only allows use of L-Servers
- Users with restricted access

If a warning or error event occurs on a managed server, the status monitoring area starts to blink.
If you click the blinking area, the server's information is displayed on the main panel.

For details of the status, refer to the information about status in the "ServerView Resource Coordinator VE Setup Guide".

Tree Panel

Resource Orchestrator displays the orchestration tree and storage tree in addition to the trees provided by ServerView Resource Coordinator VE. If resource folders have been created in the server tree, these resource folders are also displayed.
Only the orchestration tree is displayed for the following users:

- Users with a role that only allows use of L-Servers
- Users with restricted access

  The resources displayed are restricted according to the access rights of the logged in user.

Orchestration Tree

Manages and operates L-Servers and resource pools.

All resources authorized for access by the logged in user are displayed. The resources displayed differ depending on the role and access rights of the user.

The statuses of the following resources are shown in a tree view:

- Resource folders and L-Servers
- Resource pools and the resources registered in resource pools

The top-level resource folder of each tree is called the root folder. The standard tree consists of only the root folder.

The orchestration tree displays the following information:

- Resource List

  Displays information on resources related to the resource selected in the resource tree.

- Resource Details

  Displays detailed information for the resource selected in the resource tree. Additionally, external software can be opened.

- Available Pools

  A list of resource pools available for use is displayed.

- Template List

  A list of L-Server templates available for use is displayed.
  Using an L-Server template, an L-Server can be created.

Server resource tree

The server resource tree displays all chassis, servers, VM hosts, VM guests, and LAN switches managed in Resource Orchestrator, in a tree view.

Network resource tree

The network resource tree displays all LAN switches other than LAN switch blades managed in Resource Orchestrator, in a tree view.

Storage tree

The storage resource tree displays all storage management software, storage units, RAID groups, LUNs, and virtual disks of VM guests managed in Resource Orchestrator, in a tree view.

Resources displayed in the server resource tree and network resource tree are represented by an icon and their resource name.

For details on icons and their resource names, refer to the "ServerView Resource Coordinator VE Setup Guide" for the screen explanation, and the "ServerView Resource Coordinator VE Operation Guide" for notes regarding resource status.

Main Panel

The Main Panel displays information on resources selected in the tree.

Recent Operations

Displays the progress statuses and results of operations performed in Resource Orchestrator according to the user's scope of access.

Event Log

The Event Log displays information on events that have occurred.
ServerView Resource Coordinator VE events are displayed in addition to Resource Orchestrator events.
It displays a log of events that have occurred on managed resources.
The resources displayed are restricted according to the role and scope of access of the user.

<BladeViewer> button

Opens the BladeViewer interface.
BladeViewer is a management interface specially designed for blade servers. It can only be used in conjunction with PRIMERGY BX servers registered as managed servers.

Chapter 4 Setup

This chapter explains how to set up Resource Orchestrator.

4.1 Setup Procedure

This section explains the setup procedure for Resource Orchestrator.

Resource Orchestrator manages resources and assigns them to L-Servers. Resources must first be registered in Resource Orchestrator.

Resource Orchestrator is setup using the following procedure:

1. Register resources
2. Register resources in a resource pool
3. Create an L-Server template

Note

When changing physical server usage, setup Resource Orchestrator using the following procedure:

1. "5.7.1 Configuring the Admin LAN IP Address Range for Usage Change"
2. Register resources
3. Register resources in a resource pool
4. Create an L-Server template

4.2 Registering a Resource

This section explains how to register a resource in Resource Orchestrator.

4.2.1 Managed Resources

The following resources can be registered in Resource Orchestrator:

Chassis, managed server, LAN switch, VIOM, VM management software, and power monitoring device are resources shared with RCVE (Resource Coordinator VE). In addition to these shared resources, storage management software, storage resources, and network resources can be registered in Resource Orchestrator.

Table 4.1 Managed Resources

Resource	RCVE	Resource Orchestrator
Chassis	Yes	Yes
Managed server	Yes	Yes
LAN switch	Yes	Yes
VIOM	Yes	Yes
VM management software	Yes	Yes
Storage management software	No	Yes
Power monitoring device	Yes	Yes
Storage resource	No	Yes
Network resource	No	Yes

Yes: Registration possible.
No: Registration not possible.

When using blade servers, register resources in the order listed below:

1. Chassis
2. Managed servers (within the chassis)
3. LAN switch blades (within the chassis)

To automatically configure network settings when creating an L-Server, register a LAN switch blade.

Storage resources are created using VM management software, storage management software, or storage units. By registering VM management software or storage management software with Resource Orchestrator, created resources will be automatically detected. For details on VM management software, refer to "4.2.2 VM Management Software". For details on storage management software, refer to "4.2.3 Storage Management Software". For details on how to detect storage resources, refer to "4.2.4 Storage Resources".

To register a network resource, specify a network pool when creating the network resource. For details, refer to "4.3.4 Network Resources".

For details on how to register resources shared with RCVE, refer to the information regarding setup in the "ServerView Resource Coordinator VE Setup Guide".

4.2.2 VM Management Software

Resource Orchestrator manages a server (with storage and networks) with defined logical specifications (number of CPUs, memory capacity, disk capacity, number of NICs, etc.) as an L-Server. VM management software must be registered in Resource Orchestrator to manage a virtual server as an L-Server.

The following VM management software can be registered in Resource Orchestrator.

- VMware vCenter Server
- System Center Virtual Machine Manager

For details on how to register VM management software, refer to the information about VM management software registration in the "ServerView Resource Coordinator VE Setup Guide".

Note

It is necessary to first set up the following items for VM management software before registering it in Resource Orchestrator. For details on how to set up VM management software, refer to the VM management software manual.

[VMware]

- Volumes have been created
- Zoning and affinity have been set
- I/O virtualization is controlled by RCVE and VIOM
- VMware ESX has been set to recognize VMFS
- Dynamic assignment is performed using VMFS

For details, refer to the "ServerView Resource Coordinator VE Setup Guide" and the VM host manual.

When performing redundancy of L- Servers, perform settings for high availability functions (such as VMware HA) of server virtualization software in advance.
For details, refer to the server virtualization software manual.

[Hyper-V]

- The configuration enables use of SAN environments on VM hosts
- I/O virtualization is controlled by RCVE and VIOM
- Volumes have been created

- Zoning and affinity have been set
- MSFC has been added to VM hosts
- A SAN volume has been configured as a cluster disk
- A cluster disk has been added as a shared cluster volume

All created L-Servers are located on a cluster as high availability VMs.

For details, refer to the MSFC help.

4.2.3 Storage Management Software

To create an L-Server with the server type "physical", it is necessary to do so in coordination with storage management software registered with Resource Orchestrator. Use the following procedure to register storage management software:

1. Decide the storage environment.
2. Configure the storage environment using storage management software which can be registered.

   The following storage management software can be registered with Resource Orchestrator:

   - ETERNUS SF Storage Cruiser
   - Data ONTAP

   For details on storage environment settings, refer to "1.8 Required Storage Unit Environment and Configuration When Using Storage Units from an L-Server on a Physical Server".
3. Register storage management software for coordination with Resource Orchestrator.

   Execute the rcxadm storagemgr register command to register storage management software with Resource Orchestrator.

   For details on the rcxadm storagemgr register command, refer to "E.7.1 rcxadm storagemgr".

4.2.4 Storage Resources

RAID groups and aggregates controlled by storage management software, and file systems for VM guest controlled by VM management software can be managed as virtual storage resources using Resource Orchestrator.

By registering VM management software or storage management software with Resource Orchestrator, information regarding storage controlled by the VM management software or storage management software will be obtained automatically and detected as virtual storage resources.
It is necessary to register detected virtual storage resources in the storage pool. For details on how to register to the storage pool, refer to "4.3.3 Virtual Storage Resources".

When addition or modification of storage is performed using storage management software or VM management software, periodic queries are made to the storage management software or VM management software to detect changes to the configuration/status of storage. The interval between regular updates varies according to the number of storage resources.
By right-clicking a storage resource on the RC console orchestration tree and selecting [Update] on the displayed menu, the configuration/status of the storage management software and VM management software is refreshed without waiting for the regular update.
After that, perform registration in the storage pool.

Definition File for Combining FC-CA Ports of ETERNUS Storage

[Windows/Linux]
Define the combination of the WWPNs of the FC-CA ports of the ETERNUS storage used when accessing the L-Server disk in the following definition file:

Also give a definition in the file when making configuration changes such as addition of storage to resource pool.

Storage Location of the Definition File

[Windows]
Installation_folder\Manager\etc\customize_data

[Linux]
/etc/opt/FJSVrcvmr/customize_data

Definition File Name

storage_portset.rcxprop

Definition File Format

Describe the ETERNUS storage information for one device in one line using the following format: Use of line breaks is not possible.

```
storage_unit_ipaddr,"wwpnX:wwpnY","wwpnX:wwpnY",...
```

Definition File Items

- storage_unit_ipaddr

  When the same IP address as the IP address of the operation management LAN port for ETERNUS storage managed using ESC is specified in multiple lines, the definition of the first occurrence is valid.

- Portset

  A pair of FC-CA ports of ETERNUS storage used when accessing an L-Server disk, represented using the WWPN of the FC-CA ports.

  Specify a pair of FC-CA ports using two WWPNs (16 digit hexadecimal numbers) separated with colons (":"). Up to 64 combinations can be specified.

  If there is trouble with the ETERNUS storage controller, in order to avoid blocking both of the FC-CA ports used for L-Server, do not use combinations of ports on the same controller.

  WWPNs of FC-CA ports which are not connected using Fibre Channel cable cannot be specified.
  Already defined WWPNs cannot be specified for another portset.

Example

Example Definition

An example definition file is indicated below.

```
192.168.1.24,"500000E0D00C7006:500000E0D00C7086","500000E0D00C7086:500000E0D00C7087"
```

4.2.5 Network Resources

To register a network resource, specify a network pool when creating the network resource. For details, refer to "4.3.4 Network Resources".

The network environment, VM host, and physical server required to run Resource Orchestrator must satisfy the following prerequisites:

- The configuration for the admin LAN and public LAN has been designed
- The network environment for the admin LAN is configured

  Note

  When using an L-Server with the server type "Physical", the physical network adapter numbers available for the admin LAN are as below.

  - When not performing redundancy, "1" is available
  - When performing redundancy, "1" and "2" are available

- The virtual switch to connect to the admin LAN has been designed and configured [VMware]
- When using the VMware cluster function, the cluster configuration has been designed and configured [VMware]

For details on how to design and configure a network environment, refer to the following sections of the ServerView Resource Coordinator VE Setup Guide:

- Defining the Network Environment
- Configuring the Network Environment
- Registering LAN Switches
- Configuring VLANs on LAN Switch Blades

For details, refer to the "ServerView Resource Coordinator VE Setup Guide" and the VM host manual.

When using IBP

When using IBP, it is necessary to create IBP uplink set for the public LAN and the admin LAN in advance.

[Windows/Linux]
When the server type of an L-Server is "Physical", it is necessary to create an IBP uplink set for the public LAN and the admin LAN in advance, using VIOM.

- Public LAN

  Create a network resource with the same name as the created uplink set.

- Admin LAN

  Network resources for the admin LAN are created automatically.

  Describe the name of the admin LAN uplink set in the uplink set definition file for the admin LAN.

  When the definition file does not exist, define it as follows.

  Storage Location of the Uplink Set Definition File for the Admin LAN

  [Windows]
  Installation_folder\Manager\etc\customize_data\vnetwork_ibp.rcxprop

  Format of the Uplink Set Definition File for the Admin LAN

  ```
  external_admin_net_name=Admin_LAN_uplink_set_name
  ```

[VMware/Hyper-V]
When the server type of the L-Server is "VM", connect the IBP uplink sets used for the public LAN and admin LAN to the VM host regardless of VIOM, after creating each IBP uplink set.

It is not necessary to combine the name of the uplink set and the name of the network resource.

4.2.5.1 Automatic Network Configuration [VMware]

If the NIC and network resources are connected when an L-Server is created, the following settings matching the network resource definition will be registered automatically for the VM host that the L-Server will operate on.

- LAN switch blade (when using blade servers)

  A tagged VLAN is configured on the internal ports.

- Virtual switches, port groups

  If the required network resources do not exist, they are automatically created. A redundant NIC configuration will be configured.

  If it already exists, the virtual switch and port group are used.

- VM guests

  VM guests are connected to port groups.

  If an image is specified, the IP address is automatically configured.

In environments using the clustering function of VM management software, in order to enable the migration of VM guests and operation using the HA function, settings for LAN switch blades, virtual switches, and port groups are performed automatically for all VM hosts comprising the cluster.

After creating an L-Server, if VM hosts are added to the cluster afterwards, Resource Orchestrator network settings are not performed automatically. Perform the same settings as the existing VM hosts in the cluster configuration for the LAN switch blades and virtual switches of the additional VM hosts.

The RC Console can be used for LAN switch blade configuration. Right-click the VM host in the server resource tree, and select [Change Setting]-[General] from the popup menu.

For details, refer to the information about configuring VLANs on LAN switch blades in the "ServerView Resource Coordinator VE Setup Guide".

Manually perform virtual switch and port group settings using VMware functions.

Advisory Notes About Automatic Network Configuration

Resource Orchestrator supports automation of network configuration for the following six patterns of VM host configuration.

Table 4.2 VM Host Configurations Supported for Automatic Network Configuration

	Hardware	Number of LAN Switch Blades	Specification of Network Resource External Connection Ports	Number of Physical Network Adapter to Connect to Virtual Switch
a	PRIMERGY BX900 series servers LAN switch blades PG-SW111 PG-SW112	2	Select one from each of LAN switch blade 1 and 2	Use 3 and 4 for teaming (Enable 3 to perform redundancy)
b		4	Select one from each of LAN switch blade 1 and 2	Use 3 and 4 for teaming (Enable 3 to perform redundancy)
c		4	Select one from each of LAN switch blade 3 and 4	Use 5 and 6 for teaming (Enable 5 to perform redundancy)
d	PRIMERGY BX600 series servers LAN switch blades PG-SW107 (NET 1, 2) PG-SW104 (NET 3, 4)	2	Select one from each of LAN switch blade 1 and 2	Use 3 and 4 for teaming (Enable 3 to perform redundancy)
e		4	Select one from each of LAN switch blade 1 and 2	Use 3 and 4 for teaming (Enable 3 to perform redundancy)
f		4	Select one from each of LAN switch blade 3 and 4	Use 7 and 8 for teaming (Enable 7 to perform redundancy)

The numbers of physical network adapters given above can be checked on the details window of the LAN switch blade.

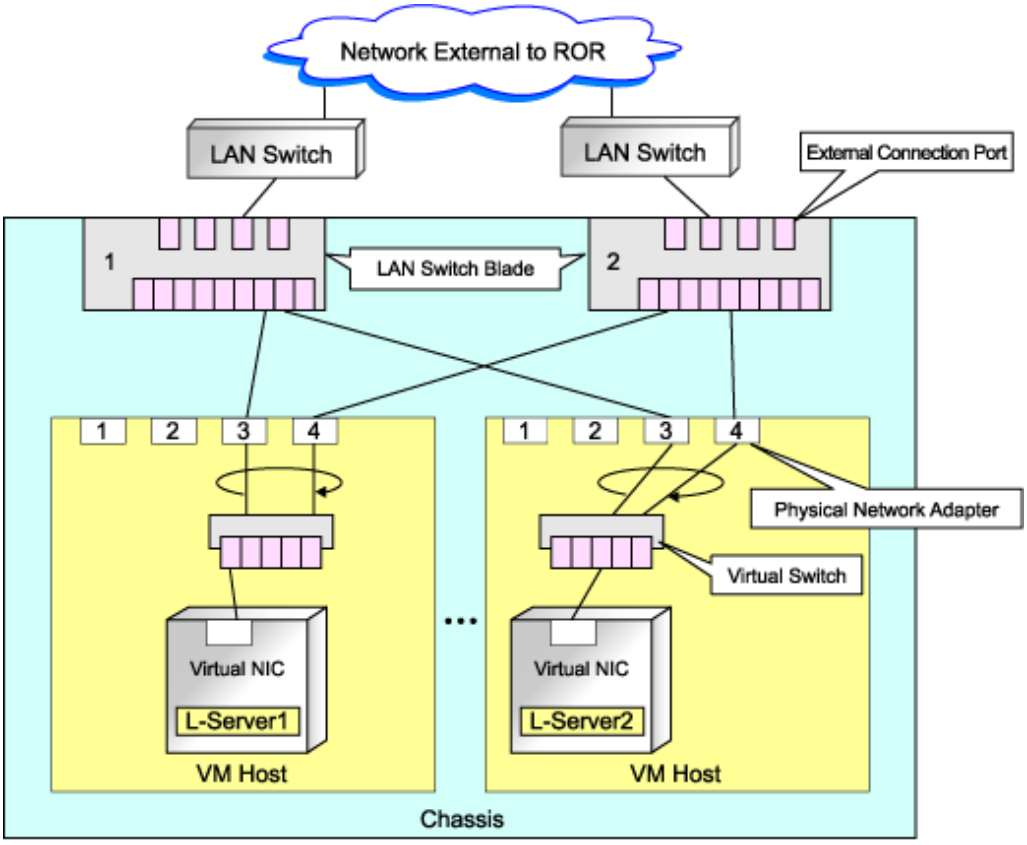
When external connection ports have not been specified (internal network) or the LAN switch blade is in IBP mode, the number 3 and number 4 physical network adapters will be used for teaming. (Enable 3 to perform redundancy)

When a virtual switch for use on the public LAN has been created in advance, or settings have been performed manually, it is necessary that the number of the physical network adapter the virtual switch is connected to matches the number in the details given above.

In rack mount server environments, only the function for connecting NICs of VM guests is provided for the port groups of virtual switches created in advance. Manually perform virtual switch and port group settings in advance. In this case, for the name of port groups using the same VLAN ID, it is necessary to use a common name on all VM hosts.

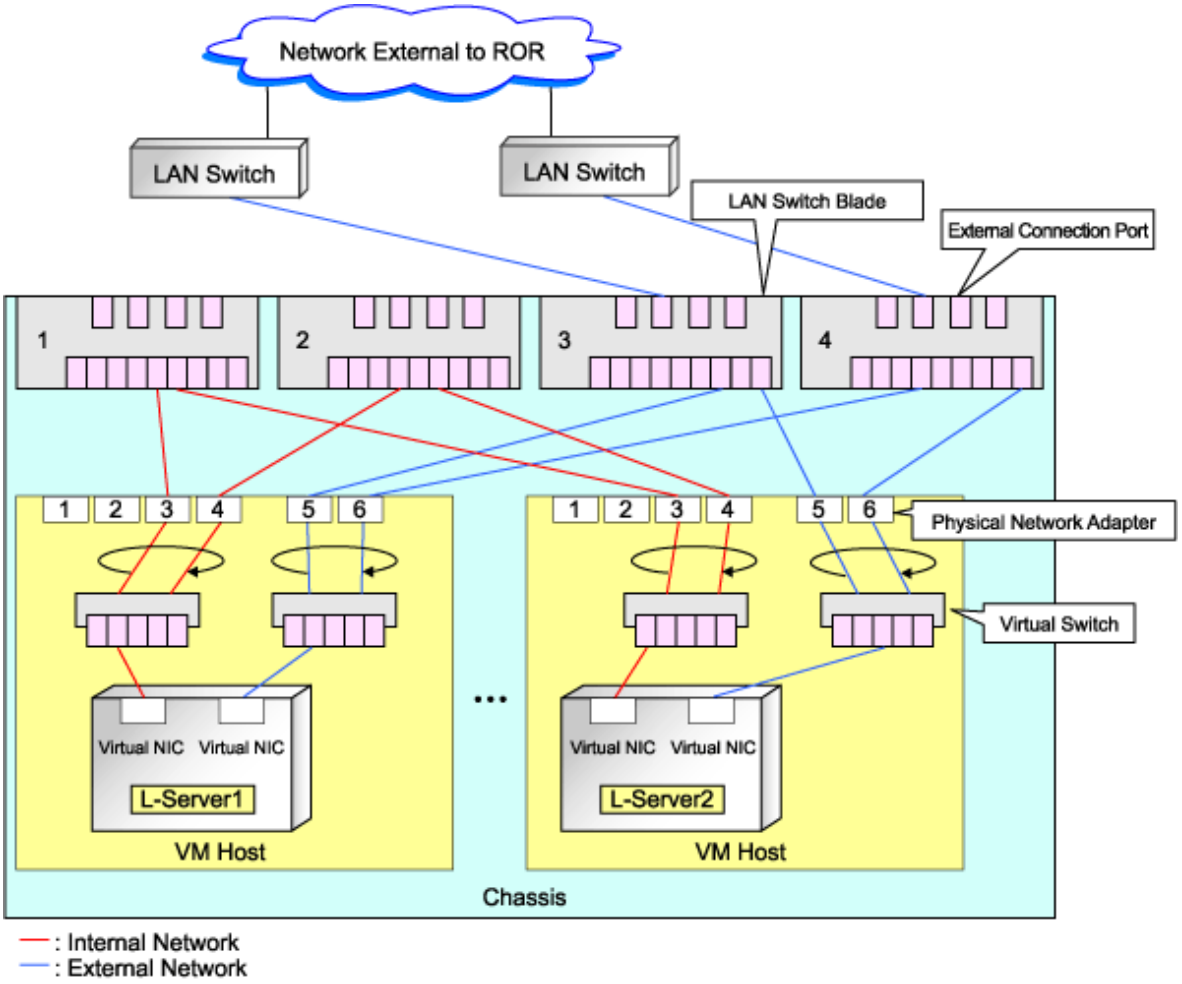
Advisory notes for automatic network configuration (VM host configuration) pattern A are as below.

Figure 4.1 Advisory Notes for Automatic Network Configuration (VM host Configuration) Pattern A



Advisory notes for automatic network configuration (VM host configuration) pattern C are as below.

Figure 4.2 Advisory Notes for Automatic Network Configuration (VM host Configuration) Pattern C



4.2.5.2 Automatic Network Configuration [Hyper-V]

If the NIC and network resources are connected when an L-Server is created, a VLAN ID is automatically configured for the NIC of the VM guest, and connected to the virtual network.

In order to perform configuration automatically, it is necessary to use a different VLAN ID for each virtual network.

Additionally, the following settings must be performed in advance.

1. Create a virtual network

   Create a virtual network with the same name (including upper and lower case characters) for all VM hosts comprising the cluster. This enables migration of VM guests between VM hosts.
   For details, refer to the procedure for addition or modification of virtual networks on hosts in the SCVMM help.

2. Configure the virtual network communication

   Configure LAN switches to enable communication using the tagged VLAN between virtual networks using the same name.
   When using blade servers, VLAN settings for LAN switch blades can be performed from the RC console.
   Right-click the VM host in the server resource tree, and select [Change Setting]-[Network Information] from the popup menu.
   For details, refer to the information regarding configuration of VLANs on LAN switch blades in the "ServerView Resource Coordinator VE Setup Guide".

3. Define the supported virtual network and VLAN ID

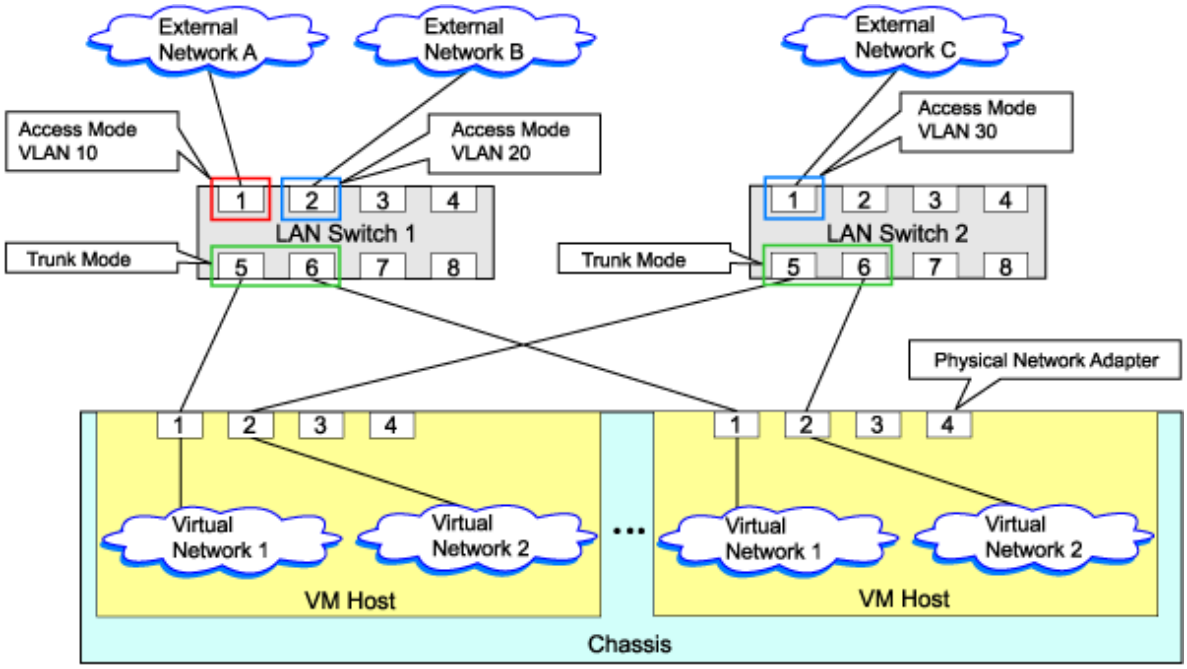
   Supported virtual networks and VLAN IDs are defined in the following definition file of Resource Orchestrator:

   Installation_folder\Manager\etc\customize_data\vnetwork_hyperv.rcxprop

For details on definition file format, refer to "File Format for Virtual Network Definitions".

An example of virtual NIC configuration and connection with virtual networks using network resources is given below:

Figure 4.3 Virtual NIC Configuration and Connection with Virtual Networks Using Network Resources [Hyper-V]



File Format for Virtual Network Definitions

Describe the virtual network definition file in one line as below:

"Virtual Network Name"= *VLAN ID*[, *VLAN ID*...]

For the *VLAN ID*, 1 to 4094 can be specified. When specifying a sequence of numbers, use hyphen ("-") such as in "1-4094".

Example

"Network A"=10

"Network B"=21,22,23

"Network C"=100-200,300-400,500

Spaces before and after equal signs ("=") and commas (",") are ignored.

Describe the virtual network correctly, as the entry is case sensitive.

When using characters of languages other than English, use the following character codes:

- Japanese: Shift-JIS
- Other languages: UTF-8

When there are multiple lines with the same virtual network name, all specified lines are valid.

When the same VLAN ID is included in a line with a different virtual network name, the first occurrence in the file is valid and the lines after it are ignored.

Example

"Network D"=11

"Network D"=12 (*1)

"Network E"=11,15 (*2)

*1: Same as when "Network D"=11,12.
*2: 11 is ignored.

An error occurs during L-Server creation if the definition of the VLAN ID of the network resource connected to the NIC cannot be found.

4.2.5.3 Automatic Network Configuration [Windows/Linux]

If network resources are connected when creating an L-Server, LAN switch blades will be registered automatically as the physical server that the L-Server will operate on.

If an image is specified, the IP address is configured.

However, when a Red Hat Enterprise Linux image is specified when creating an L-Server with server type "Physical", the IP address will not be configured automatically.
Manually configure the IP address after the image has been deployed to the L-Server.

Network resources cannot be connected, as NIC1 is always used for the admin LAN.

Advisory Notes About Automatic Network Configuration

Resource Orchestrator supports automation of network configuration for the following six patterns of physical server configuration.

Table 4.3 Physical Server Configurations Supported for Automatic Network Configuration

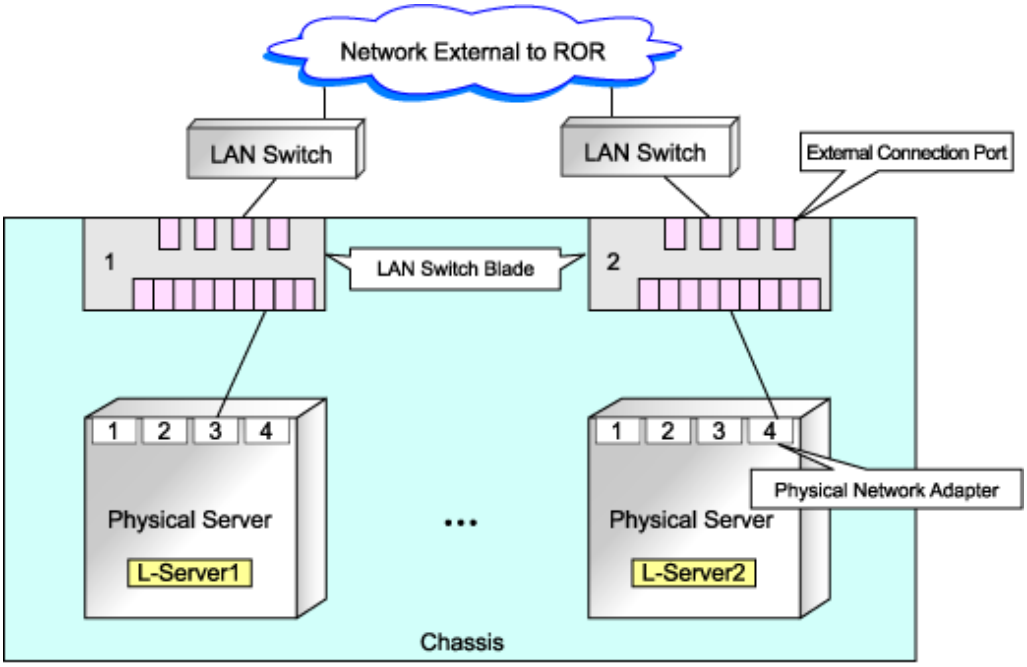
	Hardware	Number of LAN Switch Blades	Specification of Network Resource External Connection Ports	Physical Network Adapter Number
a	PRIMERGY BX900 series servers LAN switch blades PG-SW111 PG-SW112	2	Select one from each of LAN switch blade 1 and 2	3 or 4
b		4	Select one from each of LAN switch blade 1 and 2	3 or 4
c		4	Select one from each of LAN switch blade 3 and 4	5 or 6
d	PRIMERGY BX600 series servers LAN switch blades PG-SW107 (Slots 1, 2) PG-SW104 (Slots 2, 3)	2	Select one from each of LAN switch blade 1 and 2	3 or 4
e		4	Select one from each of LAN switch blade 1 and 2	3 or 4
f		4	Select one from each of LAN switch blade 3 and 4	7 or 8

The NIC number of the L-Server the network resource above is assigned to is the number of the physical network adapter of the physical server.

The numbers of physical network adapters can be checked on the details window of the LAN switch blade.
When external connection ports have not been specified (internal network) or the LAN switch blade is in IBP mode, specify 3 or 4 for the L-Server NIC assigning the network resource.

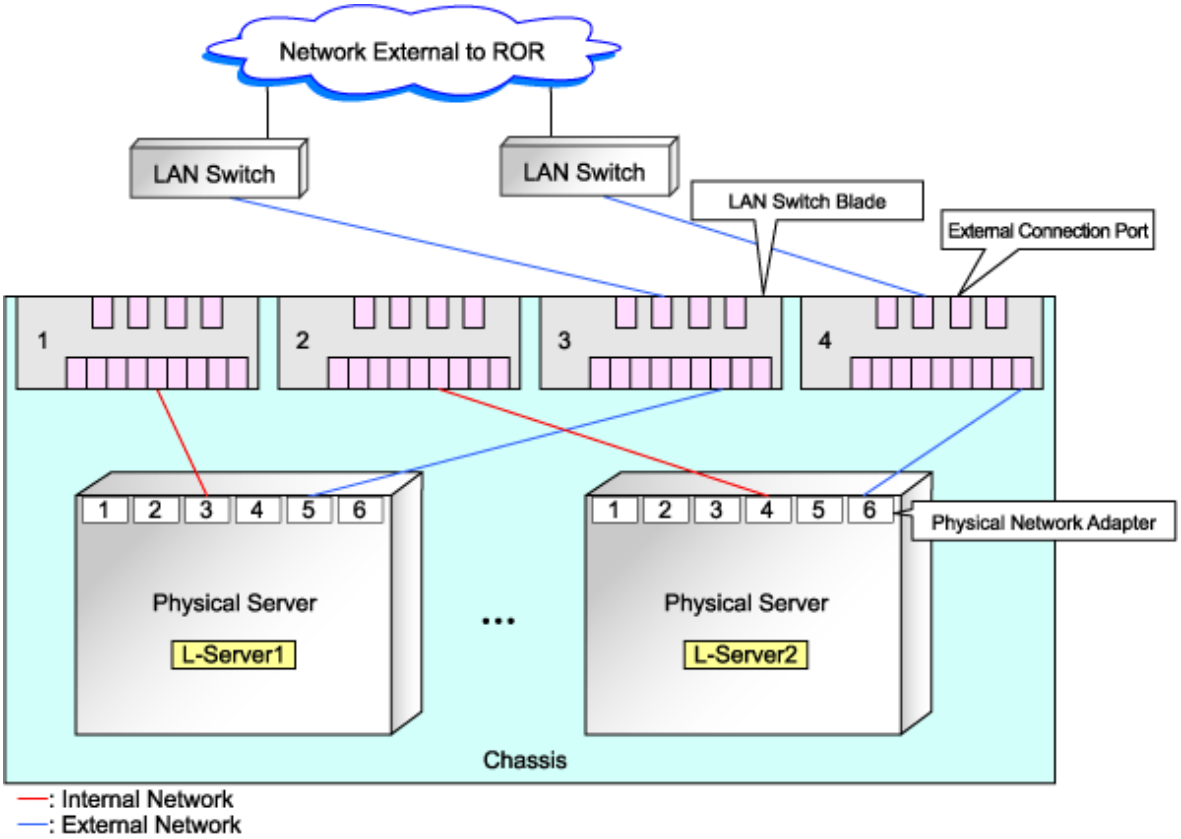
Advisory notes for automatic network configuration (Physical server configuration) pattern A are as below.

Figure 4.4 Advisory Notes for Automatic Network Configuration (Physical Server Configuration) Pattern A



Advisory notes for automatic network configuration (Physical server configuration) pattern C are as below.

Figure 4.5 Advisory Notes for Automatic Network Configuration (Physical Server Configuration) Pattern C



4.3 Registering to a Resource Pool

This section explains how to register a resource managed by Resource Orchestrator to a resource pool.

A resource pool is a type of resource folder on the orchestration tree, which stores the resources to select when creating or adding an L-Server.

A resource pool type is specified when creating a resource pool, and only resources of a specific type are stored in each type of resource pool. When installing Resource Orchestrator, one resource pool is created for each resource pool type. For details on operating multiple resource pools, refer to "Appendix A Resource Pools".

Resource Pool Types

The following types of resource pools exist:

- VM pool

  A pool that stores VM hosts used when creating new servers (VM).

- Server pool

  A pool that stores physical servers.

- Storage pool

  A pool that stores virtual storage resources used to remove disk resources when creating new L-Servers.

- Network pool

  A pool that stores the networks assigned to L-Servers.

- Address pool

  A pool that stores the IP addresses, MAC addresses, and WWNs assigned to L-Servers.

- Image pool

  A pool that stores the cloning images to deploy on L-Servers.

Resource Types

The following types of resources can be stored in resource pools.

- VM host resources

  Stored in VM pools.

- Physical server resources

  Stored in server pools.

- Virtual storage resources

  Stored in storage pools.

- Network resources

  Stored in network pools.

- Address set resources

  Stored in address pools.

- Image resources

  Stored in image pools. The following two types are available:

  - Virtual image resources

    An image that uses a template from VM management software (VMware vCenter Server and System Center Virtual Machine Manager) to create VM guests.

  - Physical image resources

    An image that uses a cloning image from cloning of a physical server in RCVE.

Templates created using VM management software, and cloning images created using RCVE, are automatically detected.

Moreover, images can be collected after creating an L-Server and manually installing an operating system.

This manual explains how to create an L-Server and collect images.

4.3.1 VM Host Resources

This section explains how to register a VM host in a VM pool.

Use the following procedure to register a VM host in a VM pool:

1. In the RC console orchestration tree, right-click VM pool, and select [Register Resources] from the popup menu.
   The [Register Resources] dialog is displayed.
2. Select the VM host to register and click <OK>.
   The VM host is registered.

4.3.2 Physical Server Resources

This section explains how to register a physical server in a server pool.

Use the following procedure to register a physical server in a server pool:

1. In the RC console orchestration tree, right-click server pool, and select [Register Resources] from the popup menu.
   The [Register Resources] dialog is displayed.
2. Select the physical server to register and click <OK>.
   A physical server is registered.

4.3.3 Virtual Storage Resources

This section explains how to register a virtual storage resource in a storage pool.

Use the following procedure to register a virtual storage resource:

1. In the RC console orchestration tree, right-click the target storage pool, and select [Register Resources] from the popup menu.
   The [Register Resources] dialog is displayed.
2. Select the virtual storage resource to register and click <OK>.
   The virtual storage resource is registered.

4.3.4 Network Resources

This section explains how to create a network resource and register the resource in a network pool.

Use the following procedure to create a network resource and register it in a network pool:

1. In the RC console orchestration tree, right-click the target network pool, and select [Create Resource] from the popup menu.
   The [Create Network Resource] dialog is displayed.
2. Enter the items below, and click <OK>.

   Network Resource Name

   Enter a name for the network resource.
   Enter up to 64 characters beginning with an alphanumeric character (upper or lower case), and including alphanumeric characters (upper or lower case), underscores ("_"), or hyphens ("-").

   Label (Optional)

   A custom label can be defined for the network resource. User-defined labels make it easier to identify the resource.
   Enter up to 32 alphanumeric characters or symbols.

Comments (Optional)

A custom comment can be defined for the network resource. For example, registering detailed work content, troubleshooting, and recovery procedures can speed up recovery.
Enter up to 256 alphanumeric characters or symbols.

VLAN ID

Specify the VLAN ID to assign to the LAN switch blade and virtual switch. Select a VLAN ID assigned to the external port of the LAN switch blade, or enter a number. Specify a pre-designed VLAN ID.

Enter an integer between "1" and "4094".

- For external networks including blade servers:

  Select the VLAN ID of an external port.

- For internal networks or external networks with rack mount servers only:

  Enter a VLAN ID.

By specifying an ID, the next time an external connection port is configured, the displayed information is refined.

External Connection Port Settings (VLAN ID/Chassis Name/Switch Name/Port Number/VLAN Type) (Optional)

Specify the external connect port to use when automatically setting external networks, including blade servers. Do not specify for internal networks or external networks with rack mount servers only.

Check the checkbox for the external connection port that was designed/configured beforehand. Select two ports to make a pair. If there are multiple chassis, select the ports for all the chassis to use.

If you connect an external network to an L-Server, perform the settings for the internal ports and virtual switches of the LAN switch blade to enable communication for the specified ports.

When specifying a port in a link aggregation configuration, confirm the settings of the LAN switch blade in advance, and select one or more ports for which link aggregation has been configured.

When specifying a port in a link aggregation configuration, if the target port is not displayed in the external connection port list, clear the "Narrow ports using VLAN IDs" checkbox. Regardless of the VLAN ID, the ports available for external connections on the LAN switch blade are displayed.

Subnet Settings (Optional)

Enter if you want to automatically set a network and IP address for the NIC connected to the network resource when deploying an image on an L-Server. IP addresses included in subnet addresses are allocated to L-Servers, but it is possible to specify a range of addresses to exclude. Clicking <Setting> will display a dialog, specify the range of IP addresses to exclude, and click <Add>. To reactivate the excluded IP addresses, check the checkbox, and click <Delete>. Clicking <OK> displays the original dialog with the entered settings.
Network addresses and broadcast addresses are automatically excluded.

Subnet Address/Subnet Mask

Enter the subnet address and subnet mask to set using the "xxx.xxx.xxx.xxx" format.
The maximum value for a subnet mask is 255.255.255.255 (32bit mask) and the minimum value is 255.255.0.0 (16bit mask). However, 255.255.255.254 cannot be specified.

Default Gateway (Optional)

Enter the IP address for the default gateway to use when communicating externally of the subnet.

IP Address to Exclude

IP addresses that are being used for other devices but you do not want to automatically assign to an L-Server (because of plans for future use) can be specified.

Information

As the network address and broadcast address are automatically excluded, do not specify them as IP addresses to exclude.

The network resource is created and registered in a network pool.

4.3.5 Address Set Resources

This section explains how to create an address set resource and register the resource in an address pool.

When creating an L-Server with the server type "Physical", an address set resource is required.

Use the following procedure to create an address set resource and register it in an address pool:

1. Register a WWN in an address pool.

   To register a WWN in an address pool, execute the rcxadm addrset create command. For details on the rcxadm addrset create command, refer to "E.3.8 rcxadm addrset".

2. Register a MAC address in an address pool.

   To register a MAC address in an address pool, execute the rcxadm addrset create command. For details on the rcxadm addrset create command, refer to "E.3.8 rcxadm addrset".

   An address set resource will be created and registered in the address pool.

4.4 Creating an L-Server Template

This section explains how to create an L-Server template.

An L-Server template comprises pre-defined specifications (number of CPUs, memory capacity, disk capacity, number of NICs, etc.) for an L-Server.

To create an L-Server template, export the provided sample L-Server template and edit the exported template. A new L-Server template can be created by importing the edited template.

Note

Use the UTF-8 character code for L-Server templates.

4.4.1 Exporting a Template

This section explains how to export an L-Server template.

Use the following procedure to export an L-Server template:

1. Select the RC console orchestration tree.

   On the [Template List] tab, right-click the L-Server template to export and select [Export] from the popup menu.
   Displays the [File Download] dialog.

2. Click <Save>.
   The L-Server template is exported.

From the command-line, execute rcxadm template export.
For details on the rcxadm template export command, refer to "E.5.1 rcxadm template".

4.4.2 Editing a Template

Edits an L-Server template. For details on how to edit the XML definition for an L-Server template, follow the instructions in "H.2 L-Server Template".
If a template is imported without editing the L-Server template name, the content of the existing L-Server template is overwritten. If an L-Server template is imported after the name is edited from when it was exported, the L-Server template is added.

4.4.3 Importing a Template

This section explains how to import an L-Server template.

Use the following procedure to import an L-Server template:

1. Select [File]-[L-Server Template]-[Import] from the RC console menu.
2. Specify the file name, and click <OK>.
   The L-Server template is imported.

   When a registered L-Server template name is included in the specified file, a warning dialog is displayed to confirm whether or not to overwrite the L-Server template.
   When overwriting it, click <OK>. When not overwriting it, click <Cancel> and return to the dialog to specify the file name.

From the command-line, execute rcxadm template import.
For details on the rcxadm template import command, refer to "E.5.1 rcxadm template".

4.5 Deleting a Template

This section explains how to delete an L-Server template.

L-Server templates that are no longer required, including the sample template, can be deleted.
Use the following method to delete an L-Server template:

On the [Template List] tab, right-click the L-Server template to delete, and select [Delete] from the popup menu.

From the command-line, execute rcxadm template delete.
For details on the rcxadm template delete command, refer to "E.5 L-Server Template Operations".

Chapter 5 L-Servers

This chapter explains the details of L-Server creation and operation.

5.1 Creation Using an L-Server Template

This section explains how to create an L-Server using an L-Server template to automatically select resources from a resource pool.

For details on how to manually install the operating system in the L-Server, refer to "5.1.1 Manual OS Installation".

For details on how to create an L-Server without using an L-Server template, or how to manually specify resources when creating an L-Server, see "Appendix D L-Server Parameter Details".

Use the following procedure to create an L-Server using an L-Server template:

1. Select the RC console orchestration tree. Select an L-Server template on the [Template List] tab of the Main Panel, and click <Create>.
   The [L-Server Register] dialog is displayed.

2. On the [Basic Information] tab of the [L-Server Register] dialog, set the following items.

   Name

   Enter a name for the L-Server.
   Enter up to 64 characters beginning with an alphanumeric character (upper or lower case), and including alphanumeric characters (upper or lower case), underscores ("_"), or hyphens ("-").

   Template

   Specify an L-Server template created in "4.4 Creating an L-Server Template".
   The L-Server template specified from [Template List] is displayed. Check the specifications (CPU performance, memory capacity, disk capacity (multiple)) for the L-Server to create.

   - For physical

     Model name, disk capacity (multiple) are displayed.

   - For virtual

     CPU performance, memory capacity, and disk capacity (multiple) are displayed.

   Image

   Specify a cloning image to deploy. Cloning images can be selected from the available image pools. To manually install an operating system, select "None".
   When "None" is selected, it is necessary to select the OS type on the [Server] tab.
   For details, refer to "D.2 [Server] Tab".

   If you specify a cloning image, the parameters for the operating system must also be specified. For details on the items that must be set, refer to "D.5 [OS] Tab".

   Information

   When a cloning image is specified, the sizes of system disks with the server type "VM" will be changed to that when the cloning image was deployed.

   Network (NIC)

   Select a network resource to connect to the NIC of the L-Server.
   A list of the NICs defined in the L-Server template is displayed. Select the network to connect to each NIC from the "Network to Connect to" column.

   When server model names have been described in the L-Server template, the number of NICs displayed will vary depending on the model name.

- When the model name is BX series:

```
PRIMERGY BX620 series  Number of NICs: 6
PRIMERGY BX920 series  Number of NICs: 4
PRIMERGY BX922 series  Number of NICs: 4
```

- When the model name is something other than BX series:

  The number of NICs will be 1, and <Add> and <Delete> buttons will be displayed in the network (NIC) parameters. Perform settings based on the physical server the L-Server will be located on.

  Clicking <Add> adds a network.
  Clicking <Delete> deletes the network in the last line of the list.

If the L-Server is a physical server, NIC number is the physical NIC number. The first NIC automatically becomes the admin LAN. Regardless of whether or not redundancy of the admin LAN is performed, network resources cannot be specified for the second NIC, so select "not connected".

Label (Optional)

A custom label can be defined for the L-Server. User-defined labels make it easier to identify the server.
Enter up to 32 alphanumeric characters or symbols.

Comments (Optional)

A custom comment can be defined for the L-Server. For example, registering detailed work content, troubleshooting, and recovery procedures can speed up the recovery of affected applications when a problem occurs.
Enter up to 256 alphanumeric characters or symbols.

3. Click <OK>.
   The L-Server is created.

Point

When manually installing the operating system in the L-Server or using the management console of server virtualization software, select the L-Server in the orchestration tree, and operate the VM for the *VM_name* displayed in [Resource Details].

The following name is automatically allocated for *VM_name*:

L-Server_name - *Number*

Number is automatically set by Resource Orchestrator to avoid a naming overlap on server virtualization software if an L-Server with the same name is created during "Appendix B Resource Folders" operations.

VM_name can be changed on server virtualization software. Even if *VM_name* is changed, L-Server and VM support are automatically maintained.

Note

When creating an L-Server, log off ETERNUSmgr of ETERNUS storage registered on ESC.

When operating NetApp storage in cluster environments and operating a partial system due to system trouble, perform operation after recovering the NetApp storage and returning the system to cluster operation.

When the status of the VM host and virtual storage is one other than "normal", the resource will be excluded from L-Server assignment regardless of its available space.

[Hyper-V]
When using the following SCVMM functions for the VM of the created L-Server, after this the L-Server will not be recognized or displayed in the orchestration tree, and operation of the L-Server becomes unavailable.

- Saving in the library, deploying from the library
- New Template

When "copying" is performed, the copied VM is not recognized as an L-Server.

Information

[Hyper-V]

- VM guests created as L-Servers have the following configuration:

  Disk and DVD

  First Disk (System Volume)

  Connected to the primary channel (0) of IDE device

  Second or Later Disk

  Connected to a SCSI adapter as data disk (*1)

  DVD Drive

  Connected to the secondary channel (0) of IDE device

  *1: Cannot be used on guest OS's without the integrated service. Only boot disks connected to the IDE adapter can be used.

  Virtual Network Adapter

  When a guest OS that Hyper-V supports is specified, a converged network adapter will be used. When a different OS has been selected, an emulated network adapter will be added.

  For details on the guest OS's supported by Hyper-V refer to the following Microsoft web site.

  Microsoft web site

URL: http://www.microsoft.com/windowsserver2008/en/us/hyperv-supported-guest-os.aspx (As of November 2010)

  CPU Type

  "1.00GHz Pentium III Xeon" (the SCVMM default value) is specified.

  The CPU type is used for internal operations of SCVMM, and it does not indicate the CPU performance. It is also different from the information displayed for the computer information of the guest OS.

- For cloning images, only system volumes are collected and deployed.

  When registering a template created using SCVMM in the image pool of Resource Orchestrator, use a template created from a VM guest which has the system volume (a disk connected to primary channel (0) of the IDE device).

  In other configurations, deploying using Resource Orchestrator will create VM guests without system volumes.

5.1.1 Manual OS Installation

This section explains how to manually install an L-Server.

- When the server type is "Physical"

  For manual OS installation, installation by remote console is recommended after starting the MB (Management Blade) or iRMC (Remote Management Controller) screen.

  When installing an OS and a multipath driver, it is necessary to make only one access path from the server to the storage.

  It is also necessary to install an agent after installing the OS, and then register it.

  For details on how to install agents, refer to "2.2 Installing the Agent".

- When the server type is "VM"

  To manually install an operating system, use VM management software.

When installing an OS manually, refer to the VMware guest OS installation guide.

VMware guest OS installation guide

URL: http://www.vmware.com/pdf/GuestOS_guide.pdf (As of November 2010)

When performing cloning of a Windows OS on an L-Server, the Microsoft Sysprep tool is necessary.
For details on obtaining tool and its installation, refer to the information regarding the Microsoft Sysprep tool in the "vSphere Basic System Administration" manual and the following VMware web site.
The necessary files vary depending on the CPU architecture (x86, x64) of the target system, and the OS version. When using Windows Server 2008, the modules are already configured in the OS so there is no need to obtain new modules.

"vSphere Basic System Administration" manual

URL: http://www.vmware.com/pdf/vsphere4/r40_u1/vsp_40_u1_admin_guide.pdf (As of November 2010)

VMware web site

URL: http://kb.vmware.com/selfservice/microsites/search.do?language=en_US&cmd=displayKC&externalId=1005593 (As of November2010)

[Hyper-V]
To use a guest OS supported by Microsoft on Hyper-V, it is necessary to install a virtual guest service on the guest OS.

For details on virtual guest service installation, refer to the Help of SCVMM.

5.1.2 Collecting and Deleting Cloning Images

This section explains how to collect and delete cloning images.

Collecting a Cloning Image

Use the following procedure to collect cloning images:

After installing the operating system, right-click the target L-Server in the orchestration tree, select [Cloning]-[Collect] from the popup menu, and click <OK>.
Cloning images are stored in image pools.

When the server type is "Physical", perform collection of cloning images after placing the server used as an L-Server into maintenance mode from the server tree.

For details, refer to the information about cloning in the "ServerView Resource Coordinator VE Setup Guide".

However, the network parameter auto-configuration function which can be configured for cloning images cannot be used for Resource Orchestrator.

When the target server of cloning image collection has a redundant NIC configured, release redundancy and then perform collection.

[VMware]
When "Automatic" is specified in the [Collect a Cloning Image] dialog, it is assumed that the virtual storage resource containing the L-Server for collecting cloning images has been specified.

[Hyper-V]
Images are stored in the SCVMM library.

Specify a library which has sufficient available disk space to store the collected images.

When "Automatic" is specified in the [Collect a Cloning Image] dialog, selection is made from libraries registered with SCVMM, but collection of images may fail as the available disk space of libraries is not managed by SCVMM.

A given cloning image (identified by its name attribute) can be managed by image version.

If a cloning image is created using VM management software, it can be used as is.

Deleting a Cloning Image

Use the following procedure to delete cloning images:

1. Left-click the target image pool in the orchestration tree.

   The [Resource List] tab is displayed.

2. Right-click the target cloning image in the image pool, and select [Delete] from the popup menu.

3. Click <OK>.

   The cloning image is deleted.

[Hyper-V]
Resource Orchestrator uses SCVMM templates for collection of images.

When collecting images from L-Servers, a template is created using a name with the version number added to the image name. When retrieving the template created by the user as an image, the template is treated as an image.

In order to collect images of L-Servers, a work area equal to the size of the disk (the system volume, all data disks, snapshot, and configuration definition file) of the target of L-Server creation is necessary. This work area is released, when collection of images is complete.

When collecting images, data disks other than the system volume are deleted.

In Resource Orchestrator, the virtual hard disk of the primary channel (0) of the IDE device is managed as the system volume.

DVD drives other than the secondary channel (0) of the IDE device are deleted. A DVD drive is added to the secondary IDE channel (0) even if there is no DVD drive in the image. If DVD drives other than this drive exist, they are deleted.

Collection of images cannot be collected, when there are snapshots. Collect images after deleting snapshots. When creating checkpoints from the SCVMM management console or creating snapshots from Hyper-V manager, collection of images will fail.

When retrieving SCVMM templates created by users using SCVMM, manage them as follows:

- The template name is the image name.
- The virtual hard disk of the primary channel (0) of the IDE device is managed as a system volume.
- When creating an L-Server from an image retrieved from a template with data disks other than the system volume, the data disks other than the system volume are deleted.
- When creating an L-Server from an image with no system volume, an L-Server with no system volume will be created.
- On L-Servers created by retrieving an image from a template where DVD drives are connected to somewhere other than the secondary IDE channel (0), these DVD drives will be deleted.
- When L-Servers are created from an image retrieved from a template not connected to a DVD drive, the DVD drive will be added to the secondary IDE channel (0).

When SCVMM template creation requirements are not met, or configuration changes are performed outside Resource Orchestrator, collection of images may fail.

When deleting cloning images, the corresponding templates in the SCVMM library are deleted.

When deleting these templates, related files (such as .vhd, .vfd, and Unattend.xml) will remain in the SCVMM library as only template definition files are deleted.

When these related files are unnecessary, delete them individually from SCVMM.

Information

[Hyper-V]

Access Control Configuration File of Image Storage Location

By specifying unavailable library shared path names in the access control configuration file of the image storage destination in advance, cloning image storage destinations can be controlled based on user groups.

Storage Location of the Configuration File

[Windows]
Installation_folder\Manager\etc\customize_data

[Linux]
/etc/opt/FJSVrcvmr/customize_data

Configuration File Name

The configuration files can be divided into definitions that are available for each user group and definitions that are common to the system. When there are both type of files, the limitations of both are valid.

- For User Groups

  library_share_user_group_name_deny.conf

- Common to System

  library_share_deny.conf

Configuration File Format

In the configuration file, library shared path names are entered on each line.

```
Library_shared_pathname
```

Example

An example definition file is indicated below:

```
\\rcxvmm1.rcxvmmshv.local\MSSCVMMLibrary
\\rcxvmm2.rcxvmmshv.local\lib
```

5.2 Power Operations

This section explains the basic operations of an L-Server.

Starting an L-Server

This section explains how to startup an L-Server.

Right-click the target L-Server in the orchestration tree, and select [Power]-[ON] from the popup menu.

In the displayed confirmation dialog, click <OK>.

The L-Server is started.

From the command-line, execute rcxadm lserver start.

For details on the command, refer to "E.3.1 rcxadm lserver".

Stopping an L-Server

This section explains how to stop an L-Server.

Right-click the target L-Server in the orchestration tree, and select [Power]-[OFF] from the popup menu.

In the displayed confirmation dialog, click <OK>.

The L-Server is stopped.

To perform a forced stop, select [Power]-[OFF (Forced)], and click <OK> in the displayed confirmation dialog.

From the command-line, execute rcxadm lserver stop.

For details on the command, refer to "E.3.1 rcxadm lserver".

Note

If no OS is installed on the L-Server, the L-Server cannot be stopped. Perform a forced stop.

Restarting an L-Server

This section explains how to restart an L-Server.

Right-click the target L-Server in the orchestration tree, and select [Power]-[Reboot] from the popup menu.

In the displayed confirmation dialog, click <OK>.

The L-Server is restarted.

To perform a forced reboot, select [Power]-[Reboot (Forced)], click <OK> in the displayed confirmation dialog.

From the command-line, execute rcxadm lserver restart.

For details on the command, refer to "E.3.1 rcxadm lserver".

Note

If no OS is installed on the L-Server, the L-Server cannot be restarted. Perform a forced restart.

5.3 Modifying an L-Server

This section explains how to perform L-Server configuration changes.

5.3.1 Modifying Specifications

This section explains how to modify L-Server specifications. Use the following procedure to modify L-Server specifications:

Note

When the server type is "Physical", modification of specifications is not possible.

1. Right-click the target L-Server in the orchestration tree, and select [Change Setting]-[Specification] from the popup menu.
   The [Modify Specification of L-Server] dialog is displayed.
2. Adjust the values in the [Modify Specification of L-Server] dialog, and click <OK>.
   The current values for each item are displayed in the [Modify Specification of L-Server] dialog. Items that have been changed are indicated with an asterisk ("*") in front of the item.

The following parameters cannot be changed while the L-Server is powered on.

- CPU Performance

- Number of CPUs
- Memory Size
- OS Type

From the command-line, execute rcxadm lserver modify.
For details on the command, refer to "E.3.1 rcxadm lserver".

5.3.2 Attaching and Detaching Disks

This section explains how to modify the disk configuration of an L-Server.

Note

Addition and deletion of disks is not possible when the server type is "Physical".

Attaching a Disk

Use the following procedure to attach a disk to an L-Server:

1. Right-click the target L-Server in the orchestration tree, and select [Change Setting]-[Attach Disk] from the popup menu.
   The [Attach Disk] dialog is displayed.
2. Enter the items below, and click <OK>.

   Disk Size

   Enter the disk size of the additional disk as a number with up to one decimal place, in units of gigabytes. "10" is the default size setting.

   Virtual Storage

   The default setting for virtual storage is "Automatic". Resource pool or virtual storage can be selected.

From the command-line, execute rcxadm lserver attach.

For details on the command, refer to "E.3.1 rcxadm lserver".

Information

[Hyper-V]
Data disks are connected to the L-Server as SCSI disks. They cannot be connected as IDE disks.

Detaching a Disk

To detach a disk, the power of the L-Server must be off.

To detach a disk while the power of the L-Server is on, specify the -online option command.

Use the following procedure to detach a disk assigned to an L-Server:

1. Right-click the target L-Server in the orchestration tree, and select [Change Setting]-[Detach Disk] from the popup menu.
   The [Detach Disk] dialog is displayed.
2. Enter the following items, check the "Detached disk information will be deleted. Are you sure?" checkbox, and click <OK>.

   Disk Resource Name

   Select the disk resource to detach. Disk resources other than system disks are displayed in the list.

From the command-line, execute rcxadm lserver detach.

For details on the command, refer to "E.3.1 rcxadm lserver".

[Hyper-V]
When changing the configuration, a maximum of up to four disks can be specified at one time.

To perform addition of five or more disks, please perform an additional configuration change.

5.3.3 Modifying the Basic Information

This section explains how to modify the basic information of L-Servers. Use the following procedure to modify the basic information of L-Servers:

1. Right-click the target L-Server in the orchestration tree, and select [Change Setting]-[General] from the popup menu.

   The [Change Setting for a Resource] dialog is displayed.

2. In the [Change Setting for a Resource] dialog, edit the items you want to modify, and click <OK>.

   The basic information of the L-Server is modified.

To change an L-Server name, the L-Server must be stopped.

When the L-Server power status is on, the L-Server name cannot be changed.

When the server type is "Physical", the L-Server name cannot be changed, regardless of the power status.

5.4 Deleting an L-Server

This section explains how to delete an L-Server. To delete an L-Server the L-Server must be stopped.

If an L-Server is deleted, the resources assigned to the L-Server are automatically made available for reuse.

1. Right-click the target L-Server in the orchestration tree, and select [Delete] from the popup menu.
   The [Delete L-Server] dialog is displayed.

2. Click <OK>.
   The target L-Server is deleted.

Note

When deleting an L-Server, log off from the ETERNUSmgr of ETERNUS storage registered on ESC.

When operating NetApp storage in cluster environments and operating a partial system due to system trouble, perform operation after recovering the NetApp storage and returning the system to cluster operation.

From the command-line, execute rcxadm lserver delete.

For details on the command, refer to "E.3.1 rcxadm lserver".

5.5 Snapshots, and Backup and Restoration of L-Servers

This section explains how to perform snapshots, and backup and restore of an L-Server.

5.5.1 Snapshot

This section provides an overview of snapshots for L-Servers.

A snapshot saves the content of an L-Server disk at the time the snapshot is taken. If the server type is "VM", the snapshot function of server virtualization software is used.
When the server type is "Physical", the snapshot function cannot be used.

If multiple snapshots are collected of the same L-Server, the snapshots are managed by automatically adding version numbers to the snapshot file name starting from 1. If the number of snapshot versions exceeds the limit (standard limit is 3), the oldest snapshot will be deleted. Use a command to change the maximum number of snapshot versions. For details on the command, refer to "E.7.2 rcxadm imagemgr".

To collect a snapshot, the power of the L-Server must be off to avoid any inconsistencies occurring in the data and file system on the disk.

However, by adding the -online option command for an L-Server that has been set in advance to enable snapshot collection when the server is running, snapshots can be collected when the server is running.
Snapshots cannot be collected from the GUI when the server is running.

For details on the settings required to collect a snapshot when the server is running, refer to the snapshot manual of the server virtualization software.
For details on the command, refer to "E.4.1 rcxadm image".

Note

The Resource Orchestrator snapshot uses the checkpoint function of SCVMM.

To collect snapshots, sufficient free space is necessary to create a difference disk on the storage destination of VM guest.
When connecting the VM management software using the path through disk, snapshot creation will fail.

Operation with snapshots collected is not recommended due to the following reasons:

- When snapshots are collected, operation uses disk difference, and performance may deteriorate.
- If a snapshot is created from a VM guest that has been moved between servers (migration), and the snapshot is restored to a different VM host, the status on SCVMM becomes "Stored" and the VM may not be able to be started. In this situation, it is necessary to return the VM guest to the VM host from which the snapshot was collected and then start it.
- For adjustment of the difference disk, it is necessary to delete not only all snapshots collected using Resource Orchestrator, but also all checkpoints created using VM management software. Adjustment of the disk is automatically performed by SCVMM, but the operation may take a long time, because it is only performed while the target VM guest is stopped.

Information

The snapshot function provided by server virtualization software records the disk from the last update. Consequently, when a disk failure occurs, the snapshot function becomes unavailable at the same time. Snapshot can be used as a corrective measure for problems such as the following:

Example

- For recovery when a problems occurs with the applied patch
- For recovery when a problem occurs when changing operating system parameters

Collecting a Snapshot

This section explains how to collect a snapshot.

To collect a snapshot, the L-Server must be stopped. Note that a snapshot can be collected from the command-line when L-Server is running.

1. Right-click the target L-Server in the orchestration tree, and select [Snapshot]-[Collect] from the popup menu.

   The [Create a Snapshot] dialog is displayed.

2. Enter the items below, and click <OK>.

   Comment

   Enter a comment that identifies the snapshot.
   Enter up to 128 alphanumeric characters or symbols.

   The snapshot is collected.

From the command-line, execute rcxadm image snapshot.

For details on the command, refer to "E.4.1 rcxadm image".

Restoring a Snapshot

This section explains how to restore a snapshot.

To restore a snapshot, the L-Server must be stopped.

1. Right-click the target L-Server in the orchestration tree, and select [Snapshot]-[Restore] from the popup menu.
   The [Restore a Snapshot] dialog is displayed.
2. Select the version of the snapshot to restore, and click <OK>.

   The snapshot is restored.

For details on the command, refer to "E.4.1 rcxadm image".

Deleting a Snapshot

This section explains how to delete unnecessary snapshots.

1. Right-click the target L-Server in the orchestration tree, and select [Snapshot]-[Delete] from the popup menu.
   The [Delete a Snapshot] dialog is displayed.
2. Select the version of the snapshot to delete, and click <OK>.

   The snapshot is deleted.

For details on the command, refer to "E.4.1 rcxadm image".

5.5.2 Backup and Restore

This section explains how to back up and restore L-Servers.

When L-Server type is "Physical", backup and restore can be used.

Backup and restore of L-Servers is the function for performing backup and restoration of L-Server system images.

For details, refer to the information about backup and restore in the "ServerView Resource Coordinator VE Operation Guide".

5.6 Moving an L-Server Between Servers (Migration)

This section explains how to move (migrate) an L-Server between servers.

When the server type is "Physical", moving between servers (migration) cannot be used.

Use the following procedure to migrate between servers:

1. Right-click the target L-Server in the orchestration tree, and select [Migration among Servers] from the popup menu.
   The [Migration among Servers] dialog is displayed.
2. Select the destination VM host name from the list, and click <OK>. Only the names VM hosts available for migration are displayed in the list.
   The selected L-Server is moved to its new host.

From the command-line, execute rcxadm lserver migrate.

For details on the command, refer to "E.3.1 rcxadm lserver".

Note

Select a destination VM host with available CPU capacity and memory. If there is insufficient CPU capacity or memory, migration between servers or starting of L-Servers may fail.

5.7 Changing Physical Server Usage

This section explains how to change physical server usage.

Changing server usage is the function for preparing more L-Servers than physical servers and is used by switching the startup L-Server. This function enables effective use of server resources as the physical server can be changed depending on the time period and situation.

The boot disk and IP address of the L-Server are stored, even while other L-Servers use the physical server.

This function can be used, when an L-Server is actually a physical server. When using virtual servers, multiple L-Servers can be located on a single VM host without any specific configuration, giving the same effects as changing the physical server.

The following two methods are available:

- Method 1: Use multiple L-Servers, switching between them, on a single physical server

  The physical server which starts the L-Server is always the same.

- Method 2: Use multiple L-Servers, switching between them, on unused servers within a server pool

  Depending on the available spare servers in a server pool, the physical server which starts the L-Server will change.

5.7.1 Configuring the Admin LAN IP Address Range for Usage Change

To create more L-Servers than physical servers, it is necessary to specify the range of admin LAN IP addresses which can be allocated to the L-Servers.

Execute the rcxadm network create command, and specify the range of admin LAN IP addresses.

For details on the command, refer to "E.3.5 rcxadm network".

It is necessary to perform this operation before registering any resources (after the first login after installation).

It is used as the admin LAN IP address for all L-Servers with the server type "Physical". When creating an L-Server, do not specify "ADMINLAN_RESOURCE".

- For the Vlanid tag, specify a value that does not overlap with any others.
- For the Network name tag and AddressSet name tag, specify "ADMINLAN_RESOURCE".
  Do not specify anything other than this name.
- For the start and end addresses, specify an IP address in the same subnet as the one specified for the manager during its installation.
- For Exclude tag specification, specify "MMB IP address for chassis" and "iRMC IP address for all physical servers that may have been registered".

For details on the XML file, refer to "H.4 Network Resources".

An example of an XML file is described below.

Example

```
<?xml version="1.0" encoding="utf-8"?>

<Pool name="NetworkPool">
<Network name="ADMINLAN_RESOURCE">
  <Comment></Comment>
  <Vlanid>1000</Vlanid>
  <AddressSet name="ADMINLAN_RESOURCE" subnet="192.168.1.0" mask="255.255.255.0"
start="192.168.1.1" end="192.168.1.254">
    <Comment></Comment>
    <Exclude>
      <AddressRange start="192.168.1.1" end="192.168.1.49" />
      <AddressRange start="192.168.1.51" end="192.168.1.191" />
    </Exclude>
    <Gateway address="192.168.1.1" />
  </AddressSet>
```

```
</Network>
</Pool>
```

5.7.2 Configuring L-Servers for Usage Change

Use the following procedure to configure L-Server usage changes:

Repeat 1. to 4. the same number of times as the number of physical servers which are used for usage change.

1. Release a physical server

   When creating an L-Server specifying "Physical Server" from the [Server] tab, if it matches the following conditions, it is necessary to release the physical server from the L-Server. If the server does not match the following conditions, it is not necessary to release the physical server.

   - When specifying "Physical Server"

     Another L-Server is already assigned to the physical server that has been specified.

   - When specifying "Pool"

     An L-Server is assigned to all physical servers in the specified server pool

   Execute the rcxadm lserver detach command, and release the physical servers from the L-Server.

   ```
   # rcxadm lserver detach -name L-Server_name -type server <RETURN>
   ```

   For *L-Server_name*, specify an L-Server that has already been assigned to a physical server.

   After releasing the physical servers from the L-Server, do not start the released L-Server until 2. to 4. are complete. If the released L-Server is started, it is necessary to perform releasing of the physical server in 1.

2. Create an L-Server

   Create an L-Server, using the procedure in "5.1 Creation Using an L-Server Template".

   When creating an L-Server for the second or later time, do so with "None" set for the image. Deploy cloning images after that.

   For details, refer to the information about deploying cloning images in the "ServerView Resource Coordinator VE Setup Guide".

3. Change L-Server configuration

   Execute the rcxadm lserver modify command, and in the XML file of the L-Server change the content of the AutoPreserve element to "true".

   Performing this operation, releases the server resources automatically when they are powered-off, and saves storage and network resources in preparation for the next startup.

   With this configuration, method 2 can be used for switching from the server allocated in step 1. to another server.

   When operating using method 2, in the XML file of L-Server, specify "Automatic" or the "*server_pool_for_use*" in the "Primary" element.

   For details on the command, refer to "E.3.1 rcxadm lserver".

   For details on the XML file, refer to "H.3 L-Servers".

   An example of an XML file is described below.

   Example

   ```
   <?xml version="1.0" encoding="utf-8"?>
   <Resources>
     <LServer name="lserver-test4" label="x">
      <Policy>
         <Repurpose>true</Repurpose>
      </Policy>
       <Primary>
   ```

```
      <PhysicalServer name="BX900-slot1" /> or <Pool name="/TenantA/ServerPool" />
    </Primary>
  </LServer>
</Resources>
```

4. Stop the L-Server

   If an L-Server is operating, stop it.

   For details, refer to "Stopping an L-Server" in "5.2 Power Operations".

5.7.3 Operation

The methods for operating physical servers after usage changes are as follow.

Perform the procedure given in "5.7.2 Configuring L-Servers for Usage Change" before performing operation.

- For method 1.

  1. Stop the source L-Server for usage change

     Stop L-Servers operating on physical servers which are required for change usage.

     For details, refer to "Stopping an L-Server" in "5.2 Power Operations".

  2. Start the destination L-Server for usage change

     Start the destination L-Server for usage change.

     For details, refer to "Starting an L-Server" in "5.2 Power Operations".

     After changing the configuration, the L-Server before changing cannot be operated, until the new L-Server has finished starting.

  Usage can be changed by repeating steps 1. and 2.

- For method 2.

  1. Confirm a server pool

     Confirm whether an unused physical server exists in the server pool.

  2. Start the destination L-Server for usage change

     Start the destination L-Server for usage change.

     For details, refer to "Starting an L-Server" in "5.2 Power Operations".

     After changing the configuration, the L-Server before changing cannot be operated, until the new L-Server has finished starting.

  Usage can be changed by repeating steps 1. and 2.

Point

- Usage cannot be changed, while the L-Server is stopped temporarily during L-Server restart.
- When power operation has been performed directly on the physical server using the RC console or commands, without performing power operation of the L-Server, the L-Server which was last operated will start.
- If the last L-Server that was operated has already been started on another physical server, its status will change so there is no boot disk and it will fail to start.

5.7.4 Releasing Configuration

1. Change L-Server configuration for fixed operation

   Execute the rcxadm lserver modify command, and in the XML file of the L-Server change the content of the AutoPreserve element to "false".

For details on the command, refer to "E.3.1 rcxadm lserver".

When an L-Server has been stopped, start it. For details, refer to "Starting an L-Server" in "5.2 Power Operations".

2. Delete unnecessary L-Servers

   When unnecessary L-Servers exist, using the procedure in "5.4 Deleting an L-Server" to delete them.

Appendix A Resource Pools

This appendix explains how to add new resource pools, and delete or modify existing resource pools.

A.1 Overview

This function manages all the resources assigned when creating an L-Server.

A resource pool is a type of resource folder that exists in the orchestration tree, and has the following features that differ from regular folders:

- Pools are selected as resources when creating or adding L-Servers.
- By specifying a resource type when creating a resource pool, only resources of the same type will be stored in that resource pool.
- The total size of the resources in the resource pool and the free space are calculated and displayed. The converted number of L-Servers for the specified L-Server template is also displayed.
- By default, a resource pool is automatically created for each resource pool type.
- Resource pools can be used with user/role management to restrict the users that can use them.
- By setting a priority for multiple resource pools, you can set the order for automatically selecting the required resources when creating an L-Server.

For details on resource pool types and the resources that are stored, refer to "Table 1.2 Resource Pool Types" in "1.2.1 Resource Pools".

A.2 Resource Pool Operations

This section explains how to resource pool operations.

Creating a Resource Pool

This section explains how to create a resource pool.

1. Right-click the root folder or a resource folder in the orchestration tree, and select [Create]-[Pool] from the popup menu.

   The [Create a Pool] dialog is displayed.

2. In the [Create a Pool] dialog, set the following items.

   Name

   Enter a name for the resource pool.
   Enter up to 32 characters, including alphanumeric characters (upper or lower case), underscores ("_"), or hyphens ("-").

   Type

   Select the type of the resource pool.

   - VM pool
   - Server pool
   - Storage pool
   - Network pool
   - Address pool
   - Image pool

   Priority

   Select the priority of the resource pool for automatically selecting a resource when creating an L-Server.
   Select a value between "1" and "10". Smaller values indicate a higher priority. "5" is selected by default.

Label

Enter a label for the resource pool.
Enter up to 32 alphanumeric characters or symbols.

Comment

Enter any comments for the resource pool.
Enter up to 256 alphanumeric characters or symbols.

3. Click <OK>.

   The created resource pool is displayed in the orchestration tree.

Modifying a Resource Pool

This section explains how to modify a resource pool.

1. Right-click the target resource pool in the orchestration tree, and select [Change Setting]-[General] from the popup menu.

   The [Change Setting for a Pool] dialog is displayed.

2. In the [Change Setting for a Pool] dialog, edit the items you want to modify.

3. Click <OK>.

   The resource pool setting information is modified.

Deleting a Resource Pool

This section explains how to delete a resource pool.

When a resource pool is deleted, the resources in that resource pool are also deleted. It is recommended that you move the resources in the resource pool to another resource pool in advance, or delete the resource pool after deleting the resources.

1. Right-click the target resource pool in the orchestration tree, and select [Delete] from the popup menu.

   The [Delete a Pool] dialog is displayed.

2. The name of the resource pool to delete is displayed in the [Delete a Pool] dialog.

   If resources are registered in the resource pool to delete, a list of those resources is displayed in "All Resources". Confirm the list, and check the "Delete All Resources" checkbox.

3. Click <OK>.

   The target resource pool is deleted.

A.3 Resource Operations

This section explains how to perform resource operations with resource pools.

Registering a Resource

This section explains how to register resources to resource pools.

1. Right-click the target resource pool in the orchestration tree, and select [Register Resources] from the popup menu.
   The [Register a Resource] dialog is displayed.

2. Check the "Select" checkbox of the resources to register in the [Register a Resource] dialog, and click <OK>.

   The resources are registered in the resource pool.

Modifying a Resource

This section explains how to modify a resource registered in a resource pool.

1. Right-click the target resource in the orchestration tree, and select [Change Setting]-[General] from the popup menu.
   The [Change Setting for a Resource] dialog is displayed.
2. In the [Change Setting for a Resource] dialog, edit the items you want to modify, and click <OK>.
   The resource settings are modified.

Moving a Resource

This section explains how to move resources between resource pools.

1. Right-click the target resource in the orchestration tree, and select [Move to Pool] from the popup menu.
   The [Move a Resource] dialog is displayed.
2. In "Destination Pool" in the [Move a Resource] dialog, select the destination resource pool for the resource, and click <OK>.
   The target resource is moved to the selected resource pool.

Unregistering a Resource

This section explains how to unregister a resource registered in a resource pool.

1. Right-click the target resource in the orchestration tree, and select [Unregister] from the popup menu.
2. The [Unregister a Resource] dialog will be displayed, then click <OK>.

Deleting a Resource

This section explains how to delete a resource registered in a resource pool.

1. Right-click the target resource in the orchestration tree, and select [Delete] from the popup menu.
2. The [Delete Resource] dialog will be displayed, then click <OK>.

A.4 View

The resource list and pool list display the resource folders, total size of resources, and free space available.

If you select the [Resource List] tab with a resource pool selected in the orchestration tree, a list of information for the resources that belong to the resource pool are displayed.

If you select the [Resource Details] tab, detailed information such as the total size of data and free space in the resource pool is displayed.

Also, if you select the [Available Pool] tab, a list of the resource pools that the user has usage rights for and the resources that belong to those pools is displayed.

Note

If the VM host does not meet the following conditions, free space will be displayed as 0.

- The power status is "ON".
- The status is "normal".
- Maintenance mode has not been set.
- The maintenance mode of server virtualization software has not been set.

L-Server Conversion View

This section explains how to display the converted number of L-Servers that can be created with VM pools, server pools, and storage pools.

1. Left-click the target VM pool in the orchestration tree, and select the [Resource List] tab.
2. In the "Template" selection list, select the L-Server template to convert.
3. Click <OK>.
   The number of L-Servers that can be created is displayed in "Number of creatable L-Servers".

Note

- When the status of the VM host and virtual storage is one other than "normal", the resource will be excluded from L-Server assignment regardless of its available space. However, a value corresponding to the available space of the resource will be displayed for the L-Server converted number.
- When the server type is "Physical" the L-Server converted number of virtual storage is an estimate, and an error may occur during L-Server creation.
- The available space on resources and the space displayed for the number of L-Servers that can be created are calculated as follows:
  - CPU, memory, available space on the network and the number of L-Servers that can be created

Total resource space - (Total of resources used for L-Server(*1))

  - Available space on the storage and the number of L-Servers that can be created

Total resource space - (Total of resources used for L-Server(*1) + total of images(*2))

  *1: This includes not only the resources for active L-Servers, but also those of resources of stopped L-Servers.
  *2: Images include cloning images and snapshots. However, the size of images is not displayed.

Appendix B Resource Folders

This appendix explains resource folders, which are used when managing a large number of resources or when you want to divide resources according to certain conditions.

B.1 Overview

Resource Orchestrator provides resource folders for managing groups of multiple resources. Resource folders are used when managing a large number of resources or when you want to divide resources according to certain conditions.

Resource folders can be created in the orchestration tree or the server resource tree.
Resource folders created in the orchestration tree can store the following resources:

- L-Servers
- Resource Pools
- Resource Folders

Resource folders created in the server resource tree can store the following resources:

- Chassis
- Servers (that are not stored in a chassis)
- Resource Folders

There are no conditions for storing resources in resource folders. They can be freely placed as management requires. You can also create hierarchies by storing other resource folders in a resource folder.

Using resource folders enable you to do the following:

- Since the number of resources handled at once is reduced, it becomes easier to select resources
- Resources can be categorized in detail

Also, in the orchestration tree, the access scope of roles can be restricted and used in combinations to restrict the resource folders that can be accessed for each administrator. This enables you to do the following.

- Divide the management scope for each administrator
- Link with roles to prevent erroneous operations from being performed on resources outside of the scope of operation privileges

When the access scope is limited to a single resource folder, that resource folder is called the "home folder". By setting a home folder, a folder does not need to be specified for the various operations that normally require a resource folder to be specified.

Resources that can be Registered

Resource folders are managed according to their resource folder type. The resources that can be registered for each resource folder type are indicated below.

Table B.1 Resource Folder Types and Resources that can be Registered

Resource Folder Types	Target Resource
Orchestration (lserver)	L-Servers
	Resource pools
Server (server)	Chassis
	Servers
Storage (storage)	Virtual storage resources

B.2 Operations

This section explains the operations for the resource folders of Resource Orchestrator.

B.2.1 Creating a Resource Folder

This section explains how to create resource folders.

1. Right-click the target resource folder in the tree, and select [Create]-[Folder] from the popup menu.

   The [Create a Folder] dialog is displayed.

2. In the [Create a Folder] dialog, set the following items.

   Name

   Enter a name for the resource folder.
   Enter up to 32 characters, including alphanumeric characters (upper or lower case), underscores ("_"), or hyphens ("-").

   Label

   Enter a label for the resource folder.
   Enter up to 32 alphanumeric characters or symbols.

   Comment

   Enter any comments for the resource folder.
   Enter up to 256 alphanumeric characters or symbols.

3. Click <OK>.

   The created resource folder is displayed in the tree.

B.2.2 Viewing a Resource Folder

This section explains how resource folders are displayed.

Resource folders are displayed in the following format:

resource folder name (*label*)

When *label* is not set, only *resource folder name* is displayed.

If you select the [Resource List] tab with a target resource folder selected in the tree, a list of information for the resources that belong to the resource folder are displayed.
If you select the [Resource Details] tab, detailed information for the resource folder is displayed.

The displayed resource folders differ according to the privileges of the user.

- Users that can access all resources

  All resource folders are displayed in the tree.

- Users that have their access scope restricted by their role

  Only the resource folders that the user has view privileges for are displayed in the tree.

B.2.3 Modifying the Basic Information

This section explains how to modify the basic information (folder name, label, comment) of resource folders.

1. Right-click the target resource folder in the tree, and select [Change Setting]-[General] from the popup menu.

   The [Folder Change Setting] dialog is displayed.

2. In the [Folder Change Setting] dialog, edit the items you want to modify.

3. Click <OK>.

   The basic information of the resource folder is modified.

B.2.4 Deleting a Resource Folder

This section explains how to delete resource folders.
The procedure for deleting resource folders differs according to the resource folder type.

For Orchestration (lserver)

1. Right-click the target resource folder in the orchestration tree, and select [Delete] from the popup menu.
   The [Delete a Folder] dialog is displayed.
2. The name of the resource folder to delete is displayed in the [Delete a Folder] dialog.
   If resource folders or resources are included in the resource folder to delete, a list of them is displayed in "All Resources".

   Confirm the list, and check the "Delete All Resources" checkbox.

   Note

   If the "Delete All Resources" checkbox is not checked, the <OK> button is not activated.
3. Click <OK>.
   The target resource folder is deleted.

For Server (server)

1. Right-click the target resource folder in the server tree, and select [Delete] from the popup menu.
   The [Delete a Folder] dialog is displayed.
2. Click <OK>.
   The target resource folder is deleted.

Note

If physical servers or chassis are registered in a resource folder, the resource folder cannot be deleted. Delete the folder after moving or deleting all physical servers and chassis from the target resource folder.

For Storage (storage)

1. Right-click the target resource folder in the orchestration tree, and select [Delete] from the popup menu.
   The [Delete a Folder] dialog is displayed.
2. Click <OK>.
   The target resource folder is deleted.

Note

If virtual storage resources or disk resources are registered in a resource folder, the resource folder cannot be deleted. Delete the folder after moving or deleting all virtual storage resources and disk resources from the target resource folder.

B.2.5 Moving a Resource

This section explains how to move resources.

1. Right-click the target resource or resource folder in the tree, and select [Move to Folder] from the popup menu.

   The [Move a Folder] or [Move a Resource] dialog is displayed.

2. In the [Move a Folder] or [Move a Resource] dialog, select the destination resource folder.
3. Click <OK>.

   The target resource is moved to the destination resource folder.

B.2.6 Moving a Resource Folder

This section explains how to move L-Server resource folders.

Use the following procedure to move L-Server resource folders to other resource folders.

1. Right-click the target L-Server in the orchestration tree, and select [Move to Folder] from the popup menu.
   The [Move a Resource] dialog is displayed.
2. Select the destination resource folder displayed in the selection list, and click <OK>.

From the command-line, execute rcxadm lserver move.

For details on the command, refer to "E.3.1 rcxadm lserver".

Appendix C Roles and User Groups

This appendix explains roles and user groups. For details, refer to "1.2.8 Restricting Access Using Roles and User Groups" and "1.2.9 Sharing Resources Between Multiple Departments Using Roles and User Groups".

C.1 Roles

This section explains roles.

Use a command to specify the role and access scope settings for users and user groups. For details on the commands, refer to "E.6 User Operations".

By specifying a combination of role and access scope for the target user or user group, the access privileges are restricted. The access scope is restricted by specifying resource folders, resource pools, or resources in the orchestration tree.

Roles are specified from the following role names:

Table C.1 Operation Scope of Roles

Resource Type	Available Operations	Role Names								
		supervisor (special administrator)	admin (administrator)	operator (operator)	monitor (monitor)	lserver_admin (L-Server administrator)	lserver_operator (L-Server operator)	lserver_monitor (L-Server monitor)	infra_admin (infrastructure administrator)	infra_operator (infrastructure operator)
L-Server	Creation/ Modification/ Deletion	Yes	Yes	No	No	Yes	No	No	No	No
	Power Operations	Yes	Yes	Yes	No	Yes	Yes	No	No	No
	Snapshot	Yes	Yes	Yes	No	Yes	Yes	No	No	No
	Backup	Yes (*1)	Yes (*1)	Yes (*1)	No	Yes (*2)	Yes (*2)	No	No	No
	Migration	Yes	Yes	No	No	No	No	No	Yes	No
	Changing of Server Usage	Yes	Yes	Yes (*3)	No	Yes	Yes (*3)	No	No	No
	Monitoring	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
	Image Collection	Yes (*1)	Yes (*1)	Yes (*1)	No	Yes (*2)	Yes (*2)	No	No	No
Resource Pool	Use/Release of Resources	Yes	Yes	No	No	Yes	No	No	No	No
	Creation/ Modification/ Deletion	Yes	Yes	No	No	No	No	No	Yes	No
	Resource Registration/ Deletion	Yes (*4)	Yes (*4)	No	No	No	No	No	Yes (*4)	No
	Monitoring	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes
Physical server, VM host	Registration/ Deletion	Yes (*5)	Yes (*5)	No	No	No	No	No	Yes (*5)	No
	Power Operations	Yes (*6)	Yes (*6)	Yes (*6)	No	No	No	No	Yes (*6)	Yes (*6)

Resource Type	Available Operations	Role Names								
		supervisor (special administrator)	admin (administrator)	operator (operator)	monitor (monitor)	lserver_admin (L-Server administrator)	lserver_operator (L-Server operator)	lserver_monitor (L-Server monitor)	infra_admin (infrastructure administrator)	infra_operator (infrastructure operator)
	Maintenance Mode Settings	Yes (*6)	Yes (*6)	No	No	No	No	No	Yes (*6)	No
	Monitoring	Yes (*6)	Yes (*6)	Yes (*6)	Yes (*6)	Yes (*6)	Yes (*6)	No	Yes (*6)	Yes (*6)
Storage	Registration/ Modification/ Deletion of Storage Management Software	Yes	Yes	No	No	No	No	No	Yes	No
	Monitoring	Yes (*6)	Yes	Yes (*6)	Yes (*6)	Yes (*6)	Yes (*6)	No	Yes (*6)	Yes (*6)
Network	Creation/ Modification/ Deletion	Yes (*6)	Yes (*5)	No	No	No	No	No	Yes (*6)	No
	Monitoring	Yes (*6)	Yes (*5)	Yes (*6)	Yes (*6)	Yes (*6)	Yes (*6)	No	Yes (*6)	Yes (*6)
Address	Creation/ Modification/ Deletion	Yes (*6)	Yes	No	No	No	No	No	Yes (*6)	No
User	Changing one's User Information	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
	Addition/ Modification/ Deletion of Users from one's Own User Group	Yes	Yes	No	No	Yes	No	No	Yes	No
	Addition/ Modification/ Deletion of Users other than Special Administrators	Yes	No	No	No	No	No	No	No	No

Yes: Operation can be performed.
No: Operation cannot be performed.

*1: When the server type of an L-Server is "Physical", operation can only be performed if the access scope is not restricted.
*2: Operation is only possible when the server type is "Virtual".
*3: Operation is only possible when L-Server attributes have been configured in advance.
*4: Operation can only be performed if the access scope is not restricted.
*5: Operation can only be performed in the server tree. It can only be performed if the access scope is not restricted.
*6: If the access scope is restricted, this operation can only be performed if a resource is selected in a resource pool.

Adding Settings

This section explains how to add role settings.

Specify the role to assign to the access scope. The default setting is "admin".
Execute the rcxadm usergroup modify command.
For details on the command, refer to "E.6.2 rcxadm usergroup".

C.2 User Groups

This section explains user groups.

Use commands to operate user groups. Only users with the special administrator role can create user groups.
For details on the command, refer to "E.6.2 rcxadm usergroup".

When you create a user account, you can set an access scope and role.
Use commands to create a user account. For details on the command, refer to "E.6.1 rcxadm user".
Use the procedures described below to set an access scope and role.

Creating a User Group

This section explains how to create user groups.

Use the following procedure to create user groups:

1. Create a User

   Execute the rcxadm user command to create a user.

2. Create a User Group and Set an Access Scope

   Execute the rcxadm usergroup create command to create a user group and set an access scope.
   For details on the command, refer to "E.6.2 rcxadm usergroup".

Modifying a User Group

This section explains how to modify user groups.

Execute the rcxadm usergroup modify command to modify a user group.
For details on the command, refer to "E.6.2 rcxadm usergroup".

Deleting a User Group

This section explains how to delete user groups.

You cannot delete a user group if it has users registered.
Before deleting the user group, move all the users that belong to the user group to another user group or delete them.

Execute the rcxadm usergroup delete command to delete a user group.

Use a user account operation command to specify the settings for users belonging to user groups. Only users with the special administrator role can modify the relationship between user groups and users. Users with the administrator, L-Server administrator, or infrastructure administrator roles cannot perform any operations related to user groups.

For details on the command, refer to "E.6.2 rcxadm usergroup".

Appendix D L-Server Parameter Details

This appendix explains how to configure an L-Server assigned with server, storage, and network specifications without using an L-Server template.

Use the following procedure to create L-Servers:

1. Right-click the target resource folder in the orchestration tree, and select [Create]-[L-Server] from the popup menu.
   The [L-Server Register] dialog is displayed.
2. Set the items required in each tab, and click <OK> to create the L-Server.

Note

Each item has an upper limit. The creation of an L-Server may fail depending on the availability of resource pools, the hardware configuration, and the VM management software specifications.

D.1 [Basic Information] Tab

Name

Enter a name for the L-Server.
Enter up to 64 characters, including alphanumeric characters (upper or lower case), underscores ("_"), or hyphens ("-").

When specifying an image selecting the server type "Physical", an L-Server name is also used for the OS host name and computer name.

When specifying a Windows image name, enter a character string of up to 63 alphanumeric characters (upper or lowercase) for the L-Server name. The string cannot be composed solely of numbers.

Template

Specify "Not Select Yet" in the selection list.

Server type

Enter the type of server to assign to the L-Server.
When assigning a physical server, select "Physical". When assigning a virtual server, select "VM".

When VM is selected for the server type, select the VM type on the [Server] tab.
However, when an image is selected, Resource Orchestrator will automatically select the VM type that matches the image, so selection is not necessary when selecting the server type.

Image

Specify the cloning image in the selection list. The available cloning images are displayed in the selection list. If omitted, an empty server without an operating system installed is created.

Information

When a cloning image is specified, the sizes of system disks with the server type "VM" will be changed to that when the cloning image was deployed.

Network (NIC)

If "None" is specified in "Template", the <Add> and <Delete> buttons are displayed.
Clicking <Add> adds a network. Perform settings based on the physical server the L-Server will be located on.
Clicking <Delete> deletes the network in the last line of the list.

When "Physical" is selected for the server type, the admin LAN will be displayed in network (NIC) number 1. As NIC number one of the L-Server is automatically assigned to the admin LAN when the server type is "Physical", this parameter cannot be changed or deleted. Regardless of whether or not redundancy of the admin LAN is performed, network resources cannot be specified for the second NIC, so select "not connected".

[Hyper-V]
When a guest OS that Hyper-V supports is specified for the OS type, a converged network adapter will be added to VM.
When another OS has been selected, an emulated network adapter will be added.
When using a converged network adapter, it is necessary to install a virtual guest service on the guest OS.
For details on virtual guest service installation, refer to the Help of SCVMM.

When creating an L-Server or changing the configuration, a maximum of four networks (NICs) can be specified at one time.
To perform addition of five or more NICs, please perform an additional configuration change.

Label (Optional)

Enter a label for the L-Server.
Enter up to 32 alphanumeric characters or symbols.

Comments (Optional)

Enter any comments for the L-Server.
Enter up to 256 alphanumeric characters or symbols.

D.2 [Server] Tab

The entry parameters on the [Server] tab change based on whether "Physical" or "VM" is selected for the server type on the [Basic Information] tab.

D.2.1 When "Physical" is Selected for Server Type

Specifications

The specifications of the physical server are displayed.

When "Automatic" or "Pool" is selected for "Physical Server", a hyphen ("-") will be displayed in each parameter.

Model

Enter the name of the model to assign to the L-Server.

Physical Server

Select the physical server to assign to the L-Server.

When a "pool" is specified, a physical server of the same model as that specified for model will be assigned from the resource pool.

When a physical server is specified, the specified physical server will be assigned.

Server Redundancy

Specify the server redundancy to assign to the L-Server. To enable redundancy, select the "HA" checkbox.

If the "HA" checkbox is selected, the "Pool for Spare Server" selection list will be enabled.

In the "Pool for Spare Server" selection list, specify the server pool that the physical server to use for automatic switchover is registered in.

When a problem occurs on the physical server, recovery is performed by automatically switching to another physical server in the same resource pool that is operating normally.

It is necessary that spare servers are physical servers not configured as L-Servers.

For the details of conditions for switchover to spare servers, refer to the information regarding server switchover conditions in the "ServerView Resource Coordinator VE Setup Guide".

Address pool (WWN/MAC)

Entry is only possible when the server type is "Physical". Specify the virtual WWN obtained from the ServerView Resource Coordinator VE I/O Virtualization Option (hereinafter I/O Virtualization Option) and the address pool of the registered MAC address. VIOM will be used for blades, and HBA address rename for rack mount servers.

D.2.2 When "VM" is Selected for Server Type

VM type

For virtual servers, select the VM type for the L-Server to be created.
It is not necessary to specify this when deploying an image, because the VM type of the image is used.

Number of CPUs

Enter the number of server CPUs to assign to the L-Server. Enter an integer between 1 and 8.

CPU Performance

Enter the server CPU speed to assign to the L-Server. Enter a number with up to one decimal place, in units of gigahertz. A number between 0.1 and 8 can be specified.

The value entered here is used to determine the CPU ratio to assign to the L-Server out of the clock speed of the physical CPU of the VM host. If VM hosts with different types of physical CPUs are registered in the VM pool, the actual processing performance may differ according to the assigned VM host.

[Hyper-V]
CPU performance is realized through the resource settings of VM guests and VM hosts.
When the SCVMM management console or a Hyper-V manager is used to change the resource reservation of a VM guest or VM host, there is a chance that the creation or starting of VM guests may fail, or the expected performance may not be obtained.
Please do not change VM guest and VM host resource reservations when L-Servers have been created.

Memory Size

Enter the memory capacity to assign to the L-Server. Enter a number with up to one decimal place, in units of gigabytes. A number between 0.1 and 255 can be specified.

OS Type

Specify the type of operating system to assign to the L-Server. It is not necessary to specify this when deploying an image, because the OS type of the image is used. The OS type can be changed after the OS installation.

[Hyper-V]
If an unsupported OS type is specified, there is a chance that installation may fail or the OS of the VM guest may not operate correctly.
Additionally, if an incorrect OS type is specified, there is a chance that image collection or L-Server creation for a specified image may fail, and a guest OS may start but hang while awaiting entry. This occurs because Microsoft's sysprep cannot be processed correctly during personalization processing.

The OS types displayed in the list are the guest OS's which can be specified on the SCVMM management console.
Resource Orchestrator displays all guest OS's in the list in order not to limit user selection, however this does not mean that all guest OS's are supported by SCVMM.

Hyper-V does not support some server type settings such as number of CPUs depending on the OS type. When an incorrect OS type and server type are selected, operation is not guaranteed.
Additionally, even when a service pack is not listed in the OS type list, it may be necessary to install the service pack.
When a guest OS that Hyper-V supports is specified for the OS type, a converged network adapter will be added to VM.
When a different OS has been selected, an emulated network adapter will be added.

For details on the guest OS's supported by SCVMM, refer to the Help of SCVMM.
For details on the guest OS's supported by Hyper-V, refer to the following Microsoft web site.

Microsoft web site

URL: http://www.microsoft.com/windowsserver2008/en/us/hyperv-supported-guest-os.aspx (As of November 2010)

VM Host (Optional)

Individually specify the resources to assign to the L-Server.
Specify a VM host or VM pool. If you do not specify a VM host or VM pool, a VM host that can create an L-Server is automatically searched for from the VM pool. If there are multiple VM pools, the VM host is searched for, beginning with the VM pool with the highest priority.

Server Redundancy

Specify the server redundancy to assign to the L-Server. To enable redundancy, select the "HA" checkbox.

The following operations are performed if you select the "HA" checkbox.

[VMware]

Selecting the "HA" checkbox locates the HA function on an enabled VM host.
When a problem occurs in the physical server that the virtual server is operating on, the virtual server can be recovered by restarting it on a physical server that is operating normally.
If the "HA" checkbox is not selected, the HA function will be preferentially located on a disabled VM host.
Even if the "HA" checkbox is not selected and the HA function is not located on a disabled VM host, or there is no available CPU or memory, the HA function will place a VM guest on an enabled VM host.
If the HA function is located on an enabled VM host, the HA function of the server virtualization software will be enabled.

[Hyper-V]
In Hyper-V environments this setting is ignored, and VM guests are always located on clustered VM hosts.

Positioning

Enter whether the physical location of the server to assign to the L-Server can be changed.

- "Fixed"

  Starts the L-Server on the same VM host that operated last time. Move the L-Server between servers to start it on a separate VM host.

- "Change at Boot"

  Automatically selects the optimal VM host when the L-Server is started. Even when "VM Host" is specified, the L-Server may operate on a separate VM host from the second time it is started.

Exclusion

Enter this when you do not want the virtual server assigned to the L-Server to operate on the same VM host as another virtual server on the physical server.
For example, when performing load-balanced work using multiple virtual servers, you can set exclusive operation to ensure that the work continues in a degenerate state because only one virtual server stops when a physical server fails. Specify an L-Server name or resource folder name that you have operating privileges for.
The virtual server of the specified L-Server is assigned to different physical servers.

If you specify a resource folder name, one's own L-Server can be included in the resource folder. In the following cases, the L-Server may be assigned to the same physical server, regardless of whether exclusive operation is specified:

- If the L-Server is moved
- If no other VM hosts that meet the conditions for exclusive operation can be found, such as when there are no VM hosts in the VM pool that have enough free space to install an L-Server
- If the HA function or automatic re-installation function (examples: VMware HA or DRS) of the VM product is enabled

D.3 [Disk] Tab

Disk

Click <Add>, and specify the following items for each disk.

Disk Size

Enter a number with up to one decimal place, in units of gigabytes. A number between 0.1 and 2048 can be specified.

[Hyper-V]
When creating an L-Server or changing the configuration, a maximum of four disks can be specified at one time.
To perform addition of five or more disks, please perform an additional configuration change.

D.4 [Network] Tab

Specify the following items.

IP Address (Optional)

Specify the IP address to assign to the L-Server. Select automatic or manual. If you select manual, enter the IP address to assign to the L-Server.

DNS Server

Specify the DNS server.

Note

[Windows/Linux]
When creating an L-Server with the server type "Physical", the IP address cannot be automatically configured if specifying a Red Hat Enterprise Linux image.

Manually configure the IP address after the image has been deployed to the L-Server.

When creating an L-Server with the server type "Physical", even if a DNS server is specified, it will not be automatically configured on the created guest OS.

[Hyper-V]
If a Windows image is specified when creating an L-Server, even if the IP address and DNS server are specified, they will not be automatically configured on the created guest OS.

The IP address and DNS server to be configured on the guest OS must either be manually configured by the user or configured using DHCP during L-Server creation. Check the IP address assign to the L-Server using the GUI or the CLI, and configure it on the guest OS.

The IP address assigned to the L-Server can also be checked from the [Resource details] tab of the RC console.

From the command-line, execute rcxadm lserver show.
For details on the rcxadm lserver show command, refer to "E.3.1 rcxadm lserver".

D.5 [OS] Tab

Enter the parameters to set for the OS when creating the L-Server. This setting is valid only if an image is specified in the [Basic Information] tab.
When the server type is "Physical", entry is not possible.

The setting process is performed the first time the L-Server is started. If an image name is not specified, it is not necessary to enter all these items.

Table D.1 List of Settings

Item	OS		Description
	Windows	Linux (*1)	
Hostname/Computer name	Auto	Auto	Enter the host name or computer name. For Windows, enter a string of between 1 and 15 alphanumeric characters or hyphens ("-"). For Linux, enter between 1 and 63 alphanumeric characters or hyphens ("-"). The string cannot be composed solely of numbers. If left blank, the L-Server name is entered. Note that underscores ("_") in the L-Server name can be converted to hyphens ("-"). If the basic information is not specified, the L-Server name is converted and set as indicated above.
Domain name	Auto/OS	Auto/OS	For Windows, enter the workgroup name. If left blank, "WORKGROUP" is set.

Item	OS		Description
	Windows	Linux (*1)	
			Settings for participation in a domain cannot be made. For Linux, enter the domain name. If left blank, "localdomain" is set. Enter between 1 and 255 alphanumeric characters, hyphens ("-"), or periods (".).
DNS search path	No	Yes/OS	Enter a list of domain names to use for DNS searching, using between 1 and 32,767 characters. You can specify the same characters as the domain name. To specify multiple domain names, use a space as the separator character.
Full name	Auto/OS	No	Enter the Windows full name using between 1 and 50 characters. By default, the value defined in the OS property definition file is entered. If left blank, "WORKNAME" is set. [Hyper-V] When the OS type is Windows Server 2008, Windows Server 2008 R2, Windows 7, or Windows Vista, a full name cannot be set for guest OS's.
Organization name	Auto/OS	No	Enter the organization name displayed in the Windows system properties using between 1 and 50 characters. If left blank, "WORKORGANIZATION" is set. [Hyper-V] When the OS type is Windows Server 2008, Windows Server 2008 R2, Windows 7, or Windows Vista, an organization name cannot be set for guest OS's.
Product key	OS	No	[VMware] If the product key is omitted, the following will happen when the OS is operated: - For Windows Server 2003, the product key entry screen is displayed the first time the server is started. - For Windows Server 2008, the OS must be activated after it is started. [Hyper-V] Omission not possible. Ensure that you specify a valid product key.
License mode	Auto/OS	No	[VMware] Specify "Seat Unit" (number of connected clients) or "Server Unit" (number of servers used at the same time). If left blank, "Server Unit" is set. [Hyper-V] Even if the license mode is specified, it is not configured in the guest OS.
Maximum number of connections	Auto/OS	No	[VMware] Specify this when "Server Unit" is set (number of servers used at the same time: server). Specify a number between 5 and 9,999. If left blank, "5" is set.

Item	OS		Description
	Windows	Linux (*1)	
			[Hyper-V] Even if the maximum number of connections is specified, it is not configured in the guest OS.
Administrator password	Yes/OS	No	Enter the same value as the Administrator password of the image to deploy. If the image to deploy does not have a password set, it will be set to the password you specify here. Enter the password using between 1 and 128 alphanumeric characters or symbols. [Hyper-V] Specify the password of the local administrator account to be used on the L-Server to be created.
Hardware clock configuration	No	Auto	Specify either "UTC" or "Local (LOCAL)". If left blank, "Local" is set.
Time zone	Auto	Auto	Specify the time zone of the OS. If left blank, the same time zone as the OS of the manager is set.

Yes: Required
Auto: A value is generated if this setting is left blank
OS: The OS property definition file value is used if this setting is left blank
No: Not required

*1: When the guest OS is Linux, not all parameters can be specified. [Hyper-V]

Information

[VMware][Hyper-V]

OS Property Definition File

By setting the default values in an OS property definition file in advance, the default values of the information on the [OS] tab, etc. are generated when creating an L-Server. Use the UTF-8 character code for OS property definition files.

Location of the Definition File

[Windows]
Installation_folder\Manager\etc\customize_data

[Linux]
/etc/opt/FJSVrcvmr/customize_data

Definition File Name

The definition file name can be used by dividing into definitions that are available for each user group and definitions that are common to the system. If the key of the definition file common to the system is the same as a definition file for a user group, priority is given to the values indicated in the definition file for the user group.

- For User Groups

  os_setting_*user_group_name*.rcxprop

- Common to System

  os_setting.rcxprop

Definition File Format

In the definition file, an item to define is entered on each line. Each line is entered in the following format.

```
Key = Value
```

Definition File Items

Specify the following items in a definition file.

Table D.2 List of Items

Item	Key	Value	Remarks
Domain name	workgroup_name	(*1)	For Windows
	domain_name	(*1)	For Linux
DNS search path	dns_search_path	(*1)	-
Full name	full_name	(*1)	-
Organization name	org_name	(*1)	-
Product key	product_key	(*1)	-
License mode	license_mode	Specify "seat" (number of connected clients) or "server" (per server: number of servers used at the same time).	-
Maximum number of connections	license_users	(*1)	-
Administrator password	admin_password	(*1)	-
Hardware clock configuration	hwclock	Specify either "UTC" or "LOCAL".	-
DNS server (for Windows)	nic*N*_dns_address*n*	Specify the IP address using numeric values (between 0 and 255) and periods.	For *N*, specify the NIC number. For *n*, specify primary ("1") or secondary ("2").
DNS server (for Linux)	dns_address*X*	Specify the IP address using numeric values (between 0 and 255) and periods.	For *X*, specify primary ("1"), secondary ("2"), or tertiary ("3").

*1: For more information on this value, refer to "Table D.1 List of Settings".

Example Definition File

An example definition file is indicated below.

```
# Windows
workgroup_name = WORKGROUP
full_name = WORKNAME
org_name = WORKORGANIZATION
product_key = AAAA-BBBB-CCCC-DDDD
license_mode = server
license_users = 5
admin_password = xxxxxxxx
nic1_dns_address1 = 192.168.0.60
nic1_dns_address2 = 192.168.0.61
nic2_dns_address1 =
nic2_dns_address2 =

# Linux
domain_name = localdomain
dns_search_path = test.domain.com
hwclock = LOCAL
dns_address1 = 192.168.0.60
dns_address2 = 192.168.0.61
dns_address3 =
```

Information

[Hyper-V]

VM Guest Administrator Account Settings Necessary When Creating an L-Server with an Image Specified

When creating an L-Server with an image specified, it is necessary to enter the "administrator password" as a parameter.

The entered "administrator password" is the one set for the Administrator of the built-in administrator account, but on some localized editions of Windows the account name may differ. In addition, when the client OS is Windows 7 or Windows Vista, on standard installations the built-in administrator account is disabled, and the user account created during installation becomes the administrator account.

When an L-Server is created with a cloning image that was collected from a localized edition of Windows or a client OS specified, it is necessary to either configure an Administrator account for the administrator and set a password, or change the name of the administrator account with the "Administrator password" so that it fits the description given in the definition file below.

Note that when using a definition file, it is not possible to define different administrator ID settings for different generations of images.

Location of the Definition File

[Windows]
Installation_folder\Manager\etc\customize_data

Definition File Name

The definition file name can be used by dividing into definitions that are available for each user group and definitions that are common to the system. Search the definition file of each user group, from the start, for the administrator name corresponding to the image. When there is no corresponding definition, search in the system's common definition file.

Modification of the definition file is soon reflected, and it becomes valid for the creation of L-Servers from that point.

- For User Groups

  image_admin_hyperv_*user_group_name*.rcxprop

- Common to System

  image_admin_hyperv.rcxprop

Definition File Format

In the definition file, describe the image name and account name for which the administrator password has been configured on a single line.

```
Image name = "Administrator_account_name"
```

The *Administrator_account_name* is displayed enclosed in double quotes (").

Blank spaces and tabs other than those in the *Administrator_account_name* are ignored.

It is possible to use an asterisk ("*") as a wildcard in image names. By specifying an asterisk ("*") it is possible to create substitute strings for strings of indefinite length.

When creating an L-Server from an image, the corresponding image name is searched for from the start of the definition file, and the specified "Administrator password" will be set for the specified administrator account name.

It is necessary to create the definition files using the following line break code and character codes:

- Line break code: CR+LF(0x0d0a)
- Character code: Shift-JIS in Japanese environment, UTF-8 in other environments

Example Definition File

An example definition file is indicated below.

- Image names and administrator account names are set in pairs.

```
FR_WIN2003_001 = "Administrator"
EN_WIN7_001 = "root"
EN_WIN7_002 = "admin"
```

- For image names that start with "FR_WIN", use "Administrator" as the name of the administrator account.

```
FR_WIN* = "Administrator"
```

- Use "Administrator" as the name of the administrator account for all images. When an image name is specified using only a wildcard, the definition after that line will be ignored.

```
* = "Administrator"
```

Appendix E Command Reference

This appendix explains the commands available in Resource Orchestrator.

E.1 Overview

This section provides an overview of the commands available in Resource Orchestrator.

The following types of commands are available:

- Login command

  rcxlogin

- Resource operation commands

  rcxadm lserver

  rcxadm vstorage

  rcxadm storage

  rcxadm disk

  rcxadm network

  rcxadm pool

  rcxadm folder

  rcxadm addrset

  rcxadm chassis

  rcxadm server

- Image operation command

  rcxadm image

- L-Server template operation command

  rcxadm template

- User operation commands

  rcxadm user

  rcxadm usergroup

- Control and environment setup commands

  rcxadm storagemgr

  rcxadm imagemgr

  rcxadm vmmgr

  rcxadm agtctl

  rcxadm certctl

  rcxadm deployctl

  rcxadm lanctl

  rcxadm mgrctl

  deployment_service_uninstall

The login command, resource operation commands, and the control and environment setup commands (excluding rcxadm storagemgr, rcxadm imagemgr, and rcxadm vmmgr) are shared with ServerView Resource Coordinator VE. For details, refer to the "ServerView Resource Coordinator VE Command Reference".
rcxadm image and rcxadm imagemgr extend the commands of ServerView Resource Coordinator VE.

User accounts with administrative privileges within the operating system can execute all commands. Other user accounts can execute the commands within the allowed scope by logging in beforehand using the rcxlogin command.

Executing privileged commands within a script requires the user to be logged in with administrative privileges for the operating system. Otherwise, the rcxlogin command should first be run with the -save option to grant access to privileged commands from scripts.
For details, refer to the "ServerView Resource Coordinator VE Command Reference".

With Resource Orchestrator, you can restrict the privileges of users by setting combinations (roles) of resources that can be accessed and operations that can be performed.
For details on user accounts and roles, refer to "Appendix C Roles and User Groups".

Information

If, in Windows Server 2008, a user account with administrative privileges that does not have the user name "Administrator" starts up a command prompt from the menu, commands executed in that prompt cannot be executed with administrative privileges.
Right-click the command prompt in the menu, select [Run as administrator] from the displayed menu to start up the command prompt, and run the required command from there.

Point

Commands available on the admin server are all located under the following folder:

[Windows]
Installation_folder\Manager\bin

[Linux]
/opt/FJSVrcvmr/bin

E.2 Login Operations

This section explains the command for logging in to Resource Orchestrator.

E.2.1 rcxlogin

rcxlogin is an existing RCVE command. For details, refer to the "ServerView Resource Coordinator VE Command Reference".

E.3 Resource Operations

This section explains the commands used to manage resources in Resource Orchestrator.

E.3.1 rcxadm lserver

Name

[Windows]
*Installation_folder***Manager\bin\rcxadm lserver** - L-Server operations

[Linux]
/opt/FJSVrcvmr/bin/rcxadm lserver - L-Server operations

Format

```
rcxadm lserver create -file file.xml [-nowait]
rcxadm lserver delete -name name [-nowait]
rcxadm lserver modify -name name -file file.xml [-nowait]
rcxadm lserver list
rcxadm lserver show -name name
```

```
rcxadm lserver start -name name [-nowait]
rcxadm lserver stop -name name [-force] [-nowait]
rcxadm lserver restart -name name [-force] [-nowait]
rcxadm lserver move -name name [-to folder] [-nowait]
rcxadm lserver attach -name name -size size [-from {pool|vstorage}] [-disk disk] [-index index] [-
nowait]
rcxadm lserver detach -name name -disk disk [-online] [-nowait]
rcxadm lserver migrate -name name [-to vmhost] [-mode {live|cold}] [-nowait]
```

Description

rcxadm lserver is the command used to perform L-Server management and operations.

Subcommands

create

Creates an L-Server.

delete

Deletes an L-Server. The resources assigned to the L-Server are automatically released, and the L-Server definition is also deleted.

modify

Modifies the resources comprising an L-Server.

list

Displays a list of the defined L-Servers.

When the server type is "Physical", the following items are not displayed.

- For rack mount servers

  CPU performance, number of CPUs, and memory capacity

show

Displays the detailed information for an L-Server.

When the server type is "Physical", the following items are not displayed.

- For rack mount servers

  CPU performance, number of CPUs, and memory capacity

start

Starts an L-Server.

stop

Stops an L-Server.

restart

Restarts an L-Server.

move

Moves an L-Server to the specified resource folder.

attach

Connects a disk resource to an L-Server and enables it to be accessed.

When the server type is "Physical", specification is not possible.

detach

Releases a disk resource from an L-Server and disables it from being accessed.

When the server type is "Physical", specification is not possible.

migrate

Changes the location of an L-Server to a specified host.
Specify either to perform a live migration, which changes the location of the L-Server without stopping it, or a cold migration, which changes the location of the L-Server after temporarily stopping it.
When the server type is "Physical", specification is not possible.

Options

-file *file.xml*

In *file.xml*, specify the path of the XML file that defines the resources that comprise the L-Server. For details on the file definition, refer to "H.3 L-Servers".

-nowait

Use this option to return directly to the command prompt without waiting for the operation of the L-Server specified in the subcommand to complete its execution.

-name *name*

In *name*, specify the name of the target L-Server to perform an operation with. To specify an L-Server that is located inside a resource folder, it is necessary to also specify the resource folder name connected with a slash ("/").

-to *vmhost*

When the server type is "Virtual", specify the name of the destination VM host in *vmhost*. The VM host must be registered in a VM pool. If this option is not specified, a VM host is automatically selected from the VM pools.

Specify a destination VM host with available CPU capacity and memory. If there is insufficient CPU capacity or memory, migration between servers or starting of L-Servers may fail.

-mode live|cold

When the server type is "Virtual", specify the migration method. Specify "live" to perform a live migration. Specify "cold" to perform a cold migration. This may not be able to be specified, depending on the power state of the VM guest. When omitted, the appropriate type will be chosen depending on the state of the VM guest.

-force

Use this option to forcibly stop or restart an L-Server without shutting down the operating system it is running on.

-to *folder*

Specify the destination resource folder in *folder*. When omitted, the server is moved to the home folder.

-size *size*

In *size*, specify the disk capacity, in units of GB. Up to one decimal place can be specified.

-from *pool*|*vstorage*

Specify the name of the resource pool or virtual storage resource from which to take the disk capacity to assign to the L-Server. When omitted, resource selection is performed automatically with priority given to storage pools.

-disk *disk*

Specify the name of the disk resource to assign to the L-Server or release from the L-Server.

-index *index*

Specify the disk number of the disk resource. By default, the number of the last disk assigned plus one is used. The maximum value differs according to the server type.

-online

Use this option to remove the disk from the L-Server while the server is running. Setting is only possible when the server type is "VM". If you remove a disk in use while the server is running, inconsistencies may occur in the data or the OS management information. Use this option after checking the status of the OS and applications.

Examples

- To display the list of defined L-Servers:

```
>rcxadm lserver list <RETURN>
NAME                TYPE     SPEC            DISKS           IPADDRESSES      STATUS
----                ----     ----            -----           -----------      ------
/TenantA/test4      Virtual  1GHz,1,1GB      4GB             -                stop
/TenantB/test2      Virtual  1.0GHz,1,2.0GB  10.0GB,12.0GB   -                stop
```

- To display the detailed information for an L-Server:

```
>rcxadm lserver show -name /TenantA/test4 <RETURN>
Name: test4
ServerType: Virtual
VMType: VMware
OSType: Microsoft Windows Server 2008 (32-bit)
CPUArch: IA
CPUPerf: 1GHz
NumOfCPU: 1
MemorySize: 1GB
VmHost: 192.168.10.10
VmGuest: test4-62
Status: stop
PowerStatus: off
Disk[0]: test4-0-disk0
DiskSize[0]: 4GB
NIC[0]: vnet1
NIC[0][IPAddress]: 192.169.1.2
Redundancy: None
Positioning: Fixed
```

E.3.2 rcxadm vstorage

Name

[Windows]
*Installation_folder***Manager\bin\rcxadm vstorage** - virtual storage resource operations

[Linux]
/opt/FJSVrcvmr/bin/rcxadm vstorage - virtual storage resource operations

Format

rcxadm vstorage list [-verbose]
rcxadm vstorage show -name *name*
rcxadm vstorage move -name *name* **-to** *pool* **[-nowait]**
rcxadm vstorage modify -name *name* **[-label** *label***] [-comment** *comment***]**

Description

rcxadm vstorage is the command used to perform operations on the virtual storage resources provided by storage management software and VM management software. Virtual storage is a storage resource that can be assigned part of a disk resource by specifying a size.

Virtual storage resources enable you to create disk resources to connect to L-Servers.

Subcommands

list

Displays a list of virtual storage resource information.

show

Displays the detailed information for a virtual storage resource.

move

Moves a virtual storage resource to the specified resource pool.

modify

Changes labels and comments of virtual storage resources.

Options

-name *name*

In *name*, specify the name of the target virtual storage resource to perform an operation with.

-to *pool*

Specify the destination resource pool in *pool*.

-nowait

Use this option to return directly to the command prompt without waiting for the operation of the virtual storage resource specified in the subcommand to complete its execution.

-label *label*

In *label*, specify the new label.

-comment *comment*

In *comment*, specify the new comments.

Examples

- To display the list of the virtual storage resource information:

```
>rcxadm vstorage list <RETURN>
NAME                     LABEL    TOTAL        FREE         STATUS
----                     -----    -----        ----         ------
vCenterServer_Storage1   -        100.0GB      80.0GB        normal
vCenterServer_data02     -        100.0GB      40.0GB        normal
vCenterServer_data03     -        100.0GB      40.0GB        normal
vCenterServer_data04     -        100.0GB      20.0GB        normal
```

- To display the details of the virtual storage resource information:

```
>rcxadm vstorage list -verbose <RETURN>
NAME                   LABEL  COMMENT  TOTAL    FREE    USED    STATUS
----                   -----  -------  -----    ----    ----    ------
vCenterServer_Storage1 -      -        100.0GB  80.0GB  20.0GB  normal
vCenterServer_data02   -      -        100.0GB  40.0GB  60.0GB  normal
vCenterServer_data03   -      -        100.0GB  40.0GB  60.0GB  normal
vCenterServer_data04   -      -        100.0GB  20.0GB  80.0GB  normal
```

- To display the detailed information for a virtual storage resource:

```
>rcxadm vstorage show -name vCenterServer_Storage1 <RETURN>
Name: vCenterServer_Storage1
```

```
Label:
Comment:
Total Size: 100.0GB
Free Size: 80.0GB
Used Size: 20.0GB
Status: normal
```

E.3.3 rcxadm storage

Name

[Windows]
*Installation_folder***Manager\bin\rcxadm storage** - physical storage unit resource operations

[Linux]
/opt/FJSVrcvmr/bin/rcxadm storage - physical storage unit resource operations

Format

rcxadm storage list [-verbose]
rcxadm storage show -name *name*
rcxadm storage modify -name *name* **[-label** *label***] [-comment** *comment***]**

Description

rcxadm storage is the command used to perform operations on the physical storage unit resources managed by storage management software.

Subcommands

list

Displays a list of physical storage unit resource information.

show

Displays details of physical storage unit resource information.

modify

Changes labels and comments of physical storage unit resources.

Options

-name *name*

In *name*, specify the name of the target physical storage unit resource to perform an operation with.

-verbose

Use this option to increase the items displayed in the list of information.

-label *label*

In *label*, specify the new label.

-comment *comment*

In *comment*, specify the new comments.

Examples

- To display a list of physical storage unit resource information:

```
>rcxadm storage list <RETURN>
NAME          LABEL   IP ADDRESS        STATUS
-----------   -----   --------------    ------
ETERNUS00     -       192.168.10.184    normal
```

- To display the details of physical storage unit resource information:

```
>rcxadm storage list -verbose <RETURN>
NAME        LABEL  COMMENT IP ADDRESS       STATUS  MODEL
---------  -----   -----   --------------   ------  --------------
ETERNUS00   -       -      192.168.10.184   normal  E2000(E210F4B)
```

- To display the detailed information for a virtual storage resource:

```
>rcxadm storage show -name ETERNUS00 <RETURN>
Name: ETERNUS00
Label:
Comment:
Model: E2000(E210F4B)
Serial number: 4170838184
IP address: 192.168.10.184
Status: normal
Port number: 4
Management software: esc00
```

E.3.4 rcxadm disk

Name

[Windows]
*Installation_folder***Manager\bin\rcxadm disk** - disk resource operations

[Linux]
/opt/FJSVrcvmr/bin/rcxadm disk - disk resource operations

Format

rcxadm disk list [-verbose]
rcxadm disk show -name *name*
rcxadm disk modify -name *name* **[-label** *label***] [-comment** *comment***]**

Description

rcxadm disk is the command used to perform operations on disk resources. A disk resource is assigned to an L-Server, and corresponds to the virtual disk of the VM guest, a LUN of ETERNUS, and FlexVol of NetApp.

Disk resources provide virtual disks to L-Servers.

Subcommands

list

Displays a list of disk resource information.

show

Displays the detailed information for a disk resource.

modify

Changes labels and comments of disk resources.

Options

-verbose

Use this option to increase the items displayed in the list of information.

-name *name*

In *name*, specify the name of the target disk resource to perform an operation with.

-label *label*

In *label*, specify the new label.

-comment *comment*

In *comment*, specify the new comments.

Examples

- To display the list of disk resource information:

```
>rcxadm disk list <RETURN>
NAME             LABEL       TOTAL       STATUS
----             -----       -----       ------
test4-0-disk0    -           4.0GB       normal
test2-0-disk0    -           10.0GB      normal
test2-0-disk1    -           12.0GB      normal
```

- To display a list of detailed disk resource information:

```
>rcxadm disk list -verbose <RETURN>
NAME                 LABEL    COMMENT  TOTAL        STATUS   VSTORAGE_NAME
----                 -----    -------  -----        ------   -------------
L-Server1-0-disk0    -        -        20.0GB       normal   E2000-40
L-Server1-0-disk1    -        -        12.0GB       normal   E2000-40
```

- To display the detailed information for a disk resource:

```
>rcxadm disk show -name L-Server1-0-disk0 <RETURN>
Name: L-Server1-0-disk0
Label:
Comment:
Total Size: 20.0GB
Status: normal
Vstorage Name: E2000-40
```

E.3.5 rcxadm network

Name

[Windows]
*Installation_folder***Manager\bin\rcxadm network** - network resource operations

[Linux]
/opt/FJSVrcvmr/bin/rcxadm network - network resource operations

Format

```
rcxadm network create -file file.xml [-nowait]
rcxadm network list
rcxadm network show -name name
rcxadm network move -name name -to pool [-nowait]
rcxadm network delete -name name [-nowait]
```

Description

rcxadm network is the command used to manage network resources. The command can be used to define network resources for the internal or external network, and manage the IP address range and subnet mask to assign.

Subcommands

create

Creates a network resource.

list

Displays a list of network resource information.

show

Displays the detailed information for a network resource.

move

Moves a network resource to the specified resource pool.

delete

Deletes a network resource.

Options

-file *file.xml*

In *file.xml*, specify the XML file that defines the network resource. For details on the XML file definition, refer to "H.4 Network Resources".

-nowait

Use this option to return directly to the command prompt without waiting for the operation of the network resource specified in the subcommand to complete its execution.

-name *name*

In *name*, specify the name of the target network resource to perform an operation with.

-to *pool*

Specify the destination resource folder in *pool*.

Examples

- To display the list of network resource information:

```
>rcxadm network list <RETURN>
NAME                    SUBNET          VLAN_ID LABEL
```

```
----                    ------          ------- -----
net_aa1                 20.10.10.0      -       net_label
net_aa2                 20.10.11.0      -       -
```

- To display the detailed information for a network resource:

```
>rcxadm network show -name net_aa1 <RETURN>
name: net_aa1
label: net_label
comment: net_comment
vlan_id: 1234
subnet: 20.10.10.0
mask: 255.255.255.0
start - end: 20.10.10.1 - 20.10.255.1
exclude_address_range[0]: 20.10.10.1 - 20.10.20.1
exclude_address_range[1]: 20.10.21.1 - 20.10.31.11
external_port_chassis[0]: chassis
external_port_switch[0]: switch_aa
external_port_number[0]: 10
external_port_chassis[1]:
external_port_switch[1]:
external_port_number[1]: 11
```

E.3.6 rcxadm pool

Name

[Windows]
*Installation_folder***Manager\bin\rcxadm pool** - resource pool operations

[Linux]
/opt/FJSVrcvmr/bin/rcxadm pool - resource pool operations

Format

rcxadm pool create -name *name* **-type** *type* **[-priority** *priority***] [-label** *label***] [-comment** *comment***] [-nowait]**
rcxadm pool list [-name *name***] [-template** *template_name***]**
rcxadm pool show -name *name*
rcxadm pool register -name *name* **-resource** *resource_name* **-type** *resource_type* **[-nowait]**
rcxadm pool unregister -name *name* **-resource** *resource_name* **-type** *resource_type* **[-nowait]**
rcxadm pool modify -name *name* **{[-new_name** *new_name***] [-priority** *priority***] [-label** *label***] [-comment** *comment***]} [-nowait]**
rcxadm pool move -name *name* **[-to** *folder***] [-nowait]**
rcxadm pool delete -name *name* **[-force] [-nowait]**

Description

rcxadm pool is the command used to manage resource pools. A resource pool is a type of resource folder in the orchestration tree, which stores the resources to select when creating or adding an L-Server. A resource pool type is specified when creating a resource pool, and only resources of a specific type are stored in each type of resource pool.

The following types of resource pools exist:

- vm

  VM pool
  A resource pool that stores VM hosts used when creating VM guests.

- server

  Server pool
  A resource pool that stores the physical servers assigned to L-Servers.

- storage

  Storage pool
  A resource pool that stores the disks assigned to L-Servers.

- network

  Network pool
  A resource pool that stores the networks assigned to L-Servers.

- address

  Address pool
  Stores the IP addresses, MAC addresses, and WWNs for assignment to L-Servers.

- image

  Image pool
  A resource pool that stores the cloning images to deploy to L-Servers.

The following types of resources exist:

- vm_host

  VM host resource
  Stored in VM pools.

- physical_server

  Physical server resource
  Stored in server pools.

- storage

  Virtual storage resource
  Stored in storage pools.

- disk

  Disk resource
  Stored in storage pools.

- network

  Network resource
  Stored in network pools.

- address_set

  Address set resource
  Stored in address pools.

- vm_image

  Virtual image resource
  Stored in image pools.

- cloning_image

  Physical image resource
  Stored in image pools.

Resource pools enable you to manage all the resources assigned when creating an L-Server.

Subcommands

create

Creates a resource pool.

list

Displays a list of resource pools. If you specify the -name argument, the specified resource pool and a list of the resources included in the resource pool are displayed. If you do not specify the -name argument, the information for all the resource pools that can be accessed is displayed.

show

Displays the detailed information for a resource pool.

register

Registers a resource to a resource pool.

unregister

Deletes a resource from a resource pool.

modify

Modifies the name, label, comment, and priority of a resource pool.

move

Moves a resource pool to the specified resource folder.
If the destination resource folder is not specified, the pool is moved to the home folder.

delete

Deletes a resource pool.

Options

-name *name*

In *name*, specify the name of the target resource pool to perform an operation with.

-type *type*

In *type*, specify the resource pool type.

-priority *priority*

In *priority*, specify a priority between 1 and 10. If omitted, "5" is set. You can specify the same priority as another pool, but it is not recommended as the order for retrieving resources will not be guaranteed.

-label *label*

In *label*, specify the label for the resource pool.

-comment *comment*

In *comment*, specify any comments for the resource pool.

-nowait

Use this option to return directly to the command prompt without waiting for the operation of the resource pool specified in the subcommand to complete its execution.

-template *template_name*

In *template_name*, specify the name of an L-Server template that can be created.

-resource *resource_name*

In *resource_name*, specify the resource name.

-type *resource_type*

In *resource_type*, specify a type for the resource.

-new_name *new_name*

In *new_name*, specify a new name for the target resource pool.

-to *folder*

Specify the destination resource folder in *folder*.
If the destination resource folder is not specified, the pool is moved to the home folder.

-force

Use this option to forcibly delete a resource pool that includes resources. When the resource pool is deleted, the resources that belong to the resource pool are unregistered.

Examples

- To display the list of resource pools:

```
>rcxadm pool list <RETURN>
NAME                TYPE    PRIORITY CPU(max.)             MEMORY(max.)
----                ----    -------- ---------             ------------
/VMPool             VM      5        2.2/3.2(1.1GHz x 2)   6.7/7.7(6.7GB)

NAME                TYPE    PRIORITY CAPACITY(max.)
----                ----    -------- --------------
/StoragePool        Storage 5        0.0/0.0(-)

NAME                TYPE    PRIORITY VLANID
----                ----    -------- ------
/NetworkPool        Network 5        -/-

NAME                TYPE    PRIORITY IMAGE
----                ----    -------- -----
/ImagePool          Image   5        3
/ImgPool            Image   5        -
```

- To display the specified resource pool and a list of the resources included in the resource pool:

```
>rcxadm pool list -name /VMPool <RETURN>
NAME                TYPE    PRIORITY CPU(max.)             MEMORY(max.)
----                ----    -------- ---------             ------------
/VMPool             VM      5        2.2/3.2(1.1GHz x 2)   6.7/7.7(6.7GB)

NAME           TYPE     CPU(FREE)            MEMORY(FREE)   STATUS  MAINTENANCE
----           ----     ---------            ------------   ------  -----------
192.168.10.10  VMHost   1.6GHz x 2 (2.2GHz)  7.7GB (6.7GB)  unknown OFF
```

- To display the detailed information for a resource pool:

```
>rcxadm pool show -name /VMPool <RETURN>
Name: VMPool
Type: VM
Priority: 5
CPU: 3.2GHz(1.1GHz x 2)
FreeCPU: 2.2GHz
MemorySize: 7.7GB(6.7GB)
FreeMemorySize: 6.7GB
```

E.3.7 rcxadm folder

Name

[Windows]
*Installation_folder***Manager\bin\rcxadm folder** - resource folder operations

[Linux]
/opt/FJSVrcvmr/bin/rcxadm folder - resource folder operations

Format

```
rcxadm folder create -file file.xml  [-nowait]
rcxadm folder create -name name [-type type] [-label label] [-comment comment] [-nowait]
rcxadm folder list [-name name] [-type type]
rcxadm folder show -name name [-type type]
rcxadm folder modify -name name [-type type] {[-new_name name] [-label label] [-comment comment]} [-
nowait]
rcxadm folder move -name name [-type type] [-to folder] [-nowait]
rcxadm folder delete -name name [-type type] [-nowait]
```

Description

rcxadm folder is the command used to manage resource folders. Use resource folder management to group resources when the number of resources managed by Resource Orchestrator becomes large or when you want to manage resources in work units. Since the resource folders can be arranged in a hierarchy, you can perform detailed categorization for resources.

The resource folder management function improves operability by grouping resources so operations can be performed on them together.
Resource folders can be used with user/role management to ensure folder level security.

Resource folders are categorized into the following three types, depending on the resources to register:

- Orchestration

  Registers L-Servers, network resources, disk resources, and resource pools.

- Servers

  Registers server tree blade chassis and rack mount servers.

- Storage

  Registers virtual storage resources.

Subcommands

create

Creates a new resource folder. Use the -file option to create the specified resource folder with resources included. If the resource folder specified in the XML file already exists, only the specified resources are created.

list

Displays the list of resource folders and the resources and subfolders included in the resource folders.
If you specify the -name argument, the specified resource folder and a list of the resources and subfolders included in the folder are displayed. If you do not specify the -name argument, the list of top level resource folders is displayed.

show

Displays the detailed information for a resource folder.

modify

Modifies the name, label, comment, and priority of the specified resource folder.

move

Moves a resource folder to the specified resource folder. If the destination resource folder is not specified, the folder is moved to the home folder.

delete

Deletes a resource folder.

Options

-file *file.xml*

In *file.xml*, specify the XML file that specifies the resource folder to create and the resources to include in the resource folder. For details on the XML file definition, refer to "H.5 Resource Folders".

-nowait

Use this option to return directly to the command prompt without waiting for the operation of the resource folder specified in the subcommand to complete its execution.

-name *name*

In *name*, specify the resource folder name. If the resource folders are arranged in a hierarchy, specify the resource folder name connected with slashes ("/").

Example

To specify SecondFolder directly below TopFolder:

/TopFolder/SecondFolder

-type *type*

In *type*, specify a resource folder type for the resource folder. Specify either "server" or "lserver" for the resource folder type. If omitted, "lserver" is set.

-label *label*

In *label*, specify the label for the resource folder.

-comment *comment*

In *comment*, specify any comments for the resource folder.

-new_name *name*

In *name*, specify a new name for the target resource folder to perform an operation with.

-to *folder*

Specify the destination resource folder in *folder*. When omitted, the folder is moved to the home folder.

Examples

- To display the list of resource folders and the resources and subfolders included in the resource folders:

```
>rcxadm folder list <RETURN>
TYPE                NAME                            LABEL
----                ----                            -----
Folder              TenantA                         -
Folder              TenantB                         -
Pool                ImagePool                       -
Pool                ImgPool                         -
Pool                NetworkPool                     -
```

```
Pool                StoragePool                     -
Pool                VMPool                          -
```

- To display the list of the resources and subfolders included in the specified resource folder:

```
>rcxadm folder list -name TenantA <RETURN>
TYPE                NAME                            LABEL
----                ----                            -----
Folder              testA                           -
LServer             test4                           -
```

- To display the detailed information for a resource folder:

```
>rcxadm folder show -name TenantA <RETURN>
name    : TenantA
label   :
comment :
```

E.3.8 rcxadm addrset

Name

[Windows]
Installation_folder\Manager\bin\rcxadm addrset - address set resource operations

[Linux]
/opt/FJSVrcvmr/bin/rcxadm addrset - address set resource operations

Format

rcxadm addrset create -name *name* **-type {MAC|WWN} -file** *file* **-pool** *pool* **[-exclude** *address*[,*address*]...**] [-label** *label*] **[-comment** *comment*] **[-nowait]**
rcxadm addrset list [-verbose]
rcxadm addrset show -name *name*
rcxadm addrset move -name *name* **[-to** *folder_name*] **[-nowait]**
rcxadm addrset delete -name *name* **[-nowait]**

Description

rcxadm addrset is the command used to manage WWNs and MAC addresses.

Subcommands

create

Creates and registers an address set resource in the address pool.

list

Displays a list of address set resources.

show

Displays details of address set resources.

move

Moves an address pool to the specified resource folder.
If the destination resource folder is not specified, the pool is moved to the home folder.

delete

Deletes an address pool. Address set resources contained in the address pool will also be deleted.

Options

-name *name*

In *name*, specify the name of the target address set resource to perform an operation with.

-verbose

Use this option to increase the items displayed in the list of information.

-type

Specify WWN or MAC address.

-file

Specify the WWN in the CD-ROM enclosed in the I/O Virtualization Option, or the list file of the MAC address.

-exclude

Of the WWNs and MAC addresses given in the list file on the CD-ROM enclosed with the I/O Virtualization Option, specify an address that has been allocated using RCVE or VIOM and is not used in management by Resource Orchestrator.

-pool

Specify the name of the resource pool to register an address set resource in.

-nowait

Use this option to return directly to the command prompt without waiting for the operation of the address set resource specified in the subcommand to complete its execution.

-label *label*

In *label*, specify the new label.

-comment *comment*

In *comment*, specify the new comments.

Examples

- To display the list of address set resource information:

```
>rcxadm addrset list <RETURN>
<?xml version="1.0" encoding="utf-8"?>

<AddressSets>
  <AddressSet name="macdata1" id="543" label="mac1" />
  <AddressSet name="wwndata1" id="540" label="wwn1" />
</AddressSets>
```

- To display the detailed information of address set resources (WWNs):

```
>rcxadm addrset show -name wwndata1 <RETURN>
<?xml version="1.0" encoding="utf-8"?>

<AddressSet name="wwndata1" id="540" label="wwn1" subnet="" mask=""
start="20:01:00:17:42:50:00:00" end="20:01:00:17:42:50:00:0f">
  <Comment>wwn-test-data-1</Comment>
  <Exclude>
  </Exclude>
  <Reserve>
```

```
  </Reserve>
</AddressSet>
```

- To display the detailed information of address set resources (MAC addresses):

```
>rcxadm addrset show -name macdata1 <RETURN>
<?xml version="1.0" encoding="utf-8"?>

<AddressSet name="macdata1" id="543" label="mac1" subnet="" mask=""
start="00:17:42:4f:00:00" end="00:17:42:4f:00:f0">
  <Comment>mac-test-data-1</Comment>
  <Exclude>
  </Exclude>
  <Reserve>
  </Reserve>
</AddressSet>
```

E.3.9 rcxadm chassis

rcxadm chassis is an existing RCVE command. For details, refer to the "ServerView Resource Coordinator VE Command Reference".

E.3.10 rcxadm server

rcxadm server is an existing RCVE command. For details, refer to the "ServerView Resource Coordinator VE Command Reference".

E.4 Image Operations

This section explains the commands used to operate images managed in Resource Orchestrator.

E.4.1 rcxadm image

rcxadm image is an existing RCVE command. For details, refer to the "ServerView Resource Coordinator VE Command Reference". This section explains the additional functions.

Name

[Windows]
*Installation_folder***Manager\bin\rcxadm image** - image operations

[Linux]
/opt/FJSVrcvmr/bin/rcxadm image - image operations

Format

```
rcxadm image create -server resource -name image [-comment comment] [-to pool] [-storage vstorage] [-
nowait]
rcxadm image delete -server resource -version version
rcxadm image restore -server resource [-version version] [-nowait]
rcxadm image list -type cloning [-name image] [-detail]
rcxadm image list -type snapshot [-server resource] [-detail]
rcxadm image snapshot -server resource [-comment comment] [-online] [-nowait]
rcxadm image move -name image -to pool [-nowait]
```

Description

The additional functions of rcxadm image are indicated below.

- A resource pool where images are stored can be specified with the -to option when creating an image. The virtual storage location for an image can be specified with the -storage option.

  rcxadm image create -server *resource* **-name** *image* **[-comment** *comment***] [-to** *pool***] [-storage vstorage] [-nowait]**

- An L-Server snapshot can be created with the snapshot subcommand.

  rcxadm image snapshot -server *resource* **[-comment** *comment***] [-nowait]**

- An L-Server snapshot can be deleted with the delete subcommand.

  rcxadm image delete -server *resource* **-version** *version*

- An L-Server snapshot can be restored with the restore subcommand.

  rcxadm image restore -server *resource* **[-version** *version***] [-nowait]**

- Cloning can be specified with the -type option when using the list command. Detailed information can also be output with the -detail option.

  rcxadm image list -type cloning [-name *image***] [-detail]**

- A snapshot can be specified with the -type option when using the list command. Detailed information can also be output with the -detail option.

  rcxadm image list -type snapshot [-server *resource***] [-detail]**

- Images registered in the orchestration tree can be moved between resource pools. The destination resource pool name can be specified with the -to option.

  rcxadm image move -name *image* **-to** *pool* **[-nowait]**

Subcommands

create

Collects a cloning image of the specified L-Server.

list

Displays the cloning images and snapshot images of the specified L-Server.

delete

In addition to the existing RCVE function, an L-Server snapshot can be deleted with the delete subcommand.

restore

In addition to the existing RCVE function, an L-Server snapshot can be restored with the restore subcommand.

snapshot

Collects a snapshot of the specified L-Server.
Setting is only possible when the server type is "Virtual".

move

Images registered in the orchestration tree are moved between resource pools.

Options

-server *resource*

Specify the name of the L-Server in *resource*.

-nowait

Use this option to return directly to the command prompt without waiting for the operation specified in the subcommand to complete its execution.

-to *pool*

Specify the name of the resource pool for storing the cloning image or the name of the destination resource pool.
If omitted, it is assumed that the resource pool with the highest priority from the resource pools with update rights has been specified.

-storage *vstorage*

Enter the name of the virtual storage or the library shared folder for storing the collected cloning image.
If omitted, it is assumed that the virtual storage resource containing the L-Server for collecting cloning images has been specified.

[Hyper-V]
It is assumed that the name of the regulated shared library folder on the SCVMM server is specified.

-type cloning|snapshot

Specify the type of image. If you specify snapshot, a snapshot image is displayed.

-detail

Displays the detailed information for the type of image.

-comment *comment*

In *comment*, enter a comment that identifies the snapshot.
Enter up to 128 alphanumeric characters or symbols.
However, use of percent signs ("%"), back slashes ("\"), and double quotes (") is not allowed in *comment*.

Note

If blank spaces are included in *comment*, enclose the *comment* character string using double quotes (").

-online

Specify when executing a snapshot, regardless of the status of the L-Server.

-name *image*

In *image*, enter a name to identify the collected cloning image.

Note

- When creating an image, a template is created in the server virtualization software with the following name:

Server Virtualization Software	Name in Server Virtualization Software
VMware Hyper-V	*Cloning_image_name@version_number*

When creating a template in the server virtualization software, do not use a name with the above format.

- When creating a template from a VM guest in the server virtualization software, set the system disk of the VM guest as indicated below.

Server Virtualization Software	System Disk
VMware	Disk with SCSI controller: 0, ID:0
Hyper-V	Device, Primary channel (0)

- Make sure the name *image* specified when creating an image does not conflict with the name of the cloning image for the physical server. For details on the cloning image of the physical server, refer to the information about cloning in the "ServerView Resource Coordinator VE Setup Guide".

E.5 L-Server Template Operations

This section explains the commands used for L-Server template operations.

E.5.1 rcxadm template

Name

[Windows]
*Installation_folder***Manager\bin\rcxadm template** - L-Server template operations

[Linux]
/opt/FJSVrcvmr/bin/rcxadm template - L-Server template operations

Format

```
rcxadm template import -file file [-nowait]
rcxadm template list [-verbose]
rcxadm template show -name name
rcxadm template export -file file [-name name]
rcxadm template modify -name name {[-new_name name] [-label label] [-comment comment]} [-nowait]
rcxadm template delete -name name [-force] [-nowait]
```

Description

rcxadm template is the command used to perform operations on L-Server templates. L-Server templates define the values such as the number of CPUs, memory capacity, and disk capacity that comprise an L-Server. Using an L-Server template enables easy creation of L-Servers.

Subcommands

import

Imports the L-Server template defined in an XML file.

list

Displays a list of the L-Server templates that can be accessed. Using the -verbose option also displays information regarding the redundancy configuration and operation location.

show

Displays the detailed information for the specified L-Server template.

export

Exports the specified L-Server template information in the XML format. If you do not specify an L-Server template with the -name option, all L-Server templates are exported.

modify

Modifies the label, comment, and name of the specified L-Server template.

delete

Deletes the specified L-Server template. Use the -force option to forcibly delete the specified L-Server template even if there are L-Servers created from the template.

Options

-file *file*

In *file*, specify the L-Server template XML file to import or export.

-nowait

Use this option to return directly to the command prompt without waiting for the operation of the L-Server template specified in the subcommand to complete its execution.

-name *name*

In *name*, specify the L-Server template name.

-verbose

Use this option to display the redundancy configuration and the operation location.

-new_name *name*

In *name*, specify the new L-Server template name.

-label *label*

In *label*, specify the new label.

-comment *comment*

In *comment*, specify the new comments.

-force

Use the -force option to forcibly delete the specified L-Server template even if there are L-Servers created from the template.

Examples

- To display a list of the L-Server templates that can be accessed:

```
>rcxadm template list <RETURN>
NAME                TYPE        SPEC                DISKS               NICS
----                ----        ----                -----               ----
no-nic              Virtual     1.0GHz,1,2.0GB      10.0GB,12.0GB       -
small               Virtual     1.0GHz,1,1.0GB      10.0GB              -
```

- To also display information regarding the redundancy configuration and the positioning:

```
>rcxadm template list -verbose <RETURN>
NAME      TYPE        SPEC              DISKS               NICS REDUNDANCY POSITIONING
----      ----        ----              -----               ---- ---------- -----------
no-nic    Virtual     1.0GHz,1,2.0GB    10.0GB,12.0GB       -    None       Fixed
small     Virtual     1.0GHz,1,1.0GB    10.0GB              -    None       Fixed
```

- To display the detailed information for the specified L-Server template:

```
>rcxadm template show -name small <RETURN>
Name: small
Label: label of the small
ServerType: Virtual
VMType: VMware
CPUArch: IA
CPUPerf: 1.0GHz
NumOfCPU: 1
MemorySize: 1.0GB
DiskSize[0]: 10.0GB
Redundancy: None
Positioning: Fixed
```

E.6 User Operations

This section explains the commands used to operate users and access privileges.

E.6.1 rcxadm user

Name

[Windows]
*Installation_folder***Manager\bin\rcxadm user** - user operations

[Linux]
/opt/FJSVrcvmr/bin/rcxadm user - user operations

Format

```
rcxadm user create -file file.xml
rcxadm user create -name name {-passwd password|-passwd_file password_file} [-label label] [-comment
comment] [-usergroup usergroup] [-role scope=role[,scope=role,...]]
rcxadm user list [-format text|xml]
rcxadm user show -name name
rcxadm user modify -name name -file file.xml
rcxadm user modify -name name {[-new_name newname] [-label label] [-comment comment] [-usergroup
usergroup] {-passwd password |-passwd_file password_file} [-role scope=role[,scope=role,...]}
rcxadm user delete -name name
```

Description

rcxadm user is the command used for registering users, changing passwords, changing privilege levels, deleting users, and restricting the access scope of operations for each user.

Subcommands

create

Creates a user.

list

Displays a list of user information in the text format or XML format.

show

Displays the detailed information for the specified user in the text format.

modify

Modifies the name, label, comment, user group, password, and operation/access scope of the specified user.

delete

Deletes the specified user.

Options

-file *file.xml*

In *file.xml*, specify the XML file that defines the attributes of the user to register or change.
It is not possible to perform batch registration or changes of multiple users using the output results of list -format xml.
For details on the XML file definition, refer to "H.6 Users".

-name *name*

In *name*, specify the user name.

-label *label*

In *label*, specify the new label.

-comment *comment*

In *comment*, specify the new comments.

-usergroup *usergroup*

In *usergroup*, specify the user group to use for setting users in batches.

-passwd *password*

In *password*, specify the password for the user.

-passwd_file *password_file*

In *password_file*, specify the password file for the user. When users other than administrators use an admin server, it is dangerous to specify the password using an argument such as -passwd because the arguments of commands issued by other users can be viewed. Use the -passwd_file option.
In the file that defines the passwords, enter a user name and password on each line, separated by a comma (","). The password entered in the line including the user name specified with the -name option will be registered.

-role *scope=role*,...

In *scope*, specify the names of the resource folders, resource pools, and resources in the orchestration tree to include in the access scope. Specify resources inside resource folders by entering a slash ("/") and the resource name after the resource folder name. Specify resource folder names or resource names for the access scope. If you do not want to restrict the access scope, omit the access scope, or specify "all". In *role*, specify the most appropriate role of the standard roles. Multiple access scopes and roles can be specified, separated by a comma (",").

- supervisor (special administrator)
- admin (administrator)
- operator (operator)
- monitor (monitor)
- lserver_admin (L-Server administrator)
- lserver_operator (L-Server operator)
- lserver_monitor (L-Server monitor)
- infra_admin (infrastructure administrator)
- infra_operator (infrastructure operator)

-format text|xml

Specify the display format. You can specify text or xml format.

When -format is omitted, it is displayed in text format.

-new_name *newname*

In *newname*, specify the new user name.

Examples

- To display a list of user information in the text format:

```
>rcxadm user list <RETURN>
NAME                USERGROUP           LABEL               ROLE
----                ---------           -----               ----
aaa                 -                   -                   all=admin
admin_user          admin               -                   -
bbb                 -                   -                   /
folder001=admin
folder_user         folder_group        -                   -
manage              -                   -                   -
```

- To display the detailed information for the specified user in the text format:

```
>rcxadm user show -name aaa <RETURN>
Name      : aaa
UserGroup :
Label     :
Comment   :
Role[0]   : all=admin
```

E.6.2 rcxadm usergroup

Name

[Windows]
*Installation_folder***Manager\bin\rcxadm usergroup** - user group operations

[Linux]
/opt/FJSVrcvmr/bin/rcxadm usergroup - user group operations

Format

```
rcxadm usergroup create -file file.xml
rcxadm usergroup create -name usergroup [-label label] [-comment comment] [-role scope=role[,...]
rcxadm usergroup list [-format {text|xml}]
rcxadm usergroup show -name usergroup
rcxadm usergroup modify -name usergroup -file file.xml
rcxadm usergroup modify -name usergroup {[-newname usergroup] [-label label] [-comment comment] [-
role scope=role[,...]}
rcxadm usergroup delete -name usergroup
```

Description

rcxadm usergroup is the command used to perform operations on multiple users and batch restriction of access scopes. By performing operations on and restricting the access scope for a user group, the settings are applied on all users registered in that user group. When different settings are specified for a user and its user group, the settings for the user are prioritized.

Subcommands

create

Creates a user group.

list

Displays a list of user group information in the text format or XML format.

show

Displays the detailed information for the specified user in the text format.

modify

Modifies the name, label, comment, and operation/access scope of the specified user group.

delete

Deletes the specified user group. You cannot delete a user group if it includes users.

Options

-file *file.xml*

In *file.xml*, specify the XML file that defines the attributes of the user group to register or change.
It is not possible to perform batch registration or changes of multiple user groups using the output results of list -format xml.
For details on the XML file definition, refer to "H.7 User Groups".

-name *usergroup*

In *usergroup*, specify the user group name.

-label *label*

In *label*, specify the new label.

-comment *comment*

In *comment*, specify the new comments.

-role *scope=role*,...

In *scope*, specify the access scope. If you do not want to restrict the access scope, omit the access scope, or specify "all". In *role*, specify a role. Multiple access scopes and roles can be specified, separated by a comma (",").

-format text|xml

Specify the display format. You can specify text or xml format.

When -format is omitted, it is displayed in text format.

-newname *usergroup*

In *usergroup*, specify the new user group name.

Examples

- To display a list of user group information in text format:

```
>rcxadm usergroup list <RETURN>
NAME                LABEL               ROLE
----                -----               ----
admin               -                   all=admin
folder_group        -                   /folder001=admin
```

- To display the detailed information for the specified user group in text format:

```
>rcxadm usergroup show -name admin <RETURN>
Name      : admin
Label     :
Comment   :
User[0]   : admin_user
Role[0]   : all=admin
```

E.7 Control and Environment Setup

This section explains the commands used for control and environment setup of the manager and agents that comprise Resource Orchestrator.

E.7.1 rcxadm storagemgr

Name

[Windows]
*Installation_folder***Manager\bin\rcxadm storagemgr** - storage management software operations

[Linux]
/opt/FJSVrcvmr/bin/rcxadm storagemgr - storage management software operations

Format

```
rcxadm storagemgr register -name name -soft_name soft_name [-label label] [-comment comment] [-
soft_url url] [-ip ipaddress] [-port number] [-user_name user_name] [-passwd password]
rcxadm storagemgr list [-verbose]
rcxadm storagemgr show -name name
rcxadm storagemgr unregister -name name
rcxadm storagemgr modify -name name [-label label] [-comment comment] [-soft_url url] [-ip
ipaddress] [-port number] [-user_name user_name] [-passwd password]
```

Description

rcxadm storagemgr is the command used to perform operations of storage management software.

Subcommands

register

Registers storage management software.

list

Displays a list of storage management software information.

show

Displays the detailed information for storage management software.

unregister

Unregisters storage management software.

modify

Changes labels, comments, IP address, port numbers, user names, and passwords of storage management software.

When the storage management software is ESC, an error occurs if -ip, -port, -user_name, or -passwd are specified.
If the storage management software is VMware vCenter Server, an error occurs because this command cannot be used to make changes.

Options

-name *name*

In *name*, specify the resource name of the target storage management software to perform an operation with.

-soft_name *soft_name*

In *soft_name*, specify the storage management software. The names that can be specified are as follow:

- When using ETERNUS SF Storage Cruiser, specify "esc".

  An error occurs if -ip, -port, -user_name, or -passwd are specified in addition to "esc".

- When using Data ONTAP, specify "ontap".

  An error occurs if -ip, -user_name, or -passwd are not specified when specifying "ontap".

-soft_url *url*

In *url*, specify the URL to use to access the storage management software.

When specifying -soft_name esc and managing only an ETERNUS, specify the URL of ETERNUSmgr for the ETERNUS.

When managing multiple ETERNUSs, do not specify -soft_url.

-ip *ipaddress*

In *ipaddress*, specify an IP address to use to access the storage management software.

-port *number*

In *number*, specify a port number to use to access the storage management software.

-user_name *user_name*

In *user_name*, specify the user ID for the storage management software.

When specifying -soft_name ontap, specify root.

-passwd *password*

In *password*, specify the password for the storage management software.

-verbose

Use this option to increase the items displayed in the list of information.

-label *label*

In *label*, specify the new label.

-comment *comment*

In *comment*, specify the new comments.

Examples

- To display the list of the storage management software information:

```
>rcxadm storagemgr list <RETURN>
NAME      LABEL    SOFT NAME                      STATUS
----      -----    ---------                      ------
esc00     -        ETERNUS SF Storage Cruiser     normal
```

- To display the details of the storage management software information:

```
>rcxadm storagemgr list -verbose <RETURN>
NAME    LABEL   COMMENT  SOFT NAME                  STATUS  IP ADDRESS PORT
----    -----   -------  ---------                  ------  ---------- ----
esc00   -       -        ETERNUS SF Storage Cruiser normal  -          -
```

- To display the detailed information for storage management software:

```
>rcxadm storagemgr show -name esc00 <RETURN>
Name: esc00
Label:
Comment:
Soft name: ETERNUS SF Storage Cruiser
Version: 14.2
URL:
IP address:
Port number:
Status: normal
User name:
Password:
```

E.7.2 rcxadm imagemgr

rcxadm imagemgr is an existing RCVE command. For details, refer to the "ServerView Resource Coordinator VE Command Reference".

Name

[Windows]
*Installation_folder***Manager\bin\rcxadm imagemgr** - modifying image management information

[Linux]
/opt/FJSVrcvmr/bin/rcxadm imagemgr - modifying image management information

Format

```
rcxadm imagemgr set -attr {vm.clone|vm.snapshot}.maxversion=value
```

Description

The additional functions of rcxadm imagemgr are indicated below.

You can specify vm.clone and vm.snapshot in attributes used for controlling the number of image versions.

rcxadm imagemgr set -attr {vm.clone|vm.snapshot}.maxversion=*max_version*

Options

-attr {vm.clone|vm.snapshot}.maxversion=*max_version*

Specify the maximum number of image file versions. Specify vm.clone for the number of cloning image versions. Specify vm.snapshot for the number of snapshot versions.
In *max_version*, specify the maximum number of image file versions to change. The values that can be specified for *max_version* are any value between 1 and 10.

E.7.3 rcxadm vmmgr

Name

[Windows]
*Installation_folder***Manager\bin\rcxadm vmmgr** - VM management software operations

[Linux]
/opt/FJSVrcvmr/bin/rcxadm vmmgr - VM management software operations

Format

```
rcxadm vmmgr list
rcxadm vmmgr show -name name
```

Description

rcxadm vmmgr is the command used to manage VM management software. The information of VM management software is displayed.

Subcommands

list

Displays a list of VM management software information.

show

Displays the detailed information for VM management software.

Options

-name *name*

In *name*, specify the name of the target VM management software to perform operations with.

Examples

- To display a list of VM management software information:

```
# rcxadm vmmgr list <RETURN>
NAME                            TYPE           IPADDRESS       STATUS
----                            ----           ---------       ------
SCVMM1                          SCVMM          192.168.10.20   normal
vCenterServer1                  vCenter Server 192.168.100.20  normal
```

- To display the detailed information for VM management software:

```
# rcxadm vmmgr show -name SCVMM1 <RETURN>
Name: SCVMM1
Type: SCVMM
IpAddress: 192.168.10.20
Status: normal
ManagementSoftwareURL: https://192.168.10.20/sdk
LibraryShare[0]: \\rcxvmmshv-dc.rcxvmmshv.local
\MSSCVMMLibrary
LibraryShare[1]: \\rcxclusterfs.rcxvmmshv.local\SCVMM-LIB

# rcxadm vmmgr show -name vCenterServer1 <RETURN>
Name: vCenterServer1
Type: vCenter Server
IpAddress: 192.168.100.20
Status: normal
ManagementSoftwareURL: https://192.168.100.20/sdk
```

Exit Status

This command returns the following values:

0

The command executed successfully.

non-zero

An error has occurred.

E.7.4 rcxadm agtctl

rcxadm agtctl is an existing RCVE command. For details, refer to the "ServerView Resource Coordinator VE Command Reference".

E.7.5 rcxadm certctl

rcxadm certctl is an existing RCVE command. For details, refer to the "ServerView Resource Coordinator VE Command Reference".

E.7.6 rcxadm deployctl

rcxadm deployctl is an existing RCVE command. For details, refer to the "ServerView Resource Coordinator VE Command Reference".

E.7.7 rcxadm lanctl

rcxadm lanctl is an existing RCVE command. For details, refer to the "ServerView Resource Coordinator VE Command Reference".

E.7.8 rcxadm mgrctl

rcxadm mgrctl is an existing RCVE command. For details, refer to the "ServerView Resource Coordinator VE Command Reference".

E.7.9 deployment_service_uninstall

deployment_service_uninstall is an existing RCVE command. For details, refer to the "ServerView Resource Coordinator VE Command Reference".

Appendix F Messages

This appendix explains the messages output or displayed by Resource Orchestrator.

When messages other than the following are output, refer to the "ServerView Resource Coordinator VE Messages".

21161

FJSVrcx:INFO:21161:*obj*:*type* is detected.

[Description]

The resource displayed in *type* has been detected.

- When "VMguest" is displayed for *type*:
  The server name of the VM guest is displayed in *obj*.
- When "cloning image" is displayed for *type*:
  The name and version of the cloning image is displayed in *obj*.
- When "snapshot image" is displayed for *type*:
  The name and version of the snapshot is displayed in *obj*.
- When "vstorage" is displayed for *type*:
  The name of the virtual storage resource is displayed in *obj*.
- When "storage" is displayed for *type*:
  The resource name of the physical storage unit is displayed in *obj*.

[Corrective Action]

No action is necessary.

21162

FJSVrcx:INFO:21162:*obj*:*type* is lost.

[Description]

The resource displayed in *type* is no longer being managed by Resource Orchestrator.

- When "VMguest" is displayed for *type*:
  The server name of the VM guest is displayed in *obj*.
- When "cloning image" is displayed for *type*:
  The name and version of the cloning image is displayed in *obj*.
- When "snapshot image" is displayed for *type*:
  The name and version of the snapshot is displayed in *obj*.
- When "vstorage" is displayed for *type*:
  The name of the virtual storage resource is displayed in *obj*.
- When "storage" is displayed for *type*:
  The resource name of the physical storage unit is displayed in *obj*.

[Corrective Action]

No action is necessary.

22700

FJSVrcx:INFO:22700:*name*:using already existing virtual switch on server *server*

[Description]

The virtual switch *name* on the server *server* is used.

[Corrective Action]

No action is necessary.

22701

FJSVrcx:INFO:22701:*name*:using already existing virtual network on server *server*

[Description]

The virtual network *name* on the server *server* is used.

- If the target server is a VMware server:

  The virtual network indicates a port group on the virtual switch.

[Corrective Action]

No action is necessary.

61166

FJSVrcx:ERROR:61166:*server_name* is not powered off.

[Description]

The power of the L-Server *server_name* has not been stopped.

The name of the L-Server is displayed in *server_name*.

[Corrective Action]

Stop the power of the L-Server. Then perform the operation again.

61167

FJSVrcx:ERROR:61167:I/O device not found for *server_name*

[Description]

The I/O device used for allocation of the server profile on the server *server_name* was not found.

When creating an L-Server with the server type "Physical", the server name selected when creating the L-Server will be displayed in *server_name*.

[Corrective Action]

Please mount an FC card in expansion slot 1 of the server.

61174

FJSVrcx:ERROR:61174:*server_name*:addresses already used in *external_software*. detail=*detail*

[Description]

The address specified for the server *server_name* already exists.

An address that is the same as one already in use may have been specified.

In *server_name*, the name of the server is displayed.

When the specified address is that of external software, the name of the external software is displayed in *external_software*.

In *detail*, a detailed message is displayed.

[Corrective Action]

Specify an unused address resource, and perform the operation again.

When the error occurs even when an unused address resource is specified, part of the external software information may be incorrect.

Refer to the external software information, and perform the operation again after deleting any duplicated addresses.

61175

FJSVrcx:ERROR:61175:*server_name*:addresses out of range in *external_software*.detail=*detail*

[Description]

- When *external_software* is VIOM

  The address specified for the server *server_name* is outside the range that is available for use.

In *server_name*, the name of the server is displayed.

In *detail*, a detailed message is displayed.

[Corrective Action]

Please change the VIOM settings so that the address (MAC address or WWN) displayed in *detail* is included in the range that is available for use.

61176

FJSVrcx:ERROR:61176:*profile_name*:already assigned to another server.

[Description]

The server profile *profile_name* is assigned to another server.

In *profile_name*, the name of the server profile is displayed.

[Corrective Action]

Delete the server profile of *profile_name*, and perform the operation again.

61177

FJSVrcx:ERROR:61177:*server_name*:a server profile is already assigned.

[Description]

Another server profile has been assigned to the server *profile_name*.

In *server_name*, the name of the server is displayed.

[Corrective Action]

Delete the server profile configured for the server *server_name*, and perform the operation again.

61178

FJSVrcx:ERROR:61178:*server_name*:server profile deletion failed (*detail*).

[Description]

Failed to delete the server profile.

In *server_name*, the name of the server is displayed.

In *detail*, a detailed message is displayed.

[Corrective Action]

Delete the server profile configured for the server *server_name*, and perform the operation again.

62501

FJSVrcx:ERROR:62501:*key*:is required

[Description]

key must be specified.

[Corrective Action]

If this message is output when creating an L-Server or importing an L-Server template, review the content of the XML file specified when operating the server, and correct the tags and values specified in *key*.

62502

FJSVrcx:ERROR:62502:*template*:L-Server created from the template remains. detail=*obj*,..

[Description]

template is being used by the L-Server output in *obj*.
If there are three or more L-Server names output in *obj*, only two are displayed, followed by "...".

[Corrective Action]

If you do not want to use the template *template* used when creating the L-Server again, perform the following operations:

- Add the -force option to the command, and perform the operation again
- Delete the L-Server template from the GUI

62503

FJSVrcx:ERROR:62503:*obj*:storage management software registration failed. detail=*detail*

[Description]

An error occurred during the control of storage management software, so registration of the storage management software *obj* failed.

[Corrective Action]

- When *detail* is "version unmatch. [*version_of_the_storage_management_software*]"

  There is an error in the *version_of_the_storage_management_software*. Use a supported version.

- When *detail* is "service is not run."

  The storage management software is not operating. Start the storage management software.

- When *detail* is "invalid storage management software name"

  There is an error in the name specified for the -soft_name option. Specify the correct name.

- When *detail* is "one or more option is short"

  A required option has not been specified. Specify the required option.

- When *detail* is "one or more option is unnecessary"

  An unnecessary option has been specified. Do not specify unnecessary options.

- When *detail* is "storagemgr is already registered"

  The specified storage management software has already been registered. Storage management software that is already registered cannot be registered.

- When *detail* is "ip address: invalid format"

  There is an error in the specified IP address. Specify the correct IP address.

- When *detail* is "port: invalid format"

  There is an error in the specified port number. Specify the port number using a decimal number.

- When *detail* is "port: out of range"

  There is an error in the specified port number. Specify the port number in the range of 0 to 65535.

If the problem is still not resolved after performing the above actions or if a value not indicated above is displayed in *detail*, collect the corresponding message and troubleshooting data, and contact Fujitsu technical staff.

62504

FJSVrcx:ERROR:62504:*obj*:changing storage management software information failed. detail=*detail*

[Description]

An error occurred during control of storage management software, so changes to the configuration of the storage management software *obj* failed.

[Corrective Action]

- When *detail* is "storagemgr is registered as VM management software"

  This command cannot be used to make configuration changes, as storage management software has been registered as VM management software. For details on how to change configuration of VM management software, refer to the "ServerView Resource Coordinator VE Setup Guide".

- When *detail* is "one or more option is unnecessary"

  An unnecessary option has been specified. Do not specify unnecessary options.

- When *detail* is "ip address: invalid format"

  There is an error in the specified IP address. Specify the correct IP address.

- When *detail* is "port: invalid format"

  There is an error in the specified port number. Specify the port number using a decimal number.

- When *detail* is "port: out of range"

  There is an error in the specified port number. Specify the port number in the range of 0 to 65535.

If the problem is still not resolved after performing the above actions or if a value not indicated above is displayed in *detail*, collect the corresponding message and troubleshooting data, and contact Fujitsu technical staff.

62505

FJSVrcx:ERROR:62505:*obj*:storage management software unregistration failed. detail=*detail*

[Description]

An error occurred in the control of the storage management software, so deletion of the storage management software *obj* failed.

[Corrective Action]

- When *detail* is "storagemgr is registered as VM management software"

  This command cannot be used for deletion as the storage management software has been registered as VM management software. For details on how to delete VM management software, refer to the "ServerView Resource Coordinator VE Setup Guide".

If the problem is still not resolved after performing the above actions or if a value not indicated above is displayed in *detail*, collect the corresponding message and troubleshooting data, and contact Fujitsu technical staff.

62510

FJSVrcx:ERROR:62510:failed to control *obj*(*ipaddress*). IF=*%1*, code=*%2*, message=*%3*

[Description]

An error occurred during control of storage management software.

In *obj*, the resource name of the storage management software is displayed.

For *ipaddress*, the IP address of the target resource is displayed.

In *%1*, the internal function name is displayed.

In *%2*, the internal code information is displayed.

In *%3*, the internal detail information is displayed.

[Corrective Action]

- If *%2* is "13115":

  Since the specified disk size is less than 20MB, creation of a volume on the storage unit failed.

  Perform the operation again after modifying the disk size.

- If *%2* is "13062":

  Since the specified disk size is larger than the available space, creation of a volume on the storage unit failed.

  Perform the operation again after modifying the disk size.

If the problem is still not resolved after performing the above actions or if a value not indicated above is displayed in internal code information, collect the corresponding message and troubleshooting data, and contact Fujitsu technical staff.

62511

FJSVrcx:ERROR:62511: failed to control *obj*. IF=*%1*, message=*%2*

[Description]

An error occurred during control of storage management software.

In *obj*, the resource name of the storage management software is displayed.

In *%1*, the internal function name is displayed.

In *%2*, the message of the storage management software is displayed.

[Corrective Action]

- If *%2* is "ERROR:ssmgr3419:The specified alias name has already been registered."

  Creation of the L-Server failed because the alias name of the affinity group has already been defined when ETERNUS storage was created.

  For details, refer to "G.17 When an L-Server is Created, "Message number 62511" is Displayed, and Creation of the L-Server Fails.".

62557

FJSVrcx:ERROR:62557:*obj* is not empty

[Description]

The specified *obj* is not empty.

[Corrective Action]

Perform the operation again after emptying the specified *obj*.

62558

FJSVrcx:ERROR:62558:*resource* in *obj1* is already used by *obj2*

[Description]

The *resource* in *obj1* is already used by *obj2*.

[Corrective Action]

- When releasing registered resources from resource pools or deleting resource pools forcibly

  Perform the operation again, after changing the *resource* so it is not used.

- When an attempt is made to delete VM management software

  Perform the operation again, after changing the *resource* so it is not used.

  If an L-Server is being managed by the VM management software, the VM management software cannot be deleted.
  If this message is displayed when deleting the VM management software, delete all L-Servers operating on VM hosts managed by the VM management software (*obj1*) to delete.

  The VM host under the management of the VM management software that is to be deleted is displayed in *resource*. When there are multiple VM hosts, an arbitrary VM host will be displayed.

  The L-Server created in *resource* is displayed in *obj2*. When there are multiple L-Servers, an arbitrary L-Server will be displayed.

- When an attempt is made to delete storage management software

  If an L-Server using virtual storage resource is being managed by the storage management software, the storage management software cannot be deleted.
  If this message is displayed when deleting the storage management software, delete all L-Servers using virtual storage resource managed by the storage management software (*obj1*) for deletion.

  The virtual storage resource under the management of the storage management software that is to be deleted is displayed in *resource*. When there are multiple virtual storage resources, an arbitrary virtual storage resource will be displayed.

  The L-Server using *resource* is displayed in *obj2*. When there are multiple L-Servers, an arbitrary L-Server will be displayed.

- L-Server template (When the server type is "Physical")

  In this case, the following messages will be output in the event log:

  - When "(create)" follows after *resource*

    The specified physical server resource is already assigned as an L-Server, or registered as a spare server.

  - When "(Spare)" follows after *resource*

    The physical server resource specified as a spare server is already assigned as an L-Server, or registered as a spare server.

  - When "(Primary)" follows after *resource*

    The physical server resource specified in the physical server usage change is already assigned as an L-Server, or registered as a spare server.

  Specify a physical server resource or resource pool that is already registered, and perform the operation again.

- When IP address is displayed in *resource*

  The network resource of the specified IP address has already been allocated to another L-Server. Specify an unused IP address for the network resource, and perform the operation again.

62559

FJSVrcx:ERROR:62559:external script *script_name* execution error *detail*

[Description]

An error occurred while executing a script registered for external integration.

[Corrective Action]

If other software is integrated into Resource Orchestrator, refer to the manuals for that software and check whether *script_name* is registered.
If *script_name* is registered, refer to the manual of that software.

If the integrated software cannot be found, collect this message and troubleshooting data, and contact Fujitsu technical staff.

62700

FJSVrcx:ERROR:62700:*name*:virtual switch creation failed on server *server* (*code*)

[Description]

Failed to create the virtual switch *name* on server *server*.

[Corrective Action]

Perform the action indicated in the *code* information.

- If *code* is 15:

  There is no response from the VM host/VM management software to the admin server request. Check the operation status and network settings of the VM host/VM management software.

- If *code* is 16:

  The VM host could not be found.

  Select [Operation]-[Update] from the RC console menu to refresh the screen, and check whether the VM host has been deleted.

- If *code* is 101, 110, 111, 112, 114, or 116:

  Communication between the admin server and the VM host/VM management software failed. Check the operation status and network settings of the VM host/VM management software.

- If *code* is 113:

  The login account information for the VM host/VM management software that was entered during registration cannot be used to communicate with the VM host/VM management software. The login account information for the VM host/VM management software may have been changed after registration.

  Change the entered values (user name and password) for the login account information to the correct values.

  For details on changing the login account information, refer to the changing VM host login account information section or the changing VM management software settings section of the "ServerView Resource Coordinator VE Setup Guide".

- If *code* is 100 or 115:

  The login account information for the VM host/VM management software entered during registration may not have the required privileges.

  Check the privilege status from the VM management software. If the account does not have the required privileges, change the entered values (user name and password) for the login account information to the values for a user with administrative privileges for the VM host/VM management software.

  For details on changing the login account information, refer to the changing VM host login account information section or the changing VM management software settings section of the "ServerView Resource Coordinator VE Setup Guide".

- If *code* is 500 or 511:

  Failed to create the virtual switch as the configuration of the physical network adapter and virtual switch of the VM host/VM management software is not capable of creating the virtual switch. Refer to "4.2.5 Network Resources", and check the configuration of the physical network adapter and virtual switch of the VM host/VM management software.

- If *code* is 513:

  Failed to create the virtual switch as the physical network adapter to connect to the virtual switch is in use. Check the network settings of the VM host/VM management software.

- If *code* is 514 or 515:

  Communication between the admin server and the VM host/VM management software failed. Check the operation status and network settings of the VM host/VM management software.

If the problem is still not resolved after performing the above actions or if a value not indicated above is displayed in *code*, collect the corresponding message and troubleshooting data, and contact Fujitsu technical staff.

62701

FJSVrcx:ERROR:62701:*name*:virtual switch deletion failed on server *server* (*code*)

[Description]

Failed to delete the virtual switch *name* on server *server*.

[Corrective Action]

Perform the action indicated in the *code* information.

As the virtual switch *name* remains on the server *server*, check its usage status and if it is no longer necessary, delete the virtual switch from the VM management software.

- If *code* is 15:

  There is no response from the VM host/VM management software to the admin server request. Check the operation status and network settings of the VM host/VM management software.

- If *code* is 16:

  The VM host could not be found.

  Select [Operation]-[Update] from the RC console menu to refresh the screen, and check whether the VM host has been deleted.

- If *code* is 101, 110, 111, 112, 114, or 116:

  Communication between the admin server and the VM host/VM management software failed. Check the operation status and network settings of the VM host/VM management software.

- If *code* is 113:

  The login account information for the VM host/VM management software that was entered during registration cannot be used to communicate with the VM host/VM management software. The login account information for the VM host/VM management software may have been changed after registration.

  Change the entered values (user name and password) for the login account information to the correct values.

  For details on changing the login account information, refer to the changing VM host login account information section or the changing VM management software settings section of the "ServerView Resource Coordinator VE Setup Guide".

- If *code* is 100 or 115:

  The login account information for the VM host/VM management software entered during registration may not have the required privileges.

  Check the privilege status from the VM management software. If the account does not have the required privileges, change the entered values (user name and password) for the login account information to the values for a user with administrative privileges for the VM host/VM management software.

  For details on changing the login account information, refer to the changing VM host login account information section or the changing VM management software settings section of the "ServerView Resource Coordinator VE Setup Guide".

- If *code* is 520:

  Failed to delete the virtual switch. Check the operation status and network settings of the VM host/VM management software. If operations performed from the VM management software are not executed, there is a problem with the VM host/VM management software. Resolve the problem with the VM host/VM management software.

- If *code* is 522:

  Failed to delete the virtual switch as the switch is in use. If the virtual switch is not necessary, delete the virtual switch from the VM management software.

- If *code* is 523 or 524:

  Communication between the admin server and the VM host/VM management software failed. Check the operation status and network settings of the VM host/VM management software.

If the problem is still not resolved after performing the above actions or if a value not indicated above is displayed in *code*, collect the corresponding message and troubleshooting data, and contact Fujitsu technical staff.

62702

FJSVrcx:ERROR:62702:*name*:virtual network creation failed on server *server* (*code*)

[Description]

Failed to create the virtual network *name* on server *server*.

- If the target server is a VMware server:

  The virtual network indicates a port group on the virtual switch.

[Corrective Action]

Perform the action indicated in the *code* information.

- If *code* is 15:

  There is no response from the VM host/VM management software to the admin server request. Check the operation status and network settings of the VM host/VM management software.

- If *code* is 16:

  The VM host could not be found.

  Select [Operation]-[Update] from the RC console menu to refresh the screen, and check whether the VM host has been deleted.

- If *code* is 101, 110, 111, 112, 114, or 116:

  Communication between the admin server and the VM host/VM management software failed. Check the operation status and network settings of the VM host/VM management software.

- If *code* is 113:

  The login account information for the VM host/VM management software that was entered during registration cannot be used to communicate with the VM host/VM management software. The login account information for the VM host/VM management software may have been changed after registration.

  Change the entered values (user name and password) for the login account information to the correct values.

  For details on changing the login account information, refer to the changing VM host login account information section or the changing VM management software settings section of the "ServerView Resource Coordinator VE Setup Guide".

- If *code* is 100 or 115:

  The login account information for the VM host/VM management software entered during registration may not have the required privileges.

  Check the privilege status from the VM management software. If the account does not have the required privileges, change the entered values (user name and password) for the login account information to the values for a user with administrative privileges for the VM host/VM management software.

  For details on changing the login account information, refer to the changing VM host login account information section or the changing VM management software settings section of the "ServerView Resource Coordinator VE Setup Guide".

- If *code* is 610:

  Failed to create the virtual network because the virtual network name already exists. Change the virtual network name for the VM host/VM management software.

- If *code* is 611:

  Failed to create the virtual network. Check the operation status and network settings of the VM host/VM management software. If operations performed from the VM management software are not executed, there is a problem with the VM host/VM management software. Perform the operation again after resolving the problem with the VM host/VM management software.

- If *code* is 613:

  Failed to create the virtual network as the virtual switch to connect to the virtual network cannot be found. Check the virtual switch of the VM host/VM management software.

- If *code* is 614 or 615:

  Communication between the admin server and the VM host/VM management software failed. Check the operation status and network settings of the VM host/VM management software.

If the problem is still not resolved after performing the above actions or if a value not indicated above is displayed in *code*, collect the corresponding message and troubleshooting data, and contact Fujitsu technical staff.

62703

FJSVrcx:ERROR:62703:*name*:virtual network deletion failed on server *server* (*code*)

[Description]

Failed to delete the virtual network *name* on server *server*.

- If the target server is a VMware server:

  The virtual network indicates a port group on the virtual switch.

[Corrective Action]

Perform the action indicated in the *code* information.

As the virtual network *name* remains on the server *server*, check its usage status and if it is no longer necessary, delete the virtual network from the VM management software.

- If *code* is 15:

  There is no response from the VM host/VM management software to the admin server request. Check the operation status and network settings of the VM host/VM management software.

- If *code* is 16:

  The VM host could not be found.

  Select [Operation]-[Update] from the RC console menu to refresh the screen, and check whether the VM host has been deleted.

- If *code* is 101, 110, 111, 112, 114, or 116:

  Communication between the admin server and the VM host/VM management software failed. Check the operation status and network settings of the VM host/VM management software.

- If *code* is 113:

  The login account information for the VM host/VM management software that was entered during registration cannot be used to communicate with the VM host/VM management software. The login account information for the VM host/VM management software may have been changed after registration.

  Change the entered values (user name and password) for the login account information to the correct values.

  For details on changing the login account information, refer to the changing VM host login account information section or the changing VM management software settings section of the "ServerView Resource Coordinator VE Setup Guide".

- If *code* is 100 or 115:

  The login account information for the VM host/VM management software entered during registration may not have the required privileges.

  Check the privilege status from the VM management software. If the account does not have the required privileges, change the entered values (user name and password) for the login account information to the values for a user with administrative privileges for the VM host/VM management software.

  For details on changing the login account information, refer to the changing VM host login account information section or the changing VM management software settings section of the "ServerView Resource Coordinator VE Setup Guide".

- If *code* is 620:

  Failed to delete the virtual network. Check the operation status and network settings of the VM host/VM management software. If operations performed from the VM management software are not executed, there is a problem with the VM host/VM management software. Resolve the problem with the VM host/VM management software.

- If *code* is 622:

  Failed to delete the virtual network as the virtual network being used by the VM guest. If the virtual network is not necessary, delete the virtual network from the VM management software.

- If *code* is 623 or 624:

  Communication between the admin server and the VM host/VM management software failed. Check the operation status and network settings of the VM host/VM management software.

If the problem is still not resolved after performing the above actions or if a value not indicated above is displayed in *code*, collect the corresponding message and troubleshooting data, and contact Fujitsu technical staff.

62704

FJSVrcx:ERROR:62704:*name*:virtual switch not found on server *server*

[Description]

The virtual switch *name* was not found on the server *server*.

[Corrective Action]

Perform the operation again after restoring the target virtual switch using the VM management software.

Due to the specification of an external port for the network resource corresponding to the virtual switch, it is necessary to connect to an appropriate physical network adapter. For details, refer to "4.2.5 Network Resources".

62705

FJSVrcx:ERROR:62705:*name*:virtual network not found on server *server*

[Description]

The virtual network *name* was not found on the server *server*.

[Corrective Action]

Perform the operation again after restoring the target virtual network using the VM management software.

When the virtual network *name* has the same name as a network resource, check the VLAN ID of the network resource using the GUI, and set the same VLAN ID for the virtual network.

When the virtual network *name* does not have the same name as a network resource, create a virtual network with the same name as the virtual network created in advance on the server *server.*

- If the target server is a VMware server:

  The virtual network indicates a port group on the virtual switch.

62706

FJSVrcx:ERROR:62706:virtual network *name*(vlan*id1*) already set vlan*id2* and exist

[Description]

An attempt was made to create a virtual network *name* assigned with vlan*id1*; however, a virtual network *name* assigned with vlan*id2* already exists.

[Corrective Action]

Perform the operation again after deleting the previously created virtual network *name* assigned with vlan*id2*, or changing the name of the virtual network on registered VM host server.

- If the target server is a VMware server:

  The virtual network indicates a port group on the virtual switch.

62707

FJSVrcx:ERROR:62707: some virtual network that sets vlan*id* exists

[Description]

There are multiple virtual networks assigned with vlan*id*.

[Corrective Action]

Change the virtual network and vlan*id* combinations so that they are unique between the registered VM hosts.

- If the target server is a VMware server:

  The virtual network indicates a port group on the virtual switch.

65300

65300: *obj* creation failed

[Description]

An error occurred while creating *obj*. *obj* has not been created.

[Corrective Action]

Check the message number displayed in the details in the dialog, and perform the appropriate action.

65301

65301: *obj* deletion failed

[Description]

An error occurred while deleting *obj*. *obj* has not been deleted.

[Corrective Action]

Check the message number displayed in the details in the dialog, and perform the appropriate action.

65302

65302: Changing of *obj* information failed

[Description]

An error occurred while modifying the information of *obj*. The information of *obj* has not been modified.

[Corrective Action]

Check the message number displayed in the details in the dialog, and perform the appropriate action.

65303

65303: Moving of *obj* failed

[Description]

An error occurred while moving *obj*. *obj* has not been moved.

[Corrective Action]

Check the message number displayed in the details in the dialog, and perform the appropriate action.

65304

65304: *obj* registration failed

[Description]

An error occurred while registering *obj*. *obj* has not been registered.

[Corrective Action]

Check the message number displayed in the details in the dialog, and perform the appropriate action.

65305

65305: Changing of *obj* settings failed

[Description]

An error occurred while modifying the configuration of *obj*. The configuration of *obj* has not been modified.

[Corrective Action]

Check the message number displayed in the details in the dialog, and perform the appropriate action.

65306

65306: *obj* migration failed

[Description]

An error occurred while moving *obj* between servers. *obj* has not been moved.

[Corrective Action]

Check the message number displayed in the details in the dialog, and perform the appropriate action.

65307

65307: Creation of snapshot image failed

[Description]

An error occurred while collecting the snapshot image. The snapshot image has not been collected.

[Corrective Action]

Check the message number displayed in the details in the dialog, and perform the appropriate action.

65308

65308: Restoration of snapshot image failed

[Description]

An error occurred while restoring the snapshot image. The snapshot image has not been restored.

[Corrective Action]

Check the message number displayed in the details in the dialog, and perform the appropriate action.

65309

65309: *obj* importation failed

[Description]

An error occurred while importing *obj*. *obj* has not been imported.

[Corrective Action]

Check the message number displayed in the details in the dialog, and perform the appropriate action.

65310

65310: *obj* release failed

[Description]

An error occurred while unregistering *obj*. *obj* has not been unregistered.

[Corrective Action]

Check the message number displayed in the details in the dialog, and perform the appropriate action.

65836

65836:User ("username") has already been registered.
FJSVrcx:ERROR:65836:User ("username") has already been registered.

[Description]

Registration failed as there is already a registered user with the same name.

[Corrective Action]

Enter a user name that has not been registered, and register it.

65903

FJSVrcx:ERROR:65903:Export to *file_name* failed.

[Description]

Export to the file specified for *file_name* failed.

[Corrective Action]

After confirming the path to the specified file name, perform the operation again.

65910

FJSVrcx:ERROR:65910:The value of *item*, *value*, is invalid.

[Description]

The process was canceled due to one of the following reasons:

- The *value* for *item* in a configuration definition file, L-Server XML file, L-Server template XML file, or the [Create an L-Server] dialog has a formatting error
- An invalid character has been used
- There is no value set

One of the following is displayed in *item*:

- Type
- operation
- Key value of the resource definition information
- A tag or attribute name of the L-Server XML file
- A tag or attribute name of the L-Server template XML file
- A key value in the [Create an L-Server]

[Corrective Action]

Perform the operation again after checking the content displayed in *item*, and resolving the cause of the error.

- Type
  - If you imported a configuration definition file in the RCXCSV V2.0 format:

    An invalid value is specified in the section name.

    Correct the definitions in the configuration definition file.
  - If you imported a configuration definition file in the RCXCSV V1.0 format:

    Something other than Chassis, EtherSwitch, or ServerBlade is specified for the resource type.

    Correct the definitions in the configuration definition file.
- operation

  A value other than "new", "change", or a hyphen ("-") is specified in the operation field, or there is a mistake in the operation area of the section header.

  Correct the definitions in the configuration definition file.
- Key value of the resource definition information

  An invalid value is specified for the displayed key, or there is a mistake in the displayed key value in the section header.

  Correct the definitions in the configuration definition file.

  For details on the values that can be specified for *item*, refer to the "ServerView Resource Coordinator VE Setup Guide".
- A tag or attribute name of the L-Server XML file

  Perform the operation again after correcting the value corresponding to the displayed key value in the L-Server XML file and correcting the definition.
- A tag or attribute name of the L-Server template XML file

  Perform the operation again after correcting the value corresponding to the displayed key value in the XML file of the L-Server template and correcting the definition.
- A key value in the [Create an L-Server]

  Perform the operation again after correcting the value corresponding to the displayed key value.

- When IP address is displayed in *value*

  An IP address outside the range that can be allocated to the network resource has been specified.
  Specify an unused IP address for the network resource, and perform the operation again.

65911

FJSVrcx:ERROR:65911:Specified resource *value* not found.

[Description]

The process was canceled because the specified resource *value* is not registered.
The resource *value* may not be included in the access scope of the user or user group that performed the operation.

- When *value* is "image key = xxx"

  The process was canceled because the registered cloning image was deleted due to deletion of a host from VMware vCenter Server.

- When "(create)" follows after *value*

  The process was canceled because one of the following applies to the specified physical server:

  - The specified physical server does not exist.
  - The specified physical server is not registered in the resource pool.
  - The specified physical server is already assigned as an L-Server.
  - The specified physical server is already assigned as a spare server.
  - The physical server resource does not exist in the resource pool.

- When "(Spare)" follows after *value*

  The process was canceled as the resource specified as a spare server does not exist.

- When "(Primary)" follows after *value*

  The process was canceled as the resource specified in the physical server usage change does not exist.

  - The specified physical server does not exist.
  - The specified physical resource pool does not exist.
  - The physical server resource does not exist in the specified resource pool.

[Corrective Action]

You cannot modify by specifying an unregistered resource name.

Perform the operation again after specifying a resource name that is already registered.

If you have specified a resource name that is already registered, there is a mistake in the key value of the resource name in the section header. Perform the operation again after correcting the configuration definition file.

To register new resource information with the specified resource name, change the operation to "new".

If "image key = xxxx" is displayed for *value*, perform the operation again after restoring the deleted cloning image and using a command to modify the L-Server configuration. When modifying the L-Server configuration, set an appropriate value in the ServerImageLink tag.

Perform the operation again after setting the access scope of resources.

65926

FJSVrcx:ERROR:65926:The file extension of *file_name* is not supported.

[Description]

The process was aborted as a file with an extension that is not the target of operation was specified.

[Corrective Action]

Specify a file with an extension that is the target of operation, and perform the operation again.

65927

FJSVrcx:ERROR:65927:*file_name* already exists.

[Description]

The specified file already exists.

[Corrective Action]

Change the file name and perform the operation again.

67112

FJSVrcx:ERROR:67112:no resources found matching *obj*.

[Description]

The resource that matches *obj* could not be found.

- When creating an L-Server with the server type "Physical"

  Failed to configure the IP address of the public LAN.

  There are the following cases:

  - When more NICs than the physical server contains have been specified

    The network (NIC) specified when creating the L-Server exceeds the number of NICs of the physical server.

  - When the drivers of cloning images are not the latest.

    When a number exceeding the number of NICs has not been specified, and the cloning image specified when creating the L-Server was Windows, the drivers of the cloning image may not be the latest.

  The number displayed as the index is the same number as the detailed display of the L-Server.

[Corrective Action]

Review the specified conditions.

- When creating an L-Server with the server type "Physical"

  - When more NICs than the physical server contains have been specified

    Check that the network (NIC) specified when creating the L-Server is smaller than the number of NICs of the physical server.

    Change the network settings and perform the operation again.

  - When the drivers of cloning images are not the latest.

    Delete the created L-Server.

    Update the drivers of the cloning image specified when creating the L-Server, and create the cloning image again.

    Create the L-Server again after specifying the re-created cloning image.

67133

FJSVrcx:ERROR:67133:*value*:out of range

[Description]

The specified value is out of range.

The value specified for *value* is output in "XML tag (specified value, range)" or "XML key (specified value, range) server/free/remain amount of ip address/remain amount of MAC address/remain amount of WWN address " format.

[Corrective Action]

Perform the operation again after correcting the specified value.

When *value* is one of the following, perform corrective action according to the content:

- For "XML key (specified value, range) server":

  Perform the operation again after checking the hardware configuration (CPU, memory) of the VM host on which the L-Server is located using the GUI.

- For "XML key (specified value, range) free":

  Perform the operation again after checking the available resources (CPU, memory) of the VM host on which the L-Server is located, and securing sufficient resources.

- For "XML key (specified value, range) remain amount of ip address/remain amount of MAC address/remain amount of WWN address", there may are the following possibilities.

  - When using an L-Server with the server type "Physical", the specified NIC number exceeds the upper limit of the supported number
  - The specified IP addresses, MAC addresses, and WWNs do not exist in the resource pool
  - There are no vacant addresses in the resource pools of IP addresses, MAC addresses, and WWNs

  Perform the operation again after reviewing the values corresponding to the displayed IP addresses, MAC addresses, and WWNs in the L-Server XML file and correcting their definitions. Add the IP addresses, MAC addresses, and WWNs that are necessary the for resource pool.

67134

FJSVrcx:ERROR:67134:*value*:invalid format

[Description]

The format of the specified value, or the content of the XML specified when performing the following is not correct:

- Creating an L-Server
- Modifying an L-Server
- Importing an L-Server template

In *value*, the following information is output:

- *XML_tag_name*
- Folder XML
- L-Server XML
- L-Server Template XML
- Network XML
- User XML
- UserGroup XML

[Corrective Action]

Perform the operation again after correcting the specified value or the content of the XML file.

For details on the XML definition file, refer to "Appendix H XML".

67136

FJSVrcx:ERROR:67136:*filename*:invalid file format

[Description]

There is an error in the file format specified for *filename*.

[Corrective Action]

Check the specified file format.

When "activation.dat" is displayed in *filename*, check the format of the license information definition file referring to the information regarding collection of cloning images in the "ServerView Resource Coordinator VE Setup Guide".

When "image_admin_hyperv.rcxprop" or "image_admin_hyperv_*user_group_name*.rcxprop" is displayed in *filename*, check the specified file format referring to "D.5 [OS] Tab".

67146

FJSVrcx:ERROR:67146:*file_name*:file not found

[Description]

The process was canceled as the target file was not found.

[Corrective Action]

Specify a file as the target of operation, and perform the operation again.

67147

FJSVrcx:ERROR:67147:*file_name*:permission denied

[Description]

If *file_name* is a resource name, no permission has been granted for the specified resource.
If *file_name* is a file name, no access is available to file *name* of Resource Orchestrator.

[Corrective Action]

If *file_name* is a resource name, perform the operation as a user with permission for the specified resource.
If *file_name* is a file name, collect this message and troubleshooting data, and contact Fujitsu technical staff.

67153

FJSVrcx:ERROR:67153:*obj*:already exists

[Description]

Refer to the explanation in "Message number 67153" in "ServerView Resource Coordinator VE Messages".

There is also the following case for Resource Orchestrator.

- When *obj* is vnet

  A network resource with the same VLANID has already been created.

[Corrective Action]

Refer to the corrective action described in "Message number 67153" in "ServerView Resource Coordinator VE Messages".

- If *obj* is vnet, perform the following corrective action.

  Either specify a different VLANID, or delete the existing network resource and then perform the operation again.

67154

FJSVrcx:ERROR:67154:*obj*:not found

[Description]

The error may be the result of one of the following:

- The specified object name *obj* does not exist
- There is no object that meets the conditions
- The object that met the conditions was deleted deletion processing
- The specified object exists, but is not included in the access scope of the user group or user that performed the operation

If this message is displayed when a command is executed, the resource type of the specified object name may differ from the type of resource that can be specified in the arguments for the command.

In *obj*, the specified object name or the resource type of the specified object name is displayed.

If the object was deleted during the process, the resource type is displayed.

If a command was executed, "server OS" for a physical OS or VM host, "VM Guest" for a VM guest, and "image" or "obj(image)" for a system image or cloning image, "library share" for a shared library, is displayed for the resource type of the object name.

When the resource type is "virtual_storage", there is a chance that there is not enough available space on the virtual storage resource.

- When *obj* begins with one of the following values, the operation has failed because the configuration of the VM host is not one that allows automatic network configuration.
  - SERVICE_NIC
  - TEAMED_NICS
  - INTERNAL_NIC
  - CHASSIS_SYSTEM
  - external port
  - nic
- When *obj* is one of the following values, the operation has failed because there is no internal resource table.
  - VnetRoute
  - CnmVirtualLanSwitch
  - CnmVirtualNetwork
- When *obj* starts with the following value, the operation has failed because there is no virtual network on the target server of L-Server creation.
  - VirtualNetwork

    When the target server is VMware, the virtual network indicates a port group on the virtual switch.
- When *obj* starts with rcx-portset, the procedure of "1.8.1.2 NetApp FAS series/V series" may not have been performed.

[Corrective Action]

After checking the following for the displayed object, perform the operation again.

- That the object exists
- That the object meets the conditions
- The access scope of the object has been set

If this message is displayed when a command is executed, perform the operation again after checking the resource type of the specified object.

[Hyper-V]

- When "library share" is output in *obj*, there is an error in the storage destination specified for the cloning image. Check if the specified shared library is available.

If one of the following is output in *obj*, perform the appropriate corrective action.

- "Selectable virtual_storage(*condition*)"

  As there is a chance that the disk of the selected virtual storage has insufficient space available, check the value of available space indicated by size=%1(GB), and perform the operation again. In *condition*, one of the following is displayed:

  - size=%1, vm_host=%2
  - size=%1, vm_host=%2, pool=%3
  - size=%1, vm_host=%2, virtual_storage=%3

- "Selectable vm_host(condition)"

  Perform the appropriate corrective action for each *condition*. In *condition*, one of the following is displayed:

  1. server status

     Perform the operation again after checking whether a VM host in the following state exists:

     - Power on
     - Monitoring status is normal
     - Maintenance mode is not set
     - Maintenance mode has not been set for the server virtualization software

  2. current host

     When performing a migration, perform the operation again after checking whether a VM host other than the one to migrate that meets the conditions in 1. exists.

  3. capacity

     Perform the operation again after checking whether a VM host with sufficient free CPU and memory exists.

  4. datastore

     Perform the operation again after checking whether a VM host sharing a data store exists.

  5. cluster

     Check and correct the following from the management window of the server virtualization software, and perform the operation again.

     - That there are two or more VM hosts in the same cluster on the server virtualization software.
     - That the HA function is enabled in the cluster configuration of the VM hosts.

  6. pool

     Perform the operation again after checking whether a VM host that can be accessed exists, or a VM host exists in a VM pool.

  7. unknown

     Perform the operation again after checking whether a VM host that can be accessed exists, or a VM host exists in a VM pool.

  8. vm_type

     Specify or change the VM host to use and perform the operation again.

     If the problem is still not resolved after performing the above actions, collect the corresponding message and troubleshooting data, and contact Fujitsu technical staff.

For details on checking the status and free capacity of a VM host, refer to "A.4 View".

- When *obj* starts with one of the following values, refer to "4.2.5 Network Resources" and check the configuration of the VM hosts.
  - SERVICE_NIC
  - TEAMED_NICS

  - INTERNAL_NIC
  - CHASSIS_SYSTEM
  - external port
  - nic
- When *obj* starts with one of the following values, wait for a short while and then perform the operation again.
  - VnetRoute
  - CnmVirtualLanSwitch
  - CnmVirtualNetwork
- When *obj* starts with the following value, perform the operation again after creating a virtual network on the target server of L-Server creation.
  - VirtualNetwork

    When the target server is VMware, the virtual network indicates a port group on the virtual switch.
- When *obj* starts with rcx-portset, check the storage unit configuration referring to "1.8.1.2 NetApp FAS series/V series".

If the problem is still not resolved after performing the above actions or if a value not indicated above is displayed in *obj*, collect the corresponding message and troubleshooting data, and contact Fujitsu technical staff.

67155

FJSVrcx:ERROR:67155:*type* *obj*:already exists

[Description]

Refer to the explanation in "Message number 67155" in "ServerView Resource Coordinator VE Messages".

There is also the following case for Resource Orchestrator.

- When *type* is "VMHost" or "PhysicalServer"

  obj has already been registered in a resource pool.
- When creating an L-Server with the server type "Physical"

  Failed to configure the IP address of the public LAN. The specified IP address is already in use.

[Corrective Action]

Refer to the corrective action described in "Message number 67155" in "ServerView Resource Coordinator VE Messages".

- When *type* is "VMHost" or "PhysicalServer", take the following corrective action:

  Perform the operation again after releasing registration of *obj* from the resource pool.
- When creating an L-Server with the server type "Physical", review the specified configuration.

  When using an L-Server with the server type "Physical", manually configure the IP address for the public LAN again.

  Perform the operation again after deleting the L-Server with the server type "Physical", and reviewing the network configuration.

67167

FJSVrcx:ERROR:67167:*obj*:contains *type*

[Description]

The request could not be executed because *obj* contains a *type* object.

The object name is displayed in *obj*.

In *type*, "physical server" is displayed for physical servers, "LAN switch" is displayed for LAN switches, "VMHost" is displayed for VM hosts, "disk" is displayed for virtual disks, and "vstorage" is displayed for virtual storage.

[Corrective Action]

Perform the operation again after deleting the *type* object from *obj*.

If "disk" is displayed in *type*, delete the L-Server using the disk resource created from the virtual storage resource displayed in *obj*.

If "vstorage" is displayed in *type*, delete the L-Server using the virtual storage resource created under the physical storage unit resource displayed in *obj*.

67168

FJSVrcx:ERROR:67168:*obj*:no disk found

[Description]

There is no disk in the VM guest specified for cloning image collection.

If you omit specifying the storage location when collecting a cloning image for a VM guest, it will be stored in the same location as the disk of the VM guest, but in this case the storage location could not be determined because the VM guest does not have a disk.

[Corrective Action]

Perform the operation again after specifying the location to store the cloning image.

67178

FJSVrcx:ERROR:67178:*obj*:is *status* status

[Description]

The request could not be executed because *obj* is in the status *status*.

One of the following is displayed in *status*:

- normal
- warning
- unknown
- stop
- error
- fatal
- power-on
- power-off
- not belonging to any storage pool
- not accessible
- not enough free space

"power-on" refers to when the power of the server is on.
"power-off" refers to when the power of the server is off.
"not belonging to any storage pool" refers to when the specified virtual storage resource is not registered in a storage pool.
"not accessible" refers to when no access is available from the specified VM host.
"not enough free space" refers to when there is insufficient disk space.

[Corrective Action]

Check the necessary requirements for the *obj* operation, and fulfill them. Perform the operation again after fulfilling the requirements.

67182

FJSVrcx:ERROR:67182:*type*:is not the same between *obj1* and *obj2*

[Description]

Refer to the explanation in "Message number 67182" in "ServerView Resource Coordinator VE Messages".

However, the following is added to *type* for Resource Orchestrator:

- resource type
- VMType
- OSType

[Corrective Action]

Refer to the corrective action described in "Message number 67182" in "ServerView Resource Coordinator VE Messages".

Also, perform the following corrective action depending on the *type* value:

- If "resource type" is displayed:

  Check the resource pool type of *obj1* and the resource type of *obj2*, and perform the operation again after specifying a suitable combination of resource pool and resource.

  For details on resource pool types and the resources that can be stored, refer to "Table 1.2 Resource Pool Types" in "1.2.1 Resource Pools".

- For VMType

  Check the VM type of the resource *obj1* and the VM type of the resource *obj2*, specify resources with the same VM type and then perform the operation again.

- For OSType

  Check the OS type of the L-Server and the images specified in XML, specify resources with the same OS type, and then perform the operation again.

67192

FJSVrcx:ERROR:67192:communication error.target=*target*

[Description]

An error occurred while communicating with *target*.

[Corrective Action]

Refer to the explanation in "Message number 67192" in "ServerView Resource Coordinator VE Messages".

67210

FJSVrcx:ERROR:67210:*obj*:is busy

[Description]

The requested process cannot be performed as another process is already being performed.

[Corrective Action]

Wait for a short while and then repeat the operation.

67214

FJSVrcx:ERROR:67214:*obj*:system image does not exist

[Description]

Either there is no system image of the managed server, or the specified version of the system image was not found. Or there is no snapshot of the managed server, or the specified version of the snapshot was not found.

[Corrective Action]

Check whether there is a system image or snapshot of the relevant managed server.

If an incorrect version was specified, specify the correct version, and perform the operation again.

There is also a chance that image files have not been synchronized. Restart the manager service referring to the information about managers in the "ServerView Resource Coordinator VE Setup Guide".

67220

FJSVrcx:ERROR:67220:spare server not found.

[Description]

There are no spare servers that fulfill the conditions. The specified spare server does not fulfill the following conditions.

Refer to the explanation in "Message number 67220" in "ServerView Resource Coordinator VE Messages".

- When an L-Server with the server type "Physical" has been switched over

  There are no physical server resources available as spare servers in the specified spare server resource pool.

[Corrective Action]

- Refer to the corrective action described in "Message number 67220" in "ServerView Resource Coordinator VE Messages".
- When an L-Server with the server type "Physical" has been switched over

  Register an additional physical server resource in the spare server resource pool specified for the target L-Server.

67255

FJSVrcx:ERROR:67255:*option*:not supported

[Description]

The specified option *option* is not supported.

Refer to the explanation in "Message number 67255" in "ServerView Resource Coordinator VE Messages".

There is also the following case for Resource Orchestrator.

- When an L-Server with the server type "Physical" was created, "NICs.NIC.NetworkLinkfor NICIndex(*num*)" is displayed in *option*

  Network resources cannot be specified for the displayed NIC.

  The number displayed for NICIndex(*num*) is a value one lower than the number specified when creating the L-Server.

[Corrective Action]

Perform the operation again after correcting the specified option.

Refer to the corrective action described in "Message number 67255" in "ServerView Resource Coordinator VE Messages".

There is also the following case for Resource Orchestrator.

- When an L-Server with the server type "Physical" was created, "NICs.NIC.NetworkLinkfor NICIndex(*num*)" is displayed in *option*

  Change the network resource settings and perform the operation again.

67280

FJSVrcx:ERROR:67280:*obj*:*function* not supported. *detail*

[Description]

Refer to the explanation in "Message number 67280" in "ServerView Resource Coordinator VE Messages".

In *detail*, the following detailed information is displayed:

- "power-off"

  The function displayed in *function* cannot be used with the current power state (power-off).

- "The last pool_type pool cannot be deleted."

  The target resource displayed in *obj* cannot be deleted because it is the last resource pool of resource pool type pool_type.

- "pool type mismatched"

  The target resource displayed in *obj* cannot be registered in the resource pool because it is a resource pool type that cannot be registered.

- "already exists in *pool name*"

  The target resource displayed in *obj* cannot be registered in the resource pool because it is already registered in *pool name*.

- "boot disk"

  The boot disk cannot be deleted.

- "invalid Redundancy"

  The function displayed in *function* cannot be used as L-Server has been located on a VM host with a disabled HA function.

- "Network pool,Address pool,and Image pool"

  The target resource cannot be included when calculating the number of L-Servers creatable for each L-Server template.

- "VirtualStorage[*virtual storage*...]","Pool[*storage pool*...]","VirtualStorage[*virtual storage*],Pool[*storage pool*]"

  The name of the virtual storage resource is displayed in *virtual storage*.

  The name of the storage pool name is displayed in *storage pool*.

  For the function displayed for *function*, it is not possible to specify system disks and data disks with differing virtual storage or storage pools.

- "*vmhost*[*vmtype*]"

  In *vmhost*, the VM host name is displayed.

  The VM type for the *vmhost* is displayed in *vmtype*.

  Migration cannot be performed when the VM types of the L-Server and the VM host specified as the migrate destination are different.

- "spare server"

  Since the operation target resource is a spare server, registration in the server pool cannot be performed.

- "some settings exist"

  Registration in the server pool cannot be performed because the target operation resource already has an OS installed, or some settings such as I/O virtualization have been configured.

- "VMType","Model","CPU","Memory","Policy.Positioning","NICs"

  The above tabs specified in the L-Server template cannot be imported, as they are not supported.

- "Not connected PhysicalServer"

  Operation cannot be performed, as the physical server is not connected due to changes to physical server usage.

- "VIOM"

  HBA address rename settings cannot be configured for the server displayed in *obj* as a virtualization method has been already configured using VIOM.

- "setting VIOM server profile"

  In the chassis mounting the server displayed in *obj*, setting of VIOM is not possible because a server with a virtualization method configured using HBA address rename already exists.

- "Network Parameter Auto-Configuration is enabled"

  Failed to configure the IP address of the public LAN. The specified cloning images cannot be used, as RCVE network parameter settings are valid.

- "Invalid target network admin LAN"

  Failed to configure the IP address of the public LAN. IP addresses cannot be configured for the admin LAN.

- "Target network overlaps with admin LAN"

  Failed to configure the IP address of the public LAN. The same network as the admin LAN cannot be configured for the public LAN.

- "Invalid agent version"

  Failed to configure the IP address of the public LAN. As an agent of a version earlier than ServerView Resource Orchestrator V2.2.1 has been installed, it is not possible to configure a public LAN IP address on the specified cloning image.

  When creating an L-Server with the server type "Physical", the IP address cannot be automatically configured if specifying a Red Hat Enterprise Linux image.

  When using the created L-Server, manually configure the public LAN IP address.

- "Not Virtual Machine" or "Physical Server"

  When the L-Server type is "Physical", use is not possible.

[Corrective Action]

The message was displayed because you are trying to use a function that is not supported by *obj*, or a function that cannot be used because the status is invalid. No action is necessary.

67295

FJSVrcx:ERROR:67295:*obj*:duplicate resource name found

[Description]

Refer to the explanation in "Message number 67295" in "ServerView Resource Coordinator VE Messages".

There is also the following case for Resource Orchestrator.

- When registering resources to resource pools

  obj has already been registered in a resource pool.

[Corrective Action]

Refer to the corrective action described in "Message number 67295" in "ServerView Resource Coordinator VE Messages".

- If *obj* has already been registered in a resource pool, it is displayed because currently registered resources cannot be registered. No action is necessary.

67320

FJSVrcx:ERROR:67320:power control error. target=*target* detail=*detail*

[Description]

An error occurred while performing with *target* power control.

[Corrective Action]

- If "duplicate resource name" is displayed in *detail*:

  The power state of the VM guest cannot be controlled because multiple VM names on the VM host conflict. Change the names so that they differ because there is an error in the VM host settings.

- If *detail* is displayed in the "(*message*,vmerrno=*error_number*,ip=*IP_address*)" format:

  An error has occurred in the control of the VM host/VM management software for the displayed *IP_address*. Perform the corrective action according to the *error_number*.

  - If *error_number* 6, 7, 8, or 9 is displayed:

    Make sure that the manager is running. If the manager has been stopped, start it and perform the operation again.

    For details on how to start the manager and to check its running state, refer to the information about starting and stopping the manager in the "ServerView Resource Coordinator VE Setup Guide".

  - If *error_number* 15 is displayed:

    There is no response from the VM host/VM management software to the admin server request. Check the operation status and network settings of the VM host/VM management software.

  - If *error_number* 16 is displayed:

    The VM host could not be found. The error may be the result of one of the following:

    - Select [Operation]-[Update] from the RC console menu to refresh the screen, and check whether the VM host has been deleted.

    [Hyper-V]

    - Hyper-V may not be installed, or the role may not be enabled.
      Check whether Hyper-V is installed and the role is enabled.

  - If *error_number* 17 is displayed:

    The VM guest could not be found. Select [Operation]-[Update] from the RC console menu to refresh the screen, and check whether the VM guest has been deleted.

    Also, check whether the VM guest is set to be moved when its power state changes from the VM management console.

  - If *error_number* 101, 110, 111, 112, 114, or 116 is displayed:

    Communication between the admin server and the VM host/VM management software failed. Check the operation status and network settings of the admin server/VM host/VM management software.

  - If *error_number* 113 is displayed:

    The login account information for the VM host/VM management software that was entered during registration cannot be used to communicate with the VM host/VM management software. The login account information for the VM host/VM management software may have been changed after registration.

    Change the entered values (user name and password) for the login account information to the correct values.

    For details on the entered values for the login account information, refer to the changing VM host login account information section or the changing VM management software settings section of the "ServerView Resource Coordinator VE Setup Guide".

  - If *error_number* 100 or 115 is displayed:

    The login account information for the VM host/VM management software entered during registration may not have the required privileges.

    Check the privilege status from the VM management software. If the account does not have the required privileges, change the entered values (user name and password) for the login account information to the values for a user with administrative privileges for the VM host/VM management software.

    For details on the entered values for the login account information, refer to the changing VM host login account information section or the changing VM management software settings section of the "ServerView Resource Coordinator VE Setup Guide".

- If *error_number* 104, 105, 135, or 136 is displayed:

  The task processing of the VM host/VM management software failed. Check the operation status and network settings of the VM host/VM management software. If operations performed from the VM management software are not executed, there is a problem with the VM host/VM management software. Perform the operation again after resolving the problem with the VM host/VM management software.

- If *error_number* 122 is displayed:

  Perform one of the following corrective actions:

  - The VM maintenance mode is set for the VM host. Perform the operation again after disabling the VM maintenance mode for the VM host.
  - Operation cannot be performed with the current power state. Check the power state of the VM guest.

- If *error_number* 123 is displayed:

  The error may be the result of one of the following:

  - The necessary power control settings for the VM guest may not have been configured. For details on the necessary power control settings for the VM guest, refer to the configuration requirements section of the "ServerView Resource Coordinator VE Setup Guide".
  - The software required for power control on the VM guest may not have been started. Perform the operation again after referring to the server virtualization software manual and checking whether the required software has been started.

- If *error_number* 124 is displayed:

  The error may be the result of one of the following:

  - The necessary power control settings for the VM guest may not have been configured.

    Check whether the necessary power control settings for the VM guest have been configured. If the settings have not been configured, perform the operation again after configuring the necessary settings.

    For details on the necessary power control settings for the VM guest, refer to the configuration requirements section of the "ServerView Resource Coordinator VE Setup Guide".

  - You may not have the required licenses for operation of the VM host/VM management software.

    Check the license status from the VM management software.

  - The login account information for the VM host/VM management software entered during registration may not have the required privileges.

    Check the privilege status from the VM management software. If the account does not have the required privileges, change the entered values (user name and password) for the login account information to the values for a user with administrative privileges for the VM host/VM management software.

    For details on the entered values for the login account information, refer to the changing VM host login account information section or the changing VM management software settings section of the "ServerView Resource Coordinator VE Setup Guide".

- If *error_number* 125 is displayed:

  The VM host is processing another task. Perform the operation again after checking whether other clients are performing operations simultaneously.

- If *error_number* 127 is displayed:

  Power control operation of the VM guest failed. The error may be the result of one of the following:

  - Check the operation status and network settings of the VM host/VM management software. If operations performed from the VM management software are not executed, there is a problem with the VM host/VM management software. Perform the operation again after resolving the problem with the VM host/VM management software.

  [Hyper-V]

  - Make sure that the OS is running on the virtual machine. Perform the operation again after starting the OS. If an OS is not installed, install an OS on the virtual machine.

- If *error_number* 400 is displayed:

  The remote command processing of the VM host failed.

  Check the operation status and network settings of the VM host. If operations performed on the VM host are not executed, there is a problem with the VM host. Perform the operation again after resolving the problem with the VM host.

If the problem is still not resolved after performing the above actions or if a value not indicated above is displayed in *detail*, collect the corresponding message and troubleshooting data, and contact Fujitsu technical staff.

67333

FJSVrcx:ERROR:67333:failed to get information from *vmhost*. detail=*detail*

[Description]

Information could not be obtained from a VM host.

In *vmhost*, the VM host name is displayed.
In *detail*, the following detailed information is displayed:

- OS list

  The list information of operating systems that can be specified could not be retrieved when creating a VM guest.

[Corrective Action]

Perform the corrective action according to the detailed information.

- OS list

  Refer to the management screen of the server virtualization software, and check whether the VM host displayed in *vmhost* is set to the VM maintenance mode. If the VM host is set to the VM maintenance mode, disable the maintenance mode.

67334

FJSVrcx:ERROR:67334:failed to restore image. detail=*detail*

[Description]

Failed to restore a VM guest.

[Corrective Action]

- If *detail* is displayed in the "(*message*,vmerrno=*error_number*,ip=*IP_address*)" format or the "(*message*,vmerrno=*error_number*,ip=*IP_address*,host=*VM_host_IP_address*)" format:

  An error has occurred in the control of the VM host/VM management software for the displayed *IP_address*. Perform the corrective action according to the *error_number*.

  - If *error_number* 6, 7, 8, or 9 is displayed:

    Make sure that the manager is running. If the manager has been stopped, start it and perform the operation again.

    For details on how to start the manager and to check its running state, refer to the information about starting and stopping the manager in the "ServerView Resource Coordinator VE Setup Guide".

  - If *error_number* 15 is displayed:

    There is no response from the VM host/VM management software to the admin server request. Check the operation status and network settings of the VM host/VM management software.

  - If *error_number* 17 is displayed:

    The VM guest/image could not be found. Select [Operation]-[Update] from the RC console menu to refresh the screen, and check whether the VM guest/image has been deleted.

  - If *error_number* 19 is displayed:

    The image could not be found. Wait for around three minutes and then repeat the operation.

- If *error_number* 101, 110, 111, 112, 114, 116, or 148 is displayed:

  Communication between the admin server and the VM host/VM management software failed. Check the operation status and network settings of the admin server/VM host/VM management software.

- If *error_number* 100 or 115 is displayed:

  The login account information for the VM host/VM management software entered during registration may not have the required privileges.
  Check the privilege status from the VM management console. If the account does not have the required privileges, change the entered values (user name and password) for the login account information to the values for a user with administrative privileges for the VM host/VM management software.

  For details, refer to the "ServerView Resource Coordinator VE Setup Guide".

- If *error_number* 104, 105, 135, 136, or 508 is displayed:

  The task processing of the VM host/VM management software failed. Check the operation status and network settings of the VM host/VM management software. If operations performed from the VM management software are not executed, there is a problem with the VM host/VM management software. Perform the operation again after resolving the problem with the VM host/VM management software.

  Depending on the VM management software, a recovery operation may be required before performing the operation again. For details on the recovery method, refer to the manual of the VM management software.

- If *error_number* 113 is displayed:

  The login account information for the VM host/VM management software that was entered during registration cannot be used to communicate with the VM host/VM management software. The login account information for the VM host/VM management software may have been changed after registration.
  Change the entered values (user name and password) for the login account information to the correct values.

  For details, refer to the "ServerView Resource Coordinator VE Setup Guide".

- If *error_number* 141, 143, 144, 145, 146, or 147 is displayed:

  The VM guest could not be restored using an image. Check the cause of the error in the VM host/VM management software, and resolve the error.

- If *error_number* 142 is displayed:

  Failed to restore an image because another operation was performed on the VM guest to restore. Perform the operation again after waiting a while.

If the problem is still not resolved after performing the above actions or if a value not indicated above is displayed in *detail*, collect the corresponding message and troubleshooting data, and contact Fujitsu technical staff.

67350

FJSVrcx:ERROR:67350:configuration error. target=*target*

[Description]

There may be an error in the configuration file for communication with the destination *target*.

[Corrective Action]

When *target* is "storage unit", refer to "4.2.4 Storage Resources" and correctly describe the FC-CA port combination definition file of the ETERNUS storage.

If *target* is something other than the above, collect this message and troubleshooting data, and contact Fujitsu technical staff.

67359

FJSVrcx:ERROR:67359:*obj*: VM host registration failed detail=*detail*

[Description]

An error occurred in the control of the VM host, so registration of the VM host *obj* failed.

[Corrective Action]

Refer to the explanation in "Message number 67359" in "ServerView Resource Coordinator VE Messages".

When using Resource Orchestrator, if *detail* is displayed in the "(*message*,vmerrno=*error_number*,ip=*IP_address*)"format, the following may also be relevant:

- If *error_number* 6, 7, 8, or 9 is displayed:

  Make sure that the manager is running. If the manager has been stopped, start it and perform the operation again.

  For details on how to start the manager and how to check its running state, refer to the information about starting and stopping the manager in the "ServerView Resource Coordinator VE Setup Guide".

67360

FJSVrcx:ERROR:67360:stopping spare server failed target=*target* detail=*detail*

[Description]

Stopping of the spare server *target* failed.

[Corrective Action]

Refer to the explanation in "Message number 67360" in "ServerView Resource Coordinator VE Messages".

When using Resource Orchestrator, if *detail* is displayed in the "(*message*,vmerrno=*error_number*,ip=*IP_address*)"format, the following may also be relevant:

- If *error_number* 6, 7, 8, or 9 is displayed:

  Make sure that the manager is running. If the manager has been stopped, start it and perform the operation again.

  For details on how to start the manager and how to check its running state, refer to the information about starting and stopping the manager in the "ServerView Resource Coordinator VE Setup Guide".

67363

FJSVrcx:ERROR:67363:*obj*:changing VM host login account information failed detail=*detail*

[Description]

An error occurred in communication with the VM host, so changing of the login account information of the VM host *obj* failed.

[Corrective Action]

Refer to the explanation in "Message number 67363" in "ServerView Resource Coordinator VE Messages".

When using Resource Orchestrator, if *detail* is displayed in the "(*message*,vmerrno=*error_number*,ip=*IP_address*)"format, the following may also be relevant:

- If *error_number* 6, 7, 8, or 9 is displayed:

  Make sure that the manager is running. If the manager has been stopped, start it and perform the operation again.

  For details on how to start the manager and how to check its running state, refer to the information about starting and stopping the manager in the "ServerView Resource Coordinator VE Setup Guide".

67368

FJSVrcx:ERROR:67368:*obj*:entering VM host maintenance mode failed. detail=*detail*

[Description]

Setting of VM maintenance mode for the VM host *obj* failed.

[Corrective Action]

Refer to the explanation in "Message number 67368" in "ServerView Resource Coordinator VE Messages".

When using Resource Orchestrator, if *detail* is displayed in the "(*message*,vmerrno=*error_number*,ip=*IP_address*)"format, the following may also be relevant:

- If *error_number* 6, 7, 8, or 9 is displayed:

  Make sure that the manager is running. If the manager has been stopped, start it and perform the operation again.

  For details on how to start the manager and how to check its running state, refer to the information about starting and stopping the manager in the "ServerView Resource Coordinator VE Setup Guide".

- If *error_number* 534 is displayed:

  Check if the target VM host name is correct.

- If *error_number* 535 is displayed:

  Check if the VM management server can communicate correctly with the DNS server. If this does not resolve the problem, contact Fujitsu technical staff.

67369

FJSVrcx:ERROR:67369:*obj*:exiting VM host maintenance mode failed. detail=*detail*

[Description]

Releasing of VM maintenance mode for the VM host *obj* failed.

[Corrective Action]

Refer to the explanation in "Message number 67369" in "ServerView Resource Coordinator VE Messages".

When using Resource Orchestrator, if *detail* is displayed in the "(*message*,vmerrno=*error_number*,ip=*IP_address*)"format, the following may also be relevant:

- If *error_number* 6, 7, 8, or 9 is displayed:

  Make sure that the manager is running. If the manager has been stopped, start it and perform the operation again.

  For details on how to start the manager and how to check its running state, refer to the information about starting and stopping the manager in the "ServerView Resource Coordinator VE Setup Guide".

- If *error_number* 534 is displayed:

  Check if the target VM host name is correct.

- If *error_number* 535 is displayed:

  Check if the VM management server can communicate correctly with the DNS server. If this does not resolve the problem, contact Fujitsu technical staff.

67380

FJSVrcx:ERROR:67380:*obj*:VM management software registration failed. detail=*detail*

[Description]

An error occurred in the control of the VM management software, so registration of the VM management software *obj* failed.

[Corrective Action]

Refer to the explanation in "Message number 67380" in "ServerView Resource Coordinator VE Messages".

When using Resource Orchestrator, if *detail* is displayed in the "(*message*,vmerrno=*error_number*,ip=*IP_address*)"format, the following may also be relevant:

- If *error_number* 6, 7, 8, or 9 is displayed:

  Make sure that the manager is running. If the manager has been stopped, start it and perform the operation again.

  For details on how to start the manager and how to check its running state, refer to the information about starting and stopping the manager in the "ServerView Resource Coordinator VE Setup Guide".

- If *error_number* 99 is displayed:

  Due to temporary inconsistencies in the information held by VM host/ VM management software resulting from multiple operations, obtaining of information from VM host/ VM management software failed. Check the operating status and network settings of the VM host/VM management software, and perform the operation again.

67381

FJSVrcx:ERROR:67381:*obj*:changing VM management software information failed. detail=*detail*

[Description]

An error occurred in the control of the VM management software, so changing the settings of the VM management software *obj* failed.

[Corrective Action]

Refer to the explanation in "Message number 67381" in "ServerView Resource Coordinator VE Messages".

When using Resource Orchestrator, if *detail* is displayed in the "(*message*,vmerrno=*error_number*,ip=*IP_address*)"format, the following may also be relevant:

- If *error_number* 6, 7, 8, or 9 is displayed:

  Make sure that the manager is running. If the manager has been stopped, start it and perform the operation again.

  For details on how to start the manager and how to check its running state, refer to the information about starting and stopping the manager in the "ServerView Resource Coordinator VE Setup Guide".

67385

FJSVrcx:ERROR:67385:migrating VM guest failed. *vmguest* migrate from *vmhost1* to *vmhost2*. detail=*detail*

[Description]

Migration of the VM guest *vmguest* failed. Server *vmhost1* is the source and server *vmhost2* is the destination.

[Corrective Action]

Refer to the explanation in "Message number 67385" in "ServerView Resource Coordinator VE Messages".

When using Resource Orchestrator, if *detail* is displayed in the "(*message*,vmerrno=*error_number*,ip=*IP_address*)"format, the following may also be relevant:

- If *error_number* 6, 7, 8, or 9 is displayed:

  Make sure that the manager is running. If the manager has been stopped, start it and perform the operation again.

  For details on how to start the manager and how to check its running state, refer to the information about starting and stopping the manager in the "ServerView Resource Coordinator VE Setup Guide".

- If *error_number* 534 is displayed:

  Check if the target VM host name is correct.

- If *error_number* 535 is displayed:

  Check whether the server specified as the destination has a configuration that allows migration referring to the information about server virtualization software products in the "ServerView Resource Coordinator VE Setup Guide". Check if the VM management server can communicate correctly with the DNS server. If this does not resolve the problem, contact Fujitsu technical staff.

67389

FJSVrcx:ERROR:67389:*image* is already in use on *obj*

[Description]

The specified cloning image name *image* is already in use by another VM management software *obj*.

[Corrective Action]

Perform the operation again after specifying another cloning image name.

67390

FJSVrcx:ERROR:67390:creating VM guest failed. detail=*detail*

[Description]

Failed to create a VM guest.

[Corrective Action]

- If *detail* is displayed in the "(*message*,vmerrno=*error_number*,ip=*IP_address*)" format or the "(*message*,vmerrno=*error_number*,ip=*IP_address*,host=*VM_host_IP_address*)" format:

  An error has occurred in the control of the VM host/VM management software for the displayed *IP_address*. Perform the corrective action according to the *error_number*.

  - If *error_number* 6, 7, 8, or 9 is displayed:

    Make sure that the manager is running. If the manager has been stopped, start it and perform the operation again.

    For details on how to start the manager and how to check its running state, refer to the information about starting and stopping the manager in the "ServerView Resource Coordinator VE Setup Guide".

  - If *error_number* 15 is displayed:

    There is no response from the VM host/VM management software to the admin server request. Check the operation status and network settings of the VM host/VM management software.

  - If *error_number* 16 is displayed:

    The VM host could not be found. Select [Operation]-[Update] from the RC console menu to refresh the screen, and check whether the VM host has been deleted.

  - If *error_number* 17 is displayed:

    The image could not be found. Select [Operation]-[Update] from the RC console menu to refresh the screen, and check whether the image has been deleted.

  - If *error_number* 99 is displayed:

    Due to temporary inconsistencies in the information held by VM host/ VM management software resulting from multiple operations, obtaining of information from VM host/ VM management software failed. Check the operating status and network settings of the VM host/VM management software, and perform the operation again.

  - If *error_number* 101, 110, 111, 112, 114, 116, 181, 249, 341, or 382 is displayed:

    Communication between the admin server and the VM host/VM management software failed. Check the operation status and network settings of the admin server/VM host/VM management software.

  - If *error_number* 113 is displayed:

    The login account information for the VM host/VM management software that was entered during registration cannot be used to communicate with the VM host/VM management software. The login account information for the VM host/VM management software may have been changed after registration.
    Change the entered values (user name and password) for the login account information to the correct values.

    For details, refer to the "ServerView Resource Coordinator VE Setup Guide".

- If *error_number* 100, 115, 178, 337, or 381 is displayed:

  The login account information for the VM host/VM management software entered during registration may not have the required privileges.
  Check the privilege status from the VM management console. If the account does not have the required privileges, change the entered values (user name and password) for the login account information to the values for a user with administrative privileges for the VM host/VM management software.

  For details, refer to the "ServerView Resource Coordinator VE Setup Guide".

- If *error_number* 104, 105, 135, 136, 178, 509, 510, 511, 512, 513, 519, 520, 521, 531, or 532 is displayed:

  The task processing of the VM host/VM management software failed. Check the operation status and network settings of the VM host/VM management software. If operations performed from the VM management software are not executed, there is a problem with the VM host/VM management software. Perform the operation again after resolving the problem with the VM host/VM management software.

  Depending on the VM management software, a recovery operation may be required before performing the operation again. For details on the recovery method, refer to the manual of the VM management software.

- If *error_number* 170, 171, 172, 173, 174, 175, 176, 177, 179, or 180 is displayed:

  The VM guest could not be created using an image. Check the cause of the error in the VM host/VM management software, and resolve the error.

- If *error_number* 240, 335, or 603 is displayed:

  Failed to create a VM guest because the VM guest name is already in use. Change the VM guest name or the destination VM host.

- If *error_number* 241, 242, 244, or 332 is displayed:

  Could not create a VM guest in the definition file storage location of the VM guest. Check the status of the definition file storage location of the VM guest.

- If *error_number* 245 is displayed:

  The VM guest name is invalid. Change the VM guest name.

- If *error_number* 246 is displayed:

  The specified VM host cannot create a VM guest. Change the destination VM host.

- If *error_number* 330, 331, 333, 334, 336, 340, or 342 is displayed:

  Failed to modify the VM guest. Check the cause of the error in the VM host/VM management software, and resolve the error.

- If *error_number* 338 is displayed:

  Failed to modify the configuration because another operation was performed on the created VM guest. Perform the operation again after waiting a while.

- If *error_number* 339 is displayed:

  Too many devices were specified for creation in the VM guest. Perform the operation again after decreasing the numbers of disks or NIC.

- If *error_number* 380 is displayed:

  Failed to set the OS unique information for the VM guest again. Set the OS unique information for the created VM guest again.

- If *error_number* 400 is displayed:

  The remote command processing of the VM host failed. Check the operation status and network settings of the VM host.
  If operations performed on the VM host are not executed, there is a problem with the VM host. Perform the operation again after resolving the problem with the VM host.

- If *error_number* 501 or 608 is displayed:

  Make sure that the specified virtual network name exists on the VM host.

- If *error_number* 503 is displayed:

  There is no target operation image on VM management software.

  Perform the operation again after checking that there are no differences between image information on Resource Orchestrator and the VM management software.

- If *error_number* 514 is displayed:

  After confirming if there is no trouble with the administrator account information, perform the operation again.

- If *error_number* 515 or 607 is displayed:

  Perform the operation again, after specifying a supported OS for VM host.

- If *error_number* 534 is displayed:

  Check if the target VM host name is correct.

- If *error_number* 535 is displayed:

  Check if the VM management server can communicate correctly with the DNS server. If this does not resolve the problem, contact Fujitsu technical staff.

- If *error_number* 604 is displayed:

  Specify a value smaller than the physical memory size of the VM host.

- If *error_number* 605 is displayed:

  Specify a value smaller than the number of CPU cores of the VM host.

- If *error_number* 606 is displayed:

  The number exceeds the number of available CPUs. Specify a value in the available range.

- If *error_number* 609 is displayed:

  The VLAN ID value is not in the available range of values. Specify the available range of values.

- If *error_number* 614 is displayed:

  The specified value exceeds the available CPU performance. Specify the available range of values.

- If *error_number* 616 is displayed:

  The specification format for the time zone is incorrect. Specify the correct format.

- If *error_number* 617 is displayed:

  The product ID specification format is incorrect. Specify the correct format.

- If *error_number* 618 is displayed:

  Administrator information is invalid. Specify valid information.

- If *detail* is displayed in the "invalid parameter:*parameter*:*value*" format:

  The *parameter* value is invalid. Perform the operation again after modifying the entered *value*.

- If "timeout occurred" is displayed in *detail*:

  There is no response from the VM host/VM management software to the admin server request. Check the operation status and network settings of the VM host/VM management software.

If the problem is still not resolved after performing the above actions or if a value not indicated above is displayed in *detail*, collect the corresponding message and troubleshooting data, and contact Fujitsu technical staff.

67391

FJSVrcx:ERROR:67391:deleting VM guest failed. detail=*detail*

[Description]

Failed to delete the VM guest.

[Corrective Action]

- If *detail* is displayed in the "(*message*,vmerrno=*error_number*,ip=*IP_address*)" format or the "(*message*,vmerrno=*error_number*,ip=*IP_address*,host=*VM_host_IP_address*)" format:

  An error has occurred in the control of the VM host/VM management software for the displayed *IP_address*. Perform the corrective action according to the *error_number*.

  - If *error_number* 6, 7, 8, or 9 is displayed:

    Make sure that the manager is running. If the manager has been stopped, start it and perform the operation again.

    For details on how to start the manager and how to check its running state, refer to the information about starting and stopping the manager in the "ServerView Resource Coordinator VE Setup Guide".

  - If *error_number* 15 is displayed:

    There is no response from the VM host/VM management software to the admin server request. Check the operation status and network settings of the VM host/VM management software.

  - If *error_number* 16 is displayed:

    The VM host could not be found. Select [Operation]-[Update] from the RC console menu to refresh the screen, and check whether the VM host has been deleted.

  - If *error_number* 17 is displayed:

    The VM guest could not be found. Select [Operation]-[Update] from the RC console menu to refresh the screen, and check whether the VM guest has been deleted.
    Also, check whether the VM guest is set to be moved when its power state changes from the VM management console.

  - If *error_number* 101, 110, 111, 112, 114, 116, 263, or 341 is displayed:

    Communication between the admin server and the VM host/VM management software failed. Check the operation status and network settings of the admin server/VM host/VM management software.

  - If *error_number* 113 is displayed:

    The login account information for the VM host/VM management software that was entered during registration cannot be used to communicate with the VM host/VM management software. The login account information for the VM host/VM management software may have been changed after registration.
    Change the entered values (user name and password) for the login account information to the correct values.

    For details, refer to the "ServerView Resource Coordinator VE Setup Guide".

  - If *error_number* 100, 115, 260, or 337 is displayed:

    The login account information for the VM host/VM management software entered during registration may not have the required privileges.
    Check the privilege status from the VM management console. If the account does not have the required privileges, change the entered values (user name and password) for the login account information to the values for a user with administrative privileges for the VM host/VM management software.

    For details, refer to the "ServerView Resource Coordinator VE Setup Guide".

  - If *error_number* 104, 105, 135, 136, or 527 is displayed:

    The task processing of the VM host/VM management software failed. Check the operation status and network settings of the VM host/VM management software. If operations performed from the VM management software are not executed, there is a problem with the VM host/VM management software. Perform the operation again after resolving the problem with the VM host/VM management software.

    Depending on the VM management software, a recovery operation may be required before performing the operation again. For details on the recovery method, refer to the manual of the VM management software.

- If *error_number* 261 is displayed:

  Failed to delete the VM guest. Check the cause of the error in the VM host/VM management software, and resolve the error.

- If *error_number* 262 is displayed:

  Failed to delete the VM guest. VM guests cannot be deleted while their power is on. Check the power state of the VM guest.

- If *error_number* 330, 331, 332, 333, 334, 335, 336, 339, 340, or 342 is displayed:

  Failed to modify the VM guest. Check the cause of the error in the VM host/VM management software, and resolve the error.

- If *error_number* 338 is displayed:

  Failed to modify the configuration because another operation was performed on the VM guest. Perform the operation again after waiting a while.

- If *error_number* 400 is displayed:

  The remote command processing of the VM host failed. Check the operation status and network settings of the VM host.
  If operations performed on the VM host are not executed, there is a problem with the VM host. Perform the operation again after resolving the problem with the VM host.

- If "timeout occurred" is displayed in *detail*:

  There is no response from the VM host/VM management software to the admin server request. Check the operation status and network settings of the VM host/VM management software.

If the problem is still not resolved after performing the above actions or if a value not indicated above is displayed in *detail*, collect the corresponding message and troubleshooting data, and contact Fujitsu technical staff.

67392

FJSVrcx:ERROR:67392:modifying VM guest failed. detail=*detail*

[Description]

Failed to modify the configuration of the VM guest.

[Corrective Action]

- If *detail* is displayed in the "(*message*,vmerrno=*error_number*,ip=*IP_address*)" format or the "(*message*,vmerrno=*error_number*,ip=*IP_address*,host=*VM_host_IP_address*)" format:

  An error has occurred in the control of the VM host/VM management software for the displayed *IP_address*. Perform the corrective action according to the *error_number*.

  - If *error_number* 6, 7, 8, or 9 is displayed:

    Make sure that the manager is running. If the manager has been stopped, start it and perform the operation again.

    For details on how to start the manager and how to check its running state, refer to the information about starting and stopping the manager in the "ServerView Resource Coordinator VE Setup Guide".

  - If *error_number* 15 is displayed:

    There is no response from the VM host/VM management software to the admin server request. Check the operation status and network settings of the VM host/VM management software.

  - If *error_number* 16 is displayed:

    The VM host could not be found. Select [Operation]-[Update] from the RC console menu to refresh the screen, and check whether the VM host has been deleted.

  - If *error_number* 17 is displayed:

    The VM guest could not be found. Select [Operation]-[Update] from the RC console menu to refresh the screen, and check whether the VM guest has been deleted.
    Also, check whether the VM guest is set to be moved when its power state changes from the VM management console.

- If *error_number* 99 is displayed:

  Due to temporary inconsistencies in the information held by VM host/ VM management software resulting from multiple operations, obtaining of information from VM host/ VM management software failed. Check the operating status and network settings of the VM host/VM management software, and perform the operation again.

- If *error_number* 101, 110, 111, 112, 114, 116, or 341 is displayed:

  Communication between the admin server and the VM host/VM management software failed. Check the operation status and network settings of the admin server/VM host/VM management software.

- If *error_number* 113 is displayed:

  The login account information for the VM host/VM management software that was entered during registration cannot be used to communicate with the VM host/VM management software. The login account information for the VM host/VM management software may have been changed after registration.
  Change the entered values (user name and password) for the login account information to the correct values.

  For details, refer to the "ServerView Resource Coordinator VE Setup Guide".

- If *error_number* 100, 115, or 337 is displayed:

  The login account information for the VM host/VM management software entered during registration may not have the required privileges.
  Check the privilege status from the VM management console. If the account does not have the required privileges, change the entered values (user name and password) for the login account information to the values for a user with administrative privileges for the VM host/VM management software.

  For details, refer to the "ServerView Resource Coordinator VE Setup Guide".

- If *error_number* 104, 105, 135, 136, 512, 519, 520, 521, 523, 524, 525, 526, or 528 is displayed:

  The task processing of the VM host/VM management software failed. Check the operation status and network settings of the VM host/VM management software. If operations performed from the VM management software are not executed, there is a problem with the VM host/VM management software. Perform the operation again after resolving the problem with the VM host/VM management software.

  Depending on the VM management software, a recovery operation may be required before performing the operation again. For details on the recovery method, refer to the manual of the VM management software.

- If *error_number* 330, 331, 332, 333, 334, 335, 336, 339, 340, or 342 is displayed:

  Failed to modify the VM guest. Check the cause of the error in the VM host/VM management software, and resolve the error.

- If *error_number* 338 is displayed:

  Failed to modify the configuration because another operation was performed on the VM guest. Perform the operation again after waiting a while.

- If *error_number* 400 is displayed:

  The remote command processing of the VM host failed. Check the operation status and network settings of the VM host.
  If operations performed on the VM host are not executed, there is a problem with the VM host. Perform the operation again after resolving the problem with the VM host.

- If *error_number* 501 or 608 is displayed:

  Make sure that the specified virtual network name exists on the VM host.

- If *error_number* 515 or 607 is displayed:

  Select an OS supported by the VM host and then perform the operation again.

- If *error_number* 522 is displayed:

  There is no target VM guest virtual disk on VM management software.

  Perform the operation again after checking that there are no differences between virtual disk information on Resource Orchestrator and the VM management software.

- If *error_number* 533 is displayed:

  There is no virtual network adapter of the target VM guest on VM management software.

  Perform the operation again after checking that there are no differences between virtual network adapter information on Resource Orchestrator and the VM management software.

- If *error_number* 604 is displayed:

  Specify a value smaller than the physical memory size of the VM host.

- If *error_number* 605 is displayed:

  Specify a value smaller than the number of CPU cores of the VM host.

- If *error_number* 606 is displayed:

  The number exceeds the number of available CPUs. Specify the available range of values.

- If *error_number* 609 is displayed:

  The VLAN ID value is not in the available range of values. Specify the available range of values.

- If *error_number* 611 is displayed:

  This operation cannot be performed on VM guests that have not been stopped. Stop the specified VM guest and then perform the operation again.

- If *error_number* 612 or 613 is displayed:

  Waiting for a while, then perform the operation or check again.

- If *error_number* 614 is displayed:

  The specified value exceeds the available CPU performance. Specify the available range of values.

- If *detail* is displayed in the "invalid parameter:*parameter*:*value*" format:

  The *parameter* value is invalid. Perform the operation again after modifying the entered *value*.

- If "timeout occurred" is displayed in *detail*:

  There is no response from the VM host/VM management software to the admin server request. Check the operation status and network settings of the VM host/VM management software.

- If "operation failed:customizing vm guest (cpu settings)" is displayed in *detail*:

  Failed to modify the CPU count/CPU performance of the VM guest.

  - Check the operation status, network settings, and login account information of the admin server/VM host/VM management software from the RC console or VM management console.

    The manager may not be able to communicate with the VM host/VM management software. Check the status of the manager, and after restoring communication, perform the operation again.

  - Check the VM guest exists, and its operating status from the RC console or the VM management console.

    When another operation is being performed on the VM guest, wait for a while and then perform the operation again.

  If no problems are found when checking the above, check the cause of the error on the VM host/VM management software from the VM management console. If operations performed from the VM management software are not executed, there is a problem with the VM host/VM management software. Perform the operation again after resolving the problem with the VM host/VM management software.

- If "operation failed:customizing vm guest (memory settings)" is displayed in *detail*:

  Failed to modify the memory size of the VM guest.

  Refer to "If "operation failed:customizing vm guest (cpu settings)" is displayed in *detail*".

- If "operation failed:customizing vm guest (properties settings)" is displayed in *detail*:

  Failed to modify the name or OS type of the VM guest.

  Refer to "If "operation failed:customizing vm guest (cpu settings)" is displayed in *detail*".

If the problem is still not resolved after performing the above actions or if a value not indicated above is displayed in *detail*, collect the corresponding message and troubleshooting data, and contact Fujitsu technical staff.

67397

FJSVrcx:ERROR:67397:failed to create image. detail=*detail*

[Description]

Failed to collect the image of the VM guest.

[Corrective Action]

- If *detail* is displayed in the "(*message*,vmerrno=*error_number*,ip=*IP_address*)" format or the "(*message*,vmerrno=*error_number*,ip=*IP_address*,host=*VM_host_IP_address*)" format:

  An error has occurred in the control of the VM host/VM management software for the displayed *IP_address*. Perform the corrective action according to the *error_number*.

  - If *error_number* 6, 7, 8, or 9 is displayed:

    Make sure that the manager is running. If the manager has been stopped, start it and perform the operation again.

    For details on how to start the manager and how to check its running state, refer to the information about starting and stopping the manager in the "ServerView Resource Coordinator VE Setup Guide".

  - If *error_number* 15 is displayed:

    There is no response from the VM host/VM management software to the admin server request. Check the operation status and network settings of the VM host/VM management software.

  - If *error_number* 17 is displayed:

    The VM guest could not be found. Select [Operation]-[Update] from the RC console menu to refresh the screen, and check whether the VM guest has been deleted.
    Also, check whether the VM guest is set to be moved when its power state changes from the VM management console.

  - If *error_number* 19 is displayed:

    There is no target operation image on server virtualization software.
    Perform the operation again after checking that there are no differences between image information on the manager and snapshot information on the server virtualization software.

  - If *error_number* 100, 115, or 178 is displayed:

    The login account information for the VM management software entered during registration may not have the required privileges.
    Check the privilege status from the VM management software. If the account does not have the required privileges, change the entered values (user name and password) for the login account information to the values for a user with administrative privileges for the VM management software.

    For details, refer to the "ServerView Resource Coordinator VE Setup Guide".

  - If *error_number* 101, 110, 111, 112, 114, 116, 148, 181, or 263 is displayed:

    Communication between the admin server and the VM host/VM management software failed. Check the operation status and network settings of the admin server/VM host/VM management software.

  - If *error_number* 104, 105, 135, 136, 147, 178, 506, 516, 518, 531, or 532 is displayed:

    The task processing of the VM host/VM management software failed. Check the operation status and network settings of the VM host/VM management software. If operations performed from the VM management software are not executed, there is a problem with the VM host/VM management software. Perform the operation again after resolving the problem with the VM host/VM management software.

    [Hyper-V]
    When using MAK license authentication for activation of Windows Server 2008 guest OS's, there is a chance that an error has occurred due to the limit on execution of Sysprep. For these guest OS's, Sysprep can be executed a maximum of three times. As Sysprep is executed when collecting cloning images, it is not possible to collect cloning images or create L-Servers

with images specified more than three times. When Sysprep has already been executed three times, it is not possible to collect cloning images from that L-Server.
When a template created using VM management software has been registered as a cloning image, Sysprep will also be executed when the template is created using the VM management software.

- If *error_number* 113 is displayed:

  The specified login account information for the VM management software cannot be used to communicate with the VM management software.
  Change the entered values (user name and password) for the login account information to the correct values.

- If *error_number* 141, 143, 144, 145, 146, 170, 171, 172, 173, 174, 175, 176, 177, 180, or 261 is displayed:

  An error occurred while collecting the image. Check the cause of the error in the VM host/VM management software, and resolve the error.

- If *error_number* 142 or 179 is displayed:

  Failed to collect the image because another operation was performed on the target VM guest. Perform the operation again after waiting a while.

- If *error_number* 400 is displayed:

  The remote command processing of the VM host failed. Check the operation status and network settings of the VM host.
  If operations performed on the VM host are not executed, there is a problem with the VM host. Perform the operation again after resolving the problem with the VM host.

- If *error_number* 500 or 602 is displayed:

  Check if the specified library server has been started.

  Check if the specified library server can perform name resolution.

  Check the firewall configuration.

- If *error_number* 529 is displayed:

  Specify the shared volume of the cluster.

- If *error_number* 530 is displayed:

  Check the available space on the disk.

- If *error_number* 534 is displayed:

  Check if the target VM host name is correct.

- If *error_number* 535 is displayed:

  Check if the VM management server can communicate correctly with the DNS server. If this does not resolve the problem, contact Fujitsu technical staff.

- If *error_number* 600 is displayed:

  Collection of cloning images cannot be performed from VM guests which are holding snapshots. Delete the snapshots of the specified VM guest and perform the operation again.

- If *error_number* 601 is displayed:

  This operation cannot be performed on VM guests that have not been stopped. Stop the specified VM guest and then perform the operation again.

- If *error_number* 619 is displayed:

  Operations cannot be performed for VM guests using RAW disks.

- If *error_number* 620 is displayed:

  Operations cannot be performed for VM guests with no system volumes.

If the problem is still not resolved after performing the above actions or if a value not indicated above is displayed in *detail*, collect the corresponding message and troubleshooting data, and contact Fujitsu technical staff.

67398

FJSVrcx:ERROR:67398:failed to delete image. detail=*detail*

[Description]

Failed to delete the VM guest image.

[Corrective Action]

- If *detail* is displayed in the "(*message*,vmerrno=*error_number*,ip=*IP_address*)" format or the "(*message*,vmerrno=*error_number*,ip=*IP_address*,host=*VM_host_IP_address*)" format:

  An error has occurred in the control of the VM host/VM management software for the displayed *IP_address*. Perform the corrective action according to the *error_number*.

  - If *error_number* 6, 7, 8, or 9 is displayed:

    Make sure that the manager is running. If the manager has been stopped, start it and perform the operation again.

    For details on how to start the manager and how to check its running state, refer to the information about starting and stopping the manager in the "ServerView Resource Coordinator VE Setup Guide".

  - If *error_number* 15 is displayed:

    There is no response from the VM host/VM management software to the admin server request. Check the operation status and network settings of the VM host/VM management software.

  - If *error_number* 17 is displayed:

    The image could not be found. Click the <Update> button on the image list screen of the RC console to refresh the screen, and check whether the image has been deleted.

  - If *error_number* 19, 503, or 504 is displayed:

    There is no target operation image on VM management software.

    Perform the operation again after checking that there are no differences between image information on Resource Orchestrator and the VM management software.

  - If *error_number* 100, 115, 147, or 260 is displayed:

    The login account information for the VM management software entered during registration may not have the required privileges.
    Check the privilege status from the VM management software. If the account does not have the required privileges, change the entered values (user name and password) for the login account information to the values for a user with administrative privileges for the VM management software.

    For details, refer to the "ServerView Resource Coordinator VE Setup Guide".

  - If *error_number* 101, 110, 111, 112, 114, 116, 148, or 263 is displayed:

    Communication between the admin server and the VM host/VM management software failed. Check the operation status and network settings of the admin server/VM host/VM management software.

  - If *error_number* 104, 105, 135, 136, 505, or 507 is displayed:

    The task processing of the VM host/VM management software failed. Check the operation status and network settings of the VM host/VM management software. If operations performed from the VM management software are not executed, there is a problem with the VM host/VM management software. Perform the operation again after resolving the problem with the VM host/VM management software.

  - If *error_number* 113 is displayed:

    The specified login account information for the VM management software cannot be used to communicate with the VM management software.
    Change the entered values (user name and password) for the login account information to the correct values.

- If *error_number* 261 is displayed:

  An error occurred while deleting the image. Check the cause of the error in the VM host/VM management software, and resolve the error.

If the problem is still not resolved after performing the above actions or if a value not indicated above is displayed in *detail*, collect the corresponding message and troubleshooting data, and contact Fujitsu technical staff.

67399

FJSVrcx:ERROR:67399:failed to deploy image. detail=*detail*

[Description]

Failed to deploy the cloning image of the VM guest.

[Corrective Action]

- If *detail* is displayed in the "(*message*,vmerrno=*error_number*,ip=*IP_address*)" format:

  An error has occurred in the control of the VM host/VM management software for the displayed *IP_address*. Perform the corrective action according to the *error_number*.

  - If *error_number* 6, 7, 8, or 9 is displayed:

    Make sure that the manager is running. If the manager has been stopped, start it and perform the operation again.

    For details on how to start the manager and how to check its running state, refer to the information about starting and stopping the manager in the "ServerView Resource Coordinator VE Setup Guide".

  - If *error_number* 15 is displayed:

    There is no response from the VM host/VM management software to the admin server request. Check the operation status and network settings of the VM host/VM management software.

  - If *error_number* 17 is displayed:

    The VM guest/image could not be found. Select [Operation]-[Update] from the RC console menu to refresh the screen, and check whether the VM guest has been deleted. Click the <Update> button on the cloning image list screen of the RC console to refresh the screen, and check whether the image has been deleted.
    Also, check whether the VM guest is set to be moved when its power state changes from the VM management console.

  - If *error_number* 100, 115, 178, 260, 337, or 381 is displayed:

    The login account information for the VM management software entered during registration may not have the required privileges.
    Check the privilege status from the VM management software. If the account does not have the required privileges, change the entered values (user name and password) for the login account information to the values for a user with administrative privileges for the VM management software.

    For details, refer to the "ServerView Resource Coordinator VE Setup Guide".

  - If *error_number* 101, 110, 111, 112, 114, 116, 181, 263, 341, or 382 is displayed:

    Communication between the admin server and the VM host/VM management software failed. Check the operation status and network settings of the admin server/VM host/VM management software.

  - If *error_number* 104, 105, 135, or 136 is displayed:

    The task processing of the VM host/VM management software failed. Check the operation status and network settings of the VM host/VM management software. If operations performed from the VM management software are not executed, there is a problem with the VM host/VM management software. Perform the operation again after resolving the problem with the VM host/VM management software.

  - If *error_number* 113 is displayed:

    The specified login account information for the VM management software cannot be used to communicate with the VM management software.
    Change the entered values (user name and password) for the login account information to the correct values.

- If *error_number* 170, 171, 172, 173, 174, 175, 176, 177, or 180 is displayed:

  An error occurred while deploying the image. Check the cause of the error in the VM host/VM management software, and resolve the error.

- If *error_number* 179 is displayed:

  Failed to deploy the image. The requested process could not be executed because the VM guest/image is being used by another process.
  Check whether the VM guest/image is being used by another process from the VM management software.

- If *error_number* 261 is displayed:

  An error occurred while deleting the image. Check the cause of the error in the VM host/VM management software, and resolve the error.

- If *error_number* 262 is displayed:

  Failed to delete the VM guest. VM guests cannot be deleted while their power is on. Check the power state of the VM guest.

- If *error_number* 330, 332, 333, 334, 336, 340, 342, or 380 is displayed:

  Failed to modify the VM guest. Check the cause of the error in the VM host/VM management software, and resolve the error.

- If *error_number* 338 is displayed:

  Failed to modify the configuration because another operation was performed on the created VM guest or the destination VM guest for deployment. Perform the operation again after waiting a while.

- If *error_number* 339 is displayed:

  The total number of devices for the destination VM guest for deployment and the image to deploy is too great. Perform the operation again after decreasing the numbers of disks or NIC in the image to deploy or the destination VM guest for deployment.

If the problem is still not resolved after performing the above actions or if a value not indicated above is displayed in *detail*, collect the corresponding message and troubleshooting data, and contact Fujitsu technical staff.

67999

FJSVrcx:ERROR:67999:internal error, *details*.

[Description]

Either an internal error has occurred or there was a problem while loading the specified XML file during the following operations:

- L-Server creation or configuration modification
- Importing an L-Server template

[Corrective Action]

When this message is displayed during creation or configuration modification of an L-Server or while importing an L-Server template, check and correct the contents of the specified XML file and then perform the operation again.

In cases other than the above, contact Fujitsu technical staff.

68296

FJSVrcx:ERROR:68296:deployment engine cli error:*detail*

[Description]

An error occurred in the manager command.

Refer to the explanation in "Message number 68296" in "ServerView Resource Coordinator VE Messages".

There is also the following case for Resource Orchestrator.

- When creating an L-Server with the server type "Physical"

  Deployment of the cloning image failed. The backup/restore procedure for the admin server may have been performed incorrectly.

[Corrective Action]

Refer to the corrective action described in "Message number 68296" in "ServerView Resource Coordinator VE Messages".

There is also the following case for Resource Orchestrator.

- When creating an L-Server with the server type "Physical"

  If a message not related to the above actions is output, collect the corresponding message and troubleshooting data, and contact Fujitsu technical staff.

69111

FJSVrcx:ERROR:69111:communication error. target=*target* detail=*detail*

[Description]

An error occurred while communicating with *target*.

[Corrective Action]

Refer to the corrective action described in "Message number 69111" in "ServerView Resource Coordinator VE Messages". Also, perform the following corrective action depending on the *target* value.

- If the IP address of the VM management software is displayed in *target*, check whether or not communication with VM management software is possible.

  - Use a ping command, etc. to check whether there is a problem with the network environment between the admin server and the VM management software.
  - If a LAN cable has become disconnected, reconnect it.
  - If the VM management product has VM management software, check whether there is a problem with connecting to the VM management product from the VM management software.

  If the IP address of the VM management software is displayed in *target*, perform the following corrective action depending on the *detail* value.

  - For "VMware vCenter Server communication error(virtual_storage_resource_name)"

    Check the status of the virtual storage resources registered in the storage pool.

    When the status is something other than "unknown", corrective action is not necessary as a communication error has occurred but recovery is complete.

    When the status is "unknown", update virtual storage resources.

    If the status does not change, perform the following corrective action:

    - Check that "VMware vCenter Server" is operating correctly on the IP address output for *target*.

      For details on the check method, refer to the manual of the "VMware vCenter Server".

    - Check that communication is possible with the IP address output for *target*.

      For the recovery procedure, refer to "Message number 67192".

  - For "VMware vCenter Server communication error"

    - Check that VMware vCenter Server is operating correctly on the IP address output for *target*.

      For details on the check and configuration method, refer to the VMware vCenter Server manual.

    - Check that communication is possible with the IP address output for *target*.

      For the recovery procedure, refer to "Message number 67192".

  - For "System Center Virtual Machine Manager communication error(virtual_storage_resource_name)"

    Check the status of the virtual storage resources registered in the storage pool.

When the status is something other than "unknown", corrective action is not necessary as a communication error has occurred but recovery is complete.

When the status is "unknown", update virtual storage resources. If the status does not change, take the following corrective action.

- Check that SCVMM is operating correctly on the IP address output for *target*.

  For details on the check method, refer to the SCVMM manual.

- Check that communication is possible with the IP address output for *target*.

  For the recovery procedure, refer to "Message number 67192".

- For "System Center Virtual Machine Manager communication error"

  Perform the following corrective actions:

  - Check that SCVMM is operating correctly on the IP address output for *target*.

    For details on the check method, refer to the SCVMM manual.

  - Check that communication is possible with the IP address output for *target*.

    For the recovery procedure, refer to "Message number 67192".

- If the IP address of the storage management software is displayed in *target*, perform the following corrective actions:

  - The necessary settings for the storage management software may not have been completed. Check the configuration, referring to "1.8 Required Storage Unit Environment and Configuration When Using Storage Units from an L-Server on a Physical Server".

  - Check that communication is possible with the IP address output for *target*.

    For the recovery procedure, refer to "Message number 67192".

  If the problem is still not resolved after performing the above actions, collect this message and troubleshooting data, and contact Fujitsu technical staff.

If the problem is still not resolved after performing the above actions, collect the corresponding message and troubleshooting data, and contact Fujitsu technical staff.

Appendix G Troubleshooting

This appendix explains how to solve problems and gather troubleshooting data for a technical investigation.

G.1 Collecting Troubleshooting Data

This section explains how to collect the data required to diagnose the causes of problems.

Use the following method to collect data with the rcxadm mgrctl snap command or the rcxadm agtctl snap command, and collect VM management software data.

Collection Method

Perform the following procedure on the server from which data is to be collected:

1. Log on to the server with OS administrator privileges.

   OS administrative privileges are required to collect troubleshooting data.

2. Execute the rcxadm mgrctl snap -full command or the rcxadm agtctl snap -full command.

   Note that the command differs depending on the server from which data is collected.

   - For admin servers:

     [Windows]

     >"*Installation_folder***Manager\bin\rcxadm" mgrctl snap -full [-dir** *dir***]** <RETURN>

     [Linux]

     # **/opt/FJSVrcvmr/bin/rcxadm mgrctl snap -full [-dir** *dir***]** <RETURN>

   - For managed servers:

     [Windows/Hyper-V]

     >"*Installation_folder***Agent\bin\rcxadm" agtctl snap -full[-dir** *dir***]** <RETURN>

     [Linux/VMware]

     # **/opt/FJSVrcxat/bin/rcxadm agtctl snap -full [-dir** *dir***]** <RETURN>

3. Collect the storage management software and VM management software data.

   For details on the collection method, refer to the manuals of each storage management software and VM management software.

   [VMware]
   If the VM management software is VMware vCenter Server, perform the following operations. Check that sufficient disk space is available in the storage location as the size of the collected troubleshooting data file is large.

   a. Start the VMware vSphere(TM) Client and connect to VMware vCenter Server as a user with system administrator privileges.

   b. From the menu, select [Administration]-[Export System Logs].

   c. For the collection target, specify VMware vCenter Server.

   d. Specify the storage location, and click <OK>.

   Send the collected troubleshooting data to Fujitsu technical staff.

For details on troubleshooting data, refer to the notes on troubleshooting data given in the "ServerView Resource Coordinator VE Operation Guide".

G.2 "Message number 21162" is Displayed When the Configuration of the Server Virtualization Software (VMware) is Changed.

Description

In environments where VMware vCenter Server is registered as the VM management software, the message below is output and the cloning image is deleted if you delete a VM host from VMware vCenter Server.

FJSVrcx:INFO:21162:*image*(version=*version*):cloning image is lost.

For details on the message, refer to "Message number 21162".

Corrective Action

- Refer to the server virtualization software manual for how to restore the L-Server template. Next, check whether the following message is output:

  FJSVrcx:INFO:21161:*image*(version=*version*):cloning image is detected.

- If the cloning images were registered in a resource pool, refer to "E.3.6 rcxadm pool" to register each cloning image in a resource pool.

  Example Command

  >**rcxadm pool register -name ImagePool -resource master_image -type vm_image** <RETURN>

- If the cloning image was being used with an L-Server, refer to "E.3.1 rcxadm lserver" to modify the L-Server. Use the following format when specifying the XML file:

```
<?xml version="1.0" encoding="utf-8"?>
<Resources>
  <LServer name="L-Server name">
    <ServerImageLink name="cloning_image_name" version="generation" />
  </LServer>
</Resources>
```

Example

```
<?xml version="1.0" encoding="utf-8"?>
<Resources>
  <LServer name="L-Server1">
    <ServerImageLink name="master_image" version="3" />
  </LServer>
</Resources>
```

Example Command

>**rcxadm lserver modify -name L-Server1 -file c:\temp\modify.xml** <RETURN>

G.3 The Guest OS Associated With the L-Server Does Not Start Properly When the L-Server Assigned With an Image is Started For the First Time.

Description

When an L-Server assigned with an image is started for the first time or when the guest OS is being started, one of the following messages is displayed on the guest OS console and the guest OS fails to startup.

a. "The computer restarted unexpectedly or encountered an unexpected error." is displayed

b. "Windows could not parse or process the unattend answer file for pass [specialize]" is displayed

c. "Your Product Key uniquely identifies your copy of windows." is displayed on the product key entry screen

d. "The system could not log you on. Make sure your User name and domain are correct, then type your password again. Letters in passwords must be typed using the correct case." is displayed

Corrective Action

The parameters set for the OS specified when creating the L-Server may be incorrect. Set the correct values and perform the operation again.

- For a. through c.:

  Check the product key value. If the value is not correct, set the correct value.

- For d.:

  Check the administrator password value. If the value is not correct, set the correct value.

For details on OS parameter settings, refer to "D.5 [OS] Tab".

G.4 On the RC console, the Value of the [Resource List] tab is "?", and on other tabs, "There is no information to display." is Displayed.

Description

In the following cases, on the RC console, the value of resources on the [Resource List] tab will be "?", and on the other tabs, "There is no information to display." is displayed.

a. When a user who has had all of their access scope settings deleted logs in to the RC console.

b. When a user who has had all of the resources in their set access scope deleted logs in to the RC console.

c. When the access scope settings of a user are all deleted while the user is logged in to the RC console.

d. When all the resources in the access scope settings of a user are all deleted while the user is logged in to the RC console.

Example

Example of Panel Display Trouble

- [Resource List] tab
  The value of resources will be "?".

- Other tabs
  "There is no information to display." is displayed.

Corrective Action

Log off from the RC console, then configure the range of the access for the user so that the relevant resources exist. Log in to the RC console again and the information is displayed correctly.

For details on access scope settings, refer to "Appendix C Roles and User Groups".

G.5 After Collection of Images Fails, Images Not Registered in the Image Pool Remain on VM Management Software.

Description

Even if image collection fails due to problems other than those involving VM management software, such as the manager stopping, images which are not registered in the image pool may remain on VM management software. In this case, the following messages will be output in the event log.

FJSVrcx:ERROR:61143:creating cloning image:failed
FJSVrcx:ERROR:67397:failed to create image. detail=(clone *VM_guest_name*:task result error,vmerrno=104,ip=*IP_address*)
FJSVrcx:ERROR:67397:failed to create image. detail=(PowerShell script execution error : create_image:create image failed. See details in the job result in System Center Virtual Machine Manager.,vmerrno=518, ip=*IP_address*, host=*VM_host_IP_address*)

For details on these messages, refer to "Message number 67397" and the "ServerView Resource Coordinator VE Messages".

Corrective Action

Make sure that the manager is running, and use the following procedure for restoration:

1. Check the resource name related to the error message above with the event log on the RC console. The image name is displayed for the resource name of "Message number 61143" in the "ServerView Resource Coordinator VE Messages".
2. Wait until a "Message number 21161" containing the image name confirmed in 1. is output in the event log. This message displays the image name and generation.
3. Display the VM management console and check if the image of *Image_name@Generation* exists.
4. If there was an image in 3., delete it from the VM management console.

   For details on how to delete images, refer to the server virtualization software manual.
5. Wait until a "Message number 21162" containing the image name deleted in 4. is output in the event log. After that, perform the collection of the image again.

G.6 When Trying to Open the [Migration among Servers] Dialog for an L-Server with unknown Status, it may Indicate Loading but not become Operable.

Description

When trying to open the [Migration among Servers] dialog for an L-Server with unknown status, it may indicate loading but not become operable. The following causes are possible:

a. A VM guest used on the L-Server has deleted from server virtualization software.
b. During L-Server deletion, system failure of the VM management software server or VM management software has occurred.
c. During L-Server deletion, system failure of admin server or manager occurs.

Corrective Action

Close the [Migration among Servers] dialog, when loading takes a very long time.
After that, check that the admin server, manager, VM management software server, or VM management software have been started, and perform the relevant operation.

- For a.:

  Delete the L-Server.

- For b. or c.:

  Delete the L-Server again.

G.7 The Status of an L-Server is Displayed as unknown, and "Message number 67154" is Displayed Even if Operations Other Than L-Server Deletion are Performed.

Description

The status of an L-Server is displayed as unknown, and even if operations other than L-Server deletion are performed, the following message is displayed.

```
FJSVrcx:ERROR:67154:VM Guest:not found
```

The following causes are possible:

a. A VM guest used on the L-Server has deleted from server virtualization software.

b. During L-Server deletion, system failure of the VM management software server or VM management software has occurred.

c. During L-Server deletion, system failure of admin server or manager occurs.

For details on the message, refer to "Message number 67154".

Corrective Action

Check that the admin server, manager, VM management software server, or VM management software have been started, and perform the relevant operation.

- For a.:

  Delete the L-Server.

- For b. or c.:

  Delete the L-Server again.

G.8 When System Failure Occurs on the Admin Server or Manager, or Job Cancellation or Timeout Occurs on the VM Management Software, L-Server Creation Fails, and VM Guests in the Process of Being Created Using Server Virtualization Software Remains.

Description

During L-Server creation, if system failure occurs on the admin server or manager, or job cancellation or timeout occurs on the VM management software, one of the following messages may be output in the event log, and L-Server creation may fail.

- FJSVrcx:ERROR:67390:creating VM guest failed. detail=(*message*,vmerrno=9,ip=*IP_address*)
- FJSVrcx:ERROR:67392:modifying VM guest failed. detail=(*message*,vmerrno=9,ip=*IP_address*)
- FJSVrcx:ERROR:67390:creating VM guest failed. detail=(PowerShell script execution error : create_vmguest:task result error,vmerrno=104,ip=*IP_address*, host=*VM_host_IP_address*)
- FJSVrcx:ERROR:67390:creating VM guest failed. detail=(PowerShell script execution error : create_vmguest:task result timeout,vmerrno=105,ip=*IP_address*,host=*VM_host_IP_address*)

After starting the manager again, one of the following messages is output in the event log, and creation of the L-Server being created before the manager stopped fails.

- FJSVrcx:ERROR:67390:creating VM guest failed. detail=(clone *image_name*:task result error,vmerrno=104,ip=*IP_address*)
- FJSVrcx:ERROR:67390:creating VM guest failed. detail=(create *VM_Guest_Name*:task result error,vmerrno=104,ip=*IP_address*)
- FJSVrcx:ERROR:67390:creating VM guest failed. detail=(PowerShell script execution error : create_vmguest:VM guest already exists,vmerrno=603,ip=*IP_address*,host=*VM_host_IP_address*)

For details on the messages, refer to "Message number 67390" and "Message number 67392".

When the message above is output, VM guest in process of creation may remain on server virtualization software.

Corrective Action

Make sure that the manager is running, and use the following procedure for restoration:

1. Check the VM guest name related to the error message above with the event log on the RC console. The VM guest name is displayed for the resource name in the event log.
2. Display the VM management console, and check if the VM guest checked in 1. exists.
3. If there was a VM guest in 2., delete it from the VM management console. For details on how to delete VM guests, refer to the server virtualization software manual. (*1)

   *1: When server virtualization software is VMware, select "Delete from Disk", when deleting VM guest.
4. After confirming from the server tree or orchestration tree on the RC console that the VM guest that was checked in 1. does not exist, create the L-Server again.

G.9 When System Failure Occurs on the VM Management Software Server or VM Management Software during L-Server Creation, Creation Fails but VM Guests Being Created on Server Virtualization Software May Remain.

Description

During L-Server creation, if system failure occurs on the VM management software server or VM management software, one of the following messages may be output in the event log, and L-Server creation may fail.

- FJSVrcx:ERROR:67390:creating VM guest failed. detail=(vmware remote error,vmerrno=101,ip=*IP_address*)
- FJSVrcx:ERROR:67390:creating VM guest failed. detail=(logout failed(remote error),vmerrno=116,ip=*IP_address*)
- FJSVrcx:ERROR:67390:creating VM guest failed. detail=timeout occurred
- FJSVrcx:ERROR:67392:modifying VM guest failed. detail=(vmware remote error,vmerrno=101,ip=*IP_address*)
- FJSVrcx:ERROR:67392:modifying VM guest failed. detail=(logout failed(remote error),vmerrno=116,ip=*IP_address*)

For details on the messages, refer to "Message number 67390" and "Message number 67392".

When the message above is output, VM guests in the process of being created may remain on server virtualization software.

Corrective Action

Make sure that the VM management software is running, and use the following procedure for restoration.

1. Check the resource name related to the error message above with the event log on the RC console. The VM guest name is displayed for the resource name.
2. Display the VM management console, and check if the VM guest checked in 1. exists.
3. If there was a VM guest in 2., delete it from the VM management console.

   For details on how to delete VM guests, refer to the server virtualization software manual. (*1)

   *1: When server virtualization software is VMware, select "Delete from Disk", when deleting VM guest.
4. Check if the VM management software can communicate with the manager. Select the VM management software in the server resource tree of the RC console, and check if the status displayed on the main panel is normal.
5. After confirming from the server tree or orchestration tree on the RC console that the VM guest that was checked in 1. does not exist, create the L-Server again.

G.10 When Deleting an L-Server, "Message number 67391", "Message number 67210" or "Message number 67280" are Displayed and Deletion Fails.

Description

The VM host, which the L-Server is running on, detects that the VM guest of the L-Server does not exist, so the following messages are output and L-Server deletion fails.

- FJSVrcx:ERROR:67391:deleting VM guest failed. detail=(*VM_guest_name*:vmguest not found,vmerrno=17,ip=*IP_address*)
- FJSVrcx:ERROR:67210:VM_guest_name(VM guest):is busy
- FJSVrcx:ERROR:67280:VM_guest_name:deleting VM guest not supported. (VM type)

For details on the messages, refer to "Message number 67391", "Message number 67210" and "Message number 67280".

Corrective Action

Check the name of the VM guest of the L-Server using the GUI or the CLI.

- When using the GUI:
  1. Display the RC console.
  2. Select the L-Server on the orchestration tree.
  3. Select the [Resource Details] tab on the main panel, and check the guest name of the resource.
- When using the CLI:
  1. Execute the following command:

     >**rcxadm lserver show -name** *L-Server_name* <RETURN>
  2. Check the display of "VmGuest:".

If the VM guest name is not displayed, delete the L-Server again.

If the VM guest name is displayed, check that migration is not being performed from the management screen of the VM management software, and then delete the L-Server again.

When any message is output during deletion of the L-Server, check that the VM guest name of the L-Server is not displayed, and then delete the L-Server again.

G.11 When Creation of an L-Server Takes a Long Time, or L-Server Creation Fails and "Message number 67390" is Displayed.

Description

Due to hardware failure, L-Server creation may take an excessive amount of time.

When it does take a long time, the following message is output and L-Server creation may fail.

```
FJSVrcx:ERROR:67390:creating VM guest failed. detail=timeout occurred
```

For details on the message, refer to "Message number 67390".

Corrective Action

There is a possibility that the hardware of the server used for L-Server creation has failed.

Check the following:

a. When the server used to create the L-Server is a blade server, if failure of the Fibre Channel switch blade has occurred.

b. When the server used to create the L-Server is a blade server, if failure of the LAN switch blade has occurred.

When hardware failure has occurred, update the hardware information held by the server virtualization software.

For details on how to update hardware information, refer to the server virtualization software manual.

G.12 When Starting an L-Server, "Message number 67320" is Displayed, and Starting of the L-Server Fails.

Description

When starting the L-Server, the following message is displayed, and starting of the L-Server may fail.

```
ERROR:67320:power control error.target=target detail=( VM guest:vmguest not found,vmerrno=17,ip=IP_address)
```

The following causes are possible:

a. Migration has been performed on VMware.

b. The DRS (Distributed Resource Scheduler) function of VMware is enabled.

For details on the message, refer to "Message number 67320".

Corrective Action

In the RC console orchestration tree, right-click the target L-Server, and select [Update] from the popup menu. Check if the resource status of the updated L-Server is normal.

G.13 Migrating an L-Server between Servers Fails, and "Message number 67385" is Displayed.

Description

After starting an L-Server operating on a VMware VM host, when migration between servers is performed before completion of starting of the OS, the following message is output and migration fails.

FJSVrcx:ERROR:67385:migrating VM guest failed. *VM_guest_name* migrate from *source_server* to *destination_server*. detail=(*message*,vmerrno=150,ip=*IP_address*)

For details on the message, refer to the "ServerView Resource Coordinator VE Messages".

Corrective Action

Perform the operation again after starting of the L-Server's OS is complete.

G.14 When Job Cancellation or Timeout Occurs on VM Management Software, Collection of Cloning Images Fails and VM Guests in the Process of Being Copied Remain on the VM Management Software.

Description

During cloning image collection, if job cancellation or timeout occurs on the VM management software, one of the following messages will be output in the event log, and cloning image collection may fail.

FJSVrcx:ERROR:67397:failed to create image. detail=(PowerShell script execution error : create_image:duplicate vmguest failed. See details in the job result in System Center Virtual Machine Manager.,vmerrno=516,ip=*IP_address*,host=*VM_host_IP_address*)

For details on the message, refer to "Message number 67397".

When the message above is output, VM guests in process of being copied may remain on VM management software.

Corrective Action

Use the following procedure to perform recovery.

1. Display the VM management console, and check if a VM guest whose name starts with "!temp_ror" exists.
2. If there is a VM guest that meets the condition in 1., delete it from the VM management console. For details on how to delete VM guests, refer to the server virtualization software manual.
3. Collect cloning images again.

G.15 When Collecting A Cloning Master, "Message number 21161" or "Message number 21162" is Displayed.

Description

When collection of a cloning image is performed for an L-Server which is a virtual server with Hyper-V VM type, one of the following messages may be output in the event log. The VM guest name whose name starts with "!temp_ror" is displayed for *obj*.

- FJSVrcx:INFO:21161:obj:VM guest is detected.

- FJSVrcx:INFO:21162:obj:VM guest is lost.

For details on the messages, refer to "Message number 21161" and "Message number 21162".

Corrective Action

No action is necessary.

G.16 After Collection of Images Fails, Snapshots Which Cannot be Referred to or Operated from Resource Orchestrator Remain on VM Management Software.

Description

Even if snapshot collection fails due to problems other than those involving VM management software, such as the manager stopping, collected snapshots may exist on VM management software.

Corrective Action

Start the manager, make sure that the collection of snapshots has been completed, and use the following procedure for restoration:

1. Display the VM management console and check if there are multiple snapshots whose *L-Server_host_name* and *generation* are the same among the snapshots whose name is RCX_*L-Server_host_name*@*Generation*.
2. If there were multiple snapshots in 1., delete snapshots other than latest ones from the VM management console.

   For details on how to delete snapshots, refer to the server virtualization software manual.

G.17 When an L-Server is Created, "Message number 62511" is Displayed, and Creation of the L-Server Fails.

Description

When creating the L-Server, the following message is displayed, and creation of the L-Server may fail.

FJSVrcx:ERROR:62511:failed to control *obj*. IF=*%1*, message="ERROR:ssmgr3419:The specified alias name has already been registered."

In *obj*, the resource name of the storage management software is displayed.

In *%1*, the internal function name is displayed.

Creation of the L-Server failed because the alias name of the affinity group has already been defined when ETERNUS storage was created.

Corrective Action

Using the following procedure, identify the overlapping affinity group, delete the affinity group and the Volume defined in the affinity group, and then create the L-Server again.

1. Check the resource name of the unused address set resource (WWN) with the smallest number.

   a. Execute the following command:

   > *Installation_folder***Manager\bin\rcxadm addrset show -name** *Resource_name_of_the_Address_Set_Resource(WWN)* <RETURN>

b. Identify the unused address set resource (WWN) with the smallest number.

   The range of the "start" and "end" inside the AddressSet tag becomes the range of the Address set resource (WWN).

   In the range of address set resources (WWN), all addresses other than those below are considered unused address set resources (WWN).

   - Addresses which are not used for management by Resource Orchestrator, and are displayed in the Exclude tag
   - Addresses which have been allocated, and are displayed in the Reserve tag

   From the unused address set resources, identify the one with the smallest number.

   Example

   When the output result is the one below, the resource name of the unused address set resource (WWN) with the smallest number will be "20:01:00:17:42:50:00:02".

```
<?xml version="1.0" encoding="utf-8"?>
  <AddressSet name="wwndata1" id="540" label="wwn1" subnet="" mask=""
start="20:01:00:17:42:50:00:00" end="20:01:00:17:42:50:00:0f">
    <Comment>wwn-test-data-1</Comment>
    <Exclude>
      20:01:00:17:42:50:00:00
    </Exclude>
    <Reserve>
      20:01:00:17:42:50:00:01
    </Reserve>
  </AddressSet>
```

2. Identify the alias name of the affinity group created when creating ETERNUS storage during L-Server creation.

   Extract the characters corresponding to "XX" below from the resource name of the unused address set resource (WWN) with the smallest number. These characters become the alias name of the affinity group created when creating ETERNUS storage.

```
"YY:XX:YY:YY:YY:XX:XX:XX"
```

   Example

   For "20:01:00:17:42:50:00:02" it would be "01500002".

3. Identify the affinity group to delete.

   Execute the following command to display the affinity groups of each ETERNUS storage that is managed using ESC.

```
> ESC_manager_installation_folder\Manager\opt\FJSVssmgr\sbin\storageadm affinity info -ipaddr ETERNUS_IP_address
<RETURN>
```

   Check if the alias name of the affinity group identified in 2. is included in the affinity group alias names displayed in "NAME".

   - If the alias name is included, the relevant affinity group will be the target of deletion.
   - If the alias name is not included, collect troubleshooting data, and contact Fujitsu technical staff.

4. Identify the volume to delete.

   Execute the following command to display the volume numbers of each Volume defined in the affinity group identified in 3.

```
> ESC_manager_installation_folder\Manager\opt\FJSVssmgr\sbin\storageadm affinity info -ipaddr ETERNUS_IP_address -
affinitygroup Affinity_group_number <RETURN>
```

   The Volume with the volume number matching that displayed in "Volume" becomes the target of deletion.

5. Deletes the affinity group.

   Execute the following command to delete the affinity group identified in 3.

   > *ESC_manager_installation_folder***Manager\opt\FJSVssmgr\sbin\storageadm affinity delete -ipaddr** *ETERNUS_IP_address* **-affinitygroup** *Affinity_group_number* <RETURN>

6. Deletes Volume.

   Execute the following command to delete the Volume identified in 4.

   > *ESC_manager_installation_folder***Manager\opt\FJSVssmgr\sbin\storageadm volume delete -ipaddr** *ETERNUS_IP_address* **-volume** *Volume_number***[,** *Volume_number***,...]** <RETURN>

When the message from the storage management software is one other than the above, refer to the manual of the storage management software, take the necessary corrective action for the message, and then perform the operation again.

Appendix H XML

This appendix explains XML definitions.

H.1 Overview

This section explains the XMLs used by Resource Orchestrator.

The following types of XMLs are used by Resource Orchestrator:

- L-Server Template
- L-Servers
- Network Resources
- Disk
- Resource Folders
- Users
- User Groups

Note

- Use the UTF-8 character code for XML files.
- As a rule, line breaks and blank spaces are recognized as data in an XML. Make sure that there are no unnecessary line breaks or blank spaces when defining an XML file. Additionally, specify tags and attributes according to the Resource Orchestrator XML specifications. Tags not listed in the XML specifications are not recognized.
- Resources that are specified in an XML must be included in the access scope of the user that performs the operation.

H.2 L-Server Template

The XML definition for an L-Server template is shown below.
If a template is imported without editing the L-Server template name, the content of the existing L-Server template is overwritten. If an L-Server template is imported after the name is edited from when it was exported, the L-Server template is added.
When defining multiple L-Server templates, define multiple L-Servers for each file, assign them different L-Server template names, and enclose them with LserverTemplates tags.

```
<?xml version="1.0" encoding="utf-8"?>
<LServerTemplates>
  <LServerTemplate name="L-Server#1 Template Name" id="L-Server Template ID" label="Label">
    <Comment>Comment</Comment>
    <ServerType>Server Type</ServerType>
    <Model>Model Name</Model>
    <VMType>VM Type</VMType>
    <CPU>
      <CPUArch>CPU Architecture</CPUArch>
      <CPUPerf>CPU Performance</CPUPerf>
      <NumOfCPU>Number of CPUs</NumOfCPU>
    </CPU>
    <Memory>
      <MemorySize>Memory Size</MemorySize>
    </Memory>
    <Disks>
      <Disk>
        <DiskIndex>Disk Index</DiskIndex>
        <DiskSize>Disk Size</DiskSize>
```

```
      </Disk>
    </Disks>
    <NICs>
      <NumOfNIC>Number of NICs</NumOfNIC>
    </NICs>
    <Policy>
      <Redundancy>Redundancy</Redundancy>
      <Positioning>Positioning</Positioning>
    </Policy>
  </LServerTemplate>
  <LServerTemplate name="L-Server#2 Template Name" id="L-Server Template ID" label="Label">
  ...
  </LServerTemplate>
</LServerTemplates>
```

Element Name	Description	Remarks (Possible Values, Examples)
L-Server template name	Name of L-Server template	Character string beginning with an alphanumeric character and containing up to 32 alphanumeric characters, underscores ("_"), and hyphens ("-")
L-Server template ID	ID for L-Server template	Optional. For internal management purposes.
Label	Label for L-Server template (optional)	Character string of up to 32 alphanumeric characters or symbols
Comment	Comment for L-Server template (optional)	Character string of up to 256 alphanumeric characters or symbols
Server type	Type of server to assign as an L-Server	When the server type is "Virtual", specify Virtual. When the server type is "Physical", specify Physical.
Model name (Physical servers only)	Model name of the server to assign to L-Server	Specify the model name of the server to assign to the L-Server. Specify the model name of the server after checking the basic information on the [Resource details] tab of the server resource tree.
VM type (Virtual servers only)	Type of VM to assign as an L-Server	Specify when the server type is "Virtual". VMware Hyper-V
CPU architecture (Virtual servers only)	CPU architecture to assign to L-Server (optional)	IA If omitted, IA is set.
CPU performance (Virtual servers only)	CPU performance to assign to L-Server	A number with up to one decimal place, in units of gigahertz Specify in the range specifiable for L-Server.
Number of CPUs (Virtual servers only)	Number of CPUs to assign to L-Server	An integer equal to or greater than 1 Specify in the range specifiable for L-Server.
Memory size (Virtual servers only)	Size of memory to assign to L-Server	A number with up to one decimal place, in units of gigabytes Specify in the range specifiable for L-Server.
Disk index	Number of disk to assign to L-Server (optional; required when disk size is specified)	Integer starting from 0 0: Boot disk Other than 0: Data disk Specify in the range specifiable for L-Server.
Disk size	Size of disk to remove (optional; required when disk index is specified)	A number with up to one decimal place, in units of gigabytes If omitted, a disk size is assigned according to the

Element Name	Description	Remarks (Possible Values, Examples)
		size of the image specified when creating the L-Server. Specify in the range specifiable for L-Server.
Number of NICs (Virtual servers only)	Number of NICs for L-Server (optional)	An integer equal to or greater than 1 Specify in the range of NIC index of L-Server +1.
Redundancy	Redundancy to assign to L-Server (optional)	- None No redundancy - HA Place in a server with HA set If omitted and not specified when creating the L-Server, None is set. Refer to the server redundancy on the "D.2 [Server] Tab".
Positioning	Physical position to assign to L-Server	- Fixed Fixed physical position - AttachAtBoot Position changes upon startup

If there is only one L-Server template, the LServerTemplates tag is optional.

Example

- L-Server template (When the server type is "Virtual")

```
<?xml version="1.0" encoding="utf-8"?>
<LServerTemplate name="template1" label="for virtual server">
  <Comment>2010/XX/XX created for work A</Comment>
  <ServerType>Virtual</ServerType>
  <VMType>VMware</VMType>
  <CPU>
    <CPUArch>IA</CPUArch>
    <CPUPerf>1.0</CPUPerf>
    <NumOfCPU>2</NumOfCPU>
  </CPU>
  <Memory>
    <MemorySize>2.0</MemorySize>
  </Memory>
  <Disks>
    <Disk>
      <DiskIndex>0</DiskIndex>
      <DiskSize>100.0</DiskSize>
    </Disk>
    <Disk>
      <DiskIndex>1</DiskIndex>
      <DiskSize>200.0</DiskSize>
    </Disk>
  </Disks>
  <NICs>
    <NumOfNIC>2</NumOfNIC>
  </NICs>
  <Policy>
    <Redundancy>None</Redundancy>
    <Positioning>Fixed</Positioning>
```

```
  </Policy>
</LServerTemplate>
```

- L-Server template (When the server type is "Physical")

```
<?xml version="1.0" encoding="utf-8"?>
<LServerTemplate name="template2" label="for physical server">
  <Comment>2010/XX/XX created for work B</Comment>
  <ServerType>Physical</ServerType>
  <Model>PRIMERGY BX922 S2</Model>
  <Disks>
    <Disk>
      <DiskIndex>0</DiskIndex>
      <DiskSize>40.0</DiskSize>
    </Disk>
  </Disks>
  <Policy>
    <Redundancy>None</Redundancy>
  </Policy>
</LServerTemplate>
```

H.3 L-Servers

The XML definition for an L-Server is shown below.

```
<?xml version="1.0" encoding="utf-8"?>
<Resources>
  <LServer name="L-Server name" label="Label">
    <Comment>Comment</Comment>
    <TemplateLink name="L-Server template name"/>
    <ServerImageLink name="image name" version="image version"/>
    <ServerType>Server Type</ServerType>
    <Model>Model Name</Model>
    <VMType>VM Type</VMType>
    <OSType>OS Type</OSType>
    <CPU>
      <CPUArch>CPU Architecture</CPUArch>
      <CPUPerf>CPU Performance</CPUPerf>
      <NumOfCPU>Number of CPUs</NumOfCPU>
    </CPU>
    <Memory>
      <MemorySize>Memory Size</MemorySize>
    </Memory>
    <Disks>
      <Disk name="Disk name">
        <DiskIndex>Disk Index</DiskIndex>
        <DiskSize>Disk Size</DiskSize>
        <From>
          <VirtualStorage name="Virtual storage resource name"/>
          <Pool name="Storage pool name"/>
        </From>
      </Disk>
    </Disks>
    <NICs>
      <NIC>
        <NICIndex>NIC Index</NICIndex>
        <NetworkLink name="Network name"/>
        <MacAddress auto="MACAddressAutoSelect" from="MacAddressSet" pool="AddressPool"/>
        <IpAddress>IP Address</IpAddress>
      </NIC>
```

```
    </NICs>
    <HBAs>
      <HBA>
        <HBAIndex>HBAIndex</HBAIndex>
        <WWN auto="WWNAutoSelect" from="WWNAddressSet" Pool=AddressPool"/>
      </HBA>
    </HBAs>
    <Policy>
      <Redundancy>Redundancy</Redundancy>
      <Positioning>Positioning</Positioning>
      <Exclusion>Exclusion</Exclusion>
    </Policy>
    <Repurpose>Server Automatic Release(true|false)</Repurpose>
    <Primary>Next server to start</Primary>
    <From>
      <VmHost name="VM host resource name"/>
      <Pool name="Pool name"/>
      <PhysicalServer name="Physical server name"/>
    </From>
    <Spare>
      <Pool name="Reserve setting server pool name"/>
      <PhysicalServer name="Physical server name"/>
    </Spare>
    <OSSetting>
      <ComputerName>Computer name, hostname</ComputerName>
      <FullName>Full Name</FullName>
      <ProductKey>Product Key</ProductKey>
      <AdminPassword>Administrator Password</AdminPassword>
      <CAL>License Mode</CAL>
      <CALMaxConnection>Maximum Number of Connections</CALMaxConnection>
      <OrganizationName>Organization Name</OrganizationName>
      <DomainName>Domain Name</DomainName>
      <DNSSearchPaths>
        <DNSSearchPath>DNS Search Path</DNSSearchPath>
        <DNSSearchPath>DNS Search Path</DNSSearchPath>
      </DNSSearchPaths>
      <DNSServers>
        <DNSServer nic="NIC Index" ip="DNS IP Address" />
        <DNSServer nic="NIC Index" ip="DNS IP Address" />
      </DNSServers >
      <TimeZone>Time Zone</TimeZone>
      <HardwareClock>Hardware Clock Configuration</HardwareClock>
    </OSSetting>
  </LServer>
</Resources>
```

To place an L-Server in a specific resource folder, enclose the L-Server tag in the Folder tag, not the Resources tag.
If the Resources tag is specified, the L-Server is created in the home folder of the user that executed the operation.
To modify an already created L-Server, use the Resources tag.

```
<?xml version="1.0" encoding="utf-8"?>
<Folder name="Resource folder name">
  <LServer name="L-Server name" label="Label">
    ...
  </LServer>
</Folder>
```

Element Name	Description	Remarks (Possible Values, Examples)
L-Server name (*1, *2)	Name of the L-Server	Character string beginning with an alphanumeric character and containing up to 64 alphanumeric characters, underscores ("_"), and hyphens ("-")
Label (*1, *3)	Label for the L-Server (optional)	Character string of up to 32 alphanumeric characters or symbols
Comment (*1, *3)	Comment for the L-Server (optional)	Character string of up to 256 alphanumeric characters or symbols
L-Server template name	Name of the L-Server template to use for the L-Server (optional)	Specify the resource name of an existing L-Server template.
Image name	Name of the cloning image to deploy to the L-Server's boot disk (optional)	Specify the resource name of an existing cloning image. For details, refer to "5.1 Creation Using an L-Server Template".
Image version	Version of the cloning image to deploy to the L-Server's boot disk (optional)	An integer If omitted, the latest version is used.
Server type (*4)	Type of server to assign as an L-Server	When the server type is "Virtual", specify Virtual. When the server type is "Physical", specify Physical.
Model name (Physical servers only)	Model name of the server to assign to L-Server	Specify the model name of the server to assign to the L-Server. Specify the model name of the server after checking the basic information on the [Resource details] tab of the server resource tree.
VM type (*4) (Virtual servers only)	Type of VM to assign as an L-Server	VMware Hyper-V
OS type (*1)	Type of OS for the L-Server. This setting can be omitted if an image is specified.	[VMware] For the possible values that can be set, refer to the information displayed on the GUI, or the values described in the "NAME" column of the VMware website (*5). [Hyper-V] For the possible values that can be set, refer to the information displayed on the GUI, or the Name of the operating system object that can be obtained from the Virtual Machine Manager database of Microsoft(R) System Center Virtual Machine Manager 2008 R2. This information can be obtained using Get-OperatingSystem Cmdlet.
CPU architecture (*4)	CPU architecture to assign to L-Server (optional)	IA If omitted, IA is set.
CPU performance (*1, *4)	CPU performance to assign to L-Server	A number with up to one decimal place, in units of gigahertz For details of the specifiable range, refer to "D.2 [Server] Tab".
Number of CPUs (*1, *4)	Number of CPUs to assign to L-Server	An integer equal to or greater than 1 For details of the specifiable range, refer to "D.2 [Server] Tab".
Memory size (*1, *4)	Size of memory to assign to L-Server	A number with up to one decimal place, in units of gigabytes For details of the specifiable range, refer to "D.2 [Server] Tab".

Element Name	Description	Remarks (Possible Values, Examples)
Disk name	Name of the disk to assign to the L-Server (optional)	Character string beginning with an alphanumeric character and containing up to 32 alphanumeric characters, underscores ("_"), and hyphens ("-"). If omitted, a name is automatically generated.
Disk index (*4)	Number of the disk to assign to the L-Server	Integer starting from 0 0: Boot disk Other than 0: Data disk Specify a number between 0 and 59.
Disk size (*4)	Size of disk to remove	A number with up to one decimal place, in units of gigabytes For details of the specifiable range, refer to size in "D.3 [Disk] Tab".
Virtual storage	Virtual storage from which the disk to assign to the L-Server is removed (optional) If specified at the same time as storage pool, priority is given to this attribute.	Specify the resource name of an existing virtual storage. [Hyper-V] When specifying this element, specify the same virtual storage for all disks.
Storage pool	Resource pool for extracting the virtual storage to create the disk to assign to the L-Server (optional)	Specify the resource name of an existing storage pool. If there are storage pools with the same name on different levels, the level must also be specified. Folder/Pool [Hyper-V] When specifying this element, specify the same storage pool for all disks.
NIC Index	Number to identify the NIC definition to assign to the L-Server	An integer starting from 0. Specify a number between 0 and 9.
Network Name	Name of the network that the L-Server connects to	Specify the name of an existing network resource. When the server type is "Physical", for the NIC with the NICIndex 0, do not specify the network name and IP address. This NIC is used for the admin LAN. The NIC with the NICIndex 1 is used for redundancy of the admin LAN, so do not specify the network name or IP address.
MAC Address (Physical servers only)	MAC address to assign to the L-Server	The MAC address can be specified using the following methods: - MAC address direct specification <MacAddress auto="false">MAC address format</MacAddress> For the MAC address format, specify the MAC address in either hyphen ("-") or colon (":") delimited form. ("xx-xx-xx-xx-xx-xx" or "xx:xx:xx:xx:xx:xx") - Auto allocation <MacAddress auto="true" from="MacAddressSetResource"/> or <MacAddress auto="true" pool="Address pool"/> An address in the MAC address range set in the MACAddressSetResource or MAC address range registered in the specified address pool will automatically be assigned.

Element Name	Description	Remarks (Possible Values, Examples)
IP address	IP address to assign to the L-Server (optional)	The IP address can be specified using the following methods: <IpAddress>IP address format</IpAddress> Specify an IP address. <IpAddress auto="true"/> An IP address is automatically assigned from the address range set for the network resource. Even if the IpAddress tag is omitted, an IP address is automatically assigned from the address range set for the network resource.
HBA Number (Physical servers only)	Number to identify the HBA definition to assign to the L-Server	Integer starting from 0 Specify a number between 0 and 1.
WWN (Physical servers only)	WWN to assign to the L-Server	The WWN can be specified using the following methods: - WWN direct specification <WWN auto="false">WWN format</WWN> For the WWN format, specify the WWN in colon (":") delimited form. ("xx:xx:xx:xx:xx:xx:xx") - Auto allocation <WWN auto="true" from="WWNAddressSetResource"/> <WWN auto="true" pool="Address pool name"/> An address in the WWN scope set in the WWN address set resources or WWN scope registered in the specified address pool will automatically be assigned.
Redundancy (*1, *4)	Redundancy to assign to L-Server (optional)	- None No redundancy - HA Place in a server with HA set If omitted and not specified when creating the L-Server, None is set. Refer to the server redundancy on the "D.2 [Server] Tab".
Positioning (*1, *4)	Physical position to assign to L-Server (optional)	- Fixed Fixed physical position - AttachAtBoot Position changes upon startup If omitted, Fixed is set. When the server type is "Physical", specification is not possible.
Exclusion (Virtual servers only) (*1)	Exclusive operation with another virtual server on a physical server (optional)	L-Server name or folder name. No exclusion is performed if the L-Server or folder is not included in the access scope or the specified resource does not exist.

Element Name	Description	Remarks (Possible Values, Examples)
Server Automatic Release (Physical servers only)	Automatic release of servers during power off (optional)	Specify whether or not to automatically release the servers assigned to the L-Server when they are powered off. When enabling automatic release, specify true. When not enabling automatic release, specify false. If left blank false is set.
Next server to start (Physical servers only)	Next server to start (optional)	Valid when true is specified for Server automatic release. When true is specified, specify the next server to start as follows: - When starting from the same server <Primary> <PhysicalServer name="Physical server name"/> </Primary> A server in the server pool <Primary> <Pool name="Server pool name"/> </Primary> - When specifying automatic selection from all usable servers in the server pool <Primary auto="true"> If left blank, the physical server that was used the last time will be set.
VM host (Virtual servers only)	VM host to create the VM to assign to the L-Server (valid when assigning for the first time only). If specified at the same time as resource pool, priority is given to this attribute. (optional)	Specify the resource name of a registered VM host.
VM pool (Virtual servers only)	Resource pool to extract the VM host to create the VM to assign to the L-Server (valid only when assigning for the first time). (optional)	Specify the resource name of a registered VM pool. If there are VM pools with the same name on different levels, the level must also be specified. Folder/Pool
Server pool (Physical servers only)	The resource pool that comprises the physical servers assigned to L-Servers.	Specify the resource names of existing server pools. If there are server pools with the same name on different levels, the level must also be specified. Folder/Pool
Reserve setting server pool (Optional) (Physical servers only)	Specify the server pool for reserve settings. (optional)	Valid when redundancy has been configured. If there are server pools with the same name on different levels, the level must also be specified. Folder/Pool
Computer name, hostname (*6)	Computer name and hostname	For values that can be specified, refer to "Table D.1 List of Settings" of the "D.5 [OS] Tab".
Full name (*6)	Full name used for Windows	
Product key (*6)	Windows product key	
Administrator password (*6)	Administrator password used for Windows	
License mode (*6)	Client access license set for Windows	
Maximum number of connections (*6)	Number of client connections set for Windows	

Element Name	Description	Remarks (Possible Values, Examples)
Organization name (*6)	Organization name used for Windows	
Domain name (*6)	Domain name used for the OS	
DNS search path (*6)	DNS search path used for Linux	For values that can be specified, refer to "Table D.1 List of Settings" of the "D.5 [OS] Tab". To specify multiple values, use multiple tags. <DNSSearchPaths> <DNSSearchPath>DNS Search Path 1</DNSSearchPath> <DNSSearchPath>DNS Search Path 2</DNSSearchPath> </DNSSearchPaths>
NIC Index (*6)	NIC index used to set the DNS	NIC index used to set the DNS IP address. This index is required when the OS is Windows. If the OS is Linux, leave the nic attribute blank. Specify a number between 0 and 9.
DNS IP address (*6)	DNS IP address	For Windows, use the DNS IP address to set for each NIC. For Linux, use the DNS IP address to set for the system.
Time zone (*6)	Time zone for the OS	- For the time zones that can be specified using Windows, refer to the Microsoft website (*7). Convert the value from the "Index" column to a decimal, or specify a value from the "Time" column. - Examples of the time zones that can be specified using Linux are listed below. To specify other time zones, refer to the information displayed using commands provided by the OS such as timeconfig. - Asia/Tokyo - US/Pacific - US/Central - US/Eastern - Europe/Berlin - Europe/Amsterdam - Europe/London - Asia/Seoul - Asia/Hong_Kong - Australia/Canberra
Hardware clock configuration (*6)	Clock configuration used for Linux.	For values that can be specified, refer to "Table D.1 List of Settings" of the "D.5 [OS] Tab".
Resource folder name (*8)	Name of the resource folder to place the L-Server	To specify the level, use the following format: Folder name/ Folder name

*1: Values can be changed by changing an L-Server when the server type is "Virtual". Even if an L-Server template name or the content of an L-Server template specified for the L-Server template name is modified, the L-Server configuration will not be modified. Only change the OS type if no OS is installed.
*2: When "Physical" has been specified for the server type and an image name has been specified, the L-Server name will be the OS hostname/computer name.
When specifying a Windows image name, enter a character string of up to 63 alphanumeric characters (upper or lowercase) for the L-Server name. The string cannot be composed solely of numbers.

*3: Values can be changed by changing an L-Server when the server type is "Physical".
*4: Only specify if no L-Server template is used or if the values specified in the L-Server template will not be used.
*5: For details on the possible values, refer to the VMware website below.

VMware web site

URL:
http://www.vmware.com/support/developer/vc-sdk/visdk400pubs/ReferenceGuide/vim.vm.GuestOsDescriptor.GuestOsIdentifier.html
(As of November 2010)

*6: Personalizing information to be specified after the image is deployed. Only specify if there is no OS property definition file or if you want to change the existing values.
*7: Refer to the Microsoft web site below.

Microsoft web site

URL: http://support.microsoft.com/kb/973627/en-us/ (As of November 2010)

*8: Specify if creating an L-Server in a resource folder.

Example

- Creating an L-Server that does not deploy a cloning image using an L-Server template (When server type is "Physical")

```
<?xml version="1.0" encoding="utf-8"?>
<Resources>
  <LServer name="first_server">
    <TemplateLink name="small"/>
    <ServerType>Physical</ServerType>
    <Model>PRIMERGY BX620 S6</Model>
    <NICs>
      <NIC>
        <NICIndex>2</NICIndex>
        <NetworkLink name="net01"/>
      </NIC>
    </NICs>
  </LServer>
</Resources>
```

- Creating an L-Server that does not deploy a cloning image using an L-Server template (When server type is "Virtual")

```
<?xml version="1.0" encoding="utf-8"?>
<Resources>
  <LServer name="first_server">
    <TemplateLink name="small"/>
    <ServerType>Virtual</ServerType>
    <OSType>Red Hat Enterprise Linux 5 (32-bit)</OSType>
    <NICs>
      <NIC>
        <NICIndex>0</NICIndex>
        <NetworkLink name="net01"/>
      </NIC>
    </NICs>
  </LServer>
</Resources>
```

- Creating an L-Server that deploys a cloning image using an L-Server template (pre-configured OS property definition file) (When server type is "Physical")

```
<?xml version="1.0" encoding="utf-8"?>
<Resources>
  <LServer name="second_server">
    <TemplateLink name="small"/>
    <ServerType>Physical</ServerType>
    <ServerImageLink name="master_image"/>
    <NICs>
      <NIC>
        <NICIndex>2</NICIndex>
        <NetworkLink name="net01"/>
      </NIC>
    </NICs>
    <OSSetting>
      <ComputerName>host2</ComputerName>
    </OSSetting>
  </LServer>
</Resources>
```

- Creating an L-Server that deploys a cloning image using an L-Server template (pre-configured OS property definition file) (When server type is "Virtual")

```
<?xml version="1.0" encoding="utf-8"?>
<Resources>
  <LServer name="second_server">
    <TemplateLink name="small"/>
    <ServerType>Virtual</ServerType>
    <ServerImageLink name="master_image"/>
    <NICs>
      <NIC>
        <NICIndex>0</NICIndex>
        <NetworkLink name="net01"/>
      </NIC>
    </NICs>
    <OSSetting>
      <ComputerName>host2</ComputerName>
    </OSSetting>
  </LServer>
</Resources>
```

- Creating an L-Server that deploys a Linux cloning image without using an L-Server template (pre-configured OS property definition file) (When server type is "Physical")

```
<?xml version="1.0" encoding="utf-8"?>
<Resources>
  <LServer name="L-Server">
    <ServerImageLink name="RHEL5"/>
    <ServerType>Physical</ServerType>
    <Model>PRIMERGY BX620 S6</Model>
    <Disks>
      <Disk>
        <DiskIndex>0</DiskIndex>
        <DiskSize>40.0</DiskSize>
      </Disk>
      <Disk>
        <DiskIndex>1</DiskIndex>
        <DiskSize>30.0</DiskSize>
      </Disk>
    </Disks>
    <NICs>
      <NIC>
        <NICIndex>2</NICIndex>
        <NetworkLink name="net01"/>
```

```
        <MacAddress auto="true" from="MacAddressset" pool="AddressPool"/>
      </NIC>
    </NICs>
    <HBAs>
      <HBA>
        <HBAIndex>0</HBAIndex>
        <WWN auto="true" from="WnnAddressset" pool="AddressPool"/>
      </HBA>
    </HBAs>
    <Policy>
      <Redundancy>None</Redundancy>
      <Positioning>Fixed</Positioning>
    </Policy>
    <OSSetting>
      <ComputerName>host1</ComputerName>
      <DomainName>xx.zz.yy</DomainName>
      <DNSSearchPaths>
        <DNSSearchPath>10.20.30.40</DNSSearchPath>
      </DNSSearchPaths>
    </OSSetting>
  </LServer>
</Resources>
```

- Creating an L-Server that deploys a Linux cloning image without using an L-Server template (pre-configured OS property definition file) (When server type is "Virtual")

```
<?xml version="1.0" encoding="utf-8"?>
<Resources>
  <LServer name="L-Server">
    <ServerImageLink name="RHEL5"/>
    <ServerType>Virtual</ServerType>
    <CPU>
      <CPUPerf>1.0</CPUPerf>
      <NumOfCPU>1</NumOfCPU>
    </CPU>
    <Memory>
      <MemorySize>2</MemorySize>
    </Memory>
    <Disks>
      <Disk>
        <DiskIndex>0</DiskIndex>
        <DiskSize>20.0</DiskSize>
      </Disk>
      <Disk>
        <DiskIndex>1</DiskIndex>
        <DiskSize>30.0</DiskSize>
      </Disk>
    </Disks>
    <NICs>
      <NIC>
        <NICIndex>0</NICIndex>
        <NetworkLink name="net01"/>
      </NIC>
    </NICs>
    <Policy>
      <Redundancy>None</Redundancy>
      <Positioning>Fixed</Positioning>
    </Policy>
    <OSSetting>
      <ComputerName>host1</ComputerName>
      <DomainName>xx.zz.yy</DomainName>
      <DNSSearchPaths>
        <DNSSearchPath>10.20.30.40</DNSSearchPath>
```

```
      </DNSSearchPaths>
    </OSSetting>
  </LServer>
</Resources>
```

H.4 Network Resources

The XML definition for network resources is shown below.

```
<?xml version="1.0" encoding="utf-8"?>
<Pool name="Name of the resource pool to store the network resource">
<Network name="Network resource name" label="label">
  <Comment>Comment</Comment>
  <Vlanid>VLAN ID</Vlanid>
  <ExternalPorts>
        <NetworkSwitchPort number="LAN switch blade port name" switch="LAN switch blade name"/>
        <NetworkSwitchPort number="LAN switch blade port name" switch="LAN switch blade name"/>
  </ExternalPorts>
  <AddressSet name="Address set name" subnet="subnet address" mask="subnet mask">
    <Exclude>
      <AddressRange start="Start IP address #1" end="End IP address #1" />
      <AddressRange start="Start IP address #2" end="End IP address #2" />
    </Exclude>
  <DefaultGateway address="XXX.XXX.XXX.XXX"/>
  </AddressSet>
</Network>
</Pool>
```

The XXX.XXX.XXX.XXX format (dot-decimal notation) is used for the IP address, subnet address, and subnet mask.
The AddressSet tag is optional. If it is omitted, a network resource that cannot be assigned an address is created.

Element Name	Description	Remarks (Possible Values, Examples)
Resource pool name	Name of the resource pool to store the network resource	Character string beginning with an alphanumeric character and containing up to 32 alphanumeric characters, underscores ("_"), and hyphens ("-")
Network Resource Name	Name of the network resource	Character string beginning with an alphanumeric character and containing up to 32 alphanumeric characters, underscores ("_"), and hyphens ("-")
Label	Label for the network resource (optional)	Character string of up to 32 alphanumeric characters or symbols
Comment	Comment for the network resource (optional)	Character string of up to 256 alphanumeric characters or symbols
VLAN ID	VLAN ID	An integer between 1 and 4094
LAN switch blade external port number	External port number of a LAN switch blade required to create a network resource for external communications	A positive integer
LAN switch blade name	Name of a LAN switch blade with an external port	-
Address set name	Name of the address set	Character string beginning with an alphanumeric character and containing up to 32 alphanumeric characters, underscores ("_"), periods ("."), and hyphens ("-")

Element Name	Description	Remarks (Possible Values, Examples)
Subnet address	Subnet	Subnet value
Subnet mask	Subnet mask	Subnet mask value The maximum value for a subnet mask is 255.255.255.255 (32bit mask) and the minimum value is 255.255.0.0 (16bit mask). However, 255.255.255.254 cannot be specified.
IP address exclusion range (start, end)	Specify the IP address range (start and end) to exclude from the administration of Resource Orchestrator. Start and end IP addresses are included in the exclusion range. Multiple ranges can be specified.	Specification of start and end IP addresses As the network address and broadcast address are automatically excluded, do not specify them in the IP address range (start and end) to exclude.
Default gateway	Default gateway	IP address

Example

```
<?xml version="1.0" encoding="utf-8"?>
<Pool name="NetworkPool">
<Network name="man_net" label="man_net_label">
    <Comment>comment</Comment>
  <Vlanid>4000</Vlanid>
  <ExternalPorts>
    <NetworkSwitchPort number="11" switch="bx620-lan1"/>
    <NetworkSwitchPort number="12" switch="bx620-lan2"/>
  </ExternalPorts>
  <AddressSet name="192.168.99.0" subnet="192.168.99.0" mask="255.255.255.0">
    <Exclude>
      <AddressRange start="192.168.99.10" end="192.168.99.20" />
      <AddressRange start="192.168.99.30" end="192.168.99.40" />
    </Exclude>
    <DefaultGateway address="192.168.99.254"/>
  </AddressSet>
</Network>
</Pool>
```

H.5 Resource Folders

The XML definition for resource folders is shown below.

```
<?xml version="1.0" encoding="utf-8"?>
<Folder name="Resource folder name" label="Label">
  <Comment>Comment</Comment>
  <LServers>
    <LServer name="L-Server name" label="Label">
      LServer information
    </LServer>
    <LServer name="L-Server name" label="Label">
      LServer information
    </LServer>
    ...
  </LServers>
</Folder>
```

Element Name	Description	Remarks (Possible Values, Examples)
Resource folder name	Name of the resource folder	Character string beginning with an alphanumeric character and containing up to 32 alphanumeric characters, underscores ("_"), and hyphens ("-")
Label	Label for the resource folder (optional)	Character string of up to 32 alphanumeric characters or symbols
Comment	Comment for the resource folder (optional)	Character string of up to 256 alphanumeric characters or symbols

For details on the elements of LServer tags, refer to "H.3 L-Servers".

Example

```
<?xml version="1.0" encoding="utf-8"?>
<Folder name="folder001" label="Folder for work 1">
  <Comment>Created on 2010/XX/XX for work 1</Comment>
  <LServers>
    <LServer name="L-Server1" label="Label">
      LServer1 Information
    </LServer>
    <LServer name="L-Server2" label="Label">
      LServer2 Information
    </LServer>
  </LServers>
</Folder>
```

H.6 Users

The XML definition for users is shown below.

```
<?xml version="1.0" encoding="utf-8"?>
<User name="User name" label = "Label" >
    <Password >Password</Password>
    <Comment >"Comment 1"</Comment>
    <UserGroup>User group name</UserGroup>
     <Roles>
      <Role name="Role name 1">
        <Scopes>
          <Scope>Access scope 1</Scope>
          <Scope>Access scope 2</Scope>
          <Scope>Access scope 3</Scope>
        </Scopes>
      </Role>
      <Role name="Role name 2">
        <Scopes>
          <Scope>Access scope 1</Scope>
          <Scope>Access scope 2</Scope>
          <Scope>Access scope 3</Scope>
        </Scopes>
      </Role>
    <Roles>
  </User>
```

Element Name	Description	Remarks (Possible Values, Examples)
User name	Name of the user	Character string of up to 32 alphanumeric characters, underscores ("_"), hyphens ("-"), and periods (".")
Label	Label for the user (optional)	Character string of up to 32 alphanumeric characters or symbols
Password	Password for the user	Character string of up to 16 alphanumeric characters or symbols
Comment	Comment for the user (optional)	Character string of up to 256 alphanumeric characters or symbols
User group name	Name of the user group the user belongs to (optional)	Specify the name of a user group. If omitted, the user group that the current user belongs to will be assigned.
Role Names	Role name (optional)	Specify the role name to assign to the access scope.
Access scope	Set the access scope for the specified role.	Specify the scope of access to allow for the user. To restrict the access scope, specify resource folder names or resource names. If you do not want to restrict the access scope, specify "all".

Example

```
<?xml version="1.0" encoding="utf-8"?>
<User name="test_user01" label="test_user01">
  <Password>test_user01</Password>
  <Comment>test_user</Comment>
  <UserGroup>admin</UserGroup>
</User>
```

H.7 User Groups

The XML definition for user groups is shown below.

```
<?xml version="1.0" encoding="utf-8"?>
<UserGroup name ="User Group name 1" label = "label 1">
  <Comment >"Comment 1"</Comment>
   <Roles>
    <Role name="Role name 1">
      <Scopes>
        <Scope>Access scope 1</Scope>
        <Scope>Access scope 2</Scope>
        <Scope>Access scope 3</Scope>
      </Scopes>
    </Role>
    <Role name="Role name 2">
      <Scopes>
        <Scope>Access scope 1</Scope>
        <Scope>Access scope 2</Scope>
        <Scope>Access scope 3</Scope>
      </Scopes>
    </Role>
  <Roles>
</UserGroup>
```

Element Name	Description	Remarks (Possible Values, Examples)
User group name	Name of the user group	Character string (Unicode) beginning with an alphanumeric character and containing up to 32 alphanumeric characters, underscores ("_"), and hyphens ("-")
Label	Label for the user group (optional)	Character string of up to 32 alphanumeric characters or symbols
Comment	Comment for the user group (optional)	Character string of up to 256 alphanumeric characters or symbols
Role Names	Role name (optional)	Specify the role name to assign to the access scope.
Access scope	Specify the access scope for the role.	Specify the scope of access to allow for the user. To restrict the access scope, specify resource folder names or resource names. If you do not want to restrict the access scope, specify "all".

Example

```
<?xml version="1.0" encoding="utf-8"?>
<UserGroup name="admin" label="admin">
  <Comment>admin_group</Comment>
  <Roles>
    <Role name="admin">
      <Scopes>
        <Scope>all</Scope>
      </Scopes>
    </Role>
  </Roles>
</UserGroup>
```

Appendix I Backup and Restoration of Admin Servers

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

I.1 Overview

By backing up the resources of Resource Orchestrator listed below, it is possible to restore the admin server even if files needed to boot the OS are deleted, or files of the manager are deleted from the installation folder making it impossible to boot this software, or other mistakes made by system administrators result in damage to the system.
It is recommended that you create a backup once a system using Resource Orchestrator has been configured, and after the registration, modification, or deletion of resources.

The resource files managed by Resource Orchestrator are:

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

Back up Resource Orchestrator resources on the admin server using the following procedure:

1. Install the configuration definition information backup and restore tool
2. Back up certificates and session encryption keys
3. Back up system images and cloning images (*1)
4. Back up configuration definition information
5. Back up the OS property definition file
6. Check image management information (*1)

   *1: Necessary when using the RCVE backup and restore, or cloning functions for physical servers.

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

1. Reinstall the manager and the backup and restore tools of the configuration definition information, and restore the certificates and session encryption keys
2. Restore system images and cloning images (*1)
3. Restore configuration definition information
4. Restore the OS property definition file
5. Configure image management information (*1)

   *1: Necessary when using the RCVE backup and restore, or cloning functions for physical servers.

Note

Target Resources for the Backup and Restore Tool

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

System images, cloning images (files in the image file storage folder), VM management software, and VM guests consisting of VM hosts and L-Servers or virtual disks are not the target of backup and restore tools. Perform backup and restore another way.

Functional Range of the Backup and Restore Tool

The backup and restore tool does not support online backup, which is the backup of managers without stopping them.

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

Execution Timing for the Backup and Restore Tool

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

- Do not perform back up or restoration of the admin server while server switchover or failback is taking place, or while a system image is being backed up or restored.
- After backup, only when the following hardware configuration and configuration changes have not been performed, is it possible to perform restoration. When performing hardware configuration or configuration changes, perform backup again.
  - Replacement of a chassis, LAN switch, managed server, or power monitoring device hardware
  - Replacement of the NIC of a managed server
  - LAN connections between managed servers and LAN switches
  - Server switchover or takeover (*1)
  - Creation and deletion of L-Servers with the server type "Physical"
  - Attachment and detachment of L-Server disks with the server type "Physical"

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

Information

Recovery can also be performed by first backing up the entire admin server disk, and then restoring it.
In clustered manager configurations, the disk shared between cluster nodes should also be backed up and restored.

After backing up the entire disk of the admin server, when Resource Orchestrator resources have been backed up, and restoration of the entire disk of the admin server is complete, perform the steps 2.-5. in "I.4 Restoring an Admin Server" and restore system images, cloning images, and configuration definition information.

I.2 Preparations

This section explains how to prepare for backup and restore operations of the admin server.

Obtain the backup and restore tools for configuration definition information in advance to back up and restore the configuration definition information, and install them on the manager.
For details on installation, refer to the documents provided with the tools.
The location to install the tools is as follows:

[Windows]
Installation_folder\Manager\sys

[Linux]
/opt/FJSVrcvmr/sys

I.3 Backing Up the Admin Server

This section explains how to back up the admin server.

Note

- During configuration of server switchover, backup cannot be performed for servers that have been switched to spare servers. Perform backup after restoring the servers.
  For details on backup, refer to the notes on operation after server switchover given in the "ServerView Resource Coordinator VE Operation Guide".
- From the second and successive backups, there are no problems even if backed up folders and configuration definition information from the last time are deleted. Delete earlier backups when disk space constraints make it necessary to do so.
- Do not perform operations such as server switchover, failback, backup of system images, restoration, or collection or deployment of cloning images during backup.

- When operating managers in cluster environments, change the names of folders to copy to those of the folders on the shared disk.
  For details on the folder name of the shared disk, refer to the manager cluster operation settings section of the "ServerView Resource Coordinator VE Installation Guide".

1. Back up certificates and session encryption keys

   Copy the folder containing the certificates to another folder.
   Regarding the folder where the certificates are stored, refer to "Uninstallation [Windows]" in the "ServerView Resource Coordinator VE Installation Guide".

   Backup of the session encryption key is only required if passwords were saved using the -save option of the rcxlogin command. This step is not required if no password has been saved, or if passwords are to be saved again after re-installation.

   For details on the rcxlogin command, refer to the "ServerView Resource Coordinator VE Command Reference".

   When backing up the session encryption keys, copy the following folder to another folder.

   [Windows]
   Installation_folder\Manager\Rails\config\rcx_secret.key

   [Linux]
   /etc/opt/FJSVrcvmr/rails/config/rcx_secret.key

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

2. Back up system images and cloning images

   Copy the folder used to store system images and cloning images to another folder.

   For details on folders, refer to the backup of system images and cloning images sections of backup and restore of admin server in the "ServerView Resource Coordinator VE Operation Guide".

   Note

   Use this procedure when using backup and restore, and cloning of RCVE physical servers.

   - Back up system images

     For details on how to back up system images, refer to the backup information in the "ServerView Resource Coordinator VE Operation Guide".

   - Collect cloning images

     For details on how to collect cloning images, refer to the cloning information in the "ServerView Resource Coordinator VE Setup Guide".

3. Back up virtual machines of VM management software

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

4. Back up configuration definition information

   a. Stop the manager

      Stop the Resource Orchestrator manager. For details on how to stop the manager, refer to the information about stopping the manager in the "ServerView Resource Coordinator VE Setup Guide".

   b. Back up configuration definition information

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

      Specify the directory or folder using -dir. When there is currently no directory or folder, create a new directory or folder and write configuration definition information and the version XML to that directory or folder.

      When the directory or folder specified using -dir already exists, and -overwrite is specified, the configuration definition information and the version XML will be overwritten. When -overwrite is not specified, an error will occur.

```
>rcxbackup -dir dirname [-overwrite] <RETURN>
```

Note

Specify the command using an absolute path.

When specifying folders or directories, take note of the following points.

- Do not specify the system installation folder or the installation directory for the -dir option.
- Do not use double-byte characters or the following symbols to specify folders or directories for the -dir option.

  """, "|", ":", "*", "?", "/", ".", "<", ">", ",", "%", "&", "^", "=", "!", ";", "#", "'", "+", "[", "]", "{", "}"

When transferring backed up data (the directory specified using -dir) with FTP, compress the backed up data into one zip file and then transfer it.

During restoration, the certificates, configuration definition information, OS property definition files, system images and cloning images must have been backed up at the same point in time. It is recommended to store the backed up information in folders with names including the date and time of backup.

- Operation requirements

  Backup of configuration definition information cannot be performed during operation of resources such as L-Servers, resource pools, or resource folders. Perform the operation after stopping managers.

The following settings and information are not recovered after an admin server is restored. Follow the instructions below to manually recover them.

- Maintenance mode

  Maintenance mode is released after restoration is performed. If performing backup while maintenance mode is set, record the maintenance mode state for each managed server at the time of backup.

- Power consumption data for power monitoring devices

  Power consumption data for power monitoring devices cannot be restored. Exporting of power consumption data is recommended before reinstalling the manager. For details on operations, refer to the notes on power consumption data given in the "ServerView Resource Coordinator VE Operation Guide".

- VIOM coordination user names and passwords

  VIOM coordination user names and passwords cannot be restored. Register VIOM coordination before performing restoration.
  For details on operations, refer to the information about VIOM coordination registration in the "ServerView Resource Coordinator VE Setup Guide".

5. Back up information related to SystemcastWizard

   [Windows]
   Back up the following in an arbitrary folder.

   Copy files and databases, and use a registry editor to export all the following keys from the registry.

No	Overview	Targets of backup and restoration
1	Registry (*1)	HKEY_LOCAL_MACHINE\SOFTWARE\Fujitsu\SystemcastWizard(32bitOS) HKEY_LOCAL_MACHINE\SOFTWARE\Wow6432Node\Fujitsu \SystemcastWizard(64bitOS)
2	Databases	*Installation_folder*\ScwPro\scwdb\scwdb1.mdb *Installation_folder*\ScwPro\scwdb\scwdb1.mdw
3	DHCP configuration information file	*Installation_folder*\ScwPro\bin\ipTable.dat

No	Overview	Targets of backup and restoration
4	IP address configuration file	*Installation_folder*\ScwPro\bin\localipaddress.txt
5	AWWN definition file (*2)	*Installation_folder*\ScwPro\tftp\rcbootimg\awwn_*XXX.XXX.XXX.XXX*.cfg(*3) *Installation_folder*\ScwPro\tftp\rcbootimg_awwn_*XXX.XXX.XXX.XXX*.cfg(*3)

*1: On 64-bit OS's, redirection will be performed to Wow6432Node.
*2: No action is necessary in VIOM environments.
*3: In *XXX.XXX.XXX.XXX*, an IP address is displayed.

[Linux]
Back up the following in an arbitrary folder.

No	Overview	Targets of backup and restoration
1	Configuration file	/etc/opt/FJSVscw-common/scwconf.reg
2	Databases	/var/opt/FJSVscw-deploysv/scwdb/scwdb1.db /var/opt/FJSVscw-deploysv/scwdb/scwdb2.db
3	DHCP configuration information file	/var/opt/FJSVscw-pxesv/ipTable.dat
4	bootcfg configuration file (*1)	/etc/opt/FJSVscw-pxesv/ClientBoot/*
5	AWWN definition file (*2)	/var/opt/FJSVscw-tftpsv/tftproot/rcbootimg/awwn_*XXX.XXX.XXX.XXX*.cfg(*3) /var/opt/FJSVscw-tftpsv/tftproot/rcbootimg/_awwn_*XXX.XXX.XXX.XXX*.cfg(*3)

*1: All files under the directory are the target.
*2: No action is necessary in VIOM environments.
*3: In *XXX.XXX.XXX.XXX*, an IP address is displayed.

6. Back up the OS property definition file

   Back up the OS property definition file.

   For details on OS property definition file, refer to "D.5 [OS] Tab".

7. Back up of definition files for combining FC-CA ports of ETERNUS storage

   Back up the definition files for combining FC-CA ports of ETERNUS storage.

   For details on the definition file, refer to "4.2.4 Storage Resources".

   Note

   Combination definition files are only necessary when using ETERNUS for L-Server storage on physical servers.

8. Confirm image settings

   Confirm the following image settings:

   - Number of system image versions
   - Number of cloning image versions
   - Image file storage folder

Note

Use this procedure when using backup and restore, and cloning of RCVE physical servers.
For details, refer to the notes of the rcxadm imagemgr command in the "ServerView Resource Coordinator VE Command Reference".

When uninstalling the manager, it is not necessary to delete managed servers from the server tree.

I.4 Restoring an Admin Server

This section explains how to restore an admin server.

Note

When operating managers in cluster environments, change the name of the folder to restore to the folder name used on the shared disk.
For details on the folder name of the shared disk, refer to the manager cluster operation settings section of the "ServerView Resource Coordinator VE Installation Guide".

1. Reinstall the manager and the backup and restore tools of the configuration definition information, and restore the certificates and session encryption keys

   When the manager does not operate correctly due to damaged files, uninstall the manager and then reinstall it. After reinstalling backup and restore tools for configuration definition information, restore the certificates and session encryption keys.
   When re-installing the manager, use the path for the image files storage folder confirmed during backup.

   For details on how to restore the manager, refer to the information about manager installation and uninstallation in the "ServerView Resource Coordinator VE Installation Guide".

   Restoration of session encryption keys is only required if passwords were saved using the -save option of the rcxlogin command. This step is not required if no password has been saved, or if passwords are to be saved again after re-installation.

   For details on the rcxlogin command, refer to the "ServerView Resource Coordinator VE Command Reference".

   To restore session encryption keys, restore the following file from the backup folder to the given destination.

   [Windows]
   Installation_folder\Manager\Rails\config\rcx_secret.key

   [Linux]
   /opt/FJSVrcvmr/rails/config/rcx_secret.key

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

   Note

   When reinstalling the manager, as the backup and restore tools for configuration definition information are also uninstalled when the manager is uninstalled, reinstall the backup and restore tools for configuration definition information.

2. Stop the manager

   Stop the manager.

   For details on how to stop the manager, refer to the manager information in the "ServerView Resource Coordinator VE Setup Guide".

3. Restore system images and cloning images

   Restore system images and cloning images.

Note

Use this procedure when using backup and restore, and cloning of RCVE physical servers.

For details on how to restore system images and cloning images, refer to the information about restoration of system images and cloning images in the "ServerView Resource Coordinator VE Operation Guide".

4. Restore virtual machines of VM management software

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

5. Restore information related to SystemcastWizard

   [Windows]
   Restore the information that was backed up to arbitrary folders.

   Import backed up data by copying files and databases, and using a registry editor to import the keys that were backed up from the registry.

No	Overview	Targets of backup and restoration
1	Registry (*1)	HKEY_LOCAL_MACHINE\SOFTWARE\Fujitsu\SystemcastWizard(32bitOS) HKEY_LOCAL_MACHINE\SOFTWARE\Wow6432Node\Fujitsu \SystemcastWizard(64bitOS)
2	Databases	*Installation_folder*\ScwPro\scwdb\scwdb1.mdb *Installation_folder*\ScwPro\scwdb\scwdb1.mdw
3	DHCP configuration information file	*Installation_folder*\ScwPro\bin\ipTable.dat
4	IP address configuration file	*Installation_folder*\ScwPro\bin\localipaddress.txt
5	AWWN definition file (*2)	*Installation_folder*\ScwPro\tftp\rcbootimg\awwn_*XXX.XXX.XXX.XXX*.cfg(*3) *Installation_folder*\ScwPro\tftp\rcbootimg_awwn_*XXX.XXX.XXX.XXX*.cfg(*3)

*1: On 64-bit OS's, redirection will be performed to Wow6432Node.
*2: No action is necessary in VIOM environments.
*3: In *XXX.XXX.XXX.XXX*, an IP address is displayed.

[Linux]
Restore the information that was backed up to arbitrary folders to the following locations.

No	Overview	Targets of backup and restoration
1	Configuration file	/etc/opt/FJSVscw-common/scwconf.reg
2	Databases	/var/opt/FJSVscw-deploysv/scwdb/scwdb1.db /var/opt/FJSVscw-deploysv/scwdb/scwdb2.db
3	DHCP configuration information file	/var/opt/FJSVscw
4	Bootcfg configuration file (*1)	/etc/opt/FJSVscw
5	AWWN definition file (*2)	/var/opt/FJSVscw-tftpsv/tftproot/rcbootimg/awwn_*XXX.XXX.XXX.XXX*.cfg(*3) /var/opt/FJSVscw-tftpsv/tftproot/rcbootimg/_awwn_*XXX.XXX.XXX.XXX*.cfg(*3)

*1: All files under the directory are the target.
*2: No action is necessary in VIOM environments.
*3: In *XXX.XXX.XXX.XXX*, an IP address is displayed.

6. Restore configuration definition information

   a. Restore configuration definition information

      Restore the written configuration definition information in "4 Back up configuration definition information" of the "I.3 Backing Up the Admin Server".

      Execute the following command:

      >**rcxrestore -dir** *dirname* <RETURN>

      Note

      Specify the command using an absolute path.

   b. Start the manager

      Start the manager.
      For details, refer to the information about starting the manager in the "ServerView Resource Coordinator VE Setup Guide".

7. Restore the OS property definition file

   Restore the OS property definition file.

   For details on OS property definition file, refer to "D.5 [OS] Tab".

8. Restoration of definition files for combining FC-CA ports of ETERNUS storage

   Restore definition files for combining FC-CA ports of ETERNUS storage.

   For details on the definition file, refer to "4.2.4 Storage Resources".

   Note

   Combination definition files are only necessary when using ETERNUS for L-Server storage on physical servers.

9. Restore image management information

   Restore the following image management information if it was modified at the time of backup.

   - Number of system image versions
   - Number of cloning image versions

   Note

   Use this procedure when using backup and restore, and cloning of RCVE physical servers.

   For details on how to change the number of system image versions, refer to the information about the maximum number of system image versions in the "ServerView Resource Coordinator VE Setup Guide".

   For details on how to change the number of cloning image versions, refer to the information about the maximum number of cloning image versions in the "ServerView Resource Coordinator VE Setup Guide".

Note

- When operating managers in cluster environments, change the name of the folder to restore to the folder name used on the shared disk.
  For details on the folder name of the shared disk, refer to the manager cluster operation settings section of the "ServerView Resource Coordinator VE Installation Guide".
- When configuring a VM host as a spare server, leave the "operation" of the "SpareServer" section of the physical server to use as a hyphen ("-"). After completing restoration, configure the spare server for the target physical server from the RC console.

- Do not perform restoration during server switchover, failback, backup or restoration of a system image, or while a cloning image is being collected or deployed.
- When performing restoration of certificates, configuration definition information, and system images and cloning images, restore backups taken at the same point in time.
- Restoration can only be executed if none of the settings or hardware configuration changes described below have been made since the admin server was backed up:
  - Replacement of a chassis, LAN switch blade, managed server, or power monitoring device
  - Replacement of the NIC of a managed server
  - LAN connections between managed servers and LAN switch blades
  - Server switchover or takeover (*1)

    *1: If failback has been performed after server switchover, restore can be performed.
- Managed servers using HBA address rename must be restarted after being restored.
- Maintenance mode settings cannot be recovered after restoration. Set the maintenance mode in accordance with the information recorded at the time of backup.
- When an agent is registered on a managed server and when backup of system images and collection of cloning images is being used, perform either of the following after restoring the admin server.
  - Restart the managed server
  - Restart the Deployment service described in the agent information in the "ServerView Resource Coordinator VE Setup Guide"
- Connection information of LAN switches and network maps cannot be backed up. Refer to the preparation information for network maps in the "ServerView Resource Coordinator VE Operation Guide", register LAN switches and obtain the network information.
- VIOM coordination user names and passwords cannot be backed up. Register VIOM coordination before performing restoration.

  For details on operations, refer to the information about VIOM coordination registration in the "ServerView Resource Coordinator VE Setup Guide".

Glossary

aggregate

A unit for managing storage created through the aggregation of a RAID group.
Aggregates can contain multiple FlexVols.

data center

A facility that manages client resources (servers, storage, networks, etc.), and provides internet connections and maintenance/operational services.

disk resource

The unit for resources to connect to an L-Server. An example being a virtual disk provided by LUN or VM management software.

Fibre Channel

A method for connecting computers and peripheral devices and transferring data.
Generally used with servers requiring high-availability, to connect computers and storage systems.

Fibre Channel port

The connector for Fibre Channel interfaces.
When using ETERNUS storage, referred to as an FC-CA port, and when using NetApp storage, referred to as an FC port.

FlexVol

A function that uses aggregates to provide virtual volumes.
Volumes can be removed in an instant.

ICT governance

A collection of principles and practices that encourage desirable behavior in the use of ICT (Information and Communication Technology) based on an evaluation of the impacts and risks posed in the adoption and application of ICT within an organization or community.

link aggregation

Function used to multiplex multiple ports and use them as a single virtual port.
By using this function it becomes possible to use a band equal to the total of the bands of all the ports.
Also, if one of the multiplexed ports fails its load can be divided among the other ports, and the overall redundancy of ports improved.

L-Server

A logical platform composed of resource pools containing physical and virtual resources.

L-Server template

A template that defines the number of CPUs, memory capacity, disk capacity, and other specifications for resources to deploy to an L-Server.

LUN (Logical Unit Number)

A logical unit defined in the channel adapter of a storage unit.

MAC address (Media Access Control address)

A unique identifier that is assigned to Ethernet cards (hardware).
Also referred to as a physical address.
Transmission of data is performed based on this identifier. Described using a combination of the unique identifying numbers managed by/assigned to each maker by the IEEE, and the numbers that each maker assigns to their hardware.

member server

Collective term that refers to a server in a Windows network domain that is not a domain controller.

migration

The migration of a VM guest to a different VM host. The following two types of migration are available:

- Cold migration

  Migration of an inactive (powered-off) VM guest.

- Live migration

  Migration of an active (powered-on) VM guest.

physical network adapter

Hardware that provides network functions.

private cloud

A private form of cloud computing that provides ICT services exclusively within a corporation or organization.

RAID (Redundant Arrays of Inexpensive Disks)

Technology that realizes high-speed and highly-reliable storage systems using multiple hard disks.

RCVE (ServerView Resource Coordinator VE)

Automation/visualization software that enables simple server life cycle management by reducing setup, operational and maintenance efforts.

resource

Collective term or concept that refers to the ICT resources (servers, storage, and networks), both physical (hardware) and logical (software), from which a system is composed.

resource folder

An arbitrary group of resources.

resource pool

A collection of servers, storage, networks, and other resources.

role

A collection of operations that can be performed.

storage management software

Software for managing storage units.

storage resource

Collective term that refers to virtual storage resources and disk resources.

virtual storage resource

This refers to a resource that can dynamically remove a disk resource. An example being a file system for creating RAID groups or VM (VMFS of VMware, etc.).

virtual switch

A function provided by server virtualization software in order to manage L-Server (VM) networks as virtual LAN switches. Management of relationships between virtual L-Server NICs, and physical server NICs operating on VM hosts, can be performed using an operation similar to the connection of a normal LAN switch.

VMware Teaming

A function of VMware. By using VMware Teaming it is possible to perform redundancy by connecting a single virtual switch to multiple physical network adapters.

WWNN (World Wide Node Name)

A name that is set as a common value for the Fibre Channel ports of a node. However, the definitions of nodes vary between manufacturers, and may also indicate devices or adapters. Also referred to as a node WWN.

WWPN (World Wide Port Name)

A name that is a unique value and is set for each Fibre Channel port (HBA, CA, fibre channel switch ports, etc.), and is the IEEE global MAC address. As the Fibre Channel ports of the same WWPN are unique, they are used as identifiers during Fibre Channel port login. Also referred to as a port WWN.