FUJITSU

FUJITSU Software
ServerView Resource Orchestrator V3.1.2

Overview

Windows/Linux

Preface

Purpose of This Document

This manual provides an overview of FUJITSU Software ServerView Resource Orchestrator (hereinafter Resource Orchestrator).

Intended Readers

This manual is for people who want an overview of Resource Orchestrator.

Structure of This Document

This manual is composed as follows:

Chapter 1 Overview

Provides an overview of Resource Orchestrator.

Chapter 2 System Configuration

Explains system configurations of Resource Orchestrator.

Chapter 3 Image of Operation

Explains the image of operation of environments using FUJITSU Software ServerView Resource Orchestrator.

Chapter 4 User Roles in Resource Orchestrator [Cloud Edition]

Explains user roles in Resource Orchestrator.

Chapter 5 Functions

Provides an overview of the functions available in Resource Orchestrator.

Web Site URLs

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

Please understand that they are subject to change without notice.

Document Conventions

The notation in this manual conforms to the following conventions.

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

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

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

[Windows Manager]	Sections related to Windows manager
[Linux Manager]	Sections related to Linux manager
[Windows]	Sections related to Windows
[Linux]	Sections related to Linux
[Solaris]	Sections related to Solaris

[VMware]	Sections related to VMware
[Horizon View]	Sections related to VMware Horizon View
[Hyper-V]	Sections related to Hyper-V
[Xen]	Sections related to RHEL5-Xen
[KVM]	Sections related to RHEL-KVM
[Solaris Zones]	Sections related to Solaris zones
[OVM for x86 2.2]	Sections related to Oracle VM Server for x86 2.2
[OVM for x86 3.2]	Sections related to Oracle VM Server for x86 3.2
[OVM for SPARC]	Sections related to Oracle VM Server for SPARC
[Citrix Xen]	Sections related to Citrix XenServer
[Physical Servers]	Sections related to physical servers

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

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

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

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

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

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

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

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

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

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

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

- Window names, dialog names, menu names, and tab names are shown enclosed by brackets ([ ]).

- Button names are shown enclosed by angle brackets (< >) or square brackets ([ ]).

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

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

- Variables are indicated using italic text and underscores.

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

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

- If using Windows 8 or Windows Server 2012, please note the following:
  Operations descriptions in this manual use examples assuming operating systems up to Windows 7 and Windows Server 2008 - if using this product with Windows 8 or Windows Server 2012, read instructions regarding the [Start] menu as if they were instructions for the [Apps] page.
  Display the [Apps] page by right-clicking in the [Start] screen, and then clicking on [All apps].

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

Menus in the ROR console

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

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

Regarding Installation Folder Paths

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

Replace it as shown below.

- When using Windows 64-bit (x64)

  C:\Program Files (x86)\Resource Orchestrator

- When using Windows 32-bit (x86)

  C:\Program Files\Resource Orchestrator

Command Examples

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

Abbreviations

The following abbreviations are used in this manual:

Abbreviation	Products
Windows	Microsoft(R) Windows Server(R) 2003 R2, Standard Edition Microsoft(R) Windows Server(R) 2003 R2, Enterprise Edition Microsoft(R) Windows Server(R) 2003 R2, Standard x64 Edition Microsoft(R) Windows Server(R) 2003 R2, Enterprise x64 Edition Microsoft(R) Windows Server(R) 2008 Standard Microsoft(R) Windows Server(R) 2008 Enterprise Microsoft(R) Windows Server(R) 2008 R2 Standard Microsoft(R) Windows Server(R) 2008 R2 Enterprise Microsoft(R) Windows Server(R) 2008 R2 Datacenter Microsoft(R) Windows Server(R) 2012 Standard Microsoft(R) Windows Server(R) 2012 Datacenter Microsoft(R) Windows Server(R) 2012 R2 Standard Microsoft(R) Windows Server(R) 2012 R2 Datacenter Microsoft(R) Windows(R) XP Professional operating system Windows Vista(R) Business Windows Vista(R) Enterprise Windows Vista(R) Ultimate Windows(R) 7 Professional Windows(R) 7 Ultimate Windows(R) 8 Pro Windows(R) 8 Enterprise Windows(R) 8.1 Pro Windows(R) 8.1 Enterprise
Windows Server 2003	Microsoft(R) Windows Server(R) 2003 R2, Standard Edition Microsoft(R) Windows Server(R) 2003 R2, Enterprise Edition Microsoft(R) Windows Server(R) 2003 R2, Standard x64 Edition Microsoft(R) Windows Server(R) 2003 R2, Enterprise x64 Edition

Abbreviation	Products
Windows 2003 x64 Edition	Microsoft(R) Windows Server(R) 2003 R2, Standard x64 Edition Microsoft(R) Windows Server(R) 2003 R2, Enterprise x64 Edition
Windows Server 2008	Microsoft(R) Windows Server(R) 2008 Standard Microsoft(R) Windows Server(R) 2008 Enterprise Microsoft(R) Windows Server(R) 2008 R2 Standard Microsoft(R) Windows Server(R) 2008 R2 Enterprise Microsoft(R) Windows Server(R) 2008 R2 Datacenter
Windows 2008 x86 Edition	Microsoft(R) Windows Server(R) 2008 Standard (x86) Microsoft(R) Windows Server(R) 2008 Enterprise (x86)
Windows 2008 x64 Edition	Microsoft(R) Windows Server(R) 2008 Standard (x64) Microsoft(R) Windows Server(R) 2008 Enterprise (x64)
Windows Server 2012	Microsoft(R) Windows Server(R) 2012 Standard Microsoft(R) Windows Server(R) 2012 Datacenter Microsoft(R) Windows Server(R) 2012 R2 Standard Microsoft(R) Windows Server(R) 2012 R2 Datacenter
Windows PE	Microsoft(R) Windows(R) Preinstallation Environment
Windows XP	Microsoft(R) Windows(R) XP Professional operating system
Windows Vista	Windows Vista(R) Business Windows Vista(R) Enterprise Windows Vista(R) Ultimate
Windows 7	Windows(R) 7 Professional Windows(R) 7 Ultimate
Windows 8	Windows(R) 8 Pro Windows(R) 8 Enterprise Windows(R) 8.1 Pro Windows(R) 8.1 Enterprise
Linux	Red Hat(R) Enterprise Linux(R) 5 (for x86) Red Hat(R) Enterprise Linux(R) 5 (for Intel64) Red Hat(R) Enterprise Linux(R) 5.1 (for x86) Red Hat(R) Enterprise Linux(R) 5.1 (for Intel64) Red Hat(R) Enterprise Linux(R) 5.2 (for x86) Red Hat(R) Enterprise Linux(R) 5.2 (for Intel64) Red Hat(R) Enterprise Linux(R) 5.3 (for x86) Red Hat(R) Enterprise Linux(R) 5.3 (for Intel64) Red Hat(R) Enterprise Linux(R) 5.4 (for x86) Red Hat(R) Enterprise Linux(R) 5.4 (for Intel64) Red Hat(R) Enterprise Linux(R) 5.5 (for x86) Red Hat(R) Enterprise Linux(R) 5.5 (for Intel64) Red Hat(R) Enterprise Linux(R) 5.6 (for x86) Red Hat(R) Enterprise Linux(R) 5.6 (for Intel64) Red Hat(R) Enterprise Linux(R) 5.7 (for x86) Red Hat(R) Enterprise Linux(R) 5.7 (for Intel64) Red Hat(R) Enterprise Linux(R) 5.8 (for x86) Red Hat(R) Enterprise Linux(R) 5.8 (for Intel64) Red Hat(R) Enterprise Linux(R) 5.9 (for x86) Red Hat(R) Enterprise Linux(R) 5.9 (for Intel64) Red Hat(R) Enterprise Linux(R) 5.10 (for x86) Red Hat(R) Enterprise Linux(R) 5.10 (for Intel64) Red Hat(R) Enterprise Linux(R) 5.11 (for x86) Red Hat(R) Enterprise Linux(R) 5.11 (for Intel64) Red Hat(R) Enterprise Linux(R) 6.2 (for x86) Red Hat(R) Enterprise Linux(R) 6.2 (for Intel64)

Abbreviation	Products
	Red Hat(R) Enterprise Linux(R) 6.3 (for x86) Red Hat(R) Enterprise Linux(R) 6.3 (for Intel64) Red Hat(R) Enterprise Linux(R) 6.4 (for x86) Red Hat(R) Enterprise Linux(R) 6.4 (for Intel64) Red Hat(R) Enterprise Linux(R) 6.5 (for x86) Red Hat(R) Enterprise Linux(R) 6.5 (for Intel64) SUSE(R) Linux Enterprise Server 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(R) Enterprise Linux(R) 5.6 (for x86) Red Hat(R) Enterprise Linux(R) 5.6 (for Intel64) Red Hat(R) Enterprise Linux(R) 5.7 (for x86) Red Hat(R) Enterprise Linux(R) 5.7 (for Intel64) Red Hat(R) Enterprise Linux(R) 5.8 (for x86) Red Hat(R) Enterprise Linux(R) 5.8 (for Intel64) Red Hat(R) Enterprise Linux(R) 5.9 (for x86) Red Hat(R) Enterprise Linux(R) 5.9 (for Intel64) Red Hat(R) Enterprise Linux(R) 5.10 (for x86) Red Hat(R) Enterprise Linux(R) 5.10 (for Intel64) Red Hat(R) Enterprise Linux(R) 5.11 (for x86) Red Hat(R) Enterprise Linux(R) 5.11 (for Intel64) Red Hat(R) Enterprise Linux(R) 6.2 (for x86) Red Hat(R) Enterprise Linux(R) 6.2 (for Intel64) Red Hat(R) Enterprise Linux(R) 6.3 (for x86) Red Hat(R) Enterprise Linux(R) 6.3 (for Intel64) Red Hat(R) Enterprise Linux(R) 6.4 (for x86) Red Hat(R) Enterprise Linux(R) 6.4 (for Intel64) Red Hat(R) Enterprise Linux(R) 6.5 (for x86) Red Hat(R) Enterprise Linux(R) 6.5 (for Intel64)
Red Hat Enterprise Linux 5	Red Hat(R) Enterprise Linux(R) 5 (for x86) Red Hat(R) Enterprise Linux(R) 5 (for Intel64) Red Hat(R) Enterprise Linux(R) 5.1 (for x86) Red Hat(R) Enterprise Linux(R) 5.1 (for Intel64) Red Hat(R) Enterprise Linux(R) 5.2 (for x86) Red Hat(R) Enterprise Linux(R) 5.2 (for Intel64) Red Hat(R) Enterprise Linux(R) 5.3 (for x86) Red Hat(R) Enterprise Linux(R) 5.3 (for Intel64) Red Hat(R) Enterprise Linux(R) 5.4 (for x86) Red Hat(R) Enterprise Linux(R) 5.4 (for Intel64) Red Hat(R) Enterprise Linux(R) 5.5 (for x86) Red Hat(R) Enterprise Linux(R) 5.5 (for Intel64) Red Hat(R) Enterprise Linux(R) 5.6 (for x86) Red Hat(R) Enterprise Linux(R) 5.6 (for Intel64) Red Hat(R) Enterprise Linux(R) 5.7 (for x86) Red Hat(R) Enterprise Linux(R) 5.7 (for Intel64)

Abbreviation	Products
	Red Hat(R) Enterprise Linux(R) 5.8 (for x86) Red Hat(R) Enterprise Linux(R) 5.8 (for Intel64) Red Hat(R) Enterprise Linux(R) 5.9 (for x86) Red Hat(R) Enterprise Linux(R) 5.9 (for Intel64) Red Hat(R) Enterprise Linux(R) 5.10 (for x86) Red Hat(R) Enterprise Linux(R) 5.10 (for Intel64) Red Hat(R) Enterprise Linux(R) 5.11 (for x86) Red Hat(R) Enterprise Linux(R) 5.11 (for Intel64)
Red Hat Enterprise Linux 6	Red Hat(R) Enterprise Linux(R) 6.2 (for x86) Red Hat(R) Enterprise Linux(R) 6.2 (for Intel64) Red Hat(R) Enterprise Linux(R) 6.3 (for x86) Red Hat(R) Enterprise Linux(R) 6.3 (for Intel64) Red Hat(R) Enterprise Linux(R) 6.4 (for x86) Red Hat(R) Enterprise Linux(R) 6.4 (for Intel64) Red Hat(R) Enterprise Linux(R) 6.5 (for x86) Red Hat(R) Enterprise Linux(R) 6.5 (for Intel64)
RHEL5-Xen	Red Hat(R) Enterprise Linux(R) 5.4 (for x86) Linux Virtual Machine Function Red Hat(R) Enterprise Linux(R) 5.4 (for Intel64) Linux Virtual Machine Function
RHEL-KVM	Red Hat(R) Enterprise Linux(R) 6.2 (for x86) Virtual Machine Function Red Hat(R) Enterprise Linux(R) 6.2 (for Intel64) Virtual Machine Function Red Hat(R) Enterprise Linux(R) 6.3 (for x86) Virtual Machine Function Red Hat(R) Enterprise Linux(R) 6.3 (for Intel64) Virtual Machine Function Red Hat(R) Enterprise Linux(R) 6.4 (for x86) Virtual Machine Function Red Hat(R) Enterprise Linux(R) 6.4 (for Intel64) Virtual Machine Function Red Hat(R) Enterprise Linux(R) 6.5 (for x86) Virtual Machine Function Red Hat(R) Enterprise Linux(R) 6.5 (for Intel64) Virtual Machine Function
DOS	Microsoft(R) MS-DOS(R) operating system, DR DOS(R)
SUSE Linux Enterprise Server	SUSE(R) Linux Enterprise Server 11 for x86 SUSE(R) Linux Enterprise Server 11 for EM64T
OVM for x86 2.2	Oracle(R) VM Server for x86 2.2
OVM for x86 3.2	Oracle VM Server for x86 v3.2.1 Oracle VM Server for x86 v3.2.2 Oracle VM Server for x86 v3.2.3 Oracle VM Server for x86 v3.2.4 Oracle VM Server for x86 v3.2.6 Oracle VM Server for x86 v3.2.7
OVM for SPARC	Oracle(R) VM Server for SPARC
Oracle VM Manager	Oracle(R) VM Manager
Citrix XenServer	Citrix XenServer(R) 6.0 Citrix XenServer(R) 6.0.2 Citrix XenServer(R) 6.1.0
ESC	ETERNUS SF Storage Cruiser
GLS	PRIMECLUSTER GLS
Navisphere	EMC Navisphere Manager
Solutions Enabler	EMC Solutions Enabler
MSFC	Microsoft Failover Cluster
Solaris	Oracle Solaris10 05/09 (Update7) Media Pack Oracle Solaris11 11/11 Media Pack Oracle Solaris11.1 Media Pack

Abbreviation	Products
SCVMM	System Center Virtual Machine Manager 2008 R2 System Center 2012 Virtual Machine Manager System Center 2012 R2 Virtual Machine Manager
VMware	VMware vSphere(R) 4 VMware vSphere(R) 4.1 VMware vSphere(R) 5 VMware vSphere(R) 5.1 Vmware vSphere(R) 5.5
VMware ESX	VMware(R) ESX(R)
VMware ESX 4	VMware(R) ESX(R) 4
VMware ESXi	VMware(R) ESXi(TM)
VMware ESXi 5.0	VMware(R) ESXi(TM) 5.0
VMware ESXi 5.1	VMware(R) ESXi(TM) 5.1
VMware ESXi 5.5	VMware(R) ESXi(TM) 5.5
VMware Tools	VMware(R) Tools
VMware vSphere 4.0	VMware vSphere(R) 4.0
VMware vSphere 4.1	VMware vSphere(R) 4.1
VMware vSphere 5	VMware vSphere(R) 5
VMware vSphere 5.1	VMware vSphere(R) 5.1
VMware vSphere 5.5	VMware vSphere(R) 5.5
VMware vSphere Client	VMware vSphere(R) Client
VMware vCenter Server	VMware(R) vCenter(TM) Server
VMware vClient	VMware(R) vClient(TM)
VMware FT	VMware(R) Fault Tolerance
VMware DRS	VMware(R) Distributed Resource Scheduler
VMware DPM	VMware(R) Distributed Power Management
VMware vDS	VMware(R) vNetwork Distributed Switch
VMware Storage VMotion	VMware(R) Storage VMotion
VMware Horizon View	VMware Horizon View 5.2.x VMware Horizon View 5.3.x VMware Horizon 6.0 (with View)
VIOM	ServerView Virtual-IO Manager
BladeLogic	BMC BladeLogic Server Automation
Internet Explorer	Windows(R) Internet Explorer(R) 8 Windows(R) Internet Explorer(R) 9 Windows(R) Internet Explorer(R) 10 Windows(R) Internet Explorer(R) 11
ServerView Agent	ServerView SNMP Agents for MS Windows (32bit-64bit) ServerView Agents Linux ServerView Agents VMware for VMware ESX Server
RCVE	ServerView Resource Coordinator VE
ROR	FUJITSU Software ServerView Resource Orchestrator
ROR VE	FUJITSU Software ServerView Resource Orchestrator Virtual Edition

Abbreviation	Products
ROR CE	FUJITSU Software ServerView Resource Orchestrator Cloud Edition
Resource Coordinator	Systemwalker Resource Coordinator Systemwalker Resource Coordinator Virtual server Edition
SVFAB	ServerView Fabric Manager

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June 2014, Edition 2.2	J2X1-7770-02ENZ0(02)
November 2015, Edition 2.3	J2X1-7770-02ENZ0(03)

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Contents

Chapter 1 Overview

This chapter provides an overview of Resource Orchestrator.

1.1 What is FUJITSU Software ServerView Resource Orchestrator

ICT has become one of the significant management resources for business enterprises, and stable ICT system operations are essential 24 hours a day, 365 days a year.

On the other hand, manual management operations are likely to reach their limit soon, since technologies including networks are constantly evolving, and systems have become more so complicated and massive that the workload of administrator operations is increasing and requires in-depth technical knowledge.

FUJITSU Software ServerView Resource Orchestrator is platform software for private clouds, for enabling effective use of ICT resources and streamlining of operation and management.

It provides the optimal private cloud platform based on the configuration requirements for private clouds configured by customers. ICT costs can be optimized through effective use of ICT resources such as servers, storage, and networks, and streamlining of operation and management.

Figure 1.1 Features of ServerView FUJITSU Software Resource Orchestrator
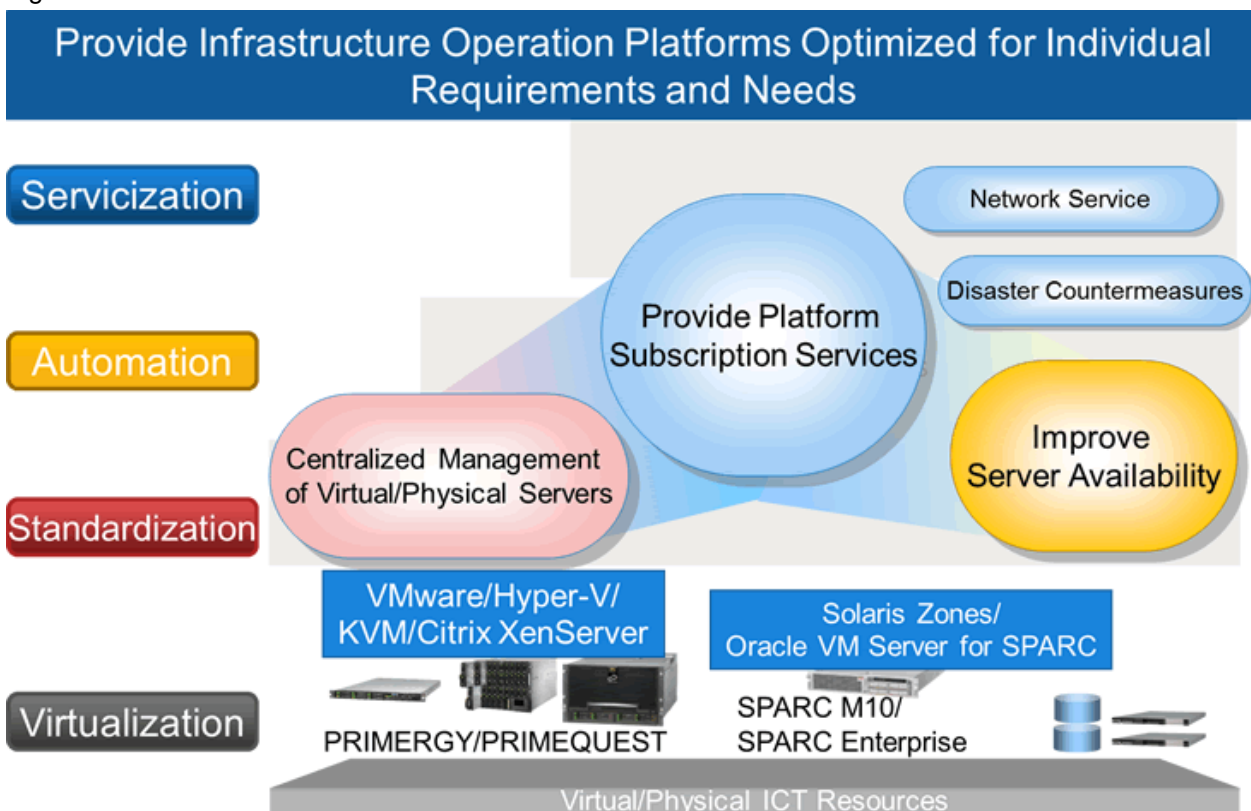
Centralized Management of Virtual and Physical Servers

Integrated operation is possible using a single console, even if a combination of virtual environments and physical environments is used. This realizes server virtualization and operation integration, and reduces the overall management workload.

Improvement of Server Availability

When a server fails, it can be switched over to a spare server automatically, and the risk of operation stopping can be reduced. Also, improvement of server availability can be realized by specifying a managed server as the spare server in advance.

Realization of a Platform Provision Service

Speedy Support for Evolving Businesses

Resource Orchestrator promptly provides servers (with storage and networks) according to the user's specific needs by managing resources, such as servers, storage, networks, and images (*), as resource pools. By simplifying the launch, expansion, and changes of business operations, this software provides quick support for evolving businesses.

* Note: A copy of the contents of a disk (including the operating system) collected from a server, which can be deployed to other servers.

Reduction of Infrastructure Investment Costs

Resource Orchestrator provides complete visualization of servers, storage resources, and network resources, making the state of each of these resources visible to users. This allows for the effective use of unused resources and planning for the installation of required resources.
Moreover, infrastructure investment costs are reduced by managing resources as resource pools, as resources that could not otherwise be diverted to other uses can be used effectively.

Reduction of Infrastructure Operating Costs

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

- Simplified configuration of systems.

- Reduced risk of mistakes through use of predefined values for parameter settings when installing an OS or setting up storage and networks.

1.2 Product Line-up

This section explains the product line-up of FUJITSU Software ServerView Resource Orchestrator.

In Resource Orchestrator, the edition can be upgraded in steps.

For details on available functions for each edition, refer to "".

Product Line-up

FUJITSU Software ServerView Resource Orchestrator Virtual Edition

FUJITSU Software ServerView Resource Orchestrator Virtual Edition (hereinafter Virtual Edition), realizes server virtualization and operation integration in virtual and physical environments. Failed servers can be automatically recovered. By introducing server automation and visualization, the workload of installation, operation, and maintenance can be reduced.

FUJITSU Software ServerView Resource Orchestrator Cloud Edition

In FUJITSU Software ServerView Resource Orchestrator Cloud Edition (hereinafter Cloud Edition), in addition to the functions of Virtual Edition, centralized management of resources in resource pools and automatic deployment of platforms according to user requirements is possible.
Reduction of the time taken to configure systems and increase efficiency of operations are also possible using the automatic deployment of platforms.

List of Optional Software

FUJITSU Software ServerView Resource Orchestrator NS Option

NS Option provides the network service functions (network security function or server load balancer function) as a software appliance, for supporting private cloud environments.

- Simple network security (IP Filtering, NAT, and Flood attack defense) essential for multi-tenant systems and multi-tiered systems using software can be realized.

- Server access in an L-Platform can be distributed, server load leveling can be realized, and also inaccessibility or access concentration due to server failure can be avoided.

FUJITSU Software ServerView Resource Orchestrator NS option (hereinafter NS option) can be used for Cloud Edition.

FUJITSU Software ServerView Resource Orchestrator DR Option

Provides the functions to promptly recover and restore (from operating to standby) the systems damaged by natural disasters, on a chassis level. It is easy to configure the backed-up system by copying the management information of the primary site to the backup site.

FUJITSU Software ServerView Resource Orchestrator DR option (hereinafter DR option) can be used for Cloud Edition.

ServerView Resource Coordinator VE I/O Virtualization Option (FJ-WWN16)

This option is necessary when using I/O virtualization. Global and unique virtual address WWN numbers which can be used for up to 16 managed servers are provided.

This option can be used for Virtual Edition and Cloud Edition.

ServerView Resource Coordinator VE I/O Virtualization Option (FJ-MAC16)

This product is an option of ServerView Resource Orchestrator and ServerView Resource Coordinator VE, and provides virtual MAC addresses that managed servers can use.
The virtual MAC addresses can be used for LAN environments using I/O virtualization with VIOM.
As many virtual MAC addresses as the number of NICs on the managed servers (excluding spare servers) for which virtualization of MAC addresses is to be performed are necessary.
This product provides 16 virtual MAC addresses, so please purchase as many as are necessary for the NICs in your environment.

Chapter 2 System Configuration

This chapter explains system configurations of Resource Orchestrator.

Admin Server

The admin server is a server used to manage managed servers and managed devices.

It is necessary to install the Resource Orchestrator manager on the admin server.

Managed Server

A server performing operations or a spare server.

Install agents on servers used for operations.

Install agents only on VM hosts in server virtualization software environments.

Note

When using VMware ESXi, it is not necessary to install a Resource Orchestrator agent on a managed server, since VMs and guest OSs are directly managed from the admin server.
Instead, install ServerView ESXi CIM Provider.

Admin LAN

A LAN for managing managed servers from an admin server.

Separate from the public LAN used to perform operations with managed servers.

Redundancy of admin LANs or public LANs can be performed using network redundancy software on the server.

Management of managed servers connected to multiple network segments on an admin server is possible.

Web Client

A client used to operate an admin server of Resource Orchestrator. Uses the management console (ROR console) on the Web browser.

Server for the HBA address rename Setup Service

HBA address rename is the I/O virtualization function provided by Resource Orchestrator.

HBA address rename enables addition or maintenance of servers by modifying the configurations of servers, without modifying the configurations of WWNs of storage units.

The server for the HBA address rename setup service is the server used to operate HBA address rename.

When an admin server and a managed server cannot communicate, the WWN settings required when starting managed servers are configured on behalf of the admin server.

When using I/O virtualization using HBA address rename, it is necessary to prepare the server on which the HBA address rename setup service will operate.

Privileged User [Virtual Edition]

A privileged user is a user who can perform all operations using resources.

A general user is a user who can only perform reference operations using resources.

Tenant User, Tenant Administrator, Infrastructure Administrator [Cloud Edition]

For details on roles of tenant users, tenant administrators, and infrastructure administrators, refer to "Chapter 4 User Roles in Resource Orchestrator [Cloud Edition]".

2.1 System Configuration Example Using Virtual Edition

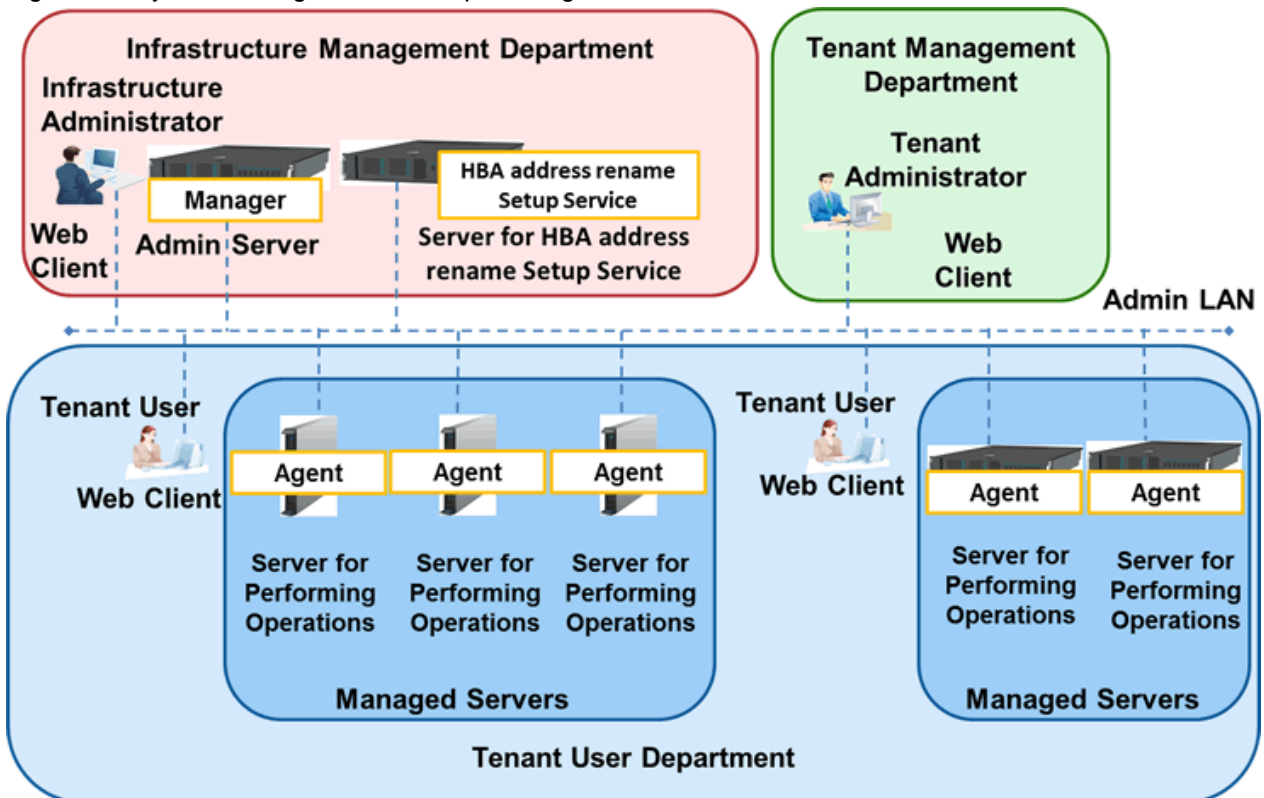An example system configuration using Virtual Edition is given below.

Figure 2.1 System Configuration Example Using Virtual Edition
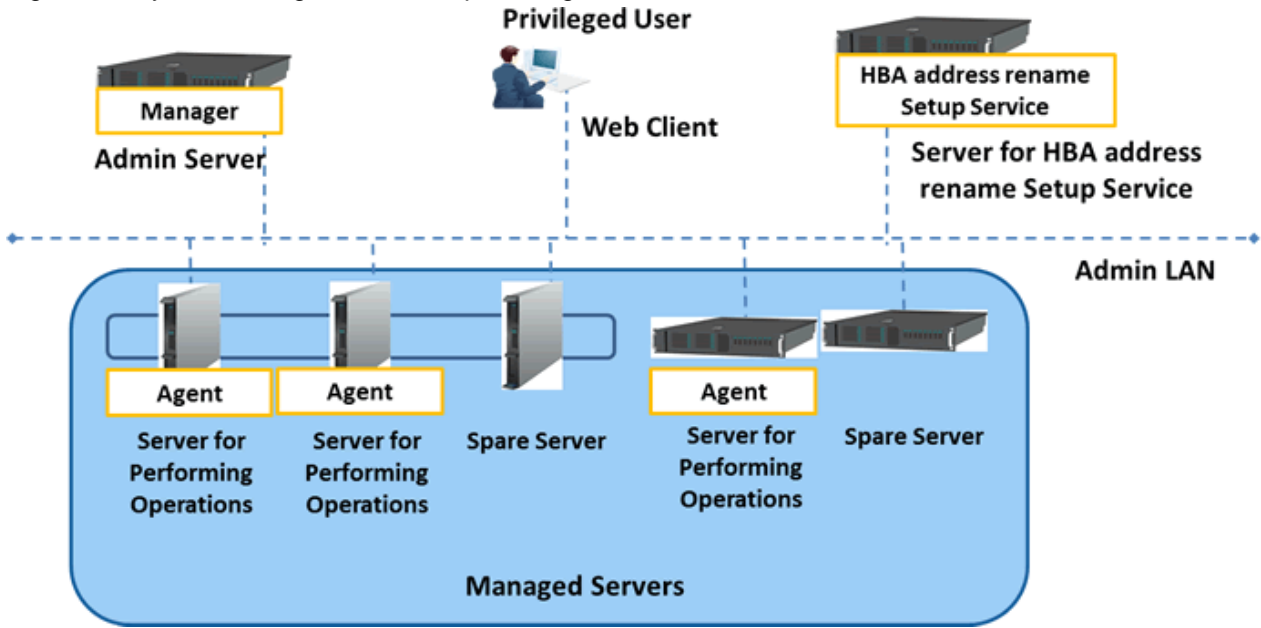
2.2 System Configuration Example Using Cloud Edition

An example system configuration using Cloud Edition is given below.

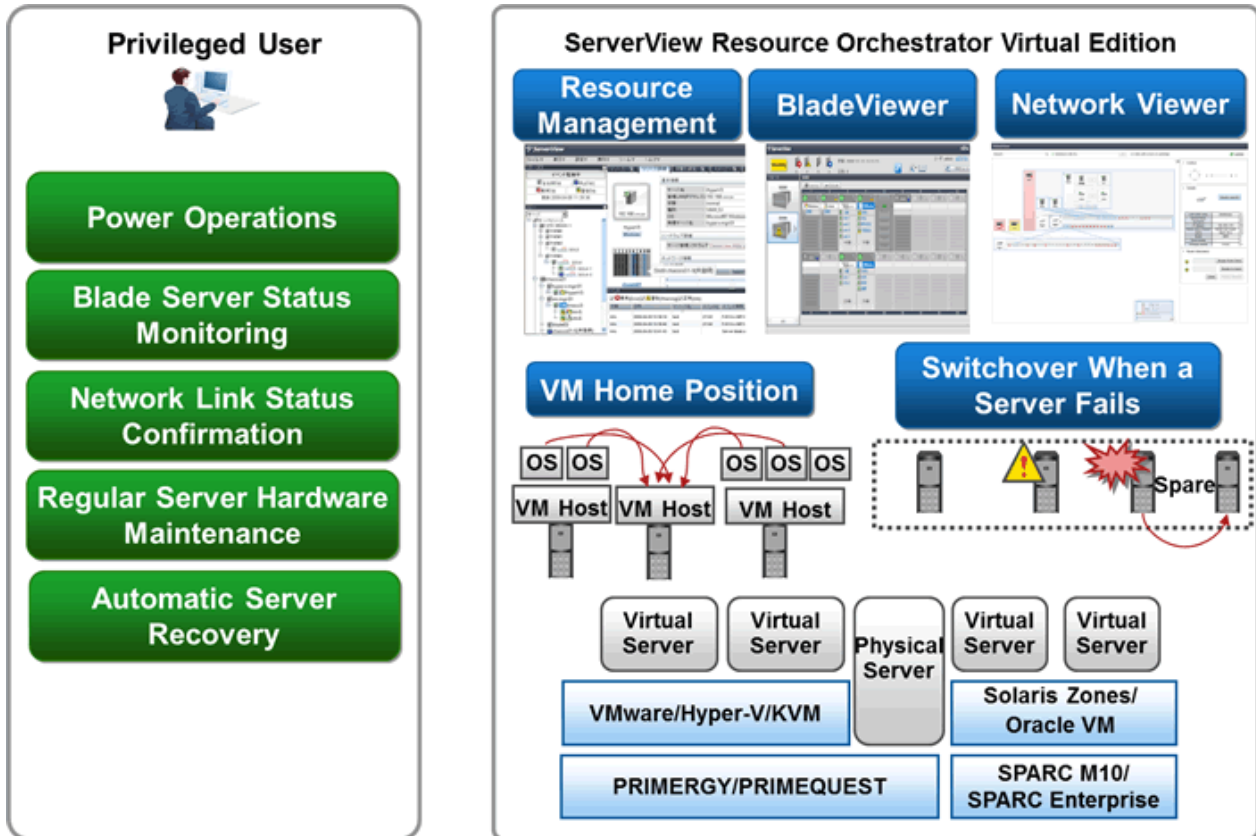Figure 2.2 System Configuration Example Using Cloud Edition

Chapter 3 Image of Operation

This chapter explains the image of operation of environments using FUJITSU Software ServerView Resource Orchestrator.

3.1 Virtual Edition

An image of operation when using Virtual Edition is given below.

Figure 3.1 Image of Operation [Virtual Edition]

Regular Operations

Once resources are registered with Resource Orchestrator, power operations such as startup or stop using a single window are available, with no need to be aware of the differences between the virtual environments, the server hardware models, or the OS types.

Operations When Trouble Occurs

- Check the statuses of blade servers using BladeViewer.

- When a network error has occurred, check NetworkViewer. Check the link statuses of servers and switches, or the switch port statuses, and investigate the effect the network error has on server operations.

Operations for Regular Server Hardware Maintenance

1. Configure the VM Home Position settings.

2. Before maintaining server hardware, back up the guest OS to another VM.

3. Perform maintenance of the server hardware.

4. The guest OS which is backed up on the other VM when switching over servers can easily be returned to its original status before server switchover using VM Home Position.

Operations when Server Hardware Fails

1. Define spare servers in advance.

2. When using PRIMERGY servers or Fujitsu M10/SPARC Enterprise, recover applications upon hardware failure by automatically switching over primary servers with pre-assigned spare servers.

3.2 Cloud Edition

An image of operation when using Cloud Edition is given below.

Figure 3.2 Image of Operation [Cloud Edition]
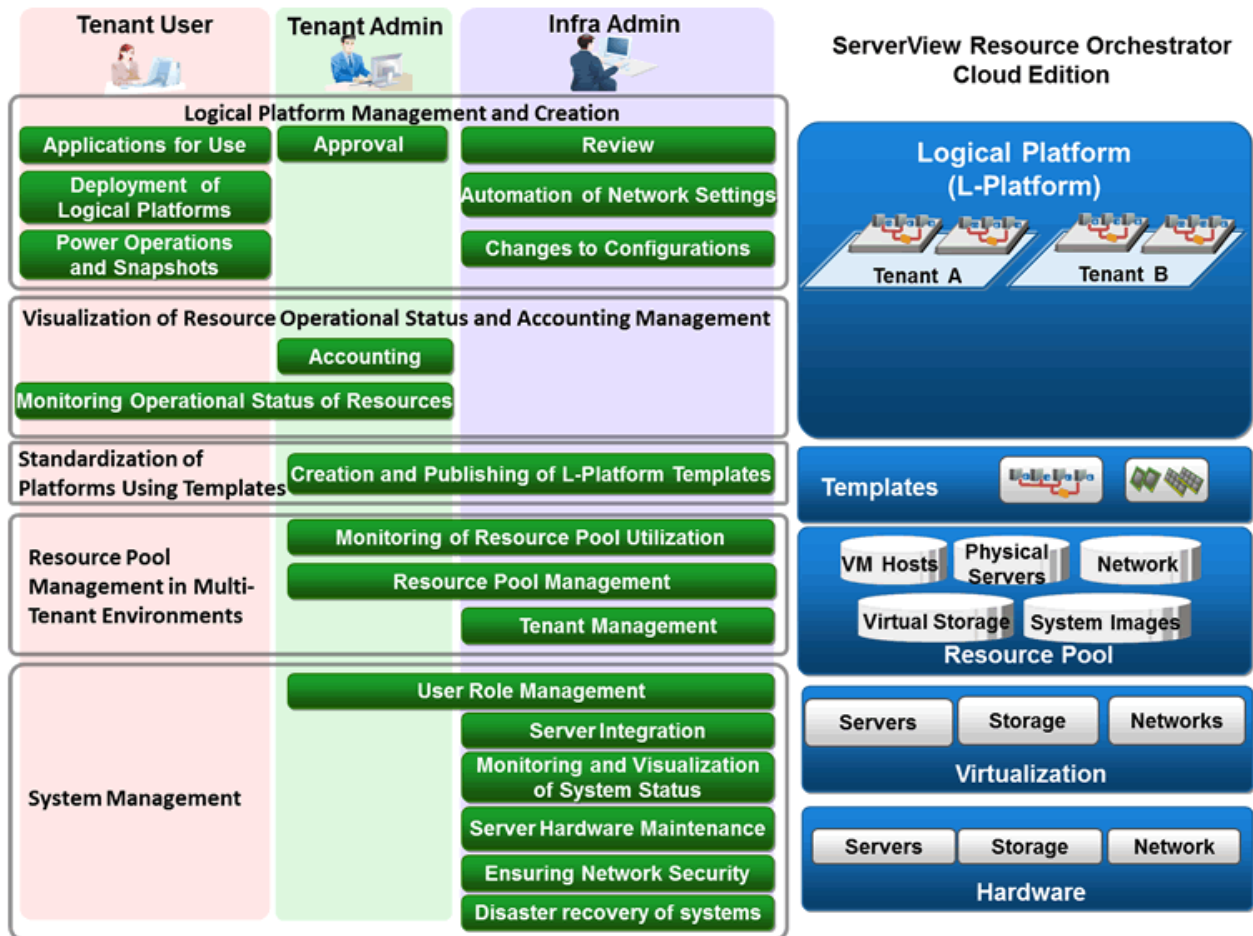
Users of Resource Orchestrator

The users who perform configuration and operation of the infrastructure platform for operations using Resource Orchestrator are given below.

For details on the roles of users, refer to "Chapter 4 User Roles in Resource Orchestrator [Cloud Edition]".

Table 3.1 User

Department	User	Overview
Service user department	Tenant user	A person who performs configuration, operation, or maintenance of business systems. Systems are configured on an allocated logical platform (L-Platform).
	Tenant administrator	The manager of a service user department which performs configuration, operation, and maintenance of a logical platform (L-Platform).

Department	User	Overview
		In Resource Orchestrator, the unit for division of management and operation of resources based on organizations or operations is called a tenant. They manage tenant users in tenants and logical platforms (L-Platforms).
Service provision department	Infrastructure administrator	A manager of a service provision department which performs configuration, operation, and maintenance of an entire infrastructure. Logical platforms (L-Platform) are allocated according to requests from service user departments.
	System administrator	A system administrator who manages the entire system. They install Resource Orchestrator and configure the necessary settings. OS administrator privileges are required for these operations. Usually, the roles of infrastructure administrator and system administrator are performed by the person.

Functions Available to Users of Resource Orchestrator

The functions available to users using the service portal provided by Resource Orchestrator (ROR console) are as shown below.

Table 3.2 Functions Available to Users of Resource Orchestrator

Functions		User	Overview
Logical platform (L-Platform) creation and management	Power operations and snapshots	Tenant user	Uses logical platforms (L-Platforms) via remote desktop or by using SSH. Power operations such as starting or stopping of the logical platform (L-Platform) can be performed. Collection and restoration of snapshots of the logical platform (L-Platform) can also be performed.
	Changes to configurations	Infrastructure administrator	Infrastructure administrators can modify the server specifications such as CPUs, memory capacity, and disk capacity defined in the logical platform (L-Platform), when requested by tenant users or tenant administrators. Effective use of resources can be realized, since resources can easily be increased or reduced according to the workload fluctuations of logical platforms (L-Platforms) being used.
	Automation of network settings	Infrastructure administrator	Configures rules and definitions for the network devices automatically, when creating, modifying, and deleting logical platforms (L-Platforms). Automating network settings enables reduction of the operational workload of tenant users.
	Logical platform (L-Platform) creation	Tenant user	Deploys logical platforms (L-Platforms) including physical and virtual servers automatically, based on templates. Automated configuration can prevent configuration errors and enable quick provision of logical platforms (L-Platforms).
	Application for use	Tenant user	Tenant users can apply to use a logical platform (L-Platform).
	Approval and review	Tenant administrator Infrastructure administrator	Applications for use can be double-checked with approval by the tenant administrator and with review by the infrastructure administrator. This promotes the appropriate use of resources by checking the validity of the application for use.
Visualization of the operational status of resources and accounting management	Accounting	Tenant administrator	Displays the usage charges for each tenant or each logical platform (L-Platform), and sends notification by e-mail. Allocates appropriate costs to resources.

Functions		User	Overview
	Monitoring operational status of resources	Tenant user Tenant administrator	Tenant users can monitor the operational statuses of allocated logical platforms (L-Platforms). Tenant administrators can monitor all logical platforms (L-Platforms) which belong to the tenants being managed. Infrastructure administrators can check the free space, and monitor the thresholds for all resources managed in resource pools.
Platform standardization using templates	Creating and releasing L-Platform templates	Tenant administrator Infrastructure administrator	Creates a template called an L-Platform template for the entire infrastructure or for each tenant. This promotes effective operation by determining the user department logical platform (L-Platform) format (standardization) and using it as a template.
Managing resources in multi-tenant environments	Monitoring resource pool utilization	Tenant administrator Infrastructure administrator	Tenant administrators can check the free space (utilization) of the resource pools which belong to the tenant being managed, and monitor their thresholds. Infrastructure administrators can check the free space (utilization) of the resource pools which can be used by multiple tenants, and monitor their thresholds. The usage status of ICT resources can be easily checked using the dashboard. Displays performance information and configuration information of logical platforms (L-Platforms), can forecast demands of resource pools, and simulate VM guest relocation.
	Resource pool management	Infrastructure administrator	Manages all ICT resources (in a resource pool). Effective use of ICT resources can be realized based on changes in the amount of usage.
	Tenant management	Infrastructure administrator	Creates, modifies, and deletes tenants to manage divided resources. Enables ICT resources to be shared between multiple departments while ensuring security.
System management	User role management	Tenant administrator Infrastructure administrator	Tenant administrators can add, modify, and delete tenant users. Infrastructure administrators can limit operations available to each user, and the resources which can be operated.
	Server integration	Infrastructure administrator	Operation of physical and virtual servers is possible using a single window, with no need to be aware of the differences of the server hardware models, or the OS types.
	Monitoring and visualization of system status	Infrastructure administrator	Visualizes the statuses of blade servers, network links, and power consumption, and monitors the system status.
	Server hardware maintenance	Infrastructure administrator	Creating backups of system disk contents before performing any OS or software installation, configuration changes, deletion or patch application can drastically reduce the time necessary to restore a server to its original state if hardware or software problems occur. When VM guests have been migrated to a different VM host for operation or maintenance of servers, it is possible to restore them to their original VM host using a single operation. When a server fails, the system can be restored by switching over primary servers with pre-assigned spare servers.
	Ensuring network security	Infrastructure administrator	Even if there are no dedicated firewall devices, security can be ensured for each tenant, each logical platform (L-Platform), or each segment.

Functions		User	Overview
	Disaster recovery of systems	Infrastructure administrator	Quickly recovers logical platforms (L-Platforms), by copying the contents of disks on the primary site to a standby site.

Operation Flow

The operation flow of a logical platform (L-Platform) is shown below.
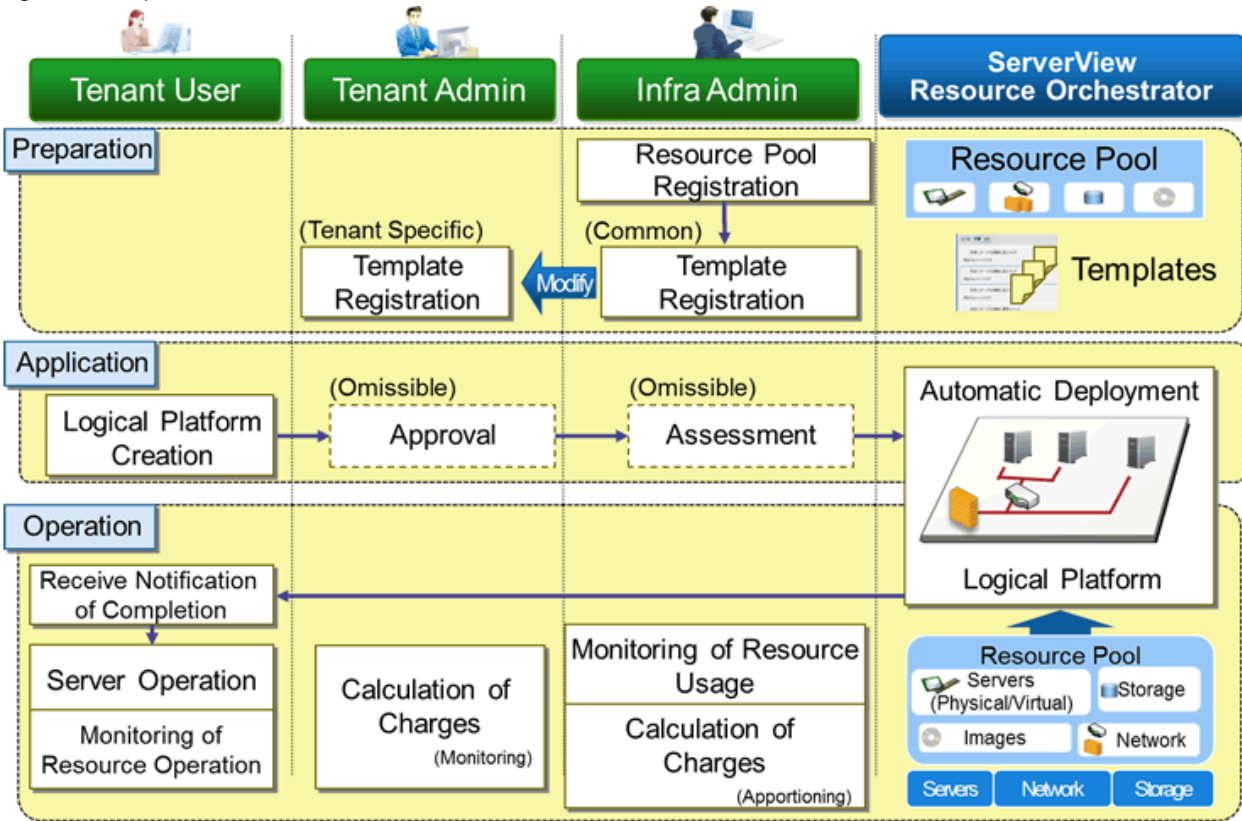
Figure 3.3 Operation Flow

Table 3.3 Operation Flow

Phase	Work	Operator	Overview
Preparation	Resource pool registration	Infrastructure administrator	Registers managed resources in the resource pool.
	Template registration	Infrastructure administrator	Registers templates that can be used by all tenants, with Resource Orchestrator.
		Tenant administrator	Registers tenant-specific templates after modifying the template common to all tenants.
Application	Logical platform (L-Platform) creation	Tenant user	Applies for logical platform (L-Platform) creation.
	Approval (Omissible)	Tenant administrator	Approves usage applications from tenant users. This work is optional.
	Review (Omissible)	Infrastructure administrator	Assesses usage applications from tenant users. This work is optional.
Operation	Receive notification of completion	Tenant user	Once the logical platform (L-Platform) is created, notification of completion is received.
			Upon receipt of the notification of completion, the logical platform (L-Platform) is ready to use.

Phase	Work	Operator	Overview
	Server operation	Tenant user	Uses logical platforms (L-Platforms) via remote desktop or by using SSH. Power operations such as starting or stopping of the logical platform (L-Platform) can be performed. Collection and restoration of snapshots of the logical platform (L-Platform) can also be performed.
	Monitoring of resource operation	Tenant user	Monitors the operational status of the logical platform (L-Platform) that they are using.
	Calculation of charges (Monitoring)	Tenant administrator	Monitors the usage charges for each tenant or each logical platform (L-Platform).
	Monitoring of resource usage	Infrastructure administrator	Monitors the amount of usage of resources.
	Calculation of charges (Apportioning)	Infrastructure administrator	Infrastructure administrators can receive usage charge files for each tenant by email. Usage charge files can be used to charge each tenant. If the accounts manager, who is responsible for charging, is not an infrastructure administrator, usage charge files can be sent to the accounts manager.

Chapter 4 User Roles in Resource Orchestrator [Cloud Edition]

This chapter explains user roles in Resource Orchestrator.

User Roles in Resource Orchestrator

The user roles in Resource Orchestrator are given below.

Figure 4.1 User Roles in Resource Orchestrator
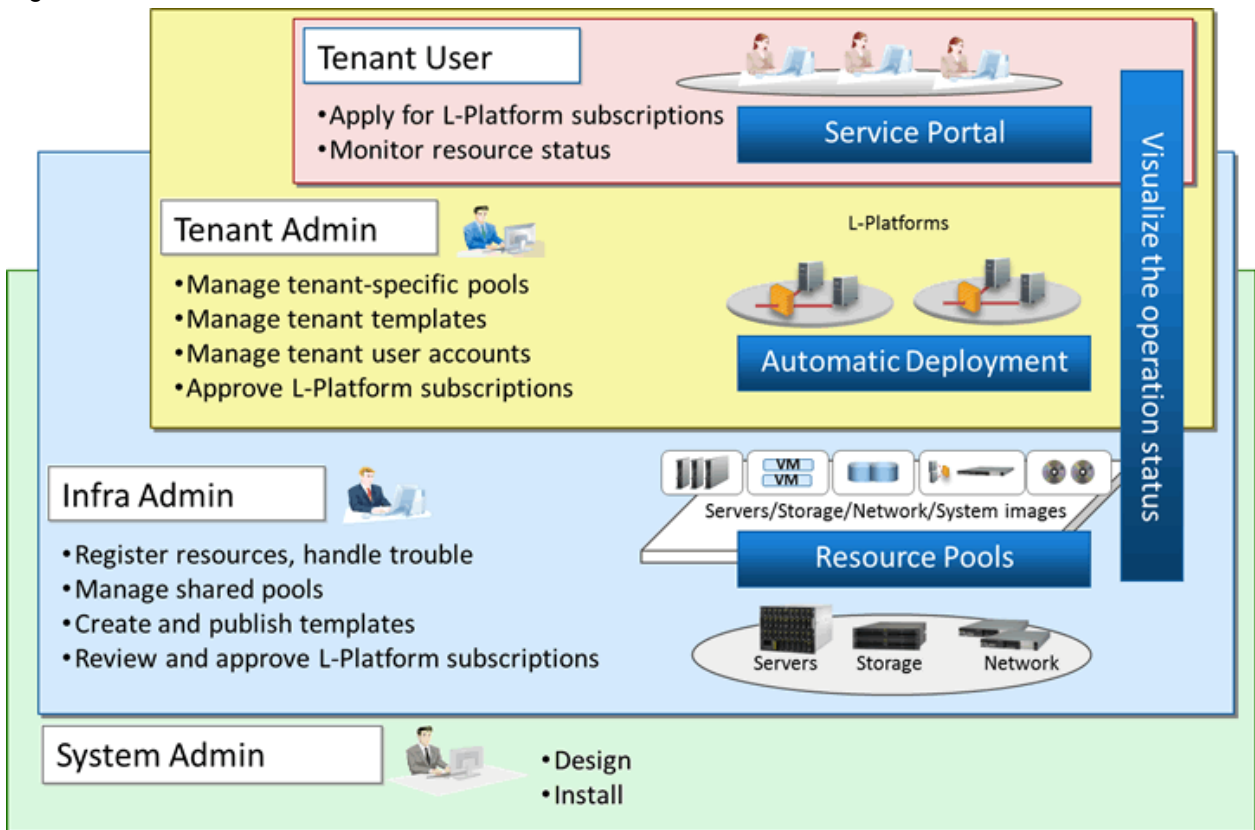
System Administrators

System administrators manage the entire system. They install Resource Orchestrator and configure the necessary settings.

OS administrator privileges are required for these operations. Usually, the roles of infrastructure administrator and system administrator are performed by the person.

Infrastructure Administrators

Infrastructure administrators manage the ICT resources (servers, storage, networks and system images) in a private cloud.

Using Resource Orchestrator, infrastructure administrators collectively manage ICT resources in resource pools, while monitoring the load and performing addition, replacement, and maintenance of ICT resources when necessary.

Infrastructure administrators prepare L-Platform templates of pre-defined logical platforms (L-Platforms) according to tenant user or tenant administrator needs, and publish them for use by tenant users or tenant administrators.

In accordance with the application process, infrastructure administrators may also receive and review applications from tenant users or tenant administrators.

The main roles and operations of infrastructure administrators are given below.

- Manage (add, switch, and maintain) the ICT resources (servers, storage, networks, and system images) in a private cloud

- Manage shared pools (global pools)

- Create and publish L-Platform templates

- Review logical platform (L-Platform) usage applications

Tenant Administrators

Tenant administrators prepare an L-Platform template which is specific to the tenant pre-defined by the infrastructure administrator according to tenant user needs, and publish it for tenant users to use.

In accordance with the application process, tenant administrators may also receive and approve applications from tenant users.

Tenant administrators can check the usage status and monitor the operational statuses of tenant users.

The main roles and operations of tenant administrators are given below.

- Manage resource pools (local pools) dedicated to tenants

- Manage L-Platform templates

- Manage accounts of tenant users

- Review and approve logical platform (L-Platform) usage applications

Tenant Users

Tenant users can apply to use logical platforms (L-Platforms), and use logical platforms (L-Platforms) configured according to their application.

When the authorization of the tenant administration department manager is required for an application, tenant users must request authorization from the manager in accordance with the application process.

The main roles and operations of tenant users are given below.

- Apply for logical platform (L-Platform) usage

- Check resource usage conditions

Roles and Access Scopes

In Resource Orchestrator, operations or the resources to operate can be limited depending on the user.

Roles

Roles are definitions of users and the various operations that they are able to use, which are based on combinations of resource types and the types of operations using resources.

Access Scopes

The scope of resources available for users in Resource Orchestrator is called an access scope (scope).

Privileges can be limited by configuring the roles and access scopes based on the user.

Chapter 5 Functions

This chapter provides an overview of the functions available in Resource Orchestrator.

5.1 Available Functions

The functions provided by Resource Orchestrator are as shown below:

Table 5.1 Available Functions

Requirement	Function	Virtual Edition	Cloud Edition
Centralized Management of Virtual and Physical Servers	Visualization of blade server status (BladeViewer)	Yes	Yes
	Visualization of network link status (NetworkViewer)	Yes	Yes
	Visualization of Power Consumption	Yes	Yes
	Recovery of migrated VM guest locations (VM Home Position)	Yes	Yes
	Centralized management of system images	Yes	Yes
	Cloning physical servers and automating configuration	Yes	Yes
Improving server availability	I/O virtualization	Yes	Yes
	Monitoring of hang-up and recovery	Yes	Yes
	Automatic recovery of failed servers	Yes	Yes
Realization of a platform provision service	Logical platforms (L-Platforms) and logical servers (L-Servers)	-	Yes
	Managing resource pools	-	Yes
	Managing resources in multi-tenant environments	-	Yes
	Standardization of logical platforms (L-Platform)	-	Yes
	L-Platform template creation and publication	No	Yes
	Subscription	No	Yes
	Approval and assessment	No	Yes
	Automating network settings	-	Yes
	Reconfiguration	No	Yes
	Power operations and snapshot	No	Yes
	Monitoring the operation status of resource	No	Yes
	Monitoring resource pool use rate	No	Yes
	Network device monitoring and operation	-	Yes
	Accounting	No	Yes
	Ensuring network security	-	Yes (*1)
	Server Load Leveling by Distributing Access to the Servers in an L-Platform	-	Yes (*1)
	Disaster recovery of systems	-	Yes (*2)

Yes: Available.

-: Not Available.

*1: When using virtual firewalls or virtual server load balancers, the NS option must be purchased.

*2: Available when the DR option is purchased.

5.2 Centralized Management of Virtual and Physical Servers

This section explains centralized management of virtual and physical servers.

In Resource Orchestrator, operation is possible using a single window, with no need to be aware of the differences of the virtual environments, the server hardware models, or the OS types.

The system monitors chassis, server hardware, OSs (physical OSs, VM (VMware ESX/ESXi, Hyper-V, or Red Hat virtualization functions), VM guests or Solaris Zones) operating on the servers as resources, and displays the statuses such as normal or error.

Resource relations for each partition of PRIMEQUEST series or Fujitsu M10/SPARC Enterprise are displayed in the tree.

This helps identify the cause of a failure and determine its impact on servers, thereby streamlining hardware maintenance.

Figure 5.1 Server Integration
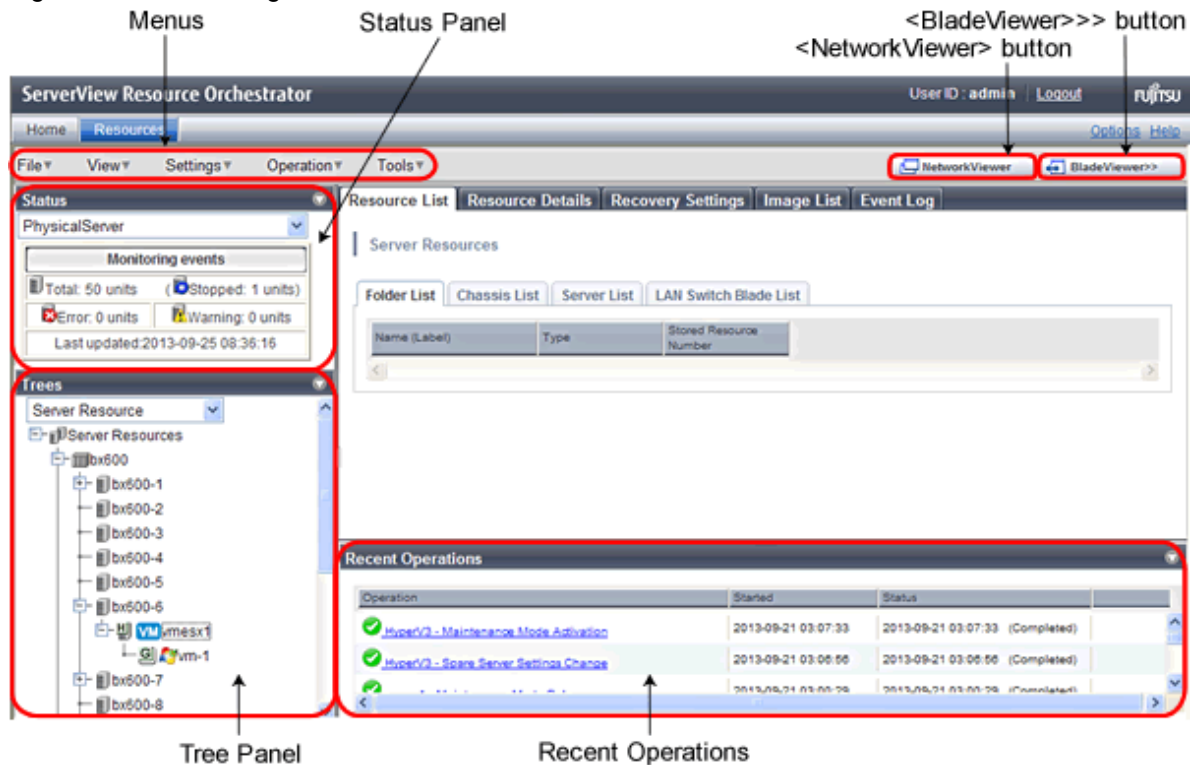
5.2.1 Visualization of Blade Server Status (BladeViewer)

Resource Orchestrator provides the BladeViewer which enables intuitive monitoring of the statuses of blade servers (startup, stop, or error).

In BladeViewer, blade chassis, server blades, virtual servers, OS and application names are displayed using an image of the blade chassis. Also, the server statuses such as started, stopped, or error are displayed.

Figure 5.2 BladeViewer
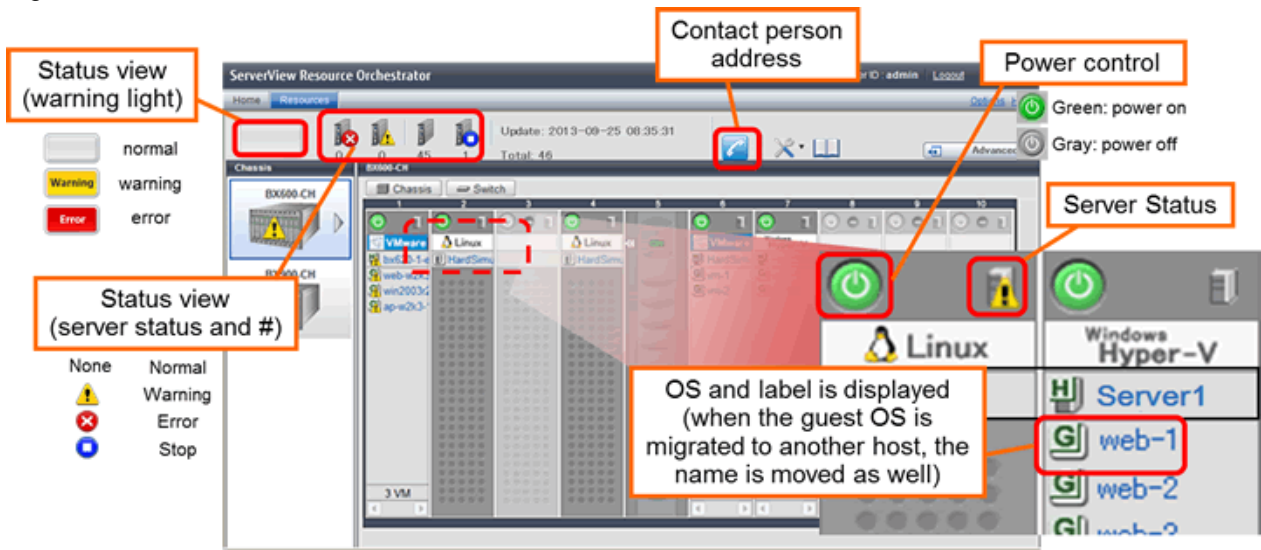
5.2.2 Visualization of Network Link Status (NetworkViewer)

The network map helps visualize and relate physical networks (between servers and switches) with virtualized networks (from VLANs or virtual switches used in server virtualization software).

Network settings can be easily checked during configuration.

The link statuses of servers and switches, or switch port statuses can be checked, and the effect on server operations caused by network errors can be easily investigated.

Figure 5.3 NetworkViewer
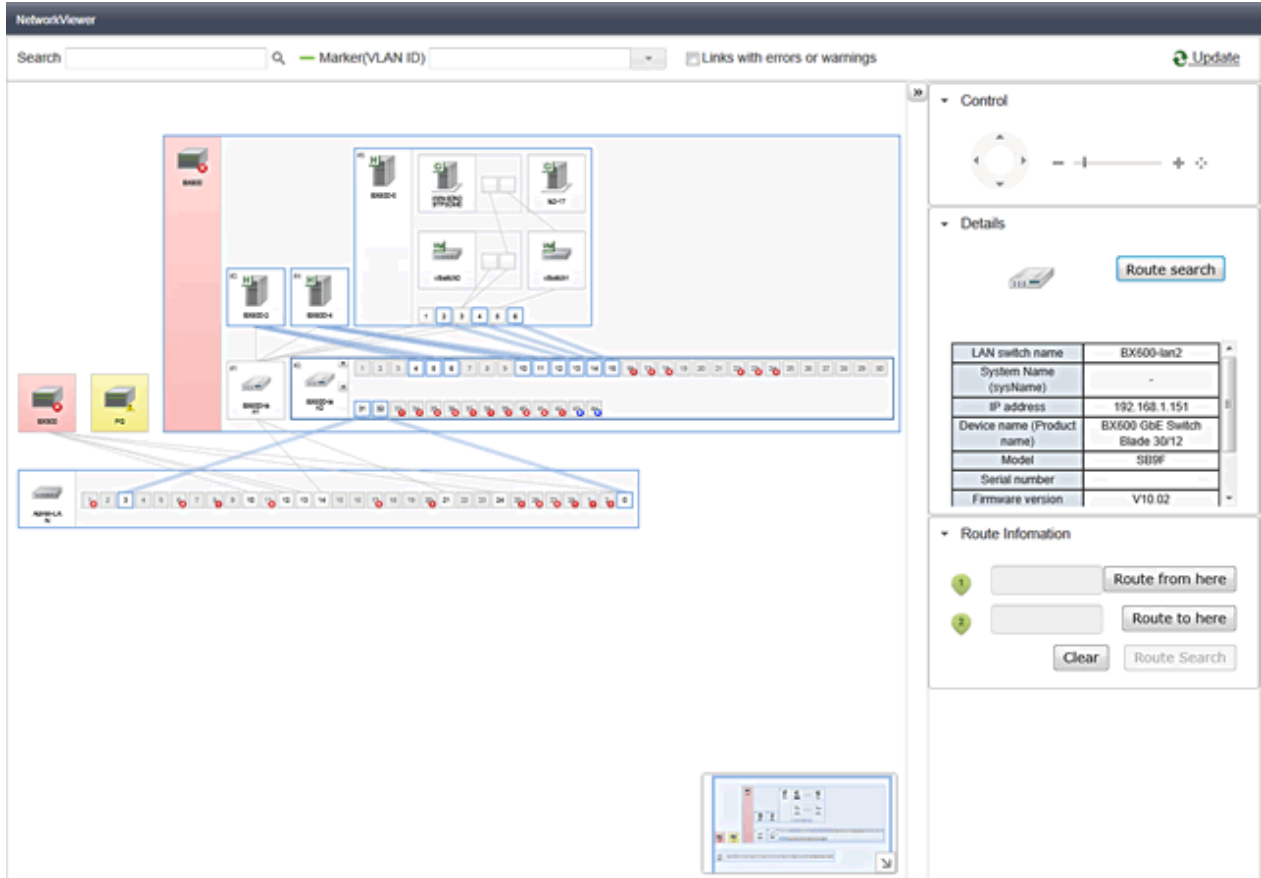
5.2.3 Visualization of Power Consumption

The fluctuation of power consumption depending on ICT resources such as chassis, servers, or UPSs can be displayed as a graph. The graph can be collected as statistical information. This function enables checking of the power consumption of servers depending on the operations.

Figure 5.4 Visualization of Power Consumption
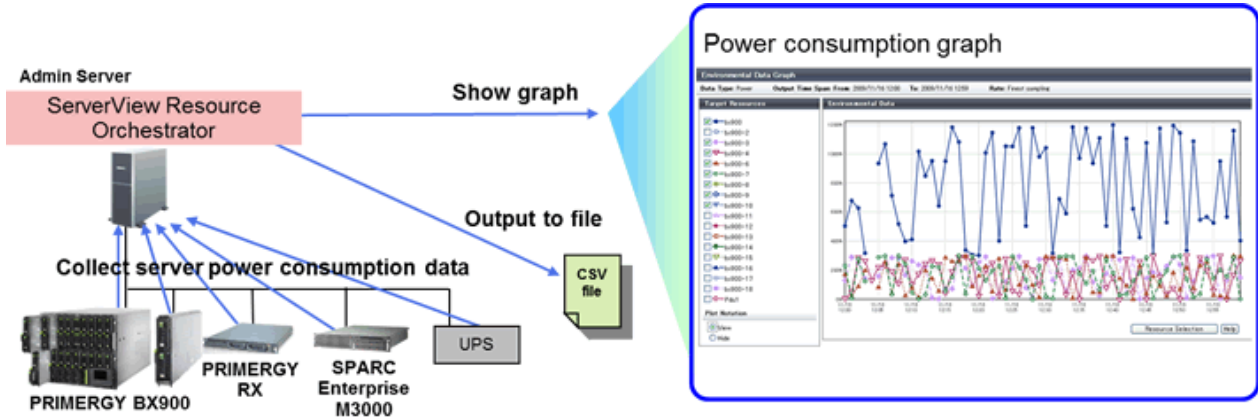
5.2.4 Recovery of Migrated VM Guest Locations (VM Home Position)

Resource Orchestrator provides the VM Home Position function, which enables the recovery of migrated VM guest locations.

By configuring the VM Home Position in advance, it is possible to restore VM guests to their original VM host using only one operation when they have been migrated to a different VM host for operation or maintenance needs.

This enables restoration of multiple VM guests to their original locations without the need to record their original locations, and reduces the risk of operational mistakes.

When virtual environments are backed up to a specific server, their status can be easily canceled.

Figure 5.5 VM Home Position
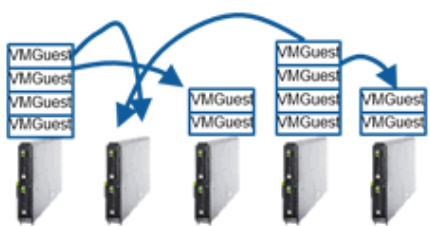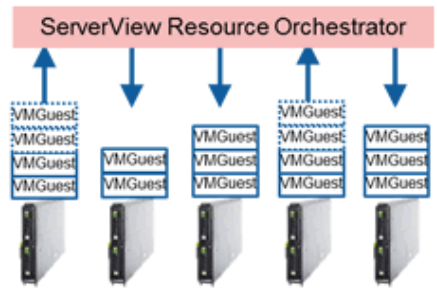
5.2.5 Centralized Management of System Images

System images are collected images that contain the contents of a system disk for system recovery.

In Resource Orchestrator, system images (only the host OS when using VMs) are backed up and centrally stored on a disk on the admin server.

Multiple versions of system images can be retained.

Creating backups before any OS or software installation, configuration changes, deletion or patch application can drastically reduce the time necessary to restore a server to its original state if hardware or software problems occur.

Figure 5.6 Centralized Management of System Images
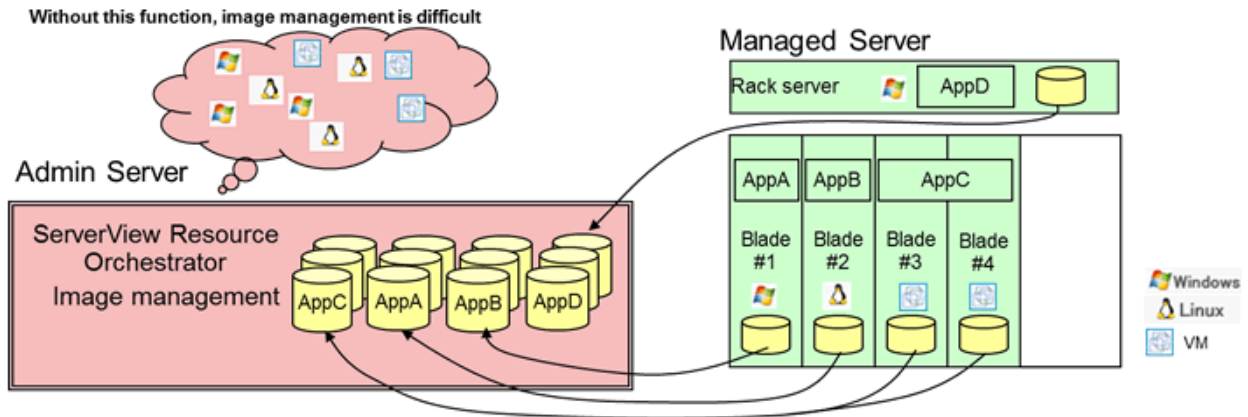
P Point
. . . .

- This function is also supported for iSCSI boot and EFI environments.

- Backup and restore of individual physical servers and VM hosts can be performed.

- VM hosts of VMware vSphere 4/5 are not the targets of backup and restore.

. . . .

5.2.6 Cloning Physical Servers and Automating Configuration

In Resource Orchestrator, cloning images can be created on the admin server, and deployed to multiple servers.

A cloning image is a backup of a system disk, which does not contain server-specific information (system node name, IP address, etc.).

When deploying a cloning image to the system disk of another server, Resource Orchestrator automatically changes server-specific information to that of the target server.

Using this function simplifies the installation procedure, as the work involved in the installation of OSs, drivers and patches, and the addition of servers can be reduced.

Software installation and configuration can be automated, as combination with BMC BladeLogic Server Automation enables continuous deployment and configuration of middleware.

Figure 5.7 Cloning Physical Servers
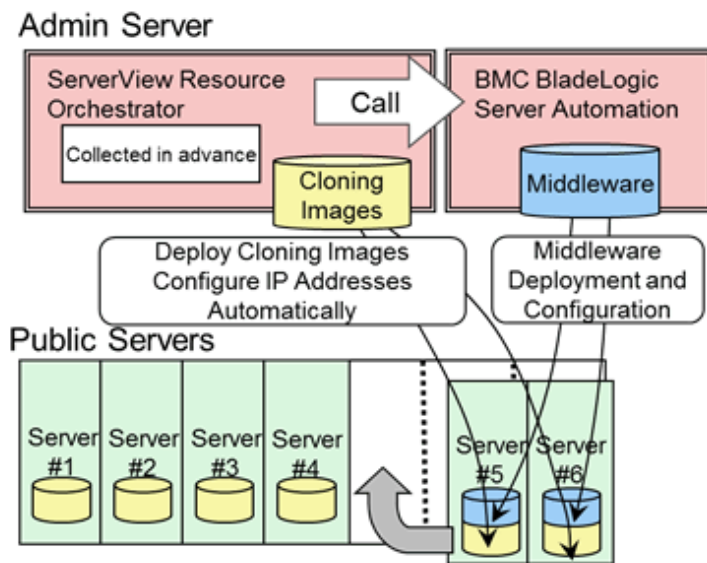
5.3 Improvement of Server Availability

This section explains the improvement of server availability.

5.3.1 I/O Virtualization

Resource Orchestrator provides an I/O virtualization function HBA address rename) to realize I/O control in a server, using virtual addresses WWN (World Wide Name) according to the server operations.

If defining volumes using the virtual address WWNs in the storage (SAN boot or SAN shared storage), it is possible to add or maintain (replace) servers dynamically just by changing the settings of the server, without any effect on complicated storage settings such as configuration modification of physical address WWNs.

This provides a simplified function using Resource Orchestrator I/O virtualization functions with ServerView Virtual-IO Manager.

5.3.2 Monitoring of Hang-up and Recovery

By regularly executing the ping command, it is possible to restart a physical server or a VM host which is not responding. (*1)
If there is still no response, recovery operations such as server switchover (*2) are performed when the OS hangs.
This improves the continuity of operations for dealing with OS level failures, not hardware failures.

*1: VMware ESXi is not supported.
*2: When using PRIMEQUEST, SPARC Enterprise partition models with divided areas, and FUJITSU M10 in Building Block configurations, recovery processes including server switchover cannot be performed.

Figure 5.8 Realization of Recovery when the OS Hangs during ping Monitoring
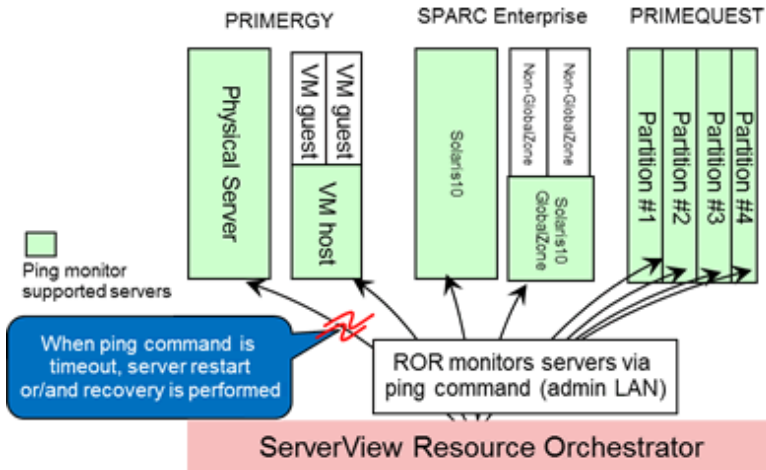
5.3.3 Automatic Recovery of Failed Servers

Recover applications after hardware failure by switching over primary servers with pre-assigned spare servers.

This shortens and simplifies the recovery procedure.

Server switchover can be realized using one of the following methods.

- Backup and restore method

  Restore the system image that was backed up in the spare server beforehand and start it in the local boot environment.

- HBA address rename method

  In a SAN boot environment, using "I/O virtualization" enables the spare server to connect to and boot from the boot disk.

- VIOM server profile switchover method

  In a SAN boot or an iSCSI boot environment, using "I/O virtualization" in combination with ServerView Virtual-IO Manager enables the spare server to connect to and boot from the boot disk.

- Storage affinity switchover method

  This is the method used when the server is a Fujitsu M10/SPARC Enterprise. Server switchover can be realized by coordinating with ETERNUS SF Storage Cruiser storage management functions, and automatically modifying configurations in SAN environments.

Automatic Recovery of Failed Servers (PRIMERGY)

For PRIMERGY, N+1 cold standby which shares spare servers is provided.

The failed server environments are inherited, and automatically recovered.

By sharing spare servers, improved availability and reduced costs are both possible.

Figure 5.9 Automatic Recovery of Failed Servers (PRIMERGY)
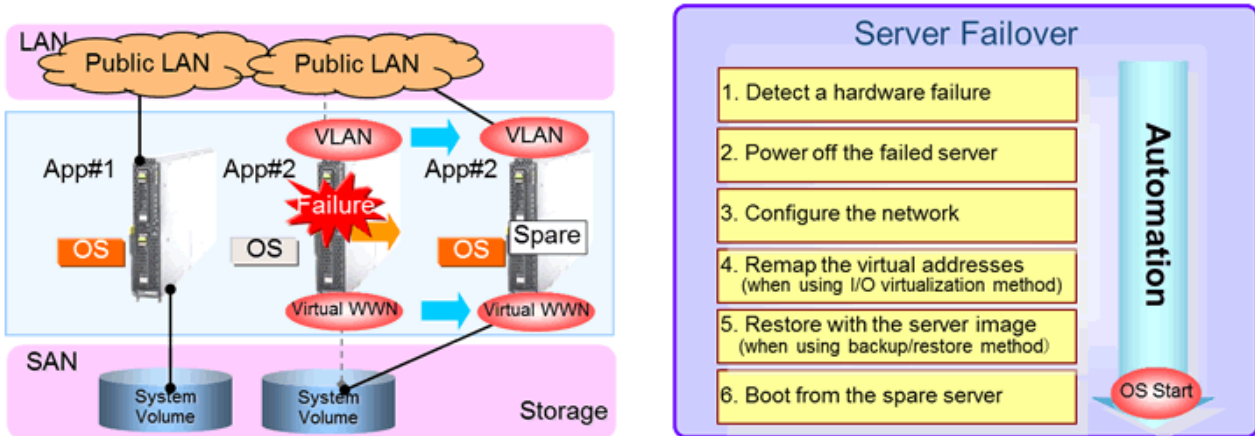
Automatic Recovery of Failed Servers (Fujitsu M10/SPARC Enterprise)

This enables recovery of Fujitsu M10/SPARC Enterprise.

Through coordination with ETERNUS SF Storage Cruiser, the switch zoning settings configured in the fibre channel switches and the host affinity settings configured in the SAN storage can be switched over automatically.

Figure 5.10 Automatic Recovery of Failed Servers (Fujitsu M10/SPARC Enterprise)
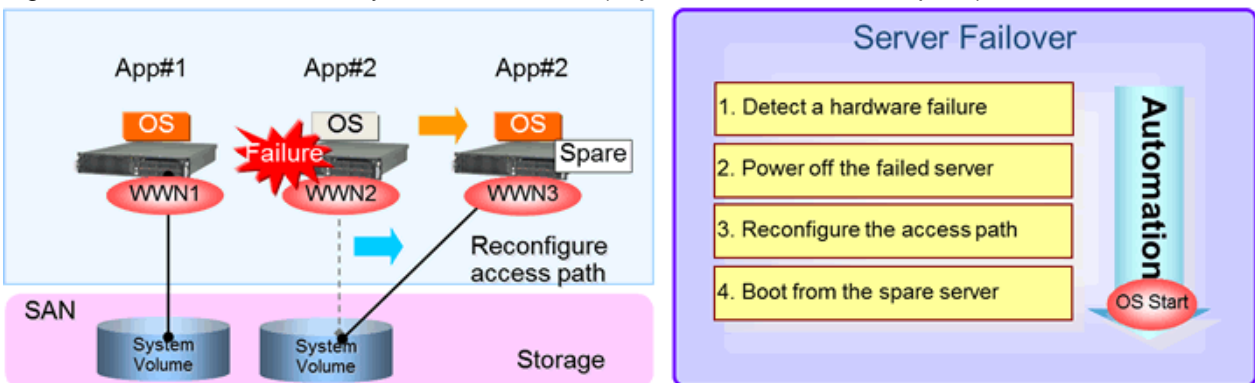
5.4 Realization of a Platform Provision Service

This section explains a platform provision service.

5.4.1 Logical Platforms (L-Platforms) and Logical Servers (L-Servers)

This section explains logical platforms (L-Platforms) and logical servers (L-Servers).

Logical Platforms (L-Platforms)

Logical platforms (L-Platforms) are a logical method for managing an entire system comprised of multiple servers, storage, and networks in Resource Orchestrator.

Multi-tiered (Web/AP/DB) systems including network devices such as firewalls or server load balancers can be managed.

By using a logical platform (L-Platform), configurations including both physical and virtual servers can be managed.

The setting and operation of multiple servers, storage, and networks can be simplified through the use of a logical platform (L-Platform).

Logical Servers (L-Servers)

A logical server (L-Server) is a method for logically managing physical and virtual servers in Resource Orchestrator.

Either physical or virtual servers can be used according to the system involved.

An L-Server used for physical servers is called a physical L-Server.

An L-Server used for virtual servers is called a virtual L-Server.

Figure 5.11 Logical Platforms (L-Platforms)
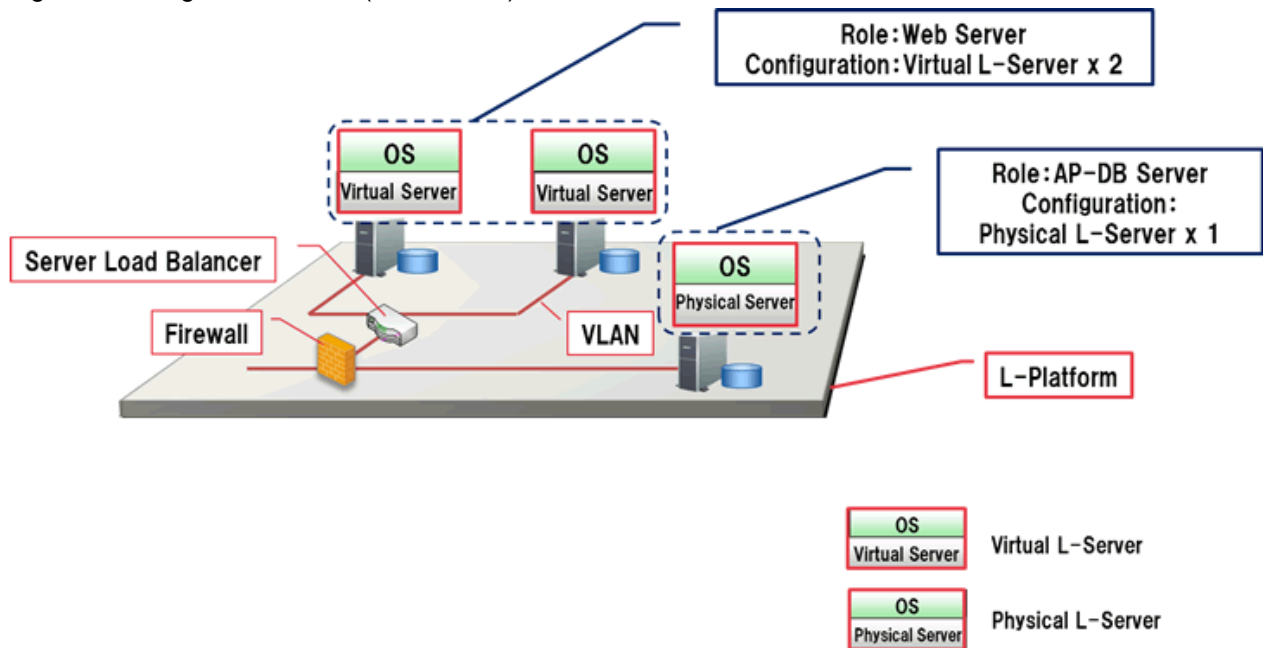
5.4.2 Resource Pool Management

This section explains how to manage resource pools.

A resource is a collective term that refers to the physical resources (hardware) and logical resources (software) from which a system is composed.

For instance, server chassis, VM hosts, storage, network (IP/MAC/WWN) addresses, and cloning images are regarded as resources.

Registering resources in the same resource pool, and allocating them to a logical server (L-Server) when necessary, improves resource utilization.

Figure 5.12 Resource Pool Management
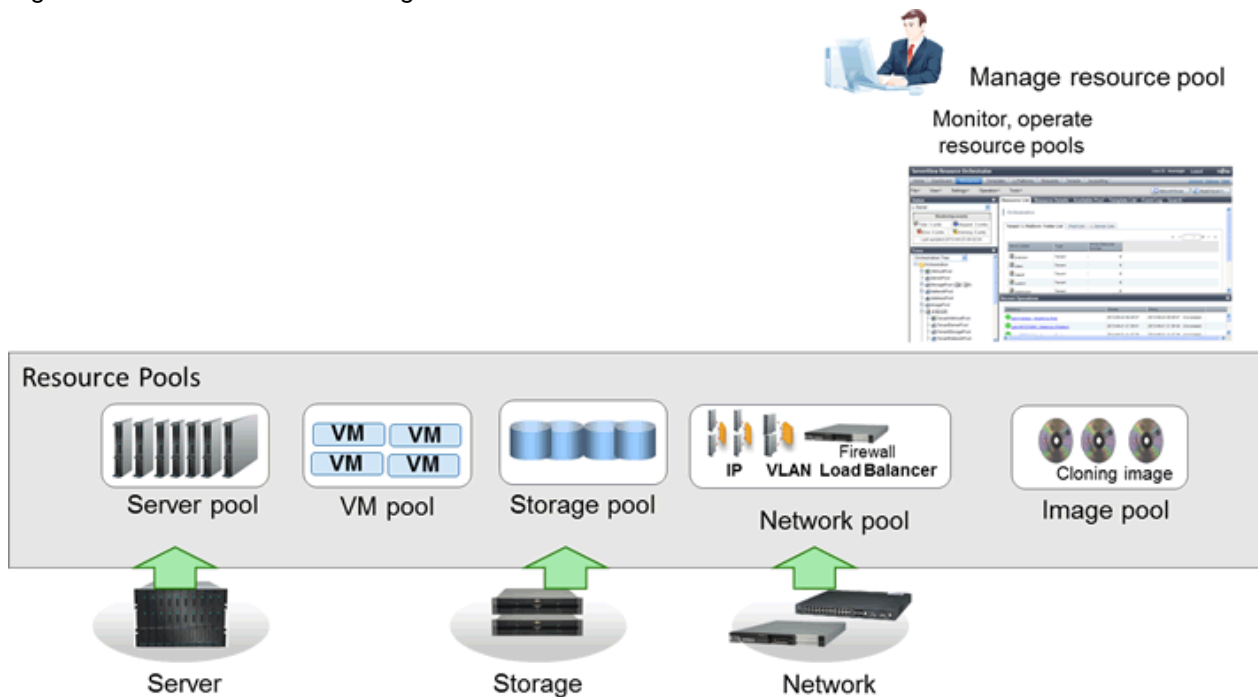
5.4.3 Resource Management in Multi-tenant Environments

This section explains how to manage resources in multi-tenant environments.

Tenants

In Resource Orchestrator, the unit for division of management and operation of resources based on organizations or operations is called a tenant.

When sharing a system in a group of companies, a company which belongs to one of those companies can be recognized as a tenant, or a user department in the company can be recognized as a tenant.

The workload of resource integration or the provision department can be reduced by dividing and managing tenants by each user department.

Resource Pools Which can be Used in Tenants

The management units of resource pools are the two types given below:

- Global Pool

    A resource pool storing resources which can be used by multiple tenants.

Figure 5.13 Global Pool
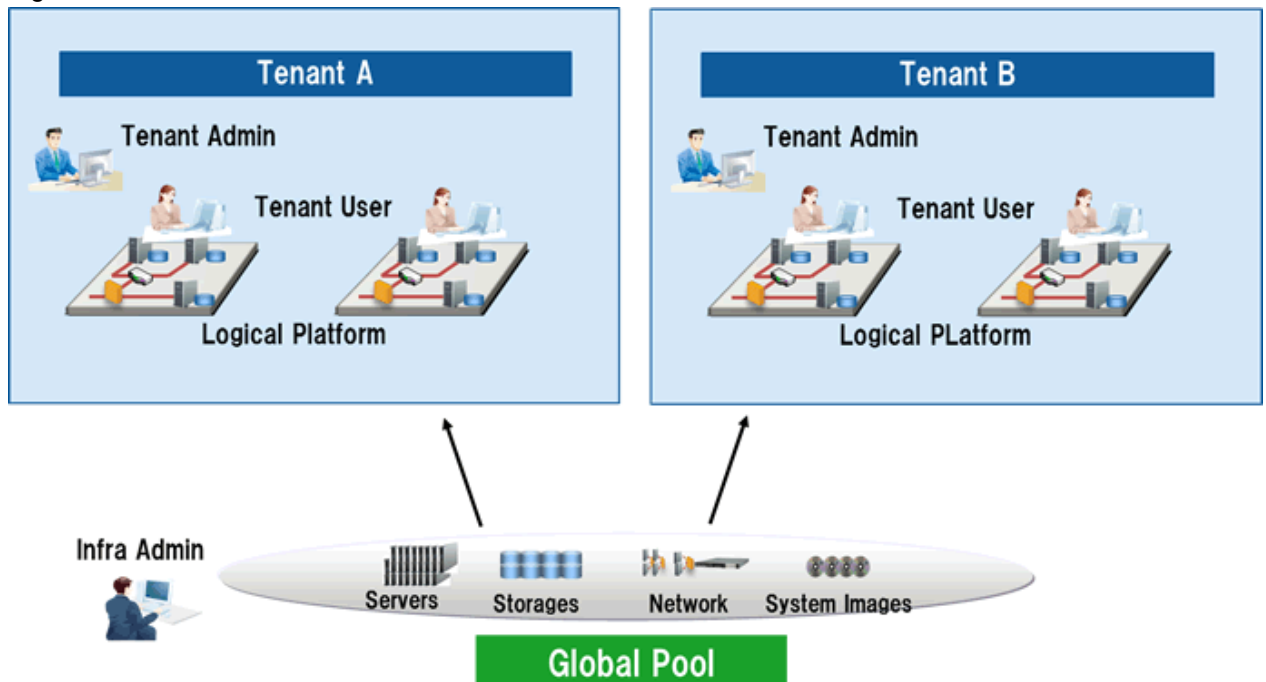
- Local Pool

    A resource pool storing resources which can be used only by a specific tenant.

Figure 5.14 Local Pool
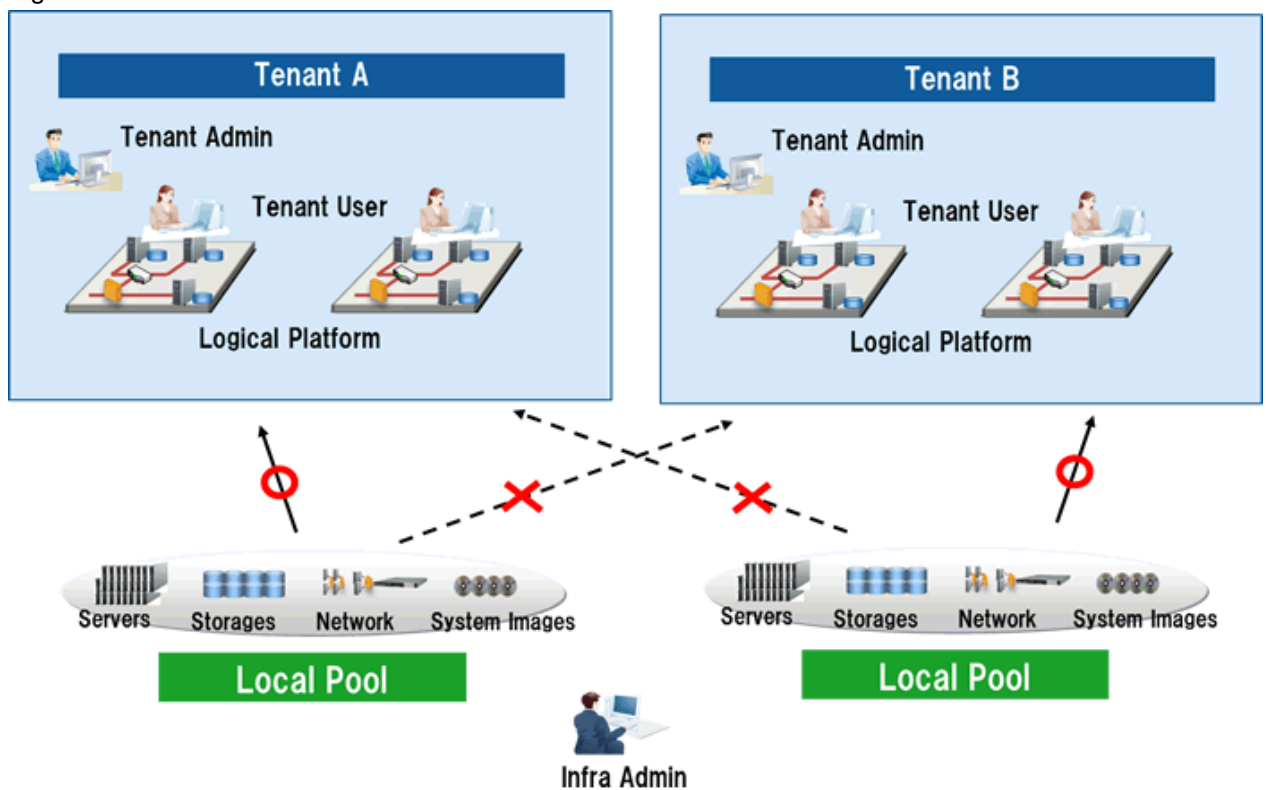
The access scopes of resource pool management units can be changed according to the use of the unit.

Table 5.2 Resource Pool Management Unit

Resource Pool Management Unit	Administrator	User
Global pools	Infrastructure administrator	All tenant users
Local pools	Tenant administrator	Users within a tenant

Advisory Notes for Tenant Operations

There must be at least one tenant administrator in a tenant, and the tenant administrator manages tenant users.

The resources in other tenants cannot be referred to.

Configuration Example of Multi-tenant Environments

The following figure shows a multi-tenant environment.

Figure 5.15 Configuration Example of Multi-tenant Environments
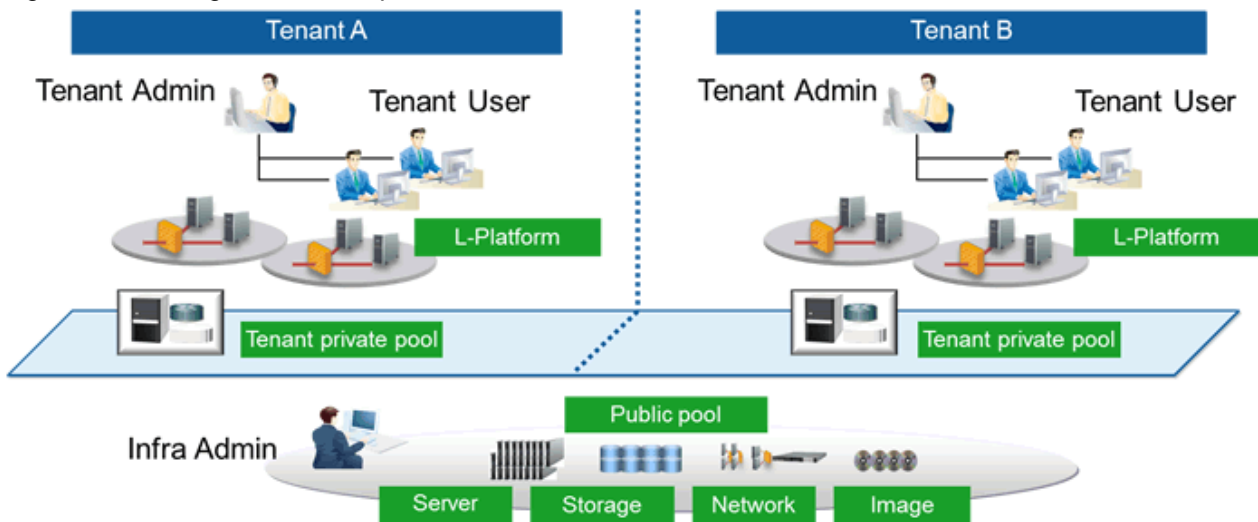
5.4.4 Standardization of Logical Platforms (L-Platform)

This section explains the standardization of logical platforms (L-Platforms).

Resource Orchestrator provides logical platforms (L-Platforms) for the entire infrastructure or for each tenant.

This realizes effective operation through use of a template (standardization) of the user department work format.

The following types of templates are provided by Resource Orchestrator:

- L-Platform Templates

    Templates that contain the specifications for servers, storage, network devices, and images that are configured for a logical platform (L-Platform).

    Refer to "5.4.5 L-Platform Template Creation and Publication".

- L-Server Templates

    Templates that define the number of CPUs, memory capacity, disk capacity, and other specifications for resources to deploy to a logical server (L-Server).

- Ruleset Definitions

    A collective rule combining script lists for configuring network devices such as firewalls or server load balancers, depending on the type of network device, the aim, and the usage.

5.4.5　L-Platform Template Creation and Publication

L-Platform templates define the specifications for L-Platforms, consisting of: software information (operating system used), image information (configuration of cloning images), segment information (configuration of network resources), and template information (configuration of the L-Platform).

Using L-Platform templates enables the standardization of L-Platform specifications and the easy creation of L-Platforms.

Windows are used to create and publish L-Platform templates. Server make-up and allocated resources (firewalls and server load balancers, for example) are specified in the L-Platform template.

There are two types of L-Platform templates: tenant-specific templates (used by specific tenants), and global templates (shared by all tenants).

When L-Platform templates are published, they can be referenced from the service portal (ROR Console) and used to create L-Platforms.

Figure 5.16 L-Platform Template Creation and Publication
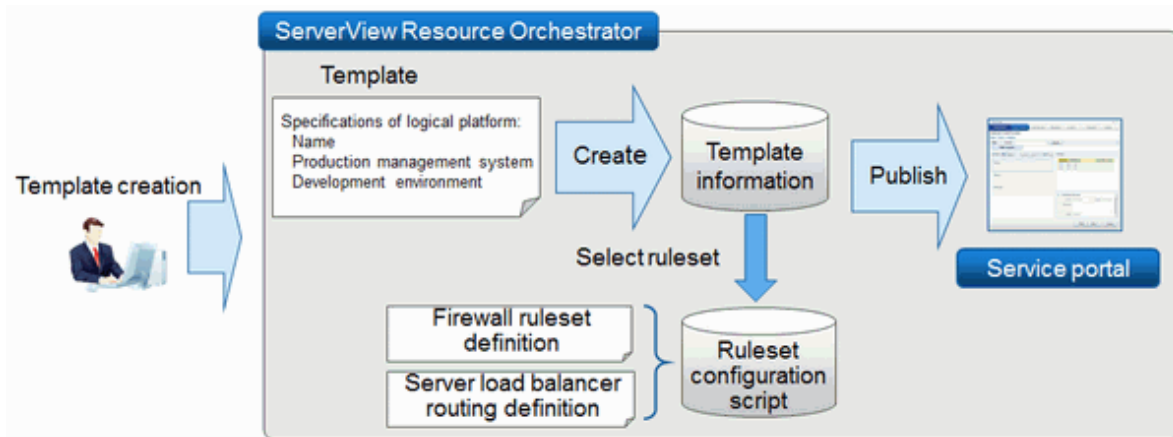
Use the Template tab in the ROR console to create L-Platform templates using the GUI.
Create the information for these in the **Startup** window of the **Template** tab.
The following is an example of such a GUI:

Figure 5.17 Example of a GUI for creating an L-Platform template
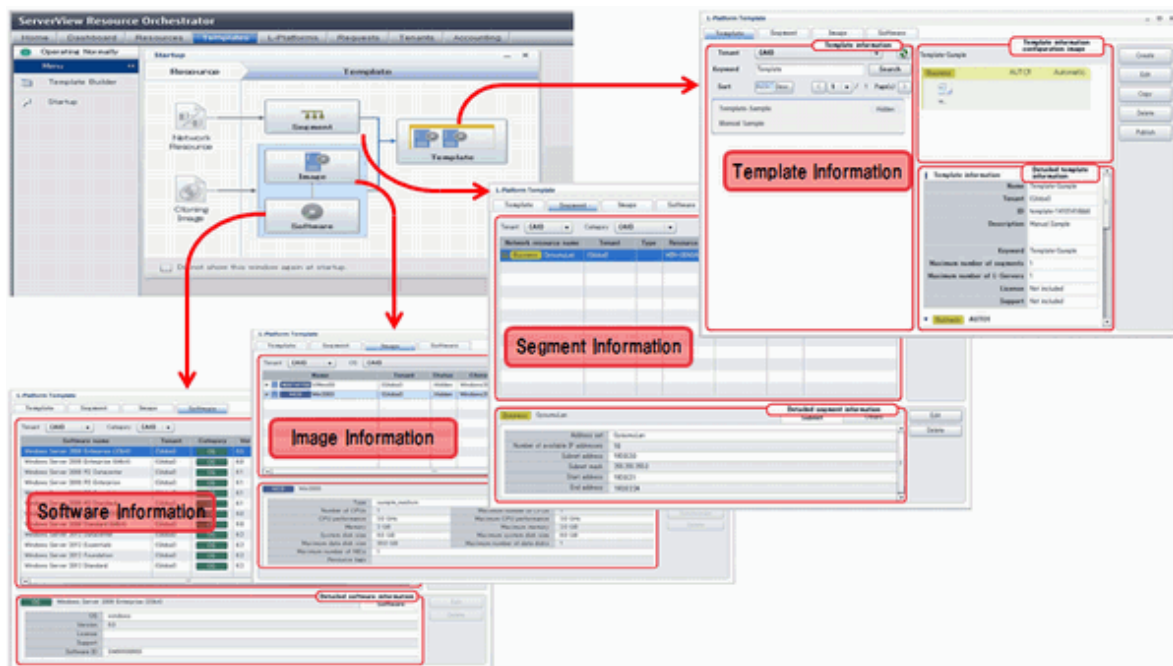
5.4.6 Subscription

It is possible to perform batch deployment of multi-level systems that include firewalls and server load balancers by selecting L-Platform templates.

You can customize resources such as CPU and memory in the L-Platform template for deployment.

Figure 5.18 Subscription
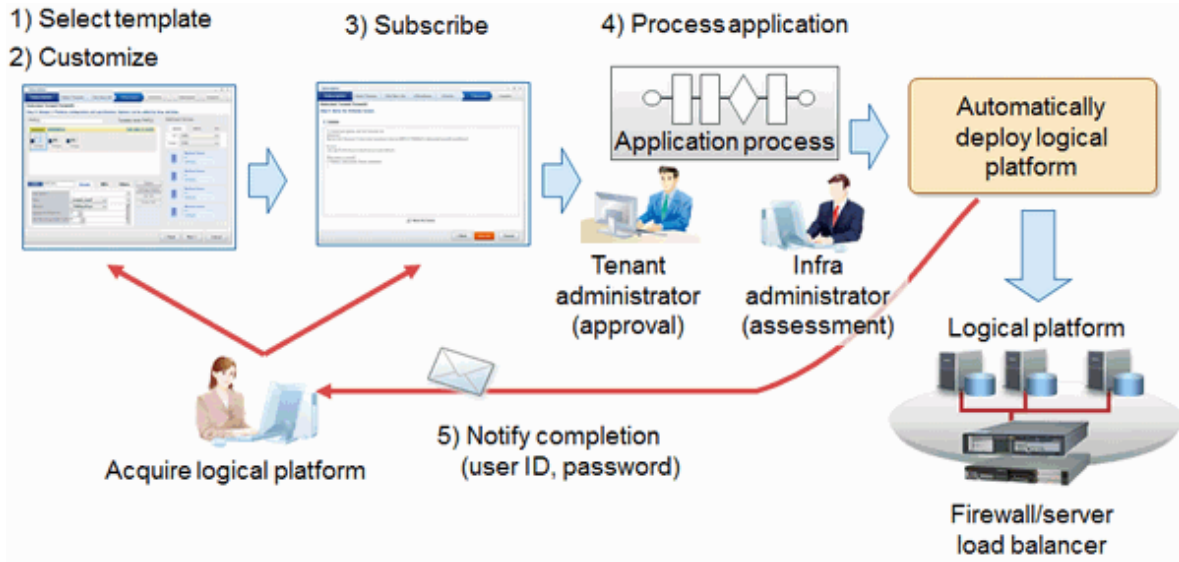
5.4.7 Approval and Assessment

The subscription of logical platforms (L-Platforms), changes to reconfiguration, and cancellations are checked in two stages, by the tenant administrator (approval) and the infra administrator (assessment). At the approval stage the application can be either approved or rejected, and at the assessment stage the application can be either accepted or dismissed.

The following outlines the application process:

Figure 5.19 Approval and Assessment
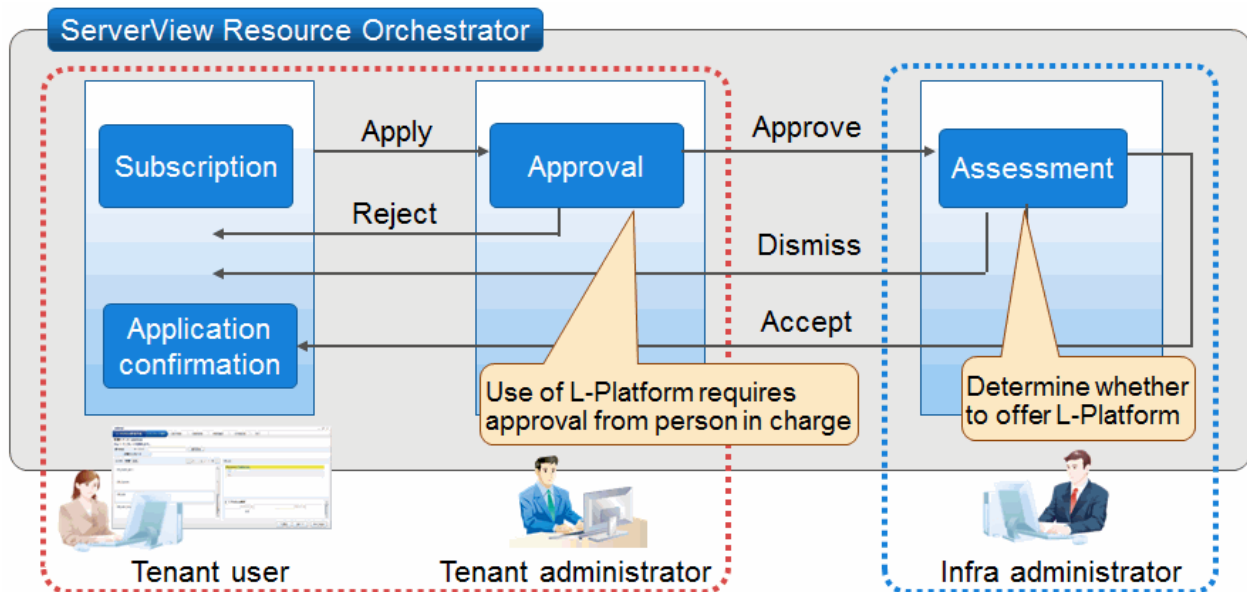
5.4.8 Automatic Network Configuration

In Resource Orchestrator, the settings of network devices to manage can be configured automatically.

In Resource Orchestrator, the settings for the following network devices are configured automatically.

- L2 switches

- Virtual switches

- LAN switch blades

- Firewalls

- Server load balancers

- Ethernet fabric switches

5.4.8.1 Automatic VLAN Network Configuration when Connecting with Virtual Servers

Networks using the VLANs can be created automatically between the network devices and virtual servers deployed on the logical platform (L-Platform).

When creating a virtual server, it can be connected to the VLAN network automatically.

Figure 5.20 Automatic VLAN Network Configuration for Connection with Virtual Servers
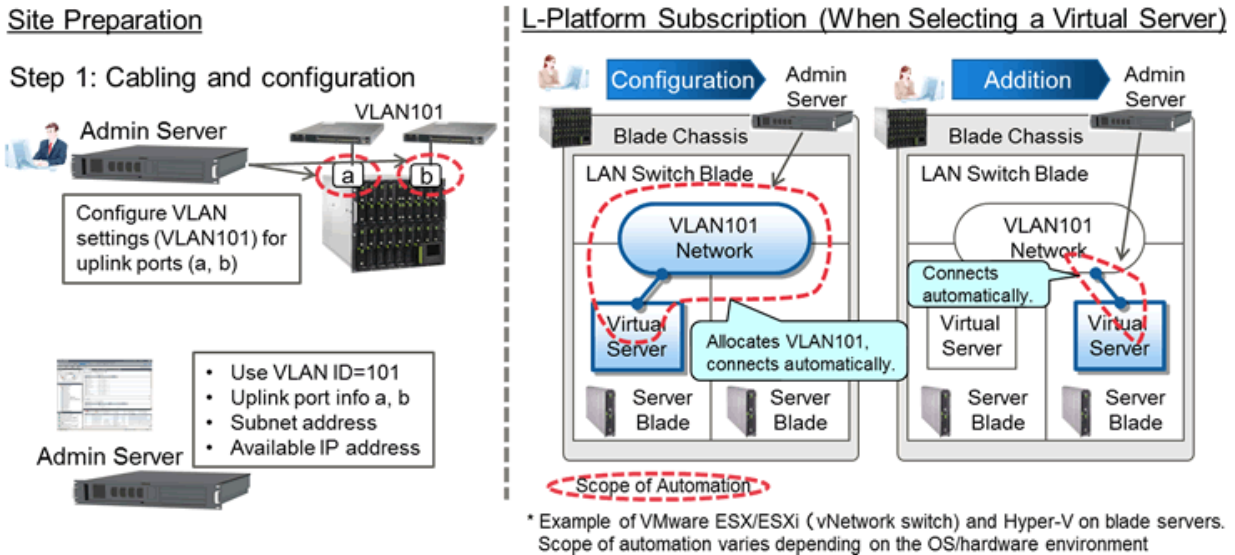
5.4.8.2 Auto-configuration of Network Devices

The definitions for the network devices (firewalls, server load balancers, or L2 switches) deployed on logical platforms (L-Platforms) as resources can be configured automatically using the scripts provided by the infrastructure administrator in advance.

- When creating or deleting network resources

  Add or delete VLANs of L2 switches.

- When creating, modifying, or deleting logical platforms (L-Platforms)

  Add, modify, or delete definitions of deployed firewalls or server load balancers.

When configuration fails, recovery processes such as deletion of uncompleted settings can be performed, by preparing scripts for recovery.

Figure 5.21 Auto-configuration of Network Devices
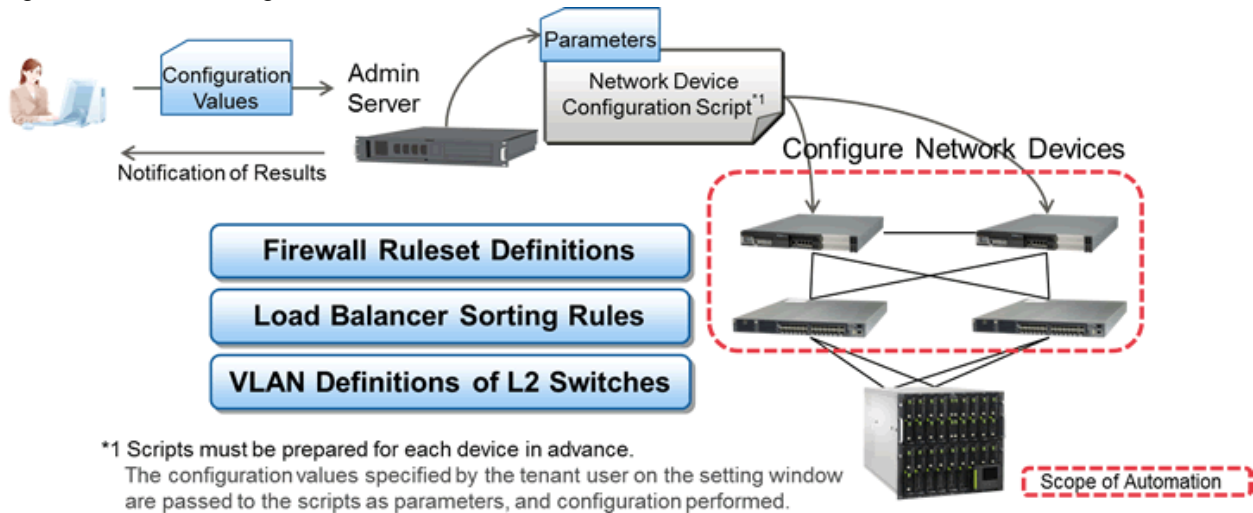
5.4.8.3 Auto-configuration when Migrating Servers

When creating network resources, if using Ethernet Fabric switches as network devices connected to servers, the VLAN port profiles for Ethernet Fabric switches can be created automatically.

By creating the VLAN port profile above, the VLAN settings are automatically migrated to the Ethernet fabric switch connected to the destination server during server migration.

Figure 5.22 Auto-configuration when Migrating Servers
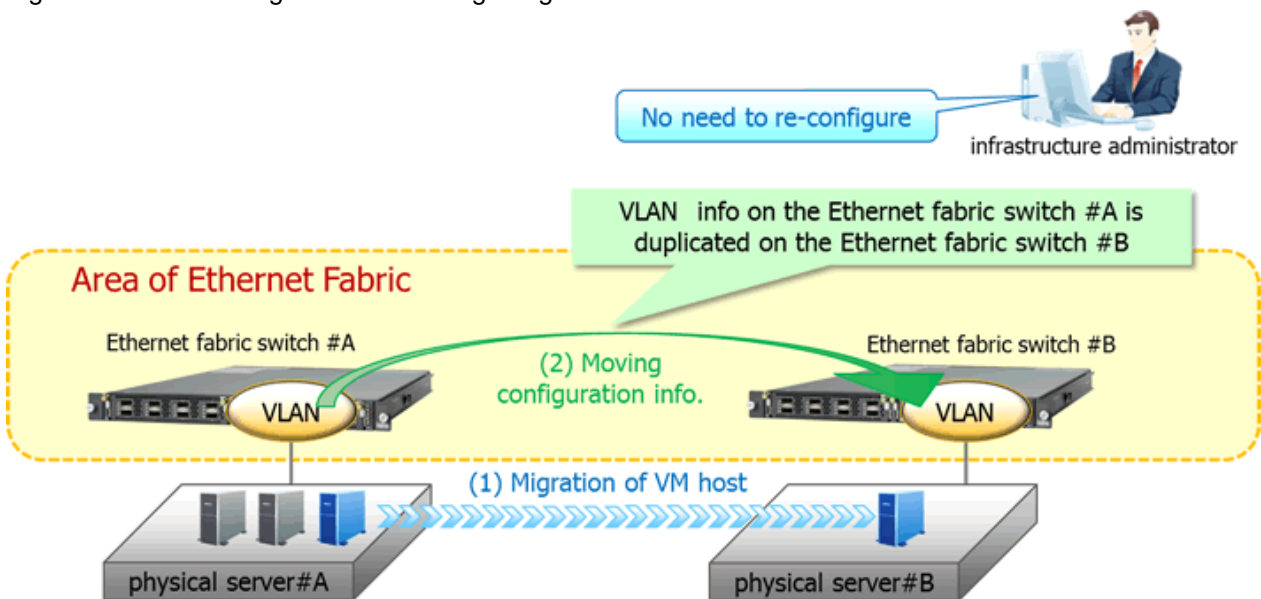
5.4.8.4 Auto-configuration of Virtual Fabrics

When a network device is Converged Fabric, auto-configuration of virtual fabrics can be performed.

This auto-configuration of virtual fabric enables creation of virtual fabrics and modification of virtual fabric settings without stopping operations.

For details on virtual fabrics, refer to "H.1.3 Virtual Fabrics" in the "Design Guide CE".

5.4.9 Reconfiguration

Reconfigure after operation has started due to a user application

Even after deploying a logical platform (L-Platform), you can change the configuration of the system and the amount of resources (number of CPUs, memory capacity, etc.).

This means that you can deal with an increase in load in a particular department by enhancing the specifications of the system.
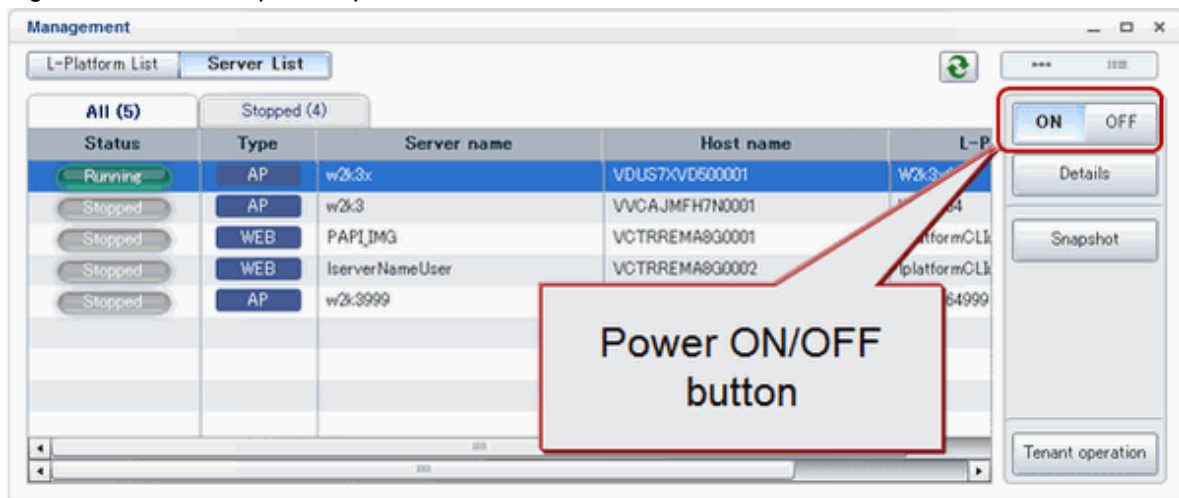
Figure 5.23 Reconfiguring after operation has started
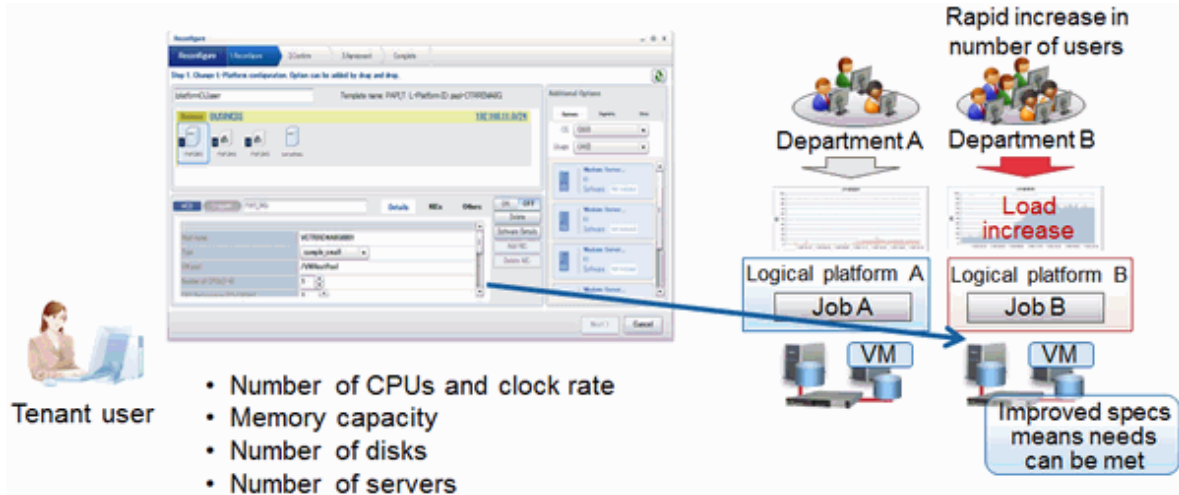
5.4.10 Power Operations and Snapshot

You can turn the power of the logical platforms (L-Platforms) and logical servers (L-Servers) on or off.

Figure 5.24 L-Server power operations

It is also possible to turn the power of all servers in an L-Platform or tenant on or off all at once.

Figure 5.25 Batch power operations within L-Platforms
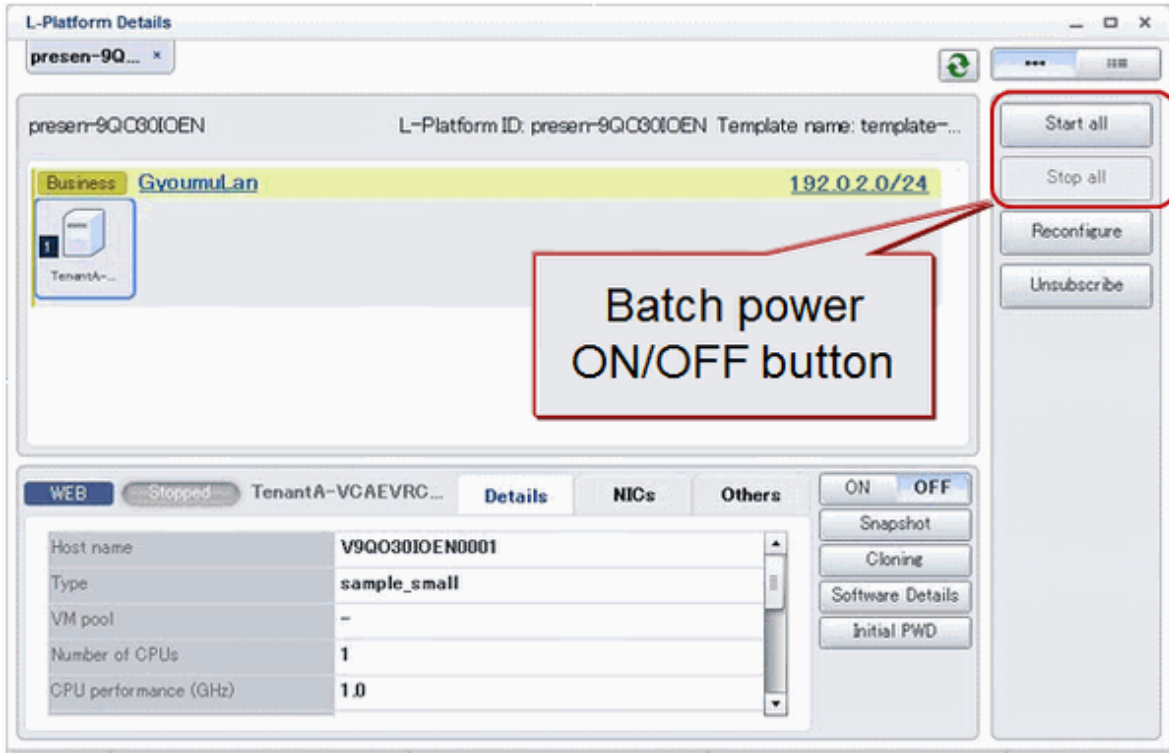
Figure 5.26 Batch power operations within tenants
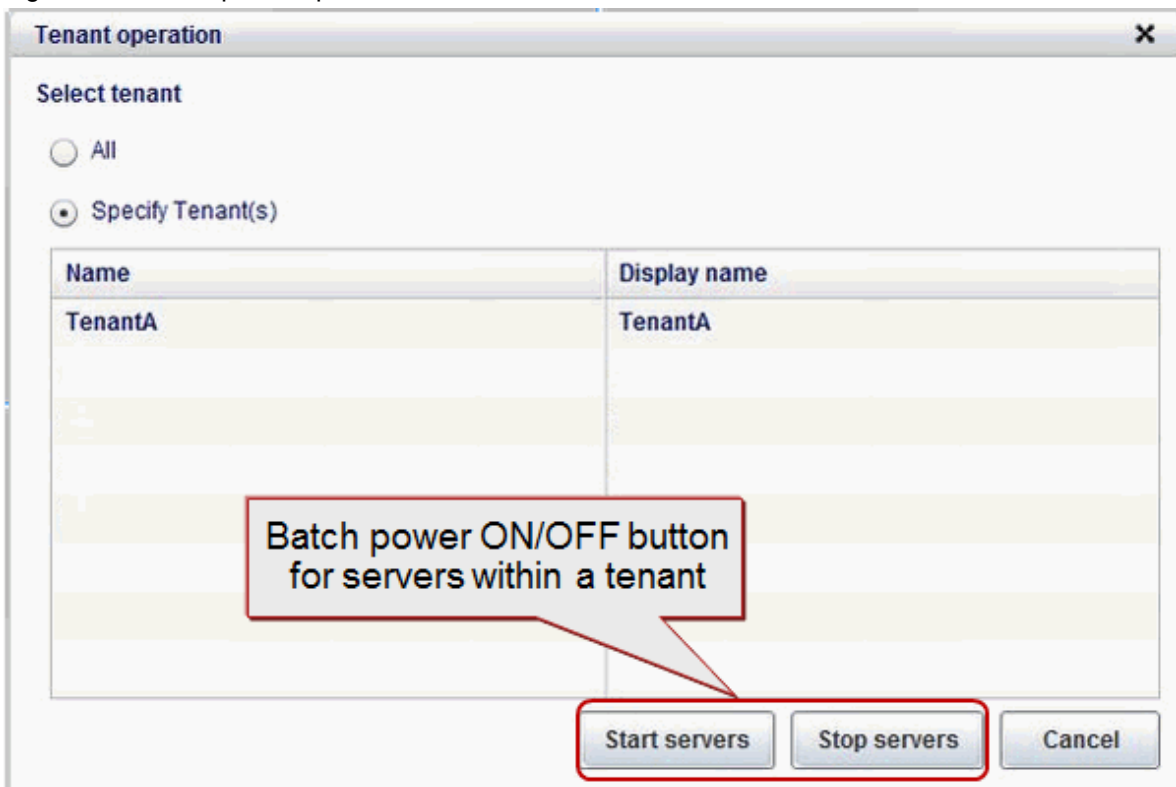
It is also possible to take and restore snapshots. The snapshots and restorations are managed for three generations, and you can easily restore any of the generations.
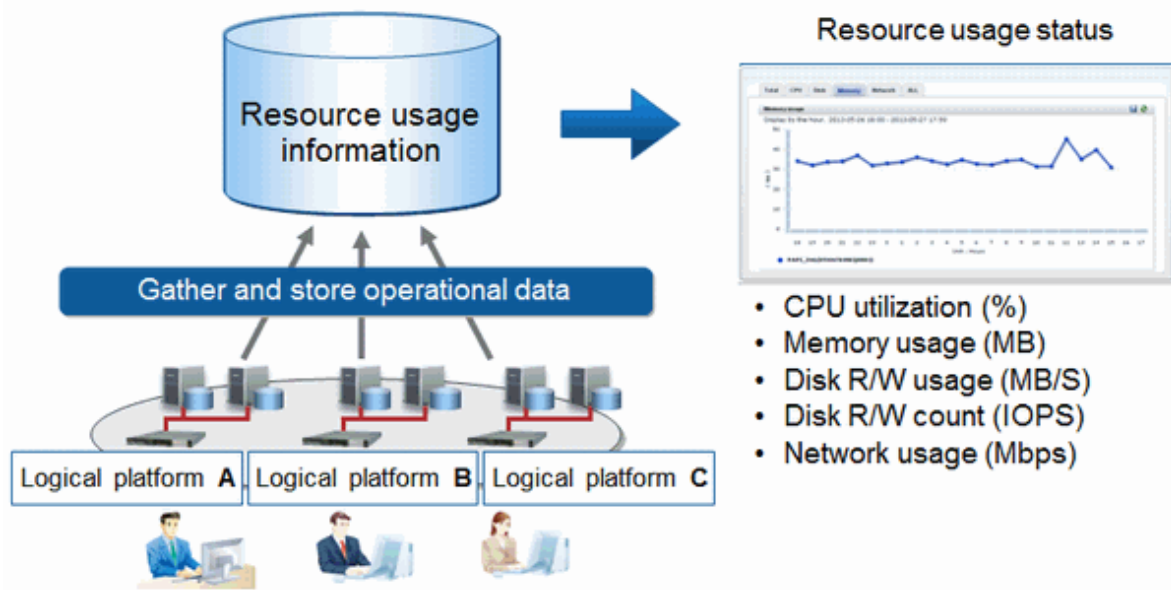
Figure 5.27 Snapshot
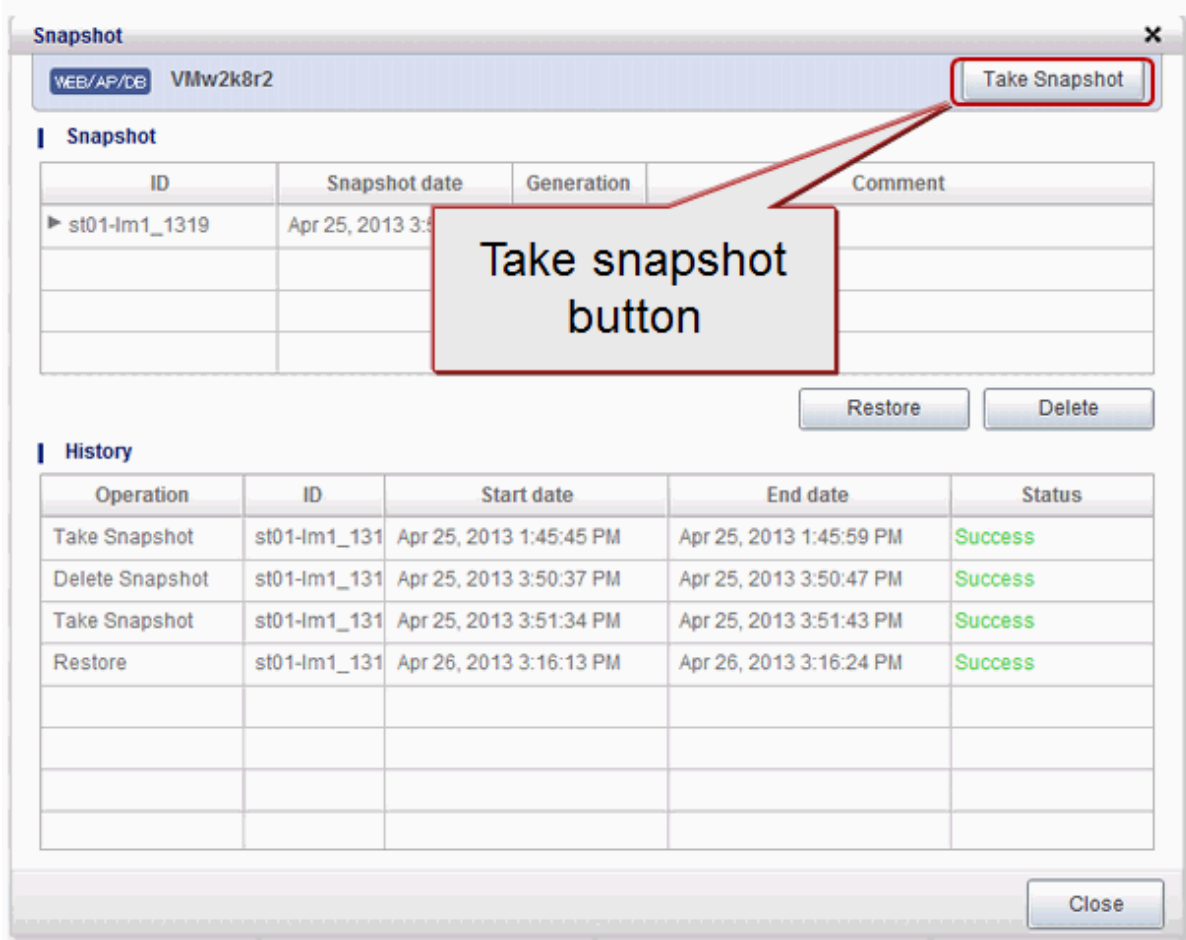
5.4.11 Monitoring the Operation Status of Resources

It is possible for you to understand at a glance the operation status and reconfiguration of a logical platform (L-Platform) and the operation status of the VM hosts.

The items that can be referenced can be limited through user roles.

Figure 5.28 Monitoring the Operation Status of Resources


## 5.4.12 Monitoring Resource Pool Use Rate

Prevention of resource depletion by forecasting resource demand

It is possible to forecast demand by using the past resource usage in a resource pool.

It is possible to quickly discover deficiencies that are usually difficult to forecast using threshold monitoring of the resource pool use rates.

Figure 5.29 Prevention of resource depletion by forecasting resource demand
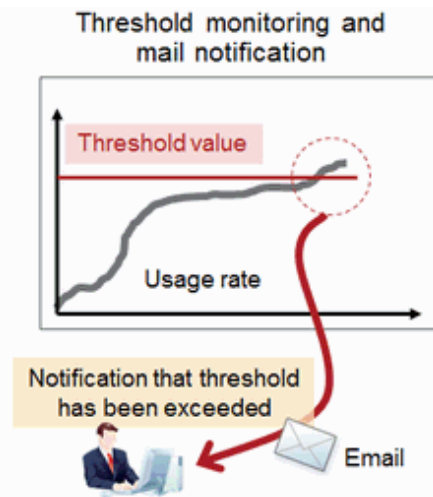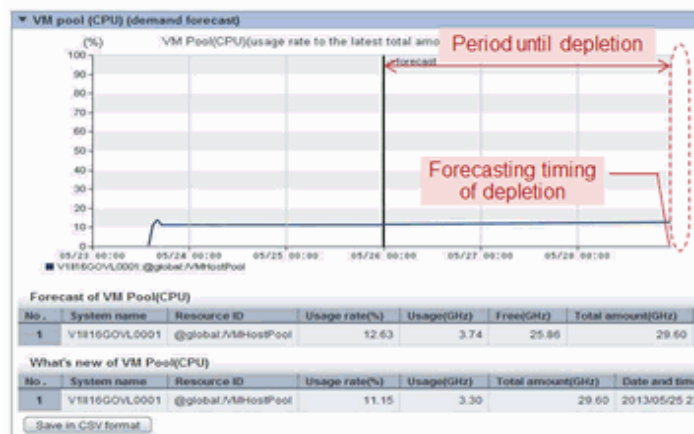
Prevention of resource depletion on VM hosts

Making the usage of resources visible for each VM host means that decisions can be made regarding overloading and underloading.

Use the reallocation simulations to relieve overloading on VM hosts, and understand how to reallocate virtual servers so that load peaks do not overlap.

Figure 5.30 Prevention of resource depletion on VM hosts
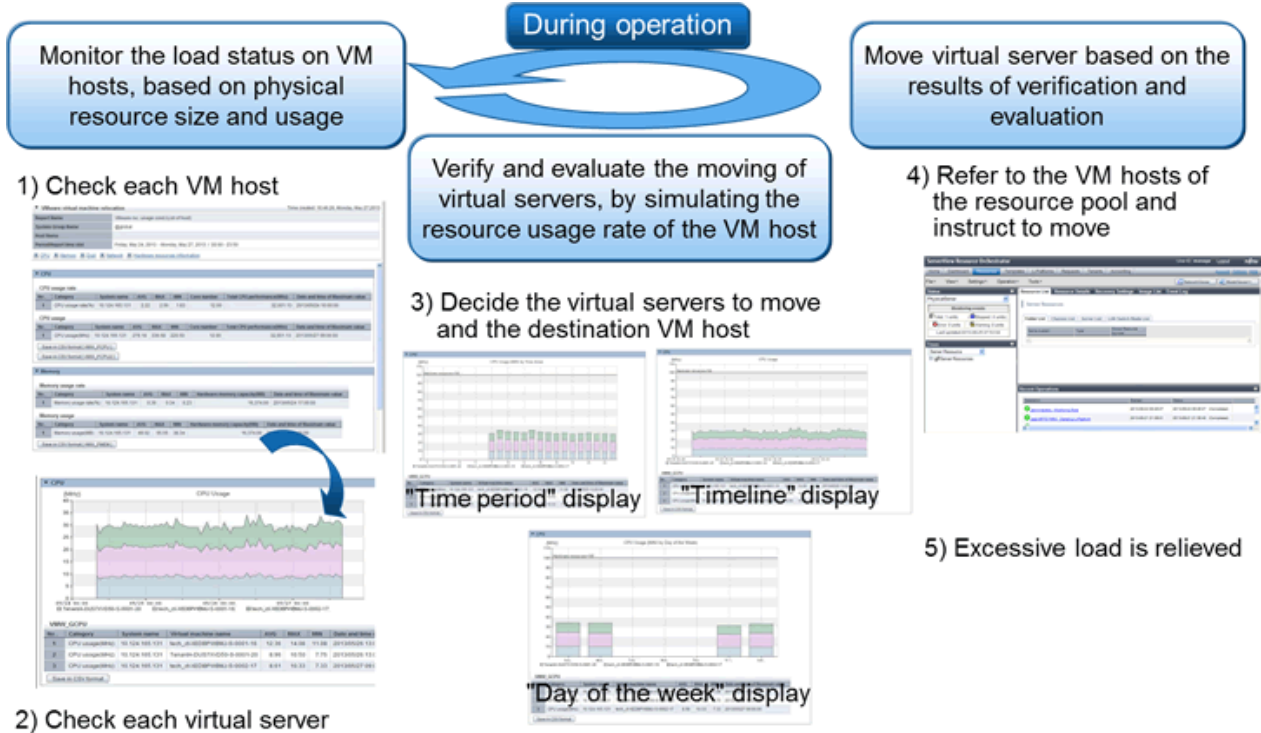
5.4.13 Network Device Monitoring and Operation

In Resource Orchestrator, monitoring of managed network devices is performed as below.

- Alive Monitoring

   Regular checks of whether the network devices of monitoring targets are operating.

- Status Monitoring

   Regular checks of the port statuses of the network devices of monitoring targets.
   The statuses may also be checked when receiving SNMP traps from the network devices of monitoring targets.
   Using this monitoring, status changes due to network device failures can be discovered at early stage.

The following operations for the target network devices are possible using managed servers.

- Opening the web management window

   The web management window provided by the target network device can be started.
   The window of ServerView Fabric Manager can be started for Converged Fabric by registering ServerView Fabric Manager as Converged Fabric management software.

- Backing up and restoration of network device files

   Network device files (network device configuration files or network device environment files) for target network devices can be backed up and restored.
   Network device environments can be easily recovered by restoring backed-up network device files when replacing network devices.

- Switchover of management mode

   By switching the "maintenance mode", it is possible to control whether the devices are regarded as targets of monitoring or auto-configuration.
   By switching the "auto-configuration targets", whether the devices are regarded as the targets of auto-configuration can be controlled.

- Operation

   The following operations can be performed for the server load balancers deployed on the logical platform (L-Platform).

- Displaying load balancing information

- Incorporating and removing load balancing target servers

Figure 5.31 Network Device Monitoring and Operation
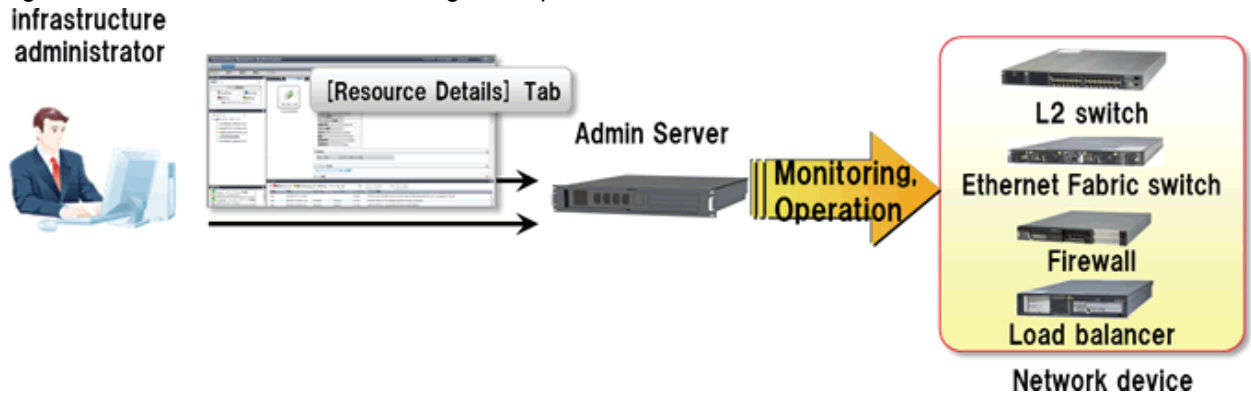
5.4.14 Accounting

Display the usage charges for each logical platform (L-Platform) for each tenant and send the usage charge files as emails.

The estimated charges are displayed when subscribing to the L-Platform, enabling the user to make the subscription with full awareness of cost-benefit performance.

The accounting API enables you to flexibly respond to different requirements for accounting.

Figure 5.32 Accounting
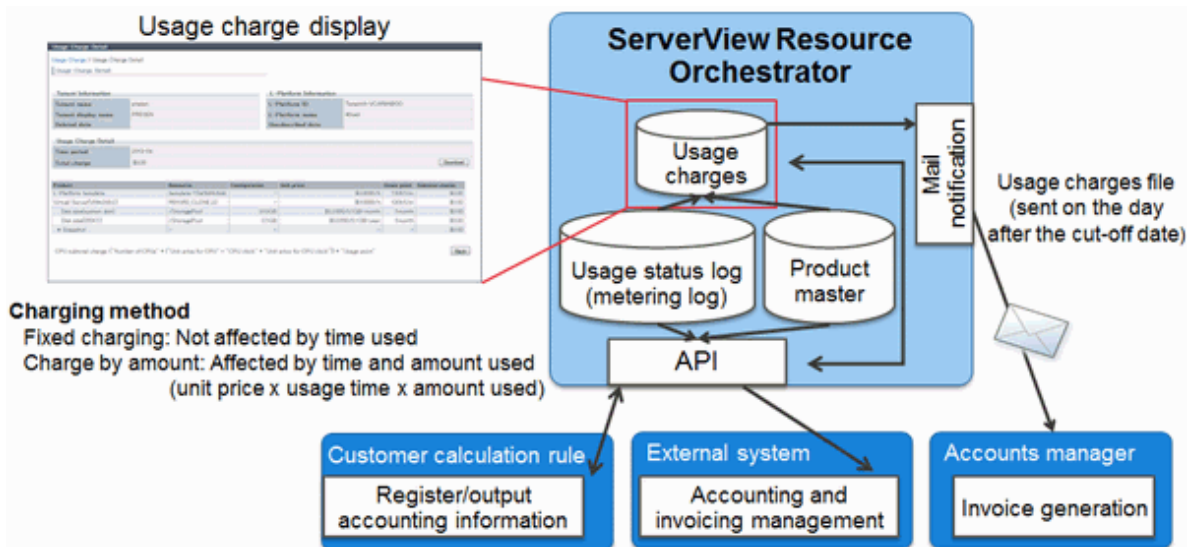
5.4.15 Ensuring Network Security

Even if there are no dedicated firewall devices, security can be ensured for each tenant, each logical platform (L-Platform), or each segment.

NS option is necessary for this function.

NS option provides the following functions for ensuring security.

- Access Control Function

  Access between tenants, logical platforms (L-Platforms), or segments can be restricted.

- Address Translation Function

  Servers in the logical platform (L-Platform) can be concealed.

- IPS Anomaly Function

Servers in the logical platform (L-Platform) can be prevented from flood attacks.

Figure 5.33 Deployment of NS Option
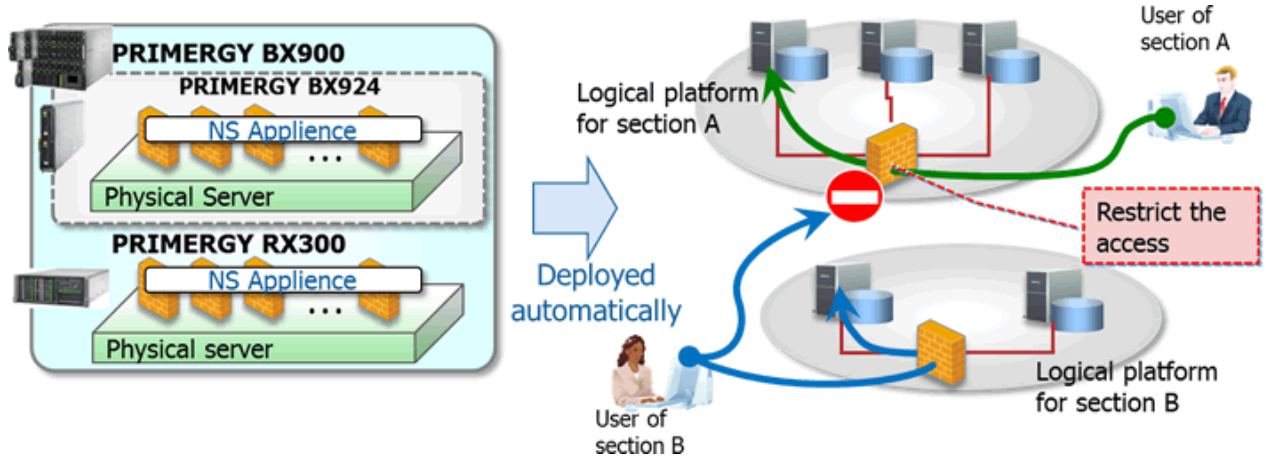
5.4.16 Server Load Leveling by Distributing Access to the Servers in an L-Platform

Even there are no dedicated server load balancer units, this function performs load leveling for individual servers by distributing access to multiple servers (L-Servers) on an L-Platform, providing stable response and flexible scalability.

NS option is necessary for this function.

NS option provides the following functions for ensuring stable response from servers (L-Servers).

- Server load balancer function

  - Server distribution method

    Server (L-Server) distribution using round robin or an algorithm with a simple minimum connection number can be performed.

  - Server failure monitoring

    Failure monitoring of servers (L-Servers) can be performed using PING monitoring, service monitoring, or HTTP application monitoring.

  - Web acceleration

    The load on the web server (L-Server) can be reduced, and the number of TCP connection establishment processes for each access from the client can be kept low by establishing the TCP connection between an NS appliance and the web server.

  - Session maintenance (guarantee of uniqueness)

    It is possible to transfer a series of packets (transaction) for a certain duration, on a node or connection basis, to the same server as was previously accessed.

  - Access limitation

    Stable operation of the distribution target server (L-Server) can be guaranteed by limiting the amount of access.

  - SSL accelerator

    This function enables load distribution by converting HTTPS to HTTP communication, and improves the high availability of web servers (L-Servers).
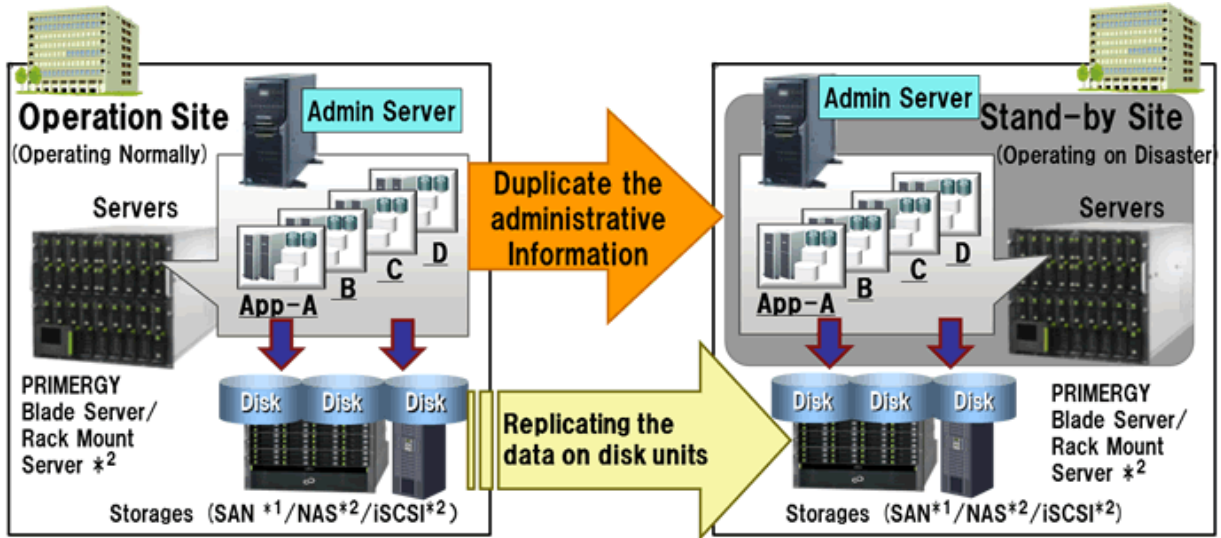
5.4.17 Disaster Recovery of Systems

The contents of disks on the primary site can be copied to a standby site.

Spare resources can be reduced by selecting the recovery targets and sharing the standby sites.

DR option is necessary for this function.

Figure 5.34 Disaster Recovery of Systems

*1: ServerView Virtual-IO Manager is required.
*2: The targets of recovery are virtual machines, and VMware vSphere 5 is one of the targets. As only copying of data (VM areas) is performed, it is necessary to boot VM hosts using built-in disks on the server or USB Flash modules.