FUJITSU

FUJITSU Software Infrastructure Manager V2.5 Infrastructure Manager for PRIMEFLEX V2.5

User's Guide

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Preface

Purpose

This manual describes the installation procedure and the general functions of the following operation and management software. This software manages and operates ICT devices such as servers, storages, and switches, as well as facility devices such as PDUs, in an integrated way.

- FUJITSU Software Infrastructure Manager (hereinafter referred to as "ISM")
- FUJITSU Software Infrastructure Manager for PRIMEFLEX (hereinafter referred to as "ISM for PRIMEFLEX")

Note

"Infrastructure Manager for PRIMEFLEX" is available only in Japan, APAC, and North America.

Product Manuals

Manual Name	Description
FUJITSU Software Infrastructure Manager V2.5 Infrastructure Manager for PRIMEFLEX V2.5 First Step Guide	This manual is for those using this product for the first time. This manual summarizes the procedures for the use of this product, the product system, and licensing. In this manual, it is referred to as "First Step Guide."
FUJITSU Software Infrastructure Manager V2.5 Infrastructure Manager for PRIMEFLEX V2.5 User's Guide	This manual describes the functions of this product, the installation procedure, and procedures for operation. It allows you to quickly grasp all functions and all operations of this product. In this manual, it is referred to as "User's Guide."
FUJITSU Software Infrastructure Manager V2.5 Infrastructure Manager for PRIMEFLEX V2.5 Operating Procedures	This manual describes the installation procedure and usages for the operations of this product. In this manual, it is referred to as "Operating Procedures."
FUJITSU Software Infrastructure Manager V2.5 Infrastructure Manager for PRIMEFLEX V2.5 REST API Reference Manual	This manual describes how to use the required APIs and provides samples and parameter information for using user-created applications that integrate with this product. In this manual, it is referred to as "REST API Reference Manual."
FUJITSU Software Infrastructure Manager V2.5 Infrastructure Manager for PRIMEFLEX V2.5 Messages	This manual describes the messages that are output when using ISM or ISM for PRIMEFLEX and the actions to take for these messages. In this manual, it is referred to as "ISM Messages."
FUJITSU Software Infrastructure Manager for PRIMEFLEX V2.5 Messages	This manual describes the messages that are output when using ISM for PRIMEFLEX and the actions to take for these messages. In this manual, it is referred to as "ISM for PRIMEFLEX Messages."
FUJITSU Software Infrastructure Manager V2.5 Infrastructure Manager for PRIMEFLEX V2.5 Items for Profile Settings (for Profile Management)	This manual describes detailed information for the items set when creating profiles for managed devices. In this manual, it is referred to as "Items for Profile Settings (for Profile Management)."
FUJITSU Software Infrastructure Manager for PRIMEFLEX V2.5 Cluster Creation and Cluster Expansion Parameter List	This manual describes Cluster Definition Parameters that are used for the automatic settings in Cluster Creation and Cluster Expansion when using ISM for PRIMEFLEX.

Manual Name	Description
	In this manual, it is referred to as "ISM for PRIMEFLEX Parameter List."
FUJITSU Software Infrastructure Manager V2.5 Infrastructure Manager for PRIMEFLEX V2.5 Glossary	This document defines the terms that you need to understand in order to use this product. In this manual, it is referred to as "Glossary."
FUJITSU Software Infrastructure Manager V2.5 Infrastructure Manager for PRIMEFLEX V2.5 Plug-in and Management Pack Setup Guide	This manual describes the procedures, from installation to operation as well as precautions and reference information, for the following features of Infrastructure Manager Plug-in. - Infrastructure Manager Plug-in for Microsoft System Center Operations Manager - Infrastructure Manager Plug-in for Microsoft System Center Virtual Machine Manager - Infrastructure Manager Plug-in for VMware vCenter Server - Infrastructure Manager Plug-in for VMware vCenter Server Appliance - Infrastructure Manager Management Pack for VMware vRealize Operations - Infrastructure Manager Plug-in for VMware vRealize Orchestrator In this manual, it is referred to as "ISM Plug-in/MP Setup Guide."

Together with the manuals mentioned above, you can also refer to the latest information about ISM by contacting your local Fujitsu customer service partner.

For the information about managed hardware products, refer to the manuals of the relevant hardware.

For PRIMERGY, refer to "ServerView Suite ServerBooks" or the manual pages for PRIMERGY.

http://manuals.ts.fujitsu.com

Intended Readers

This manual is intended for system administrators, network administrators, facility administrators, and service technicians who have sufficient knowledge of hardware and software.

Notation in this Manual

Notation

Keyboard

Keystrokes that represent nonprintable characters are displayed as key icons such as [Enter] or [F1]. For example, [Enter] means press the key labeled "Enter." [Ctrl]+[B] means hold down the key labeled "Ctrl" or "Control" and then press the B key.

Symbols

Items that require particular attention are indicated by the following symbols.

Point

Describes the content of an important point.

Note

Describes an item that requires your attention.

Variables: <xxx>

Represents variables that require replacement by numerical values or text strings in accordance with your usage environment.

Example: <IP address>

Abbreviation

This document may use the abbreviation for OS as shown in the following examples.

Official name	Abbreviation	
Microsoft(R) Windows Server(R) 2019 Datacenter	Windows Server 2019 Datacenter	Windows Server 2019
Microsoft(R) Windows Server(R) 2019 Standard	Windows Server 2019 Standard	
Microsoft(R) Windows Server(R) 2019 Essentials	Windows Server 2019 Essentials	
Red Hat Enterprise Linux 8.0 (for Intel64)	RHEL 8.0	Red Hat Enterprise Linux Or Linux
SUSE Linux Enterprise Server 15 SP1 (for AMD64 & Intel64)	SUSE 15 SP1(AMD64) SUSE 15 SP1 (Intel64) or SLES 15 SP1 (AMD64) SLES 15 SP1 (Intel64)	SUSE Linux Enterprise Server Or Linux
SUSE Linux Enterprise Server 15 (for AMD64 & Intel64)	SUSE 15(AMD64) SUSE 15(Intel64) or SLES 15(AMD64) SLES 15(Intel64)	
VMware(R) vSphere(TM) ESXi 6.7	VMware ESXi 6.7	VMware ESXi
VMware Virtual SAN	vSAN	
Microsoft Storage Spaces Direct	S2D	

Terms

For the major terms and abbreviations used in this manual, refer to "Glossary."

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Modification History

Edition	Issue Date	Modification Overview	Section	
01	July 2019	First edition	-	-
02	August 2019	Added the product name "PRIMEFLEX for Microsoft Azure Stack HCI"	Related sections throughout the manual	-
03	September 2019 Modification for ISM 2.5.0.010 patch application	Added an article on eLCM	2.4.3 OS Installation Settings	-
		Added an article on the boot mode in the BIOS settings	2.6.2.1 How to update firmware	Required preparations for using Offline Update
			2.6.2.4 Execution of firmware updates	"Note"
		Added an OS type on which the PCI card is mounted	2.6.2.4 Execution of firmware updates	"Note"
		Added an article on the [Display/ Hidden] button and saving the Network Map display settings	2.7.1 Display of Network Connection Information	Table "Switch the Network Map display" Saving the Network Map display settings
		Changed the function name "Firmware Rolling Update" to "Rolling Update"	1.1.9 Overview of ISM for PRIMEFLEX 1.3.4 Operation Requirements for ISM for PRIMEFLEX 2.12 Functions of ISM for PRIMEFLEX 2.12.4 Rolling Update 2.12.4.1 Operation in link with Firmware Management 2.12.4.2 Task list 4.5.2.4 Logs for Rolling Update	-
		Added ESXi patch application to Rolling Update	2.12.4 Rolling Update 2.12.4.1 Operation in link with Firmware Management 2.12.4.2 Task list	-
		Added SAS card firmware application to Rolling Update	2.12.4 Rolling Update 2.12.4.1 Operation in link with Firmware Management 2.12.4.2 Task list	-
		Added an article on Node Disconnection/Reintegration	1.1.9 Overview of ISM for PRIMEFLEX 1.3.4 Operation Requirements for ISM for PRIMEFLEX 2.12 Functions of ISM for PRIMEFLEX	-

Edition	Issue Date	Modification Overview	Section	
			2.12.5 Node Disconnection/ Reintegration 4.5.2.5 Logs for Note Disconnection/ Reintegration	
		Added the port number for use of ISM for Windows	A.2.1 List of Available Port Numbers	Available port numbers for ISM for each target OS
	September 2019 Major reorganization of the manual	Added an article on details for browser settings	2.1.1 GUI	"Point"
		Modified the license registration procedure	3.5.2 Register from the Operating GUI of a Web Browser	-
		Modified the requirements for Cluster Creation and Cluster Expansion	Appendix D Requirements for Cluster Creation and Cluster Expansion	-

Contents

Chapter 1 Overview of Infrastructure Manager (ISM)....1
1.1 Overview of Main Functions....1
1.1.1 Overview of Node Management....1
1.1.2 Overview of Monitoring....1
1.1.3 Overview of Profile Management....1
1.1.4 Overview of Log Management....1
1.1.5 Overview of Firmware Management....2
1.1.6 Overview of Network Management....2
1.1.7 Overview of Virtual Resource Management....2
1.1.8 Overview of Packet Analysis of Virtual Network....3
1.1.9 Overview of ISM for PRIMEFLEX....3
1.2 Configuration....4
1.3 System Requirements....6
1.3.1 Requirements for Hypervisor to Run ISM-VA (Virtual Machines)....6
1.3.2 System Requirements for Management Terminals....6
1.3.3 Service Requirements for ISM Operations....8
1.3.4 Operation Requirements for ISM for PRIMEFLEX....9
1.4 Linking with Other Products....10

Chapter 2 Functions of ISM....12
2.1 User Interface....12
2.1.1 GUI....12
2.1.2 FTP Access....15
2.1.3 Console Access....17
2.1.4 REST API....17
2.2 Node Management....17
2.2.1 Registration of Datacenters/Floors/Racks/Nodes....17
2.2.1.1 Registration of datacenters/floors/racks....18
2.2.1.2 Registration of nodes....18
2.2.1.3 Management of node information....20
2.2.1.4 Management of information on node mounting positions in racks....20
2.2.1.5 Registration of node OS information....21
2.2.1.6 Discovery of nodes....21
2.2.1.7 Adding tags to nodes....28
2.2.2 Confirmation of Datacenters/Floors/Racks/Nodes....29
2.2.3 Editing of Datacenters/Floors/Racks/Nodes....31
2.2.4 Deletion of Datacenters/Floors/Racks/Nodes....32
2.3 Monitoring....33
2.3.1 Setting of Monitoring Items and Threshold Values....33
2.3.2 Monitoring of Network Statistics Information....34
2.3.3 Action Settings....34
2.3.4 Registration of Alarm Settings....38
2.3.5 Graph Display of Monitoring History....41
2.4 Profile Management....41
2.4.1 Profile Usage....42
2.4.2 Profiles and Policies....44
2.4.2.1 Creation of policy groups/policies....45
2.4.2.2 Creation of profile groups/profiles....45
2.4.2.3 Assignment of profiles....46
2.4.2.4 Editing and reassigning profiles....46
2.4.2.5 Releasing and deleting profiles....47
2.4.2.6 Exporting and importing profiles....48
2.4.2.7 Editing/deleting profile groups....49
2.4.2.8 Editing/deleting policy groups....49
2.4.2.9 Specifying behavior when assigning profiles....50

2.4.2.10 Verifying profiles....50
2.4.3 OS Installation Settings....52
2.4.4 Virtual IO Management....54
2.4.5 Pool Management....56
2.4.6 Confirmation of Boot Information....58
2.5 Log Management....58
2.5.1 Types of Collectable Logs....60
2.5.2 Setting Log Retention Periods....62
2.5.3 Setting Log Collection Targets, Dates and Times....62
2.5.4 Operations for Log Collection....64
2.5.5 Searching Node Logs....66
2.5.6 Downloading Node Logs....67
2.5.7 Downloading Archived Logs....68
2.5.8 Deleting Node Logs....69
2.5.9 Deleting Archived Logs....70
2.6 Firmware Management....70
2.6.1 Confirmation of Firmware Versions of Nodes....71
2.6.2 Firmware Updates Using Firmware Data....71
2.6.2.1 How to update firmware....72
2.6.2.2 Behavior during updates....73
2.6.2.3 Execution of a script during updates....74
2.6.2.4 Execution of firmware updates....76
2.6.3 Confirmation of Documentation that is supplied with Firmware Data....78
2.6.4 Firmware Update Using ServerView embedded Lifecycle Management....80
2.6.4.1 Behavior during updates using eLCM....81
2.6.4.2 Execution of a script during updates....81
2.6.4.3 Execution of firmware updates....81
2.6.5 Job Management....82
2.6.6 Firmware Baseline....82
2.6.6.1 Creating Firmware Baseline definitions....83
2.6.6.2 Assigning Firmware Baseline definitions....84
2.6.6.3 Releasing Firmware Baseline definition assignments....84
2.6.6.4 Firmware update using Firmware Baseline definitions....85
2.6.6.5 Editing Firmware Baseline definitions....85
2.6.6.6 Deleting Firmware Baseline definitions....85
2.7 Network Management....86
2.7.1 Display of Network Connection Information....87
2.7.2 Updates of Network Management Information....88
2.7.3 Confirmation of Information on Changes in Network Connections....89
2.7.4 Setting of Reference Information for Changes in Network Connections....90
2.7.5 Display of Network Statistics Information....90
2.7.6 Confirmation of VLAN and Link Aggregation Settings....91
2.7.7 Change of VLAN Settings....92
2.7.8 Change of Link Aggregation Settings....92
2.7.9 Manual Setting of Network Connection Information....93
2.8 Power Capping....93
2.8.1 Adding/Editing Power Capping Setting....94
2.8.2 Enabling/Disabling Power Capping....94
2.9 Virtual Resource Management....95
2.9.1 Supported Virtual Resources....96
2.9.2 GUI for Virtual Resource Management....97
2.9.3 Operation of Virtual Resource Management....97
2.9.3.1 Monitoring of the utilization status of storage pools....98
2.9.3.2 Identification of the errors in storage pools....101
2.9.3.3 Updates of virtual resource information....105
2.10 Backup/Restore Hardware Settings....106
2.10.1 Backup of the File of Backup Hardware Settings....106

2.10.2 Export of the File of Backup Hardware Settings....107
2.10.3 Addition of Profiles from the File of Backup Hardware Settings....107
2.10.4 Addition of Policies from the File of Backup Hardware Settings....108
2.10.5 Import of the File of Backup Hardware Settings....108
2.10.6 Restoration of the File of Backup Hardware Settings....109
2.10.7 Deletion of the File of Backup Hardware Settings....110
2.11 Packet Analysis of Virtual Network....110
2.11.1 Support Targets....110
2.11.2 Check of Analysis VM....111
2.11.3 Display Item of Packet Analysis of Virtual Network....111
2.11.4 Function difference of Packet Analysis of Virtual Network....111
2.11.5 Operation of Packet Analysis of Virtual Network....112
2.11.6 Display Items of Bottleneck Analysis for Virtual Networks....113
2.12 Functions of ISM for PRIMEFLEX....114
2.12.1 Cluster Management....114
2.12.1.1 Cluster Management GUI....115
2.12.1.2 Environments supported by Cluster Management....123
2.12.1.3 Refreshing cluster information....124
2.12.1.4 Management and monitoring of clusters....125
2.12.1.5 Virtual disk monitoring for PRIMEFLEX for Microsoft Storage Spaces Direct/PRIMEFLEX for Microsoft Azure Stack HCI....127
2.12.2 Cluster Creation....128
2.12.2.1 Automatic setting item....129
2.12.2.2 Link with Profile Management....132
2.12.2.3 Cluster Definition Parameters....133
2.12.2.4 Task list....133
2.12.3 Cluster Expansion....134
2.12.3.1 Automatic setting item....135
2.12.3.2 Link with Profile Management....138
2.12.3.3 Cluster Definition Parameters....139
2.12.3.4 Task list....139
2.12.4 Rolling Update....140
2.12.4.1 Operation in link with Firmware Management....142
2.12.4.2 Task list....143
2.12.5 Node Disconnection/Reintegration (ISM 2.5.0.010 or later)....145
2.12.5.1 Task list....146
2.13 Functions of ISM Operating Platform....147
2.13.1 User Management....147
2.13.2 Repository Management....155
2.13.2.1 Storing and deleting firmware data....155
2.13.2.2 Storing and deleting OS installation files....160
2.13.2.3 Storing and deleting ServerView Suite DVD....161
2.13.3 Installation of Emulex OneCommand Manager CLI and QLogic QConvergeConsole CLI....162
2.13.4 Task Management....163
2.13.5 ISM-VA Management....163
2.13.5.1 List of commands in ISM-VA Management....164
2.13.6 Management of Cloud Management Software....167
2.13.6.1 Registering cloud management software....167
2.13.6.2 Retrieving information from cloud management software....168
2.13.6.3 Editing cloud management software....169
2.13.6.4 Deleting cloud management software....170
2.13.7 Shared Directory Management....170
2.13.7.1 Adding shared directories....170
2.13.7.2 Editing shared directories....171
2.13.7.3 Deleting shared directories....171
2.13.7.4 Mounting shared directories....172
2.13.7.5 Unmounting shared directories....172

2.13.8 Link with ISM....173
2.13.8.1 Link display for the status information of other ISM installations....173
2.13.8.2 Certificate management for links to other ISM installations....174
2.13.9 Linking with Other Software....174
2.13.9.1 Preparations in advance for Deep Security link....175
2.13.9.2 Procedure to link with Deep Security....177

Chapter 3 Installation of ISM....179
3.1 Workflow for Installing ISM....179
3.2 Installation Design for ISM....180
3.2.1 Disk Resource Estimation....180
3.2.1.1 Estimation of the required disk space for log storage....182
3.2.1.2 Estimation of the required disk space for repositories....182
3.2.1.3 Estimation of the required disk space for node management data....183
3.2.1.4 Estimation of the required disk space for ISM RAS log....183
3.2.1.5 Estimation of required disk space for maintenance data....183
3.2.1.6 Estimation of required disk space for ISM Backup/Restore....183
3.2.2 Network Design....184
3.2.3 Node Name Setup....184
3.2.4 User Design....185
3.3 Installation of ISM-VA....185
3.3.1 Installation on Microsoft Windows Server Hyper-V....185
3.3.2 Installation on VMware vSphere Hypervisor....185
3.3.3 Installation on KVM....186
3.4 Environment Settings for ISM-VA....187
3.4.1 First Start of ISM-VA....187
3.4.1.1 For ISM-VA running on Microsoft Windows Server Hyper-V (First Time)....188
3.4.1.2 For ISM-VA running on VMware vSphere Hypervisor (First Time)....188
3.4.1.3 For ISM-VA running on KVM (First Time)....191
3.4.2 Initial Setup of ISM-VA....191
3.4.2.1 Initial setup using the Basic Setting Menu....191
3.4.2.2 Initial setup using the ismadm command....192
3.5 Registration of Licenses....195
3.5.1 Procedure to Register from the Console....195
3.5.2 Register from the Operating GUI of a Web Browser....196
3.6 Registration of Users....197
3.7 Allocation of Virtual Disks....197
3.7.1 Allocation of Virtual Disks to Entire ISM-VA....197
3.7.2 Allocation of Virtual Disks to User Groups....198
3.8 Pre-Settings for Virtual Resource Management....199
3.9 Pre-Settings for Cluster Management....199
3.9.1 Pre-Settings for vSAN....199
3.9.2 Pre-settings for Microsoft Storage Spaces Direct/PRIMEFLEX for Microsoft Azure Stack HCI....202
3.9.3 Pre-settings for ISM....203

Chapter 4 Operation of ISM....205
4.1 Start and Stop of ISM....205
4.1.1 Start of ISM-VA....205
4.1.1.1 For ISM-VA running on Microsoft Windows Server Hyper-V (after installation)....205
4.1.1.2 For ISM-VA running on VMware vSphere Hypervisor (after installation)....206
4.1.1.3 For ISM-VA running on KVM (after installation)....209
4.1.2 Stop of ISM-VA....209
4.1.3 Restart of ISM-VA....210
4.1.4 Start and Stop of ISM Service....210
4.2 ISM-VA Basic Settings Menu....211
4.3 Modification of Destination Port Number....213
4.4 Backup and Restoration of ISM-VA....213
4.4.1 Backup/restoration of ISM-VA with the Hypervisor....214

4.4.2 Backup/restoration of ISM with the ISM-VA Management Command....214
4.4.2.1 Backup of ISM....218
4.4.2.2 Restoration of ISM....219
4.4.2.3 Display of backup file list....219
4.5 Collection of Maintenance Data....220
4.5.1 ISM/ISM-VA Maintenance Data....220
4.5.1.1 Switching the ISM RAS Log mode....221
4.5.1.2 Switching the ISM RAS Log level....221
4.5.1.3 Specification of core file collection directory....222
4.5.1.4 How to collect ISM maintenance data....223
4.5.2 ISM for PRIMEFLEX Maintenance Data....223
4.5.2.1 Logs for Cluster Creation....223
4.5.2.2 Logs for Cluster Expansion....223
4.5.2.3 Logs for Cluster Management....224
4.5.2.4 Logs for Rolling Update....224
4.5.2.5 Logs for Node Disconnection/Reintegration (ISM 2.5.0.010 or later)....224
4.6 Management of Virtual Disks....224
4.6.1 Cancellation of Virtual Disk Allocations....224
4.6.2 Allocation of Additional Virtual Disks to Entire ISM-VA....226
4.6.3 Allocation of Additional Virtual Disks to User Groups....226
4.7 Certificate Activation....227
4.7.1 Deployment of SSL Server Certificates....227
4.7.2 Display of SSL Server Certificates....227
4.7.3 Export of SSL Server Certificates....228
4.7.4 Creation of Self-signed SSL Server Certificates....228
4.7.5 Download of CA Certificates....228
4.8 License Settings....228
4.9 Network Settings....229
4.10 Alarm Notification Settings....230
4.11 ISM-VA Service Control....231
4.12 Display of System Information....232
4.13 Modification of Host Names....232
4.14 Operation of Plug-in....233
4.14.1 Application of Plug-in....233
4.14.2 Display of Plug-in....233
4.14.3 Deletion of Plug-in....233
4.15 ISM-VA Internal DHCP Server....234
4.15.1 Settings for ISM-VA Internal DHCP Server....234
4.15.2 Operation of ISM-VA Internal DHCP Service....235
4.15.3 Confirmation of ISM-VA Internal DHCP Server Information....236
4.15.4 Switch of DHCP Servers....236
4.16 MIB File Settings....237
4.17 Application of Patches....237
4.18 Upgrade of ISM-VA....238
4.19 ISM-VA Statistics Information Display....239
4.19.1 Overview of Statistics Information Display....239
4.19.2 Network Statistics Information Display....239
4.19.3 Real Time Information Display....240
4.19.4 Output Statistics Information File....241
4.20 Change of the SSL/TLS Protocol Version....241
4.21 Settings for Links with Other Software....241
4.22 File Upload Using the GUI....242

Chapter 5 Maintenance of Nodes....243
5.1 Maintenance Mode....243
5.2 Investigation of Errors....244

Appendix A Instructions for Manage and Operate Nodes....245

A.1 ISM Environmental Settings....245
A.1.1 DHCP/PXE Settings in Using Profile Management/Firmware Management....245
A.1.2 Pre-settings for Virtual Resource Management....246
A.1.3 ETERNUS DX/AF Drive Enclosure Display....249
A.1.4 Notes on MIB File Import....250
A.2 Details of Managed Nodes Settings....251
A.2.1 List of Available Port Numbers....251
A.2.2 Details of Node Settings....254
A.3 Details of Other Settings for Node Operation....257
A.3.1 General Standards for Firmware Update Time....258
A.3.2 General Standards for Disk Usage in Using Log Management....259

Appendix B Settings for Monitoring Target OS and Cloud Management Software....262
B.1 List of Settings Required per Monitoring Target OS/Could Management Software....262
B.1.1 Required Settings per Monitoring OSes....262
B.1.2 Required Settings per Monitoring Cloud Management Software....262
B.1.3 Precautions When Setting a Monitoring Target OS and Cloud Management Software....263
B.2 Setting Procedure for Monitoring Targets (OS: Windows)....264
B.2.1 Confirmation on Staring WinRM Service....264
B.2.2 Settings for WinRM Service....264
B.2.3 Opening the Firewall Port....267
B.2.4 Execution Policy Change for Windows PowerShell....268
B.2.5 Settings When Using a Domain User Account....268
B.3 Setting Procedure for Monitoring Targets (OS: Red Hat Enterprise Linux)....269
B.3.1 Confirmation on Starting of ssh Service....269
B.3.2 Settings When Using a Domain User Account....270
B.3.3 Settings When Using a General User Account....271
B.3.4 Common Settings for User Accounts....271
B.4 Setting Procedure for Monitoring Targets (OS: SUSE Linux Enterprise Server)....272
B.4.1 Confirmation on Starting of ssh Service....272
B.4.2 Opening the Firewall Port....273
B.4.3 Settings When Using a Domain User Account....276
B.4.4 Settings When Using a General User Account....276
B.4.5 Common Settings for User Accounts....277
B.5 Setting Procedure for Monitoring Targets (OS: VMware ESXi)....277
B.5.1 Settings When Using Domain User Account....277
B.6 Setting Procedure for Monitoring Targets (Cloud Management Software: vCenter Server)....278
B.6.1 Adding DNS Information to ISM-VA....278
B.6.2 Settings When Using Domain User Account....278
B.7 Setting Procedure for Monitoring Targets (Cloud Management Software: Microsoft Failover Cluster)....278
B.7.1 Settings When Using a Domain User Account....278
B.8 Setting Procedure for Monitoring Targets (Cloud Management Software: Microsoft System Center)....279
B.9 Setting Procedure for Monitoring Targets (Cloud Management Software: KVM)....279
B.9.1 Setting Procedure for KVM Red Hat Enterprise Linux (Using Domain User)....279
B.9.2 Setting Procedure for KVM SUSE Linux Enterprise Server (Using Domain User)....285
B.9.3 Settings When Using a General User Account....297
B.10 Setting Procedure for Monitoring Targets (Cloud Management Software: IPCOM)....298
B.10.1 Setting Procedure to Assign Privilege to Execute the Command to Retrieve the Virtual Machine Information....298
B.11 Setting Procedure for Monitoring Targets (Cloud Management Software: OpenStack)....298
B.11.1 Setting Procedure for a Controller Node....298
B.11.2 Settings when using Virtualized Network Analysis....304

Appendix C Uninstallation of ISM-VA....305

Appendix D Requirements for Cluster Creation and Cluster Expansion....308
D.1 Addable Servers....308
D.2 Cluster Creation and Cluster Expansion for ADVM Configurations....308
D.3 Network Configuration....308

D.4 Hardware Requirements....310
D.4.1 Base unit....311
D.4.2 CPU....311
D.4.3 Memory....311
D.4.4 HDD (Capacity)....311
D.4.5 SSD (Cache/Capacity)....312
D.4.6 Onboard LAN (Flexible LOM)....313
D.4.7 SAS Controller Card....313
D.4.8 Option Card (LAN card that is required to be mounted)....313
D.4.9 Options Other Than the Above....313
D.5 Software Requirements....313
D.5.1 Software Version....313
D.5.2 Software Version Check....314
D.5.3 SAS Controller Card Firmware Version Check....314
D.6 Sizing of Management VM....315

Appendix E Troubleshooting....316

Chapter 1 Overview of Infrastructure Manager (ISM)

This chapter describes an overview of the functions and system requirements for Infrastructure Manager and Infrastructure Manager for PRIMEFLEX.

1.1 Overview of Main Functions

This section describes an overview of the ISM functions.

1.1.1 Overview of Node Management

Node Management is a function that executes the following actions.

- Device information management

  Manages device information such as model names, serial numbers, and IP addresses.

- Device registration

  Registers nodes to be managed by ISM.

With this function, you can discover and register the nodes that are connected to your network, making your node registration work more efficient. In addition, you can manage rack locations on datacenter floors, node positions within racks, as well as configurations and current statuses of nodes. By using the function of visualizing the nodes in the racks (Rack View) or location on the floors (Floor View), you can execute Node Management intuitively.

For details on Node Management, refer to "2.2 Node Management."

1.1.2 Overview of Monitoring

Monitoring is a function you can use to monitor for the following events.

- SNMP Traps sent from nodes
- Changes in the "Normal" and "Error" statuses indicated by nodes
- Whether the values for Air Inlet Temperature, CPU Usage, and Power Consumption obtained from each node are within the normal ranges you have set in ISM

For these events, you can set actions such as executing a user-created script or sending a mail. You can also monitor nodes according to each user's operating procedure.

For details on Monitoring, refer to "2.3 Monitoring."

1.1.3 Overview of Profile Management

Profile Management is a function that creates, stores, and assigns profiles which are the setting information for the managed nodes.

- Execute hardware settings for the managed nodes
- Install OS on the managed nodes (servers)
- Execute assignment of virtual MAC address/virtual WWN and boot settings to managed nodes (servers)
- Creates RAID/Hot spare on managed nodes (storages)

Profile Management realizes batched processing of multiple managed nodes settings and makes it easy to execute settings to the new managed nodes.

For details on Profile Management, refer to "2.4 Profile Management."

1.1.4 Overview of Log Management

Log Management is a function that operates log collection of various kinds of logs (Hardware logs, Operating System logs, and ServerView Suite logs) for multiple managed nodes together and executes integrated management of collected logs.

- Automate collection of various kinds of logs
- Automate log management by setting their retention period/generation
- Increase efficiency of error investigation by detecting conditions of messages included in logs

You can operate error monitoring/investigation for the managed nodes effectively by using Log Management.

For details on Log Management, refer to "2.5 Log Management."

1.1.5 Overview of Firmware Management

Firmware Management is a function that operates firmware updates for multiple managed nodes together and manages versions of the firmware in an integrated manner.

- Automate firmware updates
- Integrate management of the firmware version of the managed nodes

Firmware Management can decrease your time and efforts for the maintenance of managed nodes.

For details on Firmware Management, refer to "2.6 Firmware Management."

1.1.6 Overview of Network Management

Network Management is a function that manages the status of physical connection between managed nodes and the status of virtual connection between virtual machines, virtual switches, and virtual routers.

Network Map that displays wiring of the network and its connection status enables the following operations.

- Grasp the extent of the impact of the network error visually
- Monitor change of the network connection status
- Grasp network performance (traffic) by using a graph
- Change the network switch settings (VLAN settings, link aggregation settings) easily

Network Management helps you monitor and investigate network errors between managed nodes.

For details on Network Management, refer to "2.7 Network Management."

1.1.7 Overview of Virtual Resource Management

Virtual resources means a virtual storage (storage pool) configured with multiple storages.

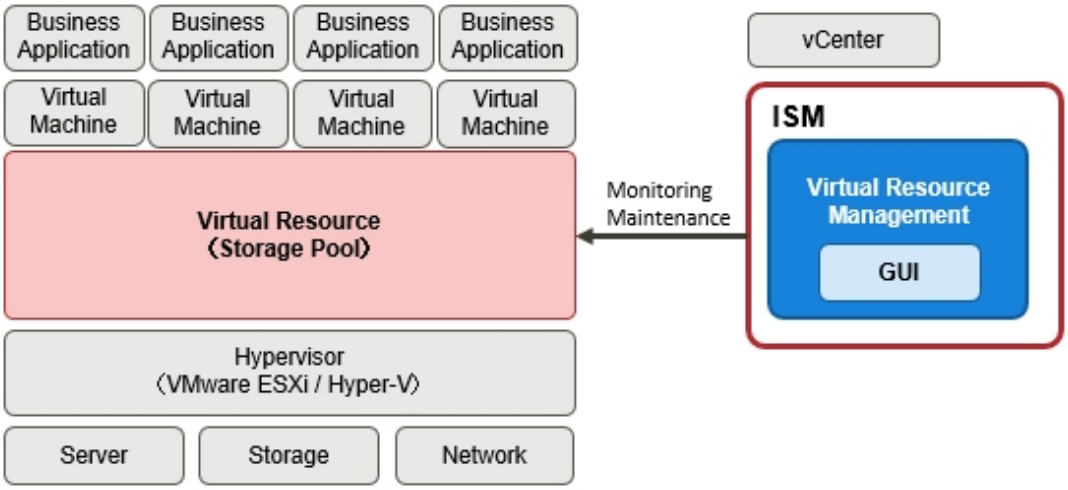
Virtual Resource Management is a function that manages storage pools by displaying status and usage rate of the storage pools.

- Monitor the usage and status of the storage pool in connection with the status of the configuring hardware devices (nodes)
- Enable smooth maintenance operation by an integrated management of storage pools on the display
- Supports re-deployment and addition (provisioning) of resources by an integrated management of storage pools to visualize the usage rate of resources and predicting the timing for additions

Virtual Resource Management supports your monitoring of errors and maintenance operation by making it easy to check relations of managed nodes and resource pools.

For details on Virtual Resource Management, refer to "2.9 Virtual Resource Management."

Figure 1.1 Overview of Virtual Resource Management



1.1.8 Overview of Packet Analysis of Virtual Network

Packet Analysis of Virtual Network is a function that displays the trends of the traffic volume and the status of the traffic quality by port, by network, or by host based on the collected packet information.

- Grasping the traffic status visually
- Support for the identification of the causes for degradations in performance

Packet Analysis of Virtual Network helps you grasp network trends and identify any trouble smoothly by yourselves.

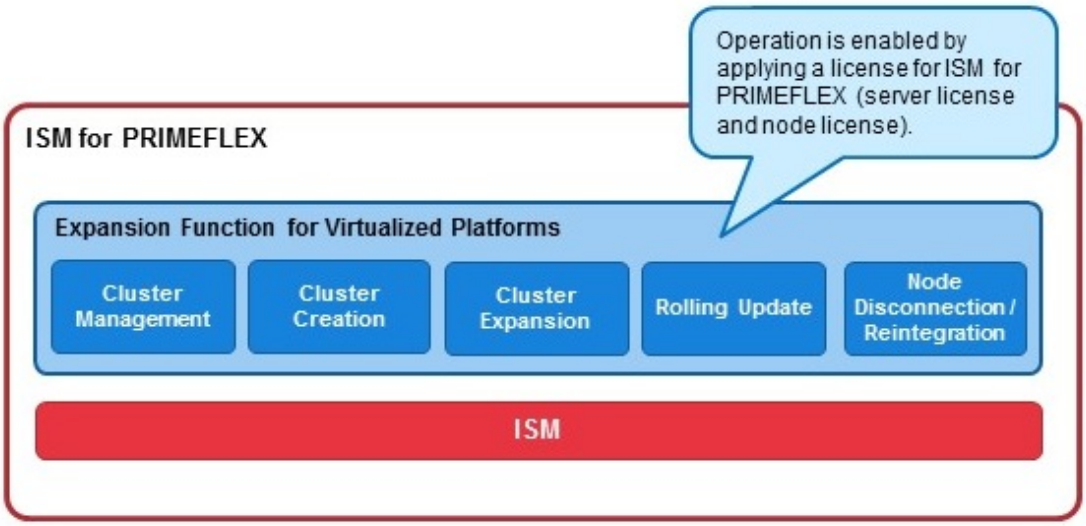
For details on Packet Analysis of Virtual Network, refer to "2.11 Packet Analysis of Virtual Network."

1.1.9 Overview of ISM for PRIMEFLEX

ISM for PRIMEFLEX provides the Virtualized Platform Expansion function in addition to the ISM functions.

ISM for PRIMEFLEX is infrastructure management software that is installed in FUJITSU Integrated System PRIMEFLEX HS, PRIMEFLEX for VMware vSAN, PRIMEFLEX for Microsoft Storage Spaces Direct, and PRIMEFLEX for Microsoft Azure Stack HCI.

Figure 1.2 Overview of ISM for PRIMEFLEX



The following is an overview of the Virtualized Platform Expansion function provided by ISM for PRIMEFLEX.

Virtualized Platform Expansion function	Overview of Function
Cluster Management	Displays the cluster information and various types of information for the related physical resources and virtual resources.
Cluster Creation	Automates the operation of creating second and later clusters, which differ from the existing one.
Cluster Expansion	Automates the operation of adding servers to expand a cluster when the cluster resources are being depleted.
Rolling Update [Note 1]	Automates firmware updates and application of ESXi patches (ISM 2.5.0.010 or later) without stopping the operations for a series of servers configuring the virtualized platform.
Node Disconnection/Reintegration (ISM 2.5.0.010 or later)	Automates maintenance tasks that involve restarting servers in a cluster without stopping operations.

[Note 1]: The function name, Firmware Rolling Update has been changed to Rolling Update in ISM 2.5.0.010 or later. If your ISM version is 2.5.0, read "Rolling Update" as "Firmware Rolling Update" when you read the descriptions.

For details on the functions of ISM for PRIMEFLEX, refer to "2.12 Functions of ISM for PRIMEFLEX."

Point

- Cluster Management can manage resources on a cluster basis.
- Cluster Creation can create clusters by using the "Create Cluster" wizard.
- Cluster Expansion can expand clusters by using the "Expand Cluster" wizard.
- Rolling Update can update firmware and apply ESXi patches by using the "Rolling Update" wizard.
- Node Disconnection/Reintegration can disconnect or reintegrate servers in a cluster from the "Node Disconnection" screen or "Node Reintegration" screen.

Note

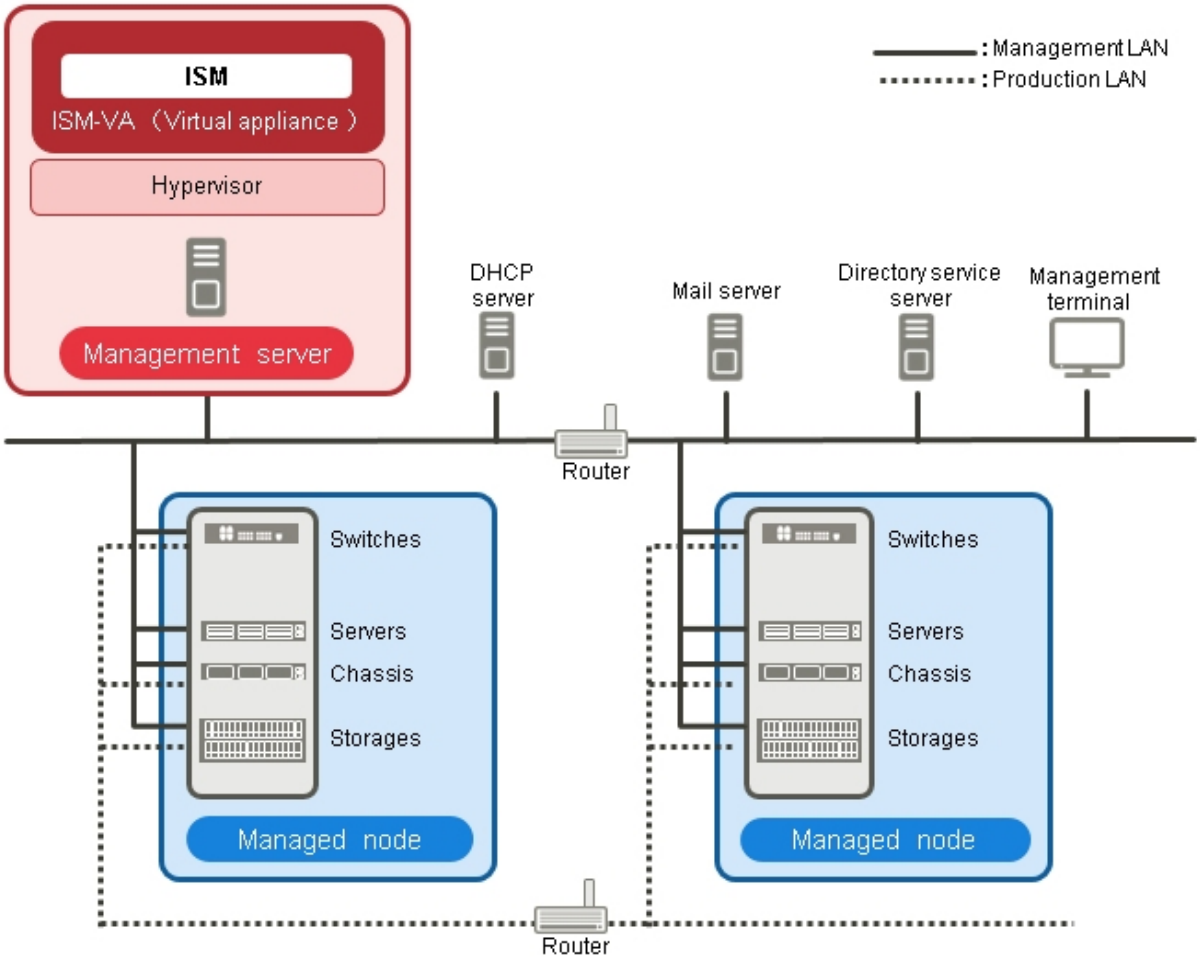
Power Capping cannot be used in ISM for PRIMEFLEX.

1.2 Configuration

In principle, ISM runs on a server that is separate from the servers to be managed. This manual refers to devices that are being managed as "nodes" (or "managed nodes"), and to servers on which ISM is running as "management servers." The management server and nodes are connected via LAN.

You can define only one network interface for ISM. If you are going to configure multiple networks, configure the router to enable communication between the networks.

Figure 1.3 Network configuration



Note

For details on the servers and services shown in "Figure 1.3 Network configuration" that are external to ISM, refer to "1.3.3 Service Requirements for ISM Operations."

Device and function		Description
Network	Management LAN	LAN used for communicating with the managed nodes so ISM can monitor and control these nodes and transfer data. To ensure security, an isolated connection environment is recommended.
	Production LAN	LAN used for transferring service data between servers and clients. This network does not connect to management servers.
Management server	Infrastructure Manager (ISM)	The software that is the operating platform of this product. ISM is provided as packaged virtual appliances into virtual machine. The virtual appliances, which are packaged ISM, will hereafter be referred to as ISM-VA. After installing ISM-VA on a hypervisor, you can control ISM-VA with a hypervisor console or an SSH client.
Management terminal		PC or tablet that is used for operating ISM through the management LAN.
Managed nodes	Switches	A node whose status is monitored and controlled by ISM.

Device and function		Description
	Storage	
	Server (Managed Server)	A node whose status is monitored and controlled by ISM. Connect BMC (iRMC) to the management LAN. To use all the functions in ISM, also connect the onboard LAN and LAN card to the management LAN.
	Chassis	A node whose status is monitored and controlled by ISM. Connects MMB to the management LAN.

For information on designing network configurations and further detailed information, refer to "A.1.1 DHCP/PXE Settings in Using Profile Management/Firmware Management."

1.3 System Requirements

This section describes the system requirements for ISM-VA (virtual machines) and management terminals that serve as the operating environment for ISM. This section also describes the external services required for a variety of ISM operations.

1.3.1 Requirements for Hypervisor to Run ISM-VA (Virtual Machines)

Requirements for a hypervisor to run ISM-VA (virtual machines) are as follows.

Item	Description
Number of CPU cores	2 cores or more [Note 1] [Note 5]
Memory capacity	8 GB or more [Note 1] [Note 5]
Free disk space	35 GB or more [Note 2] [Note 3] [Note 4] [Note 5]
Network	1 Gbps or higher
Hypervisor	Windows Server 2012/2012 R2/2016/2019 with the Hyper-V role included VMware ESXi 5.5/6.0/6.5/6.7 Red Hat Enterprise Linux 7.2/7.3/7.4/7.5/7.6/8.0 with KVM installed SUSE Linux Enterprise Server 12 SP3/15/15 SP1 with KVM installed

[Note 1]: The required number of cores and memory capacity depend on the number of nodes to be managed.

Number of nodes	Number of CPU cores	Memory capacity
1 to 100	2	8 GB
101 to 400	4	8 GB
401 to 1000	8	12 GB

[Note 2]: This is the minimum disk space required for monitoring approximately 100 nodes. The require disk space must be estimated based on the number of nodes to be managed and the ISM functions to be used. For details on how to estimate the required disk space, refer to "3.2.1 Disk Resource Estimation."

[Note 3]: To back up ISM-VA, a management server must have free disk space equivalent to or larger than that of ISM-VA.

[Note 4]: The disk space must be statically allocated upon installation of ISM-VA.

[Note 5]: To use Packet Analysis of Virtual Network, the following resources must be added to the hypervisor on which ISM-VA is running.

Additional number of CPU cores	Additional memory capacity	Additional disk capacity
2 cores or more	8 GB or more	60 GB or more

1.3.2 System Requirements for Management Terminals

System requirements for GUI (browser)

The system requirements for management terminals to run the GUI of ISM are as follows.

Item	Description
Device	PC, server, Windows 10 tablet, Android tablet, iPad
Display	- PC, server, and Windows 10 tablet: 1280 x 768 pixels or more The window size of your browser for displaying the GUI of ISM must be at least 1280 x 768 pixels. - Tablet: built-in display of the devices stated above
Network	100 Mbps or higher
Web browser	- PC, server, Windows 10 tablet: - Internet Explorer 11 or later In order to display the "3D View" screen, version 11.0.15 or later must be applied. - Microsoft Edge 25 or later - Mozilla Firefox 38 or later - Google Chrome 43 or later - Android tablet: Google Chrome 43 or later - iPad: Safari 8 or later To ensure stable operation, use the latest version of each browser.
Related software	Acrobat Reader (to display manuals)

The following devices and web browsers are supported.

Note: Y = Supported, N = Not supported

Web browser	Device			
	PC or server	Windows 10 tablet	Android tablet	iPad
Microsoft Internet Explorer	Y [Note 1][Note 4]	Y [Note 1][Note 2][Note 4]	N	N
Microsoft Edge	Y [Note 4]	Y [Note 2][Note 4]	N	N
Mozilla Firefox	Y [Note 4]	Y [Note 2][Note 4]	N	N
Google Chrome	Y [Note 4]	Y [Note 4]	Y [Note 4]	N
Safari	N	N	N	Y [Note 3][Note 4]

[Note 1]: If pop-up blocking is enabled, the GUI help will not be displayed. If the help does not appear, add the URL for displaying the GUI to [Internet Options] - [Privacy] - [Pop-up block] - [Settings] - [Addresses of trusted web sites].

[Note 2]: On the "3d View" screen, you cannot rotate, move in parallel, or zoom in and out using touch operations.

[Note 3]: Files cannot be saved because of device restrictions. Therefore, you cannot export monitoring data to CSV format, download the node logs or archived logs, or export profiles.

[Note 4]: Pop-up blocking must be disabled to open the iRMC screen from the ISM GUI. Allow pop-ups for the URL of ISM in the browser you use.

System requirements for management terminals for file transfer

The system requirements for the management terminal that transfers the files to ISM-VA, such as data required to set up managed nodes and ISM logs, are as follows.

Item	Description
Device	PC or server
Free disk space	8 GB or more
Network	100 Mbps or higher
Required software	FTP client software
Related software	SSH client software

1.3.3 Service Requirements for ISM Operations

This section describes the external services required for a variety of ISM operations.

Item	Description
Mail server (SMTP server)	A mail server is required when sending notification mail for errors and changes in the statuses of managed nodes. Set up with [Events] - [Alarms] - [SMTP Server]. **Note** In ISM, only one mail server can be registered.
Directory server	A directory server is required for the following use case. - For User Management in ISM You can use the following two directory services. - OpenLDAP - Microsoft Active Directory Register the configured directory server in [Settings] - [Users] - [LDAP Server Setting]. **Note** - In ISM, two LDAP servers can be registered, one primary and one secondary. - When a managed node uses a directory service, ISM does not link with the directory service which a managed node belongs to. Individually set the account to be able to access the managed node.
DHCP server	A DHCP server is required in the following cases. - When OS installation is executed using Profile Management - When Offline Update of Firmware Management is used To enable PXE boot on a managed node (server), configure the DHCP server so that an appropriate IPv4 address can be leased to the node. **Point** The ISM-VA internal DHCP server function can be used instead of preparing a separate DHCP server. For details on how to use the ISM-VA internal DHCP function, refer to "4.15 ISM-VA Internal DHCP Server."

Item	Description
DNS server	A DNS server is required for the following use cases. - Accessing ISM by hostname - Using an FQDN for a variety of sever settings of ISM, such as integration with an LDAP server For the procedure to set up a DNS server, refer to "Add DNS server" in "4.9 Network Settings." **Point** - Manually setting a hostname for ISM-VA if you want to access ISM with a hostname without using a DNS server. For details on how to set the hostname manually, refer to "4.13 Modification of Host Names." - Settings for ISM servers such as LDAP integration with IP addresses if you are not using a DNS server.
NTP server	An NTP server is required when time synchronization is required between ISM and managed nodes and managed clients. Use the ismadm command or the ismsetup command when you are setting the NTP server for ISM. For details on how to set it up, refer to "Enable/Disable NTP synchronization" and "Add/Remove NTP server" in "3.4.2 Initial Setup of ISM-VA."
Proxy server	A proxy server is required when accessing ISM from a management client via a proxy server. **Note** Monitored nodes and ISM cannot be connected via a proxy server.
Router	You can define only one network interface for ISM. If you are using ISM in an environment with multiple networks, you must set up a router to allow communication between the networks. If you are setting a gateway in ISM, use the ismadm command or the ismsetup command. For details on how to set it up, refer to "Modification of network settings" in "4.9 Network Settings."

For information on designing network configurations and further detailed information, refer to "A.1.1 DHCP/PXE Settings in Using Profile Management/Firmware Management."

1.3.4 Operation Requirements for ISM for PRIMEFLEX

Operation requirements for the ISM for PRIMEFLEX Virtualized Platform Expansion function

The operation requirements are as follows.

- The following licenses must be registered after the installation of ISM for PRIMEFLEX
  - Infrastructure Manager Advanced Edition for PRIMEFLEX Server License V2
  - Infrastructure Manager Advanced Edition for PRIMEFLEX Node License V2

  For the procedure to register licenses, refer to "3.5 Registration of Licenses."

Requirements for using Cluster Management

Refer to the following:

- Requirements for the Cluster Management Environment: "2.12.1.2 Environments supported by Cluster Management"
- Pre-setting requirements: "3.9 Pre-Settings for Cluster Management"

Requirements for using Cluster Creation or Cluster Expansion

Refer to the following:

- Requirements for PRIMEFLEX HS/PRIMEFLEX for VMware vSAN: "6.7.2.1 Operation requirements" in "Operating Procedures"
- Requirements for PRIMEFLEX for Microsoft Storage Spaces Direct/PRIMEFLEX for Microsoft Azure Stack HCI: "6.8.2.1 Operation requirements" in "Operating Procedures"

Requirements for using Rolling Update

Refer to the following:

- Requirements for Rolling Update: "6.6.2.1 Operation requirements for Rolling Update" in "Operating Procedures"

Requirements for using Node Disconnection/Reintegration (ISM 2.5.0.010 or later)

Refer to the following:

- Requirements for Node Disconnection/Reintegration: "6.10.2.1 Operation requirements" in "Operating Procedures"

Products supported by ISM for PRIMEFLEX V2.5

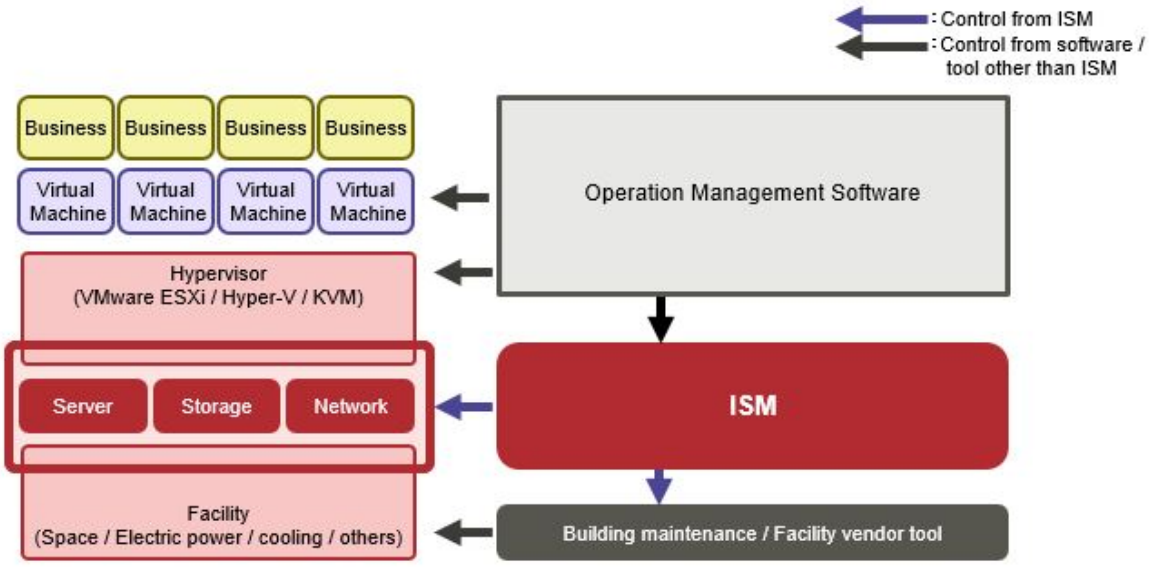
For the latest information on products supported by ISM for PRIMEFLEX V2.5, contact your local Fujitsu customer service partner.

1.4 Linking with Other Products

ISM primarily handles the management and operation of servers, storages, networks, and other hardware. ISM can link with operation management software that manages virtualized datacenter resources. Also, UPS/PDU and other facilities supported by ISM can be controlled from ISM.

By linking ISM with operation management software, seamless operation management of physical resources and virtual resources becomes possible.

Figure 1.4 Linking with other products



ISM can be linked with the following products.

- Cloud management software
- "Trend Micro Deep Security," Integrated server security product

Linking from cloud management software

Linking the following products to ISM enables seamless operation management of physical resources and virtual resources.

- Microsoft System Center Operations Manager
- Microsoft System Center Virtual Machine Manager
- VMware vCenter Server
- VMware vCenter Server Appliance
- VMware vRealize Operations
- VMware vRealize Orchestrator

The following plug-in software to link with the above products are provided in ISM.

- Infrastructure Manager Plug-in for Microsoft System Center Operations Manager
- Infrastructure Manager Plug-in for Microsoft System Center Virtual Machine Manager
- Infrastructure Manager Plug-in for VMware vCenter Server
- Infrastructure Manager Plug-in for VMware vCenter Server Appliance
- Infrastructure Manager Management Pack for VMware vRealize Operations
- Infrastructure Manager Plug-in for VMware vRealize Orchestrator

For details on plug-in software, refer to "ISM Plug-in/MP Setup Guide."

Linking with Trend Micro Deep Security

Linking with Trend Micro Deep Security enables you to display the security monitoring information of a server on the ISM GUI and you can integrate server monitoring with ISM.

For details on linking with Trend Micro Deep Security, refer to "2.13.9 Linking with Other Software."

Chapter 2 Functions of ISM

This chapter describes the functions of ISM.

Point

In order to allow users to use the various ISM functions, you must assign privileges (user roles) for the registered user groups to the appropriate users. For details on users and privileges (user role), refer to "2.13.1 User Management."

The icons shown in the table below indicate which combinations of user groups and user roles can execute operations.

User group to which a user belongs	User role held by the user	Can execute	Cannot execute
Administrator group	Administrator role	Admin	
	Operator role	Operator	Operator
	Monitor role	Monitor	Monitor
Group other than Administrator	Administrator role	Admin	Admin
	Operator role	Operator	Operator
	Monitor role	Monitor	Monitor

The attributes of users who can execute operations are as follows.

Example:

- In the example above, users with the following combinations of groups and roles can execute the operations:
  - Users who belong to an Administrator group and have an Administrator role or Operator role
  - Users who belong to a group other than the Administrator group and have an Administrator role or Operator role
- Users with a Monitor role cannot execute the respective functions, as indicated by the gray icons.

2.1 User Interface

This section describes the ISM user interface.

ISM provides the following user interfaces:

- GUI: graphical user interface for operating ISM
- FTP: file transfer interface between an FTP client and ISM-VA
- Console: command line interface for operating ISM-VA
- REST API: interface to link with application software created by users

2.1.1 GUI

ISM provides a GUI that can be operated with web browsers.

Point

- In your browser, you must enable Cookies, JavaScript, and DOM storage.
- If you are using Firefox, you must register the server certificate in your browser.
  1. Open Firefox. From the menu, select [Options].
  2. Select [Advanced], and then select [Certificates].
  3. Select [View Certificates].
  4. On the [Servers] tab, select [Add Exception].
  5. Enter "https://<IP address of ISM server> or <FQDN name of ISM server>:25566/" in [URL], and then select [Get Certificate].
  6. Confirm that the [Permanently store this exception] checkbox is checked, and then select [Confirm Security Exception].
- If you are using Internet Explorer, the following settings are required.
  1. Open Internet Explorer. From the menu, select [Tools] - [Internet options].
  2. On the [Security] tab, select the [Custom level] button, select [Enable] for the following items, and then select the [OK] button.
     - [Run ActiveX controls and plug-ins] under [ActiveX controls and plug-ins]
     - [Run ActiveX controls and plug-ins] under [Script ActiveX controls marked safe for scripting]
     - [File download] under [Downloads]
     - [Font download] under [Downloads]
  3. On the [Advanced] tab, check the [Enable DOM Storage] checkbox under [Security] and the [Play animations in webpages] checkbox under [Multimedia], and then select the [OK] button.
- If you are using Google Chrome, the following settings are required.
  1. Open Google Chrome. From the menu, select [Settings].
  2. Select [Advanced], and then select [Site Settings] under [Privacy and security].
  3. Select [Cookies] under [Permissions].
  4. Confirm that [Allow sites to save and read cookie data (recommended)] is displayed.

     If [Blocked] is displayed, enable the switch and check that [Allow sites to save and read cookie data (recommended)] is displayed.
  5. Select the arrow on the left side of [Cookies] displayed on the upper side of the screen to go back to [Site Settings].
  6. Select [JavaScript] under [Permissions].
  7. Confirm that [Allowed (recommended)] is displayed.

     If [Blocked] is displayed, enable the switch and check that [Allowed (recommended)] is displayed.
- In order to display the "3D View" screen in Internet Explorer 11, Microsoft's technical support information (hereafter referred to as "KB") 2991001 must be applied. The "3D View" screen is a GUI that displays floors, racks, and device positions within racks as three-dimensional images.

  https://support.microsoft.com/en-us/kb/2991001

  If the "3D View" screen does not display the racks, apply Microsoft's security update MS14-051, which also includes KB 2991001. For details, refer to the following website:

  https://technet.microsoft.com/en-us/library/security/ms14-051
- If you are using Google Chrome, depending on the hardware capabilities of your terminal and your graphics driver, the WebGL function (for displaying 3D graphics in browsers) may be disabled. If the WebGL function is disabled, you cannot display the "3D View" screen.

  You can use the following procedure to check whether the WebGL function is enabled or disabled.
  1. Open Google Chrome and enter "chrome://gpu" into the address bar.

2. If, under [Graphics Feature Status], [Hardware accelerated] is displayed for [WebGL], the WebGL function is enabled. Otherwise the WebGL function is disabled.

- Do not save the ISM user name and password in the web browser. If you saved them, delete the ISM user name and password.

The procedure to start the ISM GUI is as follows.

1. Start a browser and enter the following URL.

```
https://<IP address of ISM server> or <FQDN name of ISM server>:25566/
```

2. When the login screen is displayed, enter your user name and password, and then select the [Login] button.

   If a warning for the security certificate is displayed, refer to "4.7 Certificate Activation" and execute the authentication settings.

   When the first time you log in, the "Fujitsu End User Software License Agreement" screen is displayed.

3. Check the contents, and then check the [Above contents are correct.] checkbox.

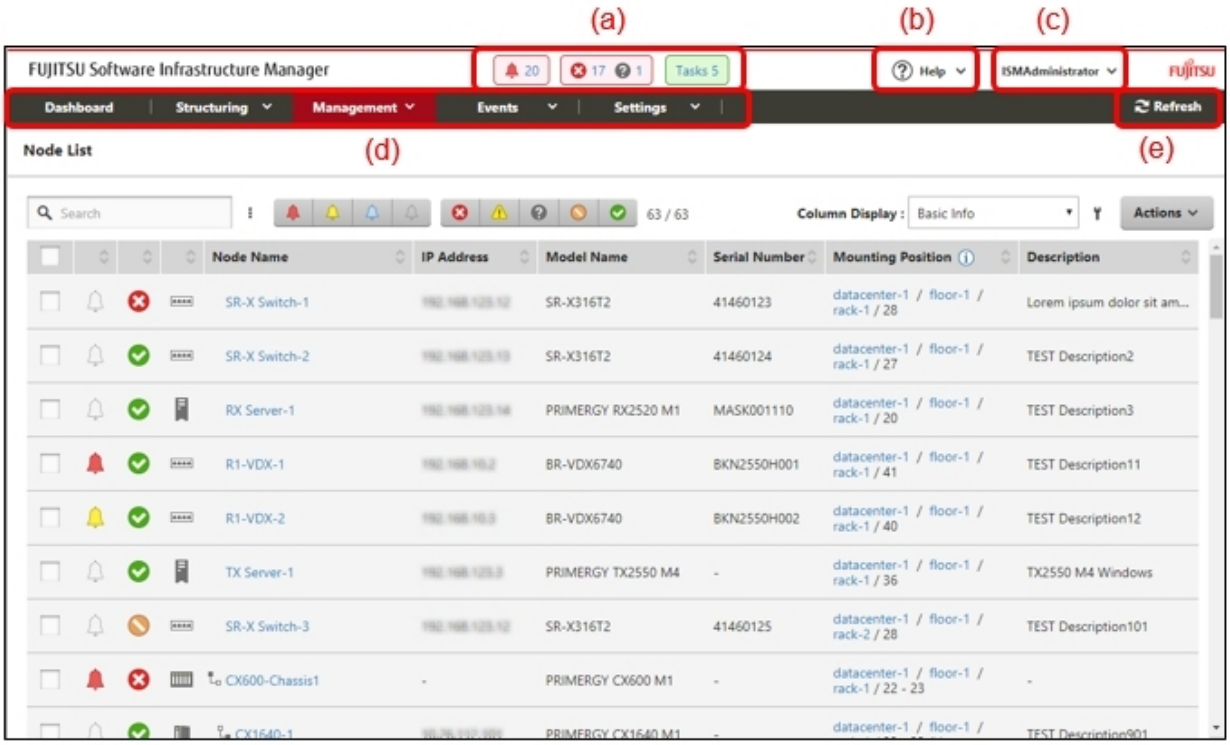
4. Select the [Agree] button.

Point

When you log in for the first time, use the following user name and password. After logging in with this user name, change the password for the default user and create new users before you continue operations.

- User Name: administrator
- Password: admin

The structure of ISM's GUI screen is as follows.



(a) Alarm status, status, and task icon

Alarm status

The number of nodes with Error alarm status is displayed. When there are no nodes with Error alarm status, the Warning alarm status icon and the number of nodes with Warning alarm status is displayed.

When there are no nodes with Error or Warning alarm status, this icon will not be displayed.

Status

The number of nodes with Error status, the Unknown status icon, and the number of nodes with Unknown status are displayed.

When there are no nodes with Error status, the Warning status icon, and the number of nodes with Warning status are displayed.

When there are no nodes with Error, Warning, or Unknown status, this icon will not be displayed.

Task

Displays the number of currently running tasks.

(b) Help

Displays help and guidance.

(c) User name

You can view the user name with which you are logged in.

In order to log out from ISM, move the mouse pointer over the user name and select [Log out].

Select [Language] to change the settings for the displayed Language, Date Format, and Time Zone on the GUI.

(d) Global Navigation Menu

This menu serves to access the various screens of ISM.

(e) Refresh button

Selecting this button refreshes the entire screen.

The GUI screens of ISM are not updated automatically as long as you stay on the same screen. (However, when you move to another screen, the latest information is retrieved again from the server).

Therefore, to confirm the latest information, you must select the [Refresh] button to update the screen.

If the following screens are set, they will refresh automatically.

- "Dashboard" screen
- "Node Registration" screen
- "Tasks" screen
- "Jobs" screen

2.1.2 FTP Access

You can use an FTP client to access the file transfer area.

Specify the IP address that you set in "3.4.2 Initial Setup of ISM-VA" to connect.

For security reasons, no files or directories are displayed immediately after login; Move to the directory with the name of the group to which the login user belongs and access the file transfer area from there.

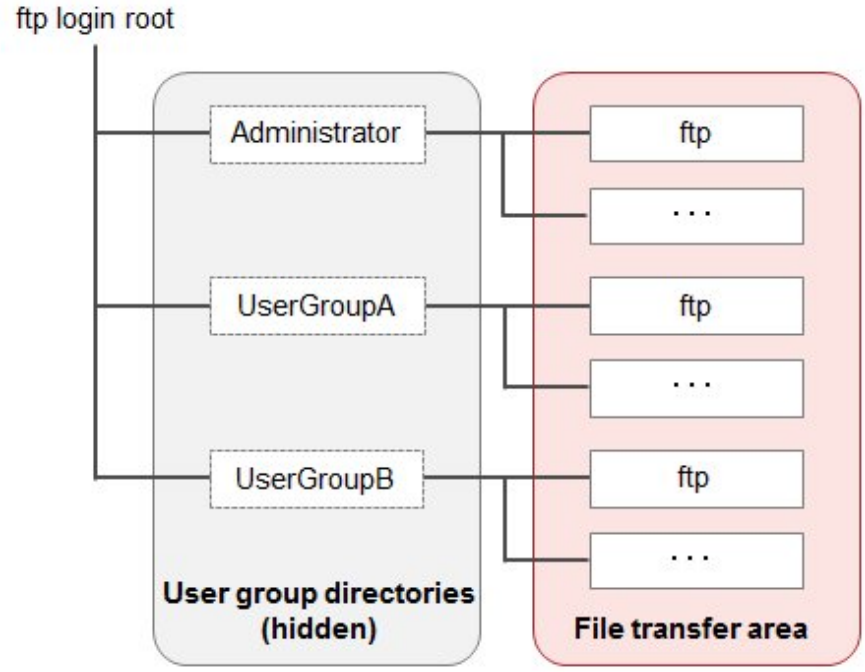
As shown in Figure 2.1, files that are sent or received via FTP are stored under "/<user group name>/ftp."

Note

- Directory names to be specified as user group names must be either user group names created with User Group Management in ISM or Administrator. For details on user group settings, refer to "2.7.2 Manage User Groups" in "Operating Procedures."
- Whenever you transfer files via FTP, be sure to use the "ftp" subdirectory in the <user group name> directory.
- Do not modify or delete any existing directories.
- When transferring patch files and other binary data, transfer it in binary mode.

- When accessing via FTP with a user that is linked with Microsoft Active Directory or LDAP, use the password registered in ISM and not the linked password.

Figure 2.1 Directory configuration in the file transfer area



Example of FTP access

The example below shows access by an administrator user who belongs to the Administrator group.

```
# ftp 192.168.1.50
Connected to 192.168.1.50 (192.168.1.50).
220 (vsFTPd 3.0.2)
Name (192.168.1.50:root): administrator
331 Please specify the password.
Password:
230 Login successful.
Remote system type is UNIX.
Using binary mode to transfer files.

ftp> ls
227 Entering Passive Mode (192,168,1,50,156,64).
150 Here comes the directory listing.
226 Transfer done (but failed to open directory).
          *Nothing is displayed directly after log in.

ftp> cd Administrator
250 Directory successfully changed.
          *Move to the directory of the group name the logged in user belongs to.

ftp> ls
227 Entering Passive Mode (192,168,1,50,156,64). 150 Here comes the directory listing.
drwxr-sr-x    2 0        1001           33 Jun 16 20:36 bin
drwxrws---    3 992      989            26 Jun 16 21:54 elasticsearch
drwxrws---    3 0        1001           21 Jun 16 23:20 ftp
drwxrws---    2 0        0               6 Jun 16 20:36 imported-fw
drwxrws---    2 0        0               6 Jun 16 20:36 imported-os
drwxrws---    2 0        0               6 Jun 16 20:36 ismlog
drwxrws---    2 0        0               6 Jun 16 20:36 logarc
```

```
drwxrws---    8 0        0              75 Jun 17 14:03 profile
drwxrws---    2 0        0               6 Jun 16 20:36 tmp
drwxrws---    2 0        1001            6 Jun 16 20:36 transfer
226 Directory send OK.
          *It is possible to access the file transfer area.
```

2.1.3 Console Access

You can execute management commands with a hypervisor console or an SSH client.

If you connect with an SSH client, specify the IP address that you set in "3.4.2 Initial Setup of ISM-VA" to connect.

As described in "2.13.1 User Management," this feature can only be used by users with the Administrator role.

For the commands that can be used, refer to "2.13.5.1 List of commands in ISM-VA Management."

Note

Automatic completion of command parameters by using the [Tab] key is not supported.

2.1.4 REST API

ISM is equipped with the REST API. With this API, ISM functions can be called from external programs. For details, refer to "REST API Reference Manual."

2.2 Node Management

Node Management manages nodes in four levels structure: datacenters, floors, racks, and nodes. Each layer is defined as follows.

- Datacenter: a building that accommodates datacenter facilities
- Floor: a machine room within a datacenter facility
- Rack: a rack that is located on a floor
- Node: a managed device that is mounted in a rack

The following functions are available.

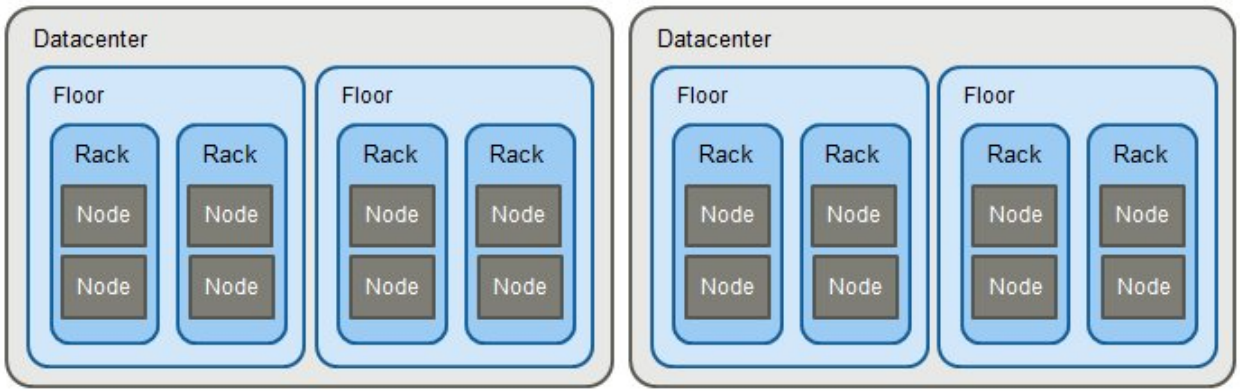
- 2.2.1 Registration of Datacenters/Floors/Racks/Nodes
- 2.2.2 Confirmation of Datacenters/Floors/Racks/Nodes
- 2.2.3 Editing of Datacenters/Floors/Racks/Nodes
- 2.2.4 Deletion of Datacenters/Floors/Racks/Nodes

2.2.1 Registration of Datacenters/Floors/Racks/Nodes

With ISM, you can manage the physical location information of nodes. The location information is uniquely specified within the level structure "Datacenter > Floor > Rack > Node mounting position in the rack (Slot number/Partition number)."

With ISM, you can set and manage the individual information of each datacenter, floor, rack, and node, as well as their hierarchy structures.

Figure 2.2 Relationships between datacenters, floors, racks, and nodes



You can execute the following operations.

- 2.2.1.1 Registration of datacenters/floors/racks
- 2.2.1.2 Registration of nodes
- 2.2.1.3 Management of node information
- 2.2.1.4 Management of information on node mounting positions in racks
- 2.2.1.5 Registration of node OS information
- 2.2.1.6 Discovery of nodes
- 2.2.1.7 Adding tags to nodes

2.2.1.1 Registration of datacenters/floors/racks

You can register information of new datacenters, floors, and racks in ISM. The datacenter, floor, and rack names that you register must be unique in ISM.

If you have registered a floor, you can display it on the "Floor View" and "3D View" screens of the GUI.

If you have registered a rack, you can display it on the "Rack View" screen of the GUI.

2.2.1.2 Registration of nodes

To manage nodes in ISM, nodes must first be registered in ISM.

When you register a node, enter all the required information. The following are the conditions for the information to be registered.

- Node names must be set to unique names in ISM.

  You cannot register a node with the same IP address or serial number as a node that is already registered in ISM.

- To access a node, the required account information must be set in the node information.

  In ISM, the specified account information is used to communicate with nodes for operations such as retrieving node information, monitoring, assigning profiles, updating firmware, and collecting logs.

For the account information that is required to communicate with each type of target node and for the settings that are required before node registration, refer to "A.2.2 Details of Node Settings."

There are two procedures for registration.

- Setting the required information and then registering manually
- Discovering and then registering nodes with the discovery function of ISM

The following is a sample operation of manual registration in ISM. For the registration procedure that uses the discovery function, refer to "2.2.1.6 Discovery of nodes." To register nodes, you must confirm information such as the model names and the IP addresses set for the nodes to be registered in advance.

1. From the Global Navigation Menu on the GUI of ISM, select [Structuring] - [Node Registration].
2. From the [Actions] button, select [Manually register nodes].
3. Follow the "Node Manual Registration" wizard and enter the setting items.
   - Node Name

     Set a name that is unique across the whole of ISM system.
   - Node Type

     Select the type of node to be registered.
   - Model Name

     Select the model name of the node. To register a type of device that is not supported, enter the model name manually.
   - IP Address

     Set the IP address of the node.
   - Web I/F URL

     Set the URL for accessing the web management screen of the node.
   - Description

     Freely enter a description of the node (comment) as required.
4. Enter the account information of the node.
5. Enter the information for mounting position of the node in the rack.
6. Select the node group to which the node is going to belong.

   If you do not specify a node group, the node remains unassigned to a group. Unassigned nodes can be managed only by a user who belongs to an Administrator group.
7. Specify tag information to be set for the node.
8. Execute registration.

Point

- You should not monitor the same node with multiple instances of ISM or multiple instances of monitoring software. Monitoring may not operate correctly, because the number of sessions a node can handle simultaneously is typically limited.
- It is recommended that you set a static IP address for the nodes registered in ISM. The node cannot be managed if its IP address is changed.
- To receive traps from nodes with SNMPv3, settings for Trap Reception for SNMP must be specified. For details, refer to "2.3 Monitoring"-"Trap reception settings."

2.2.1.3 Management of node information

On the "Node List" screen, you can select a [Node] and confirm the node information.

The account information that is set in each node in ISM is used to automatically collect information from the node in 24-hour intervals. If you want to retrieve the latest information from the node, you can also retrieve it manually.

Immediately after a node is registered, the node information is retrieved automatically.

The following is a sample operation of retrieving the node information.

1. From the Global Navigation Menu on the GUI of ISM, select [Management] - [Nodes] to display the "Node List" screen.
2. Select the name of the target node to display the Details of Node screen.
3. From the [Actions] button, select [Get Node Information].

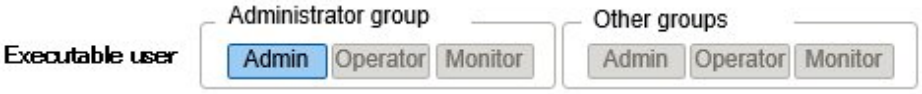
   When retrieval of the node information is completed, a log with the message ID "10020303" is output to the [Events] - [Events] - [Operation Log].
4. Select the [Refresh] button to update the Details of Node screen.

Note

If retrieval of node information is executed immediately after the PRIMERGY BX chassis (MMB) is powered on, the BX server blade and connection blade may not be displayed in Rack view.

Wait for a while and then retrieve the node information again.

2.2.1.4 Management of information on node mounting positions in racks



If you have set the mounting positions of nodes in racks, you can confirm the positions on the "Rack View" screen of the GUI.

If you did not set the mounting positions in racks, the nodes are displayed as "Not Mounted."

Setting of information on mounting positions in racks

You can set the information of the node mounting positions in a rack when you register a node. Alternatively, you can also set the mounting positions in the rack after node is registered.

The following is a sample operation for setting the information of a node mounting position in a rack after node registration.

Before you set the information of a node mounting positions in a rack, the rack must be registered.

1. From the Global Navigation Menu on the GUI of ISM, select [Management] - [Nodes] to display the "Node List" screen.
2. Select the applicable node. From the [Actions] button, select [Set Node Position].
3. Select the rack in which the node is mounted.
4. Select and then apply the position of the node.

2.2.1.5 Registration of node OS information

If an OS is already installed on a server that is registered in ISM, register the OS information.

The OS information includes information such as the OS type, IP addresses, and the account information that is required for connecting to the OS.

When you monitor a server using a domain user ID, enter the FQDN of the realm name of Active Directory in the domain name field, and enter the user name without the realm name in the user name field.

In ISM, the registered OS information is used for retrieving information that is managed by the OS on a node.

For the latest information on supported devices and OS versions, contact your local Fujitsu customer service partner.

Note

- In order to make a server OS a monitoring target in ISM, a separate installation procedure is required for each type of OS.

  When you register a domain name in the account information and a domain user in the account, you must add settings to allow monitoring by a domain user in the OS that will be monitored.

  For the information on installation procedures, refer to "Appendix B Settings for Monitoring Target OS and Cloud Management Software."

- To use a domain user to monitor the OS, you must specify the DNS and a domain environment.
  For details on how to set it, refer to "3.4.2 Initial Setup of ISM-VA."

- If no OS information is registered or the respective OSes have been shut down, a portion of the node information cannot be retrieved. Also, the information that is managed by the OS on a node cannot be retrieved.

- Enter the domain name with uppercase letters when you register OS information.

The following is a sample operation.

1. From the Global Navigation Menu on the GUI of ISM, select [Management] - [Nodes] to display the "Node List" screen.
2. Select the node name of the applicable node, and then select the [OS] tab.
3. From the [OS Actions] button, select [Edit OS Information].
4. Enter and then apply the required information.
5. From the [Actions] button, select [Get Node Information].

   When retrieval of the node information is completed, a log with the message ID "10020303" is output to the [Events] - [Events] - [Operation Log].
6. Select the [Refresh] button to refresh the display on the [OS] tab.

2.2.1.6 Discovery of nodes

With ISM, you can discover nodes that are connected to a network. The discovery function can automatically retrieves some of the required information for registering the discovered nodes and makes node registration easier.

The following types of node discovery functions are available:

- Manual Discovery

- Auto Discovery

Before you execute discovery, you must set the demanded account information that is required to connect to the nodes you want to discover.

The protocol used for discovery varies with the type of node to be discovered.

For the latest information on supported devices and OS versions, contact your local Fujitsu customer service partner.

Point

If the IP address of a DNS server is set in ISM-VA, the FQDN name of a discovered node will be retrieved.

If the FQDN name was retrieved, it will be entered as the default node name when registering the discovered node.

For the settings for the IP address of the DNS server, refer to "4.2 ISM-VA Basic Settings Menu."

Note

When retrieving the FQDN name of the IP address of a discovered node, if a reverse lookup zone is not set for the DNS, discovery will take longer than if it is set.

In this case, set a reverse lookup zone for the DNS.

Manual Discovery

Node discovery is executed manually. You can execute the following operations:

- Execution of Manual Discovery
  - Enter the discovery settings and execute Manual Discovery
  - Upload a CSV file and execute Manual Discovery
- Confirmation of results of Manual Discovery
- Registering discovered nodes

Enter the discovery settings and execute Manual Discovery

Set the required information for Manual Discovery. Node discovery is executed for the range of IP addresses that you specify. Also, some of the required node information for registration can be retrieved using the account information that was set.

1. From the Global Navigation Menu on the GUI of ISM, select [Structuring] - [Node Registration] to display the "Node Registration" screen.
2. From the [Actions] button, select [Discover nodes].
3. Enter the required information for discovery.

Item	Description
Discovery IP address range	Set the target range of IP addresses or FQDN name for discovery.
Discovery target	Select discovery target.
Communication method	Enter the account information according to the communication method of the discovery target. If you specify the discovery target, the input field to enter the communication method is displayed.

4. Execute discovery.

Upload a CSV file and execute Manual Discovery

Upload a CSV file with the required information for the Manual Discovery. Node discovery is executed based on the information entered in the CSV file. Also, some of the required node information for registration can be retrieved using the account information that was set.

1. From the Global Navigation Menu on the GUI of ISM, select [Structuring] - [Node Registration] to display the "Node Registration" screen.
2. From the [Actions] button, select [Discover nodes].
3. In [Discovery method], select "CSV upload."
4. Enter the required information for discovery.

Item	Description
File selection method	Select a specification method for CSV files.
File Path	Select a CSV file to use for discovery.
Password encryption	Select a password encryption method for the CSV file.
Behavior after execution of discovery	Specify behavior after execution of discovery. It is displayed if you select "FTP" for the file selection method.

5. Execute discovery.

Point

- If you select "FTP" in [File selection method], the CSV file must be transferred via FTP to the "/Administrator/ftp" directory in advance.

  For FTP connections and how to transfer files via FTP, refer to "2.1.2 FTP Access."

- For the [Password encryption] setting, if you use encryption for the password in the account information in the CSV file, select "Encrypted." If you are not using encryption, select "Unencrypted."
- When you select "FTP" in [File selection method], if you check the [Delete source file] checkbox in [Action after execute], the CSV file is deleted after discovery has been executed.

CSV file

Download the CSV file template from the GUI of ISM.

In the downloaded file, the first row is the item names and the second row is the options for the selected item.

Add the information of the nodes to be discovered into this CSV file.

The procedure to download the CSV file template is as follows.

1. From the Global Navigation Menu on the GUI of ISM, select [Structuring] - [Node Registration] to display the "Node Registration" screen.
2. From the [Actions] button, select [Discover nodes].
3. In [Discovery method], select "CSV upload."
4. Specify the device type in [Template], and then select the [Download] button to start the download.

   You can specify multiple device types.

Note

Delete the second row (the row with the options) of the downloaded CSV file until you are ready to upload the file.

The setting items for the CSV file are described below.

Item Name	Description
IpAddress	IP address of the discovery target node (IPv4, IPv6, or FQDN name)

Item Name	Description
IpmiAccount	User name of iRMC/BMC (IPMI)
IpmiPassword	Password of iRMC/BMC (IPMI)
IpmiPort	Port number of iRMC/BMC (IPMI) If there is no setting, 623 (default port number) is used
SshAccount	User name for SSH
SshPassword	Password for SSH
SshPort	Port number for SSH If there is no setting, 22 (default port number) is used
HttpsAccount	User name for HTTPS
HttpsPassword	Password for HTTPS
HttpsPort	Port number for HTTPS If there is no setting, 443 (default port number) is used
SnmpType	SNMP version Setting value: One of SnmpV1, SnmpV2, or SnmpV3 If you are using SNMPv2c, specify SnmpV2
SnmpPort	Port number for SNMP If there is no setting, 161 (default port number) is used
Community	Community name Required if either SnmpV1 or SnmpV2 is set for SnmpType
V3Account	User name for SNMPv3
V3SecLevel	SNMPv3 security level Setting value: Either authPriv, authNoPriv, or noAuthNoPriv
V3AuthProtocol	Authentication protocol for SNMPv3 Setting value: Either MD5 or SHA
V3AuthPassword	Authentication password for SNMPv3
V3PrivProtocol	Privacy protocol Setting value: Either DES or AES
V3PrivPassword	Privacy password for SNMPv3
V3EngineId	Engine ID for SNMPv3
V3ContextName	Context name for SNMPv3

The specific setting items for each account type are described below.

Note: R = Required, Y = Can be omitted, - = Not required

Item Name	Account type					
	IPMI	SSH	HTTPS	SNMP		
				V1	V2	V3
IpAddress	R	R	R	R	R	R
IpmiAccount	R	-	-	-	-	-
IpmiPassword	R	-	-	-	-	-

Item Name	Account type					
	IPMI	SSH	HTTPS	SNMP		
				V1	V2	V3
IpmiPort	Y	-	-	-	-	-
SshAccount	-	R	-	-	-	-
SshPassword	-	Y	-	-	-	-
SshPort	-	Y	-	-	-	-
HttpsAccount	-	-	R	-	-	-
HttpsPassword	-	-	R	-	-	-
HttpsPort	-	-	Y	-	-	-
SnmpType	-	-	-	R	R	R
SnmpPort	-	-	-	Y	Y	Y
Community	-	-	-	R	R	-
V3Account	-	-	-	-	-	R
V3SecLevel	-	-	-	-	-	R
V3AuthProtocol	-	-	-	-	-	Y [Note 1]
V3AuthPassword	-	-	-	-	-	Y [Note 1]
V3PrivProtocol	-	-	-	-	-	Y [Note 2]
V3PrivPassword	-	-	-	-	-	Y [Note 2]
V3EngineId	-	-	-	-	-	Y
V3ContextName	-	-	-	-	-	Y

[Note 1]: Required if V3SecLevel is authPriv or authNoPriv.

[Note 2]: Required if V3SecLevel is authPriv.

The procedure to prepare the CSV file is as follows.

- Create the CSV file with an arbitrary name.
- Write the item names in the first row.
- Write down the target node information in the second and following rows.
  - Enter the setting values so that they match with the position of the item names in the first row.
  - You must enter a value for the IpAddress.
  - Omit setting values that are not required for the discovery of the target nodes.
  - If an item is not required for discovery of any of the nodes, the corresponding column can be omitted from the item name row.
  - It is recommended to set an encrypted password for each password (IpmiPassword, V3AuthPassword, V3PrivPassword, SshPassword, HttpsPassword).

    Unencrypted passwords can also be set.

    For the password encryption procedure, refer to "REST API Reference Manual."

Note

Encrypted passwords and unencrypted passwords cannot be mixed in the CSV file. You must select one or the other method.

An example of the contents of the CSV file is displayed below.

```
"IpAddress","IpmiAccount","IpmiPassword","SnmpType","Community","SshAccount","SshPassword"
"192.168.10.11","admin1","********","","","",""
"192.168.10.12","admin2","********","","","",""
"ism.fujitsu.com","admin3","********","","","",""
"192.168.10.21","","","SnmpV1","comm1","user1","********"
```

Confirmation of results of Manual Discovery

Refresh the "Node Registration" screen and wait for the discovery process displayed in [Discovery Progress] to finish. After completion, confirm the discovered nodes.

If node discovery using the set account information is successful, the status becomes successful and the discovered nodes can be checked.

Note

- The discovered node information is valid only during the same session.
- Devices that are not supported may be displayed in the discovery results. Do not register devices that are not supported.
- For a VDX switch, the target for node registration and node discovery becomes VCS Fabric (Brocade VCS Fabric). Specify the virtual IP address set in Fabric, and execute node discovery and node registration. The physical switches will be discovered and registered automatically with Get Node Information after the fabric is registered as a node. If a physical switch is discovered during node discovery, the result is "Only automatic registration."
- If you operate a CFX switch or PRIMERGY BX Ethernet Switch/IBP 10Gbit/s 18/8+2 SBAX3 in fabric mode, the target for the node discovery and node registration is the virtual IP address set in the fabric. The physical switches will be discovered and registered automatically with Get Node Information after the fabric is registered as a node.

Registering discovered nodes

The following is a sample operation for registering nodes that were discovered using Manual Discovery.

1. Confirm the discovered nodes.
2. From the discovered nodes, select the ones that you want to register. Select the [Register discovered nodes] button.
3. Enter the information that is required for node registration, such as the node name, chassis name, Web I/F URL, and description.

   To change the IP address set on the device, select the version of the IP address, and then select the [Edit] button and set the IP address.
   If you set the IP address, the IP address setting operation will be executed for the device when the nodes are registered.
4. Set the information for the node's mounting position in the rack.
5. Set the node group information.
6. Execute registration.

   The account information that was used to successfully access the node during node discovery is registered as the account information for the node. The account to be registered is displayed in the [Succeeded methods] column on the "Discovered Node List" screen.

Note

- The IP address set for the device can be changed only for PRIMERGY servers and PRIMEQUEST 3000B that have DHCP enabled.

- If you change the IP address, check that the new IP address is set within a range that can be accessed from ISM. If you set an IP address that cannot be accessed from ISM, you may not be able to connect to the device.
- If you are using the "Log Collection" or "Firmware Update" functions of Cisco Catalyst switches, after registering nodes, set the password for raising the SSH privilege on the node edit screen.

Auto Discovery

For applicable devices to Auto Discovery, contact your local Fujitsu customer service partner.

With Auto Discovery, you can execute the following operations:

- Executing Auto Discovery
- Confirming the results of Auto Discovery
- Registering discovered nodes

Executing Auto Discovery

Auto Discovery is executed automatically. There are no items for which the settings need to be changed.

Note

The following requirements must be met in order to execute Auto Discovery with UPnP/Redfish.

- The following functions are on the target device side

Device	Function
PRIMERGY server PRIMEQUEST	SSDP function
PSWITCH 2048 T PSWITCH 2048 P PSWITCH 4032 P	Auto Discovery

- The network is configured so that multi-cast transmission packets sent from the target device can be received with ISM

Confirming the results of Auto Discovery

When a device is discovered, it is displayed in [Discovered Node List] on the "Node Registration" screen.

Registering discovered nodes

The following shows an example of registering a node discovered with Auto Discovery.

1. Confirm the discovered nodes.
2. From the discovered nodes, select the ones that you want to register. Select the [Register discovered nodes] button.
3. Enter the information that is required for node registration, such as the node name, chassis name, Web I/F URL, and description. Also specify the IP address to register in ISM.

   In Auto Discovery, both IPv4 and IPv6 addresses may be discovered for devices where both have been set. Specify the IP address to register in ISM.

   To change the node IP address, select the version of setting IP address (IPv4 /IPv6), select the [Edit] button to set.
   If you set an IP address, the IP address will be set for the device when registering the node.
4. Set a communication method.

   Nodes discovered with Auto Discovery are displayed. Set a communication method for each node. If you are changing the node IP address, you must set a communication method.
5. Set the information for the node's mounting position in the rack.

6. Set the node group information and tag information.
7. Execute registration.

Note

- The devices cannot be managed with IPv6 link local addresses. If the automatically discovered IP address is only an IPv6 link local address, you must set an IP address.
- The IP address set for the device can be changed only in the following cases.

Device	Description
PRIMERGY server PRIMEQUEST 3000B	Can only be changed if the device is using DHCP. If a fixed IP address is set on the device, register the IP address without making any changes.
PSWITCH 2048 T PSWITCH 2048 P PSWITCH 4032 P	Can only be changed if the device is using a fixed IP address setting. Set the right IP address for the device, and register it.

- If you change the IP address, check that the new IP address is set within a range that can be accessed from ISM. If you set an IP address that cannot be accessed from ISM, you may not be able to connect to the device.

2.2.1.7 Adding tags to nodes

In ISM, tags can freely be added to nodes. Tagging is a function that adds information to allow the user to freely group nodes. For grouping nodes, there is a node group function, but it controls the access rights of the user. On the other hand, tags can be set without coordinating with access rights. It is possible to set multiple tags for a node.

For example, by setting tags for a group of nodes with the same purpose, nodes with the same tag can be displayed in the node list and managed by using filtering.

Tags can be added to nodes during node registration. Settings can also be executed after node registration.

Adding tags after node registration

The following is a sample operation for adding tags after node registration.

1. From the Global Navigation Menu on the GUI of ISM, select [Management] - [Nodes].
2. Select the target node name to display the [Properties] tab.
3. From the [Actions] button, select [Edit].
4. Edit the tag information.
5. Select [Apply] to apply the changes.

Editing the tags of multiple nodes in a batch

You can edit the tags for multiple nodes together. The following is a sample operation for editing the tags of multiple nodes.

1. From the Global Navigation Menu on the GUI of ISM, select [Management] - [Nodes].
2. Select the nodes for which you want to edit tags, and then select [Edit Tag] from the [Actions] button.

3. Edit the tag information.

   - To add tags

     Input new tags in the [Add tag(s) to multiple nodes] field, or select existing tags and select [Add].

   - To delete multiple tags together

     Select tags from the [Delete tag(s) from multiple nodes] field, and select [Delete].

   - To delete tags individually

     Select [x] displayed on the [Tag] field in [Target Nodes].

4. Select [Apply] to apply the changes.

Filtering by specifying tags

The following is a sample operation to filter nodes by specifying tags.

1. From the Global Navigation Menu on the GUI of ISM, select [Management] - [Nodes].
2. In the search box on the top left of the screen, enter the tag name that you want to filter. If you enter a character string in the search box, candidates will be displayed and you can select "Tag:."
   Or select the [⋮] button on the right of the search box, and enter the tag that you want to filter on the displayed screen and then, select the [Filter] button.
3. Filtering is executed, and nodes with the specified tag are displayed on the "Node List" screen.

Point

You can select nodes from the filtering results and execute [Assign Profile] or [Update Firmware]. For profile assignment and firmware update, refer to "2.4 Profile Management" and "2.6 Firmware Management."

2.2.2 Confirmation of Datacenters/Floors/Racks/Nodes

Here, you can confirm the information that is registered in ISM.

Confirming datacenters, floors and racks

From the Global Navigation Menu on the GUI of ISM, select [Management] - [Datacenters] to display the "Datacenter List" screen. On the "Datacenter List" screen, select the applicable datacenter, and then confirm the display on the right side of the screen.

Confirming nodes

Confirm the nodes that are registered in ISM.

From the Global Navigation Menu on the GUI of ISM, select [Management] - [Nodes] to display the "Node List" screen. By selecting the node name of an applicable node and opening the [Properties] tab, you can confirm the information.

Point

With the settings below, log in from the login screen (iRMC) becomes unnecessary, and the web screen can be displayed by selecting the web URL of the nodes (PRIMERGY server).

- User management settings using Microsoft Active Directory
- Central Authentication Service (CAS) settings

For details, refer to "3.7 Use CAS Based Single Sign-On to Log In to the web Screen of the Server" in "Operating Procedures."

Users who perform settings must meet the following two requirements.

- The user must belong to a user group that manages all nodes
- The user must have a user role higher than the roles specified in the CAS settings

Confirming node OS information

If the OS account information is registered for the node, you can confirm the network, disk, and card information from the OS.

If you are monitoring cloud management software by using a domain user ID, enter the FQDN of the realm name of Active Directory in the domain ID field, and enter the user name without the realm name.

In this case, only the information that can be retrieved with the domain user's access rights are displayed on the GUI.

For the setup procedures for the monitoring target OS, refer to "Appendix B Settings for Monitoring Target OS and Cloud Management Software."

Downloading a script file to link with AIS Connect Support Gateway

You can download a script file to register managed nodes (PRIMERGY servers only) to AIS Connect Support Gateway (hereafter, referred to as "AIS Gateway").

The procedure to download the script file is as shown below.

1. From the Global Navigation Menu on the GUI of ISM, select [Management] - [Nodes].

   The "Node List" screen is displayed.

2. From the [Actions] button, select [Output AIS Gateway Script].

   The "Output AIS Gateway Script" screen is displayed.

3. Set a password for the zip file (Optional).
4. Select the [Output] button.

   After the download file has been created, the "Result" screen is displayed.

5. Select "Download."

Overview of the script file

The script file can be executed on the OS (Windows/Linux) on which AIS Gateway is installed.

To check the results of the script file execution, log in to AIS Gateway to confirm the setting information.

The following are the types of script files that can be downloaded.

OS	Type of script file
Windows	Batch file
	PowerShell script
Linux	Shell script (bash)

The setting items for AIS Gateway and their contents are as follows.

To add setting items or to change setting values, edit the script file as required.

AIS Gateway setting item	Setting contents
AssetName	A serial number of a managed node
Model	iRMC_ma
Description	A node name of a managed node
IP Address	An IP address of a managed node
SNMP Community	public

Note

- In the following cases, lines to register applicable managed nodes will be commented out.
  Take action as necessary, and download the file again. Or, edit the script file directly.
  - When an IP address is not specified

    Set an IP address.

    To set an IP address, refer to "2.2.3 Editing of Datacenters/Floors/Racks/Nodes" - "Editing nodes."
  - When a serial number is not retrieved

    Retrieve node information to acquire the serial number.

    For retrieving node information, refer to "2.2.1.3 Management of node information."
- This script overwrites the setting information of the managed node if the node has been registered in AIS Gateway.

  If you do not want to overwrite the settings, comment out or delete the lines that include the serial number of the appropriate managed node.

2.2.3 Editing of Datacenters/Floors/Racks/Nodes

Edit the information that is registered in ISM.

Editing datacenters, floors, and racks

The following is the operation procedure for editing datacenter, floor, and rack information.

1. From the Global Navigation Menu on the GUI, select [Management] - [Datacenters], and then select the datacenter, floor, or rack to edit on the displayed "Datacenter List" screen.
2. From the [Actions] button, select [Edit Datacenter], [Edit Floor], or [Edit Rack] accordingly.
3. Edit the information.
4. Select [Apply] to apply the changes.

Editing nodes

The following is the operation procedure for editing node information.

1. From the Global Navigation Menu on the GUI of ISM, select [Management] - [Nodes] to display the "Node List" screen.

2. Select the node name of the applicable node to display the [Properties] tab.
3. From the [Actions] button, select [Edit].
4. Edit the information about the node.
5. Select [Apply] to apply the changes.

2.2.4 Deletion of Datacenters/Floors/Racks/Nodes

Delete any information that is registered in ISM.

Deletion of datacenters

If you are going to delete a datacenter, you cannot delete it if any floors are registered in that datacenter. Delete or move any floors before you delete the datacenter.

Deletion of floors

If you are going to delete a floor, you cannot delete it if any racks are registered on that floor. Delete or move any racks before you delete the floor.

Deletion of racks

If you are going to delete a rack, you cannot delete it if any nodes are registered in that rack. Delete or move any nodes before you delete the rack.

Deletion of nodes

This operation deletes the monitoring information, log information, and other information for the applicable nodes.

Before you delete a node, complete the operations described below.

- If any tasks are being executed, wait until they have completed.
- Release any profiles assignments you have made.

Point

If you delete a node while a profile assignment is active, the node will not be deleted. (The profile remains with an "Assigned" status.) Release the profile assignments individually.

Note

An error message such as "The object does not exist" or "The object is already deleted" may appear if you are logged in from multiple terminals and have deleted any datacenters, floors, racks, and/or nodes. In this case, refresh the screen contents by one of the following procedures, and then resume operation.

- For screens other than Network Map

  Select the Refresh button.

- For Network Map

  From the [Actions] button, execute [Update network information].

Point

You cannot delete any datacenters with registered floors, floors with registered racks, or racks with registered nodes. However, when you delete a chassis in which nodes are registered, both the chassis and the nodes are deleted at the same time.

2.3 Monitoring

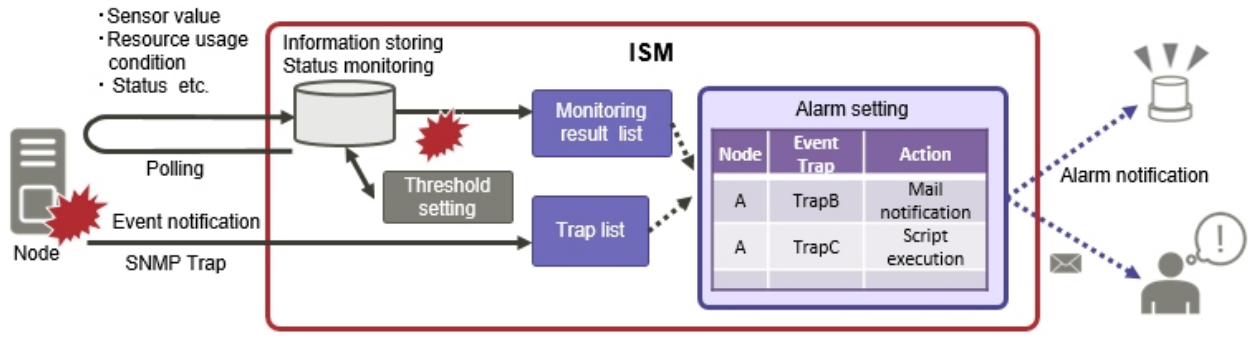
Monitoring is a function you can use for the following purposes.

- Polling for and accumulating information about status and resource usage, such as the CPU usage and the values of sensors such as those for node temperature
- Monitoring the comparison of assigned threshold values and polling results, and the status change
- Receiving incoming event notifications (SNMP Trap) from nodes
- Issuing external alarm notifications of monitoring results and of incoming event notifications from nodes

  Specify the alarm notification method as an action of alarm settings in advance.

The following shows an operation overview of Monitoring.

Figure 2.3 Image of Monitoring



The following settings are related to Monitoring.

- 2.3.1 Setting of Monitoring Items and Threshold Values
- 2.3.2 Monitoring of Network Statistics Information
- 2.3.3 Action Settings
- 2.3.4 Registration of Alarm Settings
- 2.3.5 Graph Display of Monitoring History

2.3.1 Setting of Monitoring Items and Threshold Values

Set the monitoring items (items for which to retrieve values) and the threshold values.

The following items are registered as monitoring items by default during node registration. (The details of items that can actually be managed, however, vary with each device model.)

Default monitoring item	Description
Overall status	The overall status of each managed node itself as a whole system is monitored.

Default monitoring item	Description
Power consumption	The power consumption of each managed device as a whole system as well as of individual parts are monitored.
Temperature information	The temperatures inside the racks, at air inlets and other positions are monitored.
Statuses of the various LEDs	Power LEDs, CSS LEDs, Identify LEDs, and Error LEDs are monitored. This is only applicable for PRIMERGY.

The following items can be additionally specified to be monitored.

Additional monitoring item	Description
Various types of resource information	CPU utilization rate, memory utilization rate, and other resource statuses are monitored.
Fan rotation speed	Rotation speeds of the various fans in managed devices are monitored.
Average power consumption/Average Intake Temperature	Power consumption and intake temperature are monitored at 3-minute intervals. When Power Capping is enabled and for the node with Power Capping that is set as a target can be monitored.

Procedure for adding monitoring items and threshold values

1. From the Global Navigation Menu on the GUI of ISM, select [Management] - [Nodes] to display the "Node List" screen.
2. Select the node name of the applicable node.
3. Select the [Monitoring] tab.
4. From the [Monitoring Actions] button, select [Add] to add monitoring items.

2.3.2 Monitoring of Network Statistics Information

For network switches, statistical information (traffic and so on) can be retrieved on a port basis and threshold monitoring can be set.

Setup procedure for monitoring of network statistics information/threshold monitoring

1. From the Global Navigation Menu on the GUI of ISM, select [Management] - [Nodes] to display the "Node List" screen.
2. Select the node name of the applicable network switch.
3. Select the [Network statistics] tab.
4. From the [Network statistics Actions] button, select [Edit] and enable monitoring of network statistics information.

Note

To use monitoring of network statistics information, use v2c or v3 for the SNMP account of the target node.

2.3.3 Action Settings

When ISM discovers an event, or when a trap is received from a node, an alarm can be sent for notification.

The following types of notification methods (actions) are available.

Type of notification method	Description
Execute Remote Script	Execute an arbitrary script saved on an external host on the external host.
Send E-Mail	Send mail with user-defined content.
Send/Forward Trap	Forward the received SNMP trap to an external SNMP manager, or forward an event discovered in ISM as an SNMP trap. When forwarding, the following forwarding types can be selected. - ISM forwards the trap as a sender. The sent SNMP trap is processed as if it was sent straight from ISM. Apart from information on the sender, the trap information is sent as-is. - The received trap is forwarded as-is. The received trap is forwarded to the SNMP manager as-is.
Forward Syslog	Forward events/trap messages to an external Syslog server.

Point

If you are using Forward Syslog, you must set the external Syslog servers so that they can receive Syslog forwarded from ISM. For details on how to set it, refer to "2.6 Set an Alarm (ISM internal events)" in "Operating Procedures."

Macro

The macro (automatic variable) functions displayed below can be used in the title and text body of sent emails as well as to specify parameters when executing scripts. These macros are automatically replaced with the information of the node or event.

In addition, macros that can be used differ depending on the applicable type you selected when creating the alarm setting.

The list of macros and the correspondence between the macros and the applicable types are as follows.

Note: Y = Can be used, N = Cannot be used

Macro notation	Overview	Applicable type	
		Node	System
$_ISM	ISM host name	Y	Y
$_TRGID	Node ID of target for event (Node)	Y	N
$_TRGTYPE	Target for event (System or Node)	Y	Y
$_TRG	Target name for event (Node name)	Y	N
$_IPA	IP address of the node	Y	N
$_IDN	Serial number of the node	Y	N
$_MDL	Model name of the node	Y	N
$_DC	Name of the datacenter where the node in the rack is located	Y	N
$_FLR	Name of the floor where the node in the rack is located	Y	N
$_RACK	Name of the rack where the node is located	Y	N
$_POS	Mounting position of the node in the rack The display format is different depending on the device. - When 1U server is mounted in 2U : 2U	Y	N

Macro notation	Overview	Applicable type	
		Node	System
	- When CX400 chassis (2U) is mounted in 2U, and the target server exists in its slot 2 : 2-3U slot#2 - When BX900 chassis (10U) is mounted in 2U, and the target connection blade exists in its back slot 2 : 2-11U CB#2 - When PDU is mounted : PDU2 - When Rack CDU is mounted : Not displayed		
$_MIB	MIB file name of the SNMP trap	Y	N
$_SPC	Specific trap code of SNMP trap Last digit of the OID of the SNMP trap	Y	N
$_TRP	Character string defining the TYPE of MIB of the SNMP trap	Y	N
$_SEV	Severity of the event	Y	Y
$_EVT	Message ID	Y	Y
$_MSG	Description	Y	Y
$_TIM	Time when the event occurred UTC time is displayed in RFC3339 format. (Example: 2018-01-01T00:00:00.000Z)	Y	Y
$_TIM2	Time when the event occurred Displayed in local time format. (Example: 2018-01-01-00.00.00)	Y	Y

Point

When the macro cannot be used (when [N] is shown in the table above), or when the value to be replaced does not exist, (none) is output.

Procedure for adding actions

1. From the Global Navigation Menu on the GUI of ISM, select [Events] - [Alarms].
2. Select [Actions] from the menu on the left side of the screen to display the "Action List" screen.
3. From the [Actions] button on the right side of the screen, select [Add] to add an action.

Required preparations before using an action

Execute Remote Script

Any script files to be executed must to be saved on an external host.

The following are the OS for the external host and script files that can be used.

OS	Script file (Extension)
Windows	Batch file (bat)
Red Hat Enterprise Linux	Shell script (sh)
SUSE Linux Enterprise Server	Shell script (sh)

1. Prepare the script file to be used in the action setting.
2. Deploy the script file in an arbitrary directory in the OS on the external server.

   If it is a shell script, set the execution privilege to the user who specifies the settings.
3. Specify the same settings as of the monitoring target OS to the OS of the external host.

   These settings are required to access an external host from ISM and execute a script file.

   For the setting procedures, refer to "Appendix B Settings for Monitoring Target OS and Cloud Management Software."

For Execute Remote Script, a maximum execution time (default: 300 seconds) is set.

If script execution is not completed within the set time, script execution is forcibly terminated.

Set a time in which the script can complete successfully.

E-Mail Sending

In order to send e-mails, you must register the SMTP server information in advance.

1. From the Global Navigation Menu on the GUI of ISM, select [Events] - [Alarms].
2. Select [SMTP Server] from the menu on the left side of the screen to display the "SMTP Server Settings" screen.
3. From the [Actions] button on the right side of the screen, select [Edit] to register SMTP server information.

Also note that message encryption with S-MIME is available for sending e-mails. The user certificates to be used for encryption must be imported into ISM-VA in advance.

1. Prepare the personal certificates to be used in the action setting.
2. Transfer the certificate files to ISM-VA.

   These certificates must be in PEM-encoded format.
3. In ISM-VA Management, execute the command for registering certificates.

   For details, refer to "Registration of certificates for alarm notification mails."

Send/Forward Trap

When sending or forwarding an SNMP trap, you must register the SNMP manager to send or forward it to.

1. From the Global Navigation Menu on the GUI of ISM, select [Events] - [Alarms].
2. Select [SNMP Manager] from the menu on the left side of the screen to display the "SNMP Manager List" screen.
3. From the [Actions] button on the right side of the screen, select [Add] to register SNMP manager information.

Procedure for test execution of an action

1. From the Global Navigation Menu on the GUI of ISM, select [Events] - [Alarms].
2. From the menu on the left side of the screen, select [Actions].

   The "Action List" screen is displayed.
3. From the "Action List" screen, select the action whose execution you want to test.
4. From the [Actions] button on the right side of the screen, select [Test].

   The "Action test" screen is displayed.
5. Select the [Test] button on the right side of the screen and execute a test.

When executing a test, any macros set for the action will be replaced with the following character strings.

Macro	Character string after replacement
$_ISM	TEST_ISM
$_TRGID	TEST_TRGID
$_TRGTYPE	TEST_TRGTYPE
$_TRG	TEST_TRG
$_IPA	TEST_IPA
$_IDN	TEST_IDN
$_MDL	TEST_MDL
$_DC	TEST_DC
$_FLR	TEST_FLR
$_RACK	TEST_RACK
$_POS	TEST_POS
$_MIB	TEST_MIB
$_SPC	TEST_SPC
$_TRP	TEST_TRP
$_SEV	TEST_SEV
$_EVT	TEST_EVT
$_MSG	TEST_MSG
$_TIM	TEST_TIM
$_TIM2	TEST_TIM2

2.3.4 Registration of Alarm Settings

Alarm settings are used to set in advance the action to be executed when an event is discovered in ISM, or when a trap is received from a node.

Procedure for adding alarms

1. From the Global Navigation Menu on the GUI of ISM, select [Events] - [Alarms].
2. Select [Alarms] from the menu on the left side of the screen to display the "Alarm List" screen.
3. From the [Actions] button on the right side of the screen, select [Add] to add an alarm.

For events within ISM itself (for example, completion of DVD import), select "System" under [Applicable Type].

Event type

There are the following types of events.

Event Type	Description
Event	Various events that are discovered internally in ISM. Events that trigger alarms are specified either according to their degree of severity or individually (Multiple can be specified).

Event Type	Description
Trap	SNMP traps sent from monitored devices. Based on the MIB information registered within ISM-VA, a list of receivable traps is displayed. Traps that trigger alarms are specified according to their degree of severity or individually. This type will not be displayed if "System" was selected under [Applicable Type].

Note

If the event type is Trap, the traps that become targets for generating alarms are only SNMP traps sent from monitored hardware.

Alarm status

Each node has one value for its alarm status, and this value changes when any kind of ISM event or SNMP trap relating to the node is discovered. Alarm statuses can take on the following values.

Alarm Status	Priority	Icon displayed in the ISM GUI	Description
Error	High	 Red bell icon	This icon is displayed when any of the following events are discovered: - ISM event at Error level - SNMP trap at CRITICAL level
Warning	Medium	 Yellow bell icon	This icon is displayed when any of the following events are discovered: - ISM event at Warning level - SNMP trap at MAJOR or MINOR level
Info	Low	 Blue bell icon	This icon is displayed when any of the following events are discovered: - ISM event at Info level - SNMP trap at INFORMATIONAL level
None	-	 White bell icon	This is the status when no event has been discovered.

An alarm status of "Info" or higher means that an event corresponding to that level was discovered. Select [Events] - [Events], and when the "Event List" screen is displayed, select each tab and check the contents of the discovered event.

When you have completed confirming and recovering from the discovered event, execute the following procedure to clear the alarm status.

1. From the Global Navigation Menu on the GUI of ISM, select [Management] - [Nodes] to display the "Node List" screen.
2. Select the node name of the applicable node.
3. From the [Actions] button, select [Clear Alarm].

Point

- Alarm statuses are not cleared automatically. However, if a status with a higher priority is discovered, it is displayed instead.

- You may need to turn off the power of nodes systematically to maintenance nodes. ISM has a "Maintenance Mode" function that temporarily interrupts its monitoring function so that ISM does not detect alarms that may occur during maintenance, such as a power-off alarm.

  As alarm detection and background processing in ISM are restricted for nodes that are switched into Maintenance Mode, this function prevents the repeated occurrence of alarms for the node.

  For information on Maintenance Mode, refer to "5.1 Maintenance Mode."

Trap reception settings

The supported SNMP trap reception protocols are v1, v2c, and v3.

Process for adding settings for Trap Reception for SNMP

1. From the Global Navigation Menu on the GUI of ISM, select [Settings] - [General].
2. Select [Trap Reception] from the menu on the left side of the screen to display the "Trap Reception Setting List" screen.
3. From the [Actions] button on the right side of the screen, select [Add] to add trap reception settings.
4. Select the SNMP version to set, and enter the required information.

   When setting Trap Reception for SNMPv3, select the applicable reception node, and then set "Engine ID."

Point

By retrieving node information, the latest "Engine ID" is displayed on the Trap Reception Settings screen.

Note

- When you add, edit, or delete trap reception settings, the changes are applied immediately. During the period between when a request is received and reflected, temporarily no SNMP traps will be received. When editing the trap reception settings, make sure that this behavior will not cause errors.
- To receive SNMPv3 traps, settings for Trap Reception for SNMP must be specified for each node. After node registration, execute settings for Trap Reception for SNMP.
- If you changed the "Engine ID" set for the node, retrieve the node information, and then re-set the retrieved, latest "Engine ID."
- Depending on the device, "Engine ID" cannot be retrieved when retrieving node information. For details on the node settings or details on retrieving the "Engine ID" by retrieving node information, refer to "A.2.2 Details of Node Settings."

MIB file

MIB is public information regarding the status of the network devices managed with SNMP, and is standardized as MIB-II, which was published as RFC 1213. The MIB file is text-based file that defines this public information. To send and receive SNMP traps, the receiving side is required to save the MIB file provided by the device side.

Add/update the MIB file in the following cases.

- To add a new MIB file to receive SNMP traps from non Fujitsu devices.
- To update an MIB file already registered in ISM to execute firmware update.

Note

- Registered MIB files can be deleted. However, if an SNMP trap that was defined in the deleted MIB files is received, it is processed as an unknown trap.
- Do not register multiple MIB files for which the same trap is defined. If you have registered multiple MIB files with the same trap defined, this is handled as if multiple occurrences of the same trap were received.
- To manage the severity of traps with ISM, MIB files to be imported must be written in a specific format. If imported MIB files are written in a format other than the specified format, the behavior could differ from the definition. Check that there are no errors in the format before you import MIB files.

  For details of the format for MIB files, refer to "A.1.4 Notes on MIB File Import."

Registering a MIB file

You can add a new MIB file that has not yet been registered on ISM.

1. Prepare an MIB file. Note that all the files that have a dependency relationship to MIB are required.
2. Transfer the MIB file to ISM-VA.
3. Execute the MIB registration command from ISM-VA Management.

For details, refer to "4.16 MIB File Settings."

Point

You can update an MIB file by registering a file that has the same name as an MIB file already registered on ISM.

Confirming MIB files

You can confirm the names of MIB files that are registered on ISM using a list. To confirm the list of MIB file names, execute the MIB reference command of ISM-VA Management.

For details, refer to "4.16 MIB File Settings."

Deleting MIB files

To cancel the registration of MIB files registered in ISM, delete the corresponding MIB file. To delete the MIB files, execute the MIB file deletion command of ISM-VA Management.

For details, refer to "4.16 MIB File Settings."

Point

Whenever you delete an MIB file, you should pay attention to its dependency relationships. If you delete an MIB file that has dependency relationships, traps may no longer be received.

2.3.5 Graph Display of Monitoring History

The history of the monitoring items accumulated through Monitoring can be displayed in a graph on the ISM GUI. The graph display allows you to easily see changes and tendencies in the history of the monitored items. A graph can be displayed for nodes individually, and a graph for multiple nodes can also be displayed as a dashboard widget.

For details, refer to "4.5 Display Monitoring History in a Graph" in "Operating Procedures."

2.4 Profile Management

Profile Management is a function that is mainly used for installation and construction of the system.

You can set up servers, network switches, and storages to be managed nodes.

The Profile Management target nodes for each type of node and the items that can be set are displayed below.

Table 2.1 Target nodes and available setting items of Profile Management

Node type	Target node (example)	Available setting items
Server	PRIMERGY RX PRIMERGY TX PRIMERGY BX PRIMERGY CX	- BIOS setup - iRMC setup - OS installation - Virtual IO setup
	PRIMEQUEST 2000-Partition	- MMB setup - OS installation
	PRIMEQUEST 3000E-Partition	- MMB setup - OS installation - Virtual IO setup (physical partition only)
	PRIMEQUEST 3000B	- BIOS setup - iRMC setup - OS installation
Network switch	SR-X	- Setting of administrator passwords - SNMP, NTP, and STP settings
	VDX PSWITCH 2048 T PSWITCH 2048 P PSWITCH 4032 P	- Setting of administrator passwords - SNMP and NTP settings
	CFX	- Administrator passwords and AAA settings - SNMP, Interface, and NTP settings
Storage	ETERNUS DX	- Creation of RAID groups/volumes - Creation of global hot spares - Host Affinity settings
	ETERNUS NR (NetApp)	- SNMP and NTP settings

Here, the following points are described:

- 2.4.1 Profile Usage
- 2.4.2 Profiles and Policies
- 2.4.3 OS Installation Settings
- 2.4.4 Virtual IO Management
- 2.4.5 Pool Management
- 2.4.6 Confirmation of Boot Information

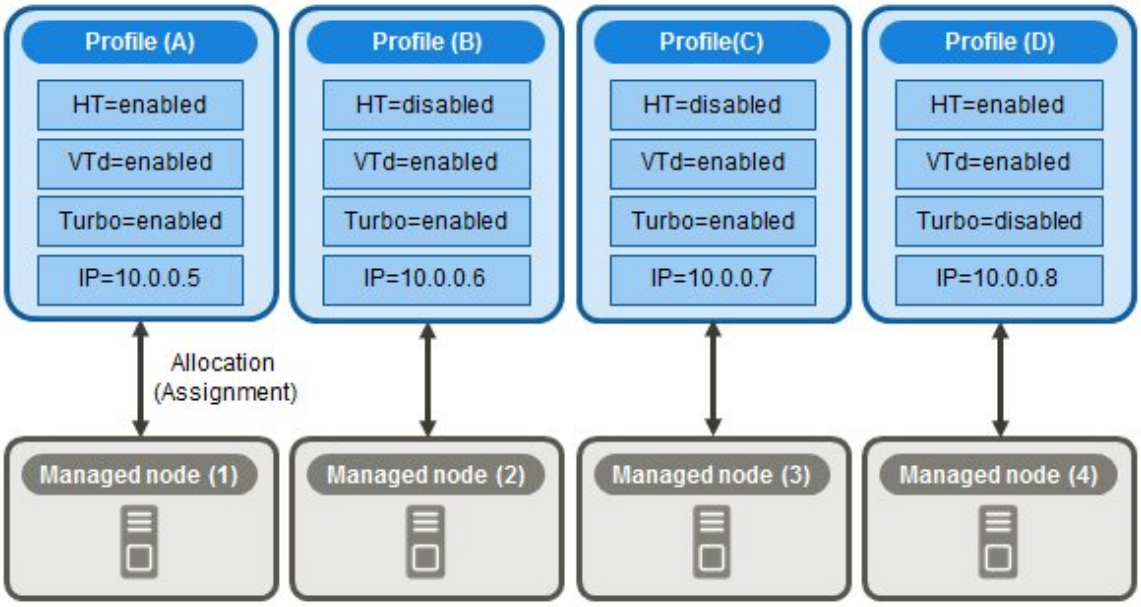
2.4.1 Profile Usage

Before you can use Profile Management to execute node settings, you must record the hardware settings (configuration) of each node and the settings at the time of OS installation in a set of definitions called a "profile."

By allocating (Assignment) this profile to nodes, the settings become effective for those nodes.

Profiles are assigned to managed nodes one-on-one. This means one profile is required for each node to be managed by a profile.

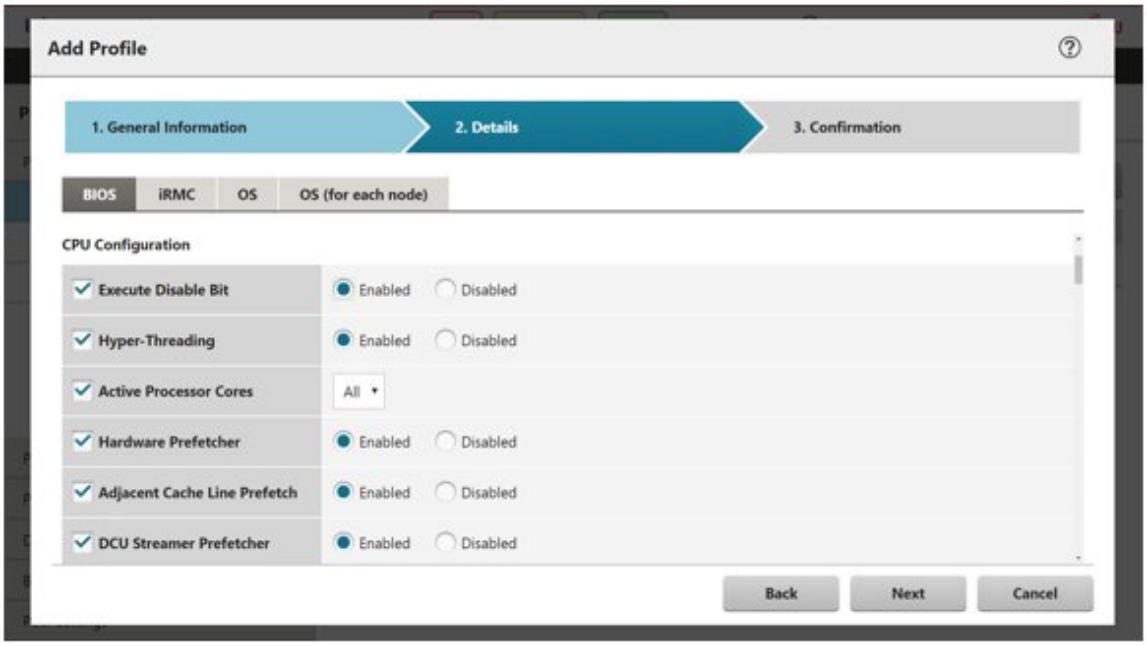
Figure 2.4 Relationships between profiles and managed nodes



Note

When you assign a profile that contains OS-related settings to a node, the OS will be installed anew according to the profile contents. This means that, if there already is an OS installed, the profile does not merely change the settings but deletes the existing OS and data before newly installing the OS.

Figure 2.5 "Creation of Profile" screen sample (GUI)



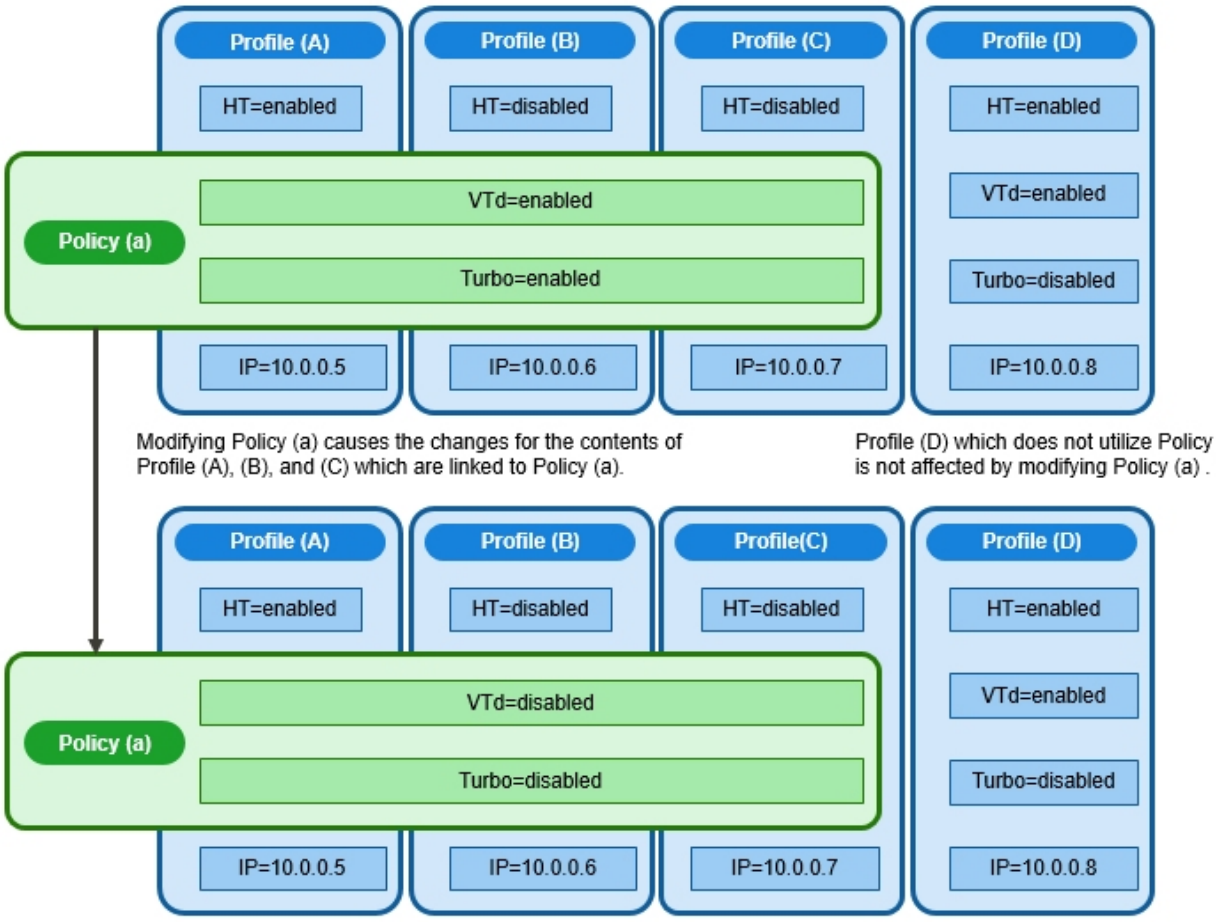
2.4.2 Profiles and Policies

Policies are structures that extract those contents to set are the same across multiple profiles to allow for batch settings. The settings in a policy are written in the same way as in a profile. However, instead of assigning a policy directly to nodes, a profile looks up the contents of the policy to assign the settings to the nodes indirectly. The contents of a single policy can be looked up by multiple profiles.

One profile is required for each node. For example, in order to set the same contents for the hardware configuration of multiple nodes, you must prepare the same number of profiles as you have nodes for which to execute the same settings. After creating the first profile, you can use the "Reference Create" function to edit duplicates of that profile for creating the required number of profiles. This procedure, however, requires that you repeat modifying all profiles, even when you want to change the contents of the same settings of all nodes.

In this case, you can use the policy function to create the profiles in advance, and you can then easily change the multiple settings together.

Figure 2.6 Relationships between profiles and policies



Note

- Profiles and policies contain general setting items that are supported on the target nodes. However, some setting items may not be supported, depending on the model and firmware version of the target node. Therefore, in the profiles and policies, do not execute any settings for items that are not supported on the nodes to which they are assigned.
- When you install an OS, you can install only an OS that is supported by the target node and the ServerView Suite DVD you are using.

Point

- If you are going to use a policy, create the policy before you create the profiles.
- You can use policies for the OS settings, BIOS settings, iRMC settings, or MMB settings on servers.

Profile groups and policy groups

Profiles and policies can be managed in groups. You can freely create groups as required (for example, by operating purpose or by time of installation) and include any profiles or policies to facilitate management.

You can include profiles in profile groups, and policies in policy groups.

2.4.2.1 Creation of policy groups/policies

Creating policy groups

1. From the Global Navigation Menu on the GUI of ISM, select [Structuring] - [Profiles].
2. From the menu on the left side of the screen, select [Policy Settings].
3. Select the location in which to create a policy group in the tree on the left side of the screen. From the [Actions] button, select [Add Group].

Creating policies

1. From the Global Navigation Menu on the GUI of ISM, select [Structuring] - [Profiles].
2. From the menu on the left side of the screen, select [Policy Settings].
3. Select the location in which to create a policy in the tree on the left side of the screen. From the [Actions] button, select [Add Policy].
4. Follow the "Add Policy" wizard and enter the settings.

   From the policy setting items, select those setting values that you want to be reflected in the profile by checking the corresponding checkboxes under the "2. Details" screen in the "Add Policy" wizard. Policy setting items for which the checkbox is unchecked will not be reflected in the profile.

Point

You can create a policy for OS settings regardless of the type of a target server. From the "1. General Information" screen in the "Add Policy" wizard, select "Server-Common" for "Category."

2.4.2.2 Creation of profile groups/profiles

Creating profile groups

1. From the Global Navigation Menu on the GUI of ISM, select [Structuring] - [Profiles].
2. Select the location in which to create a profile group in the tree on the left side of the screen. From the [Actions] button, select [Add Group].

Creating profiles

1. From the Global Navigation Menu on the GUI of ISM, select [Structuring] - [Profiles].
2. Select the location in which to create a profile in the tree on the left side of the screen. From the [Actions] button, select [Add Profile].

3. Enter the setting items according to the "Add Profile" wizard.

   From the profile setting items, select those setting values that you want to be reflected in the profile by checking the corresponding checkboxes under the "2. Details" screen in the "Add Profile" wizard. Profile setting items for which the checkbox is unchecked will not be reflected to the node settings, even if the profile is assigned to the node.

2.4.2.3 Assignment of profiles

Note

- Executing a profile assignment while you are logged in to the target node with a web operating screen or SSH may result in a profile assignment error.
- To install an OS, you must prepare the settings and files in advance. Refer to the following:

  "Required preparations for OS installation (Common)"

1. If the target node of profile assignment is a server, power off the server before you assign the profile. For nodes other than servers, switch the power on.
2. From the Global Navigation Menu on the GUI of ISM, select [Structuring] - [Profiles].
3. From the menu on the left side of the screen, select [Profile Settings] - [All Profiles].

   The "All Profiles" screen is displayed.
4. Select the profile to be assigned.
5. From the [Actions] button, select [Assign/Reassign Profile].

   The "Profile Assignment" screen is displayed.
6. Follow the instructions on the screen, and enter the setting items. For the setting items to be entered, refer to the help screen.

   To display the help screen, select [⑦] on the upper right side of the screen.

Point

Depending on the profile contents, profile assignment may require a long time to complete (for example, more than an hour). You can confirm the current progress of profile assignment on the "Tasks" screen. For details, refer to "2.13.4 Task Management."

Note

Profile assignments for BIOS/iRMC settings may fail in some iRMC firmware versions if LDAP is enabled in the iRMC settings, and HTTP is specified as the protocol in [Web I/F URL] on the Details of Node screen. In this case, edit the node information to set HTTPS in [Web I/F URL] as the protocol. For information on editing nodes, refer to "2.2.3 Editing of Datacenters/Floors/Racks/Nodes."

2.4.2.4 Editing and reassigning profiles

You can modify node settings by editing a profile that is assigned to the node and assigning the profile to the node again.

You can edit the contents of a profile while it is assigned to a node. At that time, however, changes to the profile do not immediately result in changes to the node settings. ISM handles this status as a mismatch between content of the profile and the node.

Reassign the edited profile to the node when it is convenient. When the reassignment is completed, the node settings change, and it returns to a normal status, where the profile and node settings match.

Reassigning profiles

1. From the Global Navigation Menu on the GUI of ISM, select [Structuring] - [Profiles].
2. From the menu on the left side of the screen, select [Profile Settings] - [All Profiles].

   The "All Profiles" screen is displayed.
3. Select the profile to be edited.
4. From the [Actions] button, select [Edit] to edit the profile.
5. If the target node of profile assignment is a server, power off the server before you assign the profile.

   For nodes other than servers, switch the power on.
6. Select the profile to be assigned.
7. From the [Actions] button, select [Assign/Reassign Profile].

   The "Profile Assignment" screen is displayed.
8. Follow the instructions on the screen, and enter the setting items. For the setting items to be entered, refer to the help screen.
   To display the help screen, select [⑦] on the upper right side of the screen.

Confirming the status of the assigned profile

1. From the Global Navigation Menu on the GUI of ISM, select [Structuring] - [Profiles].
2. From the menu on the left side of the screen, select [Profile Settings] - [All Profiles].

   The "All Profiles" screen is displayed.
3. Check that the node settings and profiles match.

   For the profile that has not been edited, [Assigned] is displayed in [Status].

   For the profile whose BIOS/iRMC/Virtual IO settings have been edited, [Reassignment] is displayed in [Status].

   For the profile whose OS settings only have been edited, [Assigned (Differences)] is displayed in [Status].

You can confirm whether the node settings match the profile settings by executing profile verification.

For details on verification of profiles, refer to "2.4.2.10 Verifying profiles."

Note

When [Status] is [Assigned (Differences)], you cannot perform normal re-assignment.

In this case, in the "Profile Assignment" screen, check the [Enable Advanced Settings] checkbox and use "Handle profile as assigned in ISM without actually assigning it to the node."

2.4.2.5 Releasing and deleting profiles

In the following cases, release any assigned profiles in advance:

- To delete an assigned profile

- To delete a node, which a profile is assigned, from ISM
- To remove a node to which a profile is assigned from its node group, or to modify the node group

Point

For details on node groups, refer to "2.13.1 User Management."

Releasing profiles

1. From the Global Navigation Menu on the GUI of ISM, select [Structuring] - [Profiles].
2. From the menu on the left side of the screen, select [Profile Settings] - [All Profiles].

   The "All Profiles" screen is displayed.
3. Select the profile to be released.
4. From the [Actions] button, select [Release Profile].

Deleting profiles

1. From the Global Navigation Menu on the GUI of ISM, select [Structuring] - [Profiles].
2. From the menu on the left side of the screen, select [Profile Settings] - [All Profiles].

   The "All Profiles" screen is displayed.
3. Select the profile to be deleted.
4. From the [Actions] button, select [Delete].

   You can only delete profiles whose status is [Not assigned].

2.4.2.6 Exporting and importing profiles

You can export and import profiles as text files in JSON format, if, for example, you want to reuse profiles in another ISM system or store assigned profiles in the Management terminal.

Point

Policies can also be exported and imported.

Exporting profiles

1. From the Global Navigation Menu on the GUI of ISM, select [Structuring] - [Profiles].
2. From the menu on the left side of the screen, select [Profile Settings] - [All Profiles].

   The "All Profiles" screen is displayed.
3. Select the profiles to be exported.
4. From the [Actions] button, select [Export].
5. Set an encryption password key (required), and then execute the export with the [Export] button.

Importing profiles

1. From the Global Navigation Menu on the GUI of ISM, select [Structuring] - [Profiles].

2. Select the location in which to store the profile in the tree on the left side of the screen. From the [Actions] button, select [Import].
3. Select an option in [File selection method].
   - Local

     Import a profile stored locally.
   - FTP

     Import a profile from the FTP server of ISM-VA.

     You must transfer the profile to the "/<User group name>/ftp" directory of ISM-VA in advance.

     For FTP connections and how to transfer to FTP, refer to "2.1.2 FTP Access."
4. Specify the profile to be imported in [File Path].
5. Select [Profile Type].
6. Enter [Profile Group Name].
7. Enter the decryption password key you set in [Decryption Password Key] when exporting the profiles (required), and then execute the import with the [Import] button.

Point

- The files you transferred to the FTP server of ISM-VA are no longer required after the import has finished. Use an FTP command to delete them.
- Because profiles contain passwords and other security information, you must specify an encryption key when you export profiles.

2.4.2.7 Editing/deleting profile groups

Editing profile groups

1. From the Global Navigation Menu on the GUI of ISM, select [Structuring] - [Profiles].
2. In the tree on the left side of the screen, select the location of the profile group to be edited, and then select the profile group in the list on the right.
3. From the [Actions] button, select [Edit] to edit profile groups.

Deleting profile groups

1. From the Global Navigation Menu on the GUI of ISM, select [Structuring] - [Profiles].
2. In the tree on the left side of the screen, select the location of the profile group to be deleted, and then select the profile group in the list on the right.
3. From the [Actions] button, select [Delete].

2.4.2.8 Editing/deleting policy groups

Editing policy groups

1. From the Global Navigation Menu on the GUI of ISM, select [Structuring] - [Profiles].
2. From the menu on the left side of the screen, select [Policy Settings].
3. In the tree on the left side of the screen, select the location of the policy group to be edited, and then select the policy group in the list on the right.
4. From the [Actions] button, select [Edit] to edit the policy group.

Deleting policy groups

1. From the Global Navigation Menu on the GUI of ISM, select [Structuring] - [Profiles].
2. From the menu on the left side of the screen, select [Policy Settings].
3. In the tree on the left side of the screen, select the location of the policy group to be deleted, and then select the policy group in the list on the right.
4. From the [Actions] button, select [Delete].

2.4.2.9 Specifying behavior when assigning profiles

Normally, you either newly assign a profile to a node or reassign an already assigned profile after changing it. However, during the assignment/reassignment operation on the GUI, you can check the [Enable Advanced Settings] checkbox on the "Profile Assignment" screen to change the behavior conditions (Assignment mode) when assigning profiles. In addition, for servers, you can specify the scope to which to assign a profile separately for each function group (BIOS, iRMC, MMB, OS, and Virtual IO).

The behavior conditions (Assignment mode) you can specify are as follows.

- "Assign profile also to unchanged portions"

  With a profile assigned, the node settings are overwritten even if the node and profile contents match.
  Note, however, that you cannot reassign an OS part of the profile.

- "Hot Profile Assignment (with node power remaining on)"

  When you assign a profile to a server, usually you must assign the profile while the power of the target node is switched off. Selecting this operation allows you to assign the profile while the power of the target node remains on.

  Note the following points.

  - Some parts of BIOS settings, iRMC settings, and MMB settings are not applied until the server is rebooted.

    After completion of the profile assignment, reboot the server at any time.

  - You cannot select this mode when OS settings or virtual IO settings are the target of your profile assignment.
  - For servers where iRMC S5 is installed, profiles for BIOS settings cannot be assigned in this mode.
  - If the iRMC firmware version of the server where iRMC S4 is installed is 9.xxF or later, profiles for BIOS settings cannot be assigned in this mode. If you want to assign profiles for BIOS settings in this mode, use iRMC firmware version 8.xxF.

- "Handle profile as assigned in ISM without actually assigning it to the node"

  Profile assignment is completed only internally within ISM management, without actually executing any changes on the node. Therefore, after an assignment, differences between node statuses and ISM Management statuses may occur.

2.4.2.10 Verifying profiles

If you change the BIOS/iRMC settings for the server directly after assigning a profile, the contents of the BIOS/iRMC settings for the server may be different from the settings for the assigned profile. By executing verification of the profile, you can check if the contents of the BIOS/iRMC settings for the server match the assigned profile and you can confirm that there are no discrepancies.

Execution status or execution results of the verification of profiles are displayed in [Verify Status] of the GUI. If there are discrepancies between the contents of the BIOS/iRMC settings for the server and the profile settings, a message is displayed to the event and [Mismatch] is displayed in [Verify Status]. When [Verify Status] is [Mismatch], check the setting items that are different in the applicable profile, and determine that the contents of the node settings were intended to change. You must change the status to [Match] in [Verify Status] by reassigning profiles or editing profiles to match the contents of the BIOS/iRMC settings for the server and the settings of the profile.

Verification of profiles is available for the following settings:

- BIOS/iRMC settings for the PRIMERGY and PRIMEQUEST 3000B series

Verification of profiles can be executed for the profiles whose status are as follows:

- Assigned
- Reassignment
- Assigned (Differences)

Here, the following points are described:

- Procedures to execute verification of profiles
- Procedures to check the items that do not match when [Verify Status] is [Mismatch]

Procedures to execute verification of profiles

ISM automatically verifies profiles (at approximately 24-hour intervals). You can also verify profiles at any time. The following is the procedure to verify profiles.

1. From the Global Navigation Menu on the GUI of ISM, select [Structuring] - [Profiles].
2. From the menu on the left side of the screen, select [Profile Settings] - [All Profiles].

   The "All Profiles" screen is displayed.
3. Select the profile to verify.
4. From the [Actions] button, select [Verify].

   The "Verify" screen is displayed.
5. Confirm the contents and select the [Execute] button.

   You can check the current progress of the verification of profile on the "Tasks" screen. For details, refer to "2.13.4 Task Management."

   After the task is complete, check [Verify Status] of the applicable profile. If [Verify Status] is "Processing," select the [Refresh] button to update the screen.

Procedures to check the items that do not match when [Verify Status] is [Mismatch]

The following is the procedure to check for discrepancies in the applicable profile when [Mismatch] is displayed in [Verify Status].

1. From the Global Navigation Menu on the GUI of ISM, select [Structuring] - [Profiles].
2. From the menu on the left side of the screen, select [Profile Settings] - [All Profiles].

   The "All Profiles" screen is displayed.
3. Select the profile name for which [Verify Status] is [Mismatch].
4. Select the [BIOS] or [iRMC] tab.

   If there are discrepancies, the "There are differences in the profile settings." message is displayed.
5. Select "Differences from the server settings" from the pull down box below the message.

   The items that are different are displayed in red.

Point

- To confirm the BIOS settings with verification of profiles, the backup files of the BIOS parameters must be saved on the server. Therefore, when you assign a profile, enable [Automatic BIOS Parameter Backup] in the iRMC settings for the profile.
- If the setting for [Automatic BIOS Parameter Backup] is disabled in the iRMC settings for the server or if the server does not have this setting, verification of profiles can not be executed with the latest BIOS settings. In this case, execute the verification of profiles (refer to "Procedures to execute verification of profiles ") after you have backed up the hardware settings for the BIOS (refer to "2.10.1 Backup of the File of Backup Hardware Settings"). To check the existence of the [Automatic BIOS Parameter Backup] settings in the iRMC settings for the server, refer to the following manuals.
  - "ServerView Suite Remote Management iRMC S2/S3 - integrated Remote Management Controller"
  - "Fujitsu Software ServerView Suite iRMC S4 Web Interface"
  - "Fujitsu Software ServerView Suite iRMC S5 Web Interface"
- If the node is in Maintenance Mode, ISM will not routinely execute verification of profiles. In this case, manually execute verification of profiles.
- The [Proxy Server] - [Password] item in the iRMC settings is not verified.
- If a profile has been assigned with the following settings on the "Profile Assignment" screen, [Verify Status] will be [Verify Failed]. In this case, manually execute verification of profiles.
  - [Assignment Mode]: "Handle profile as assigned in ISM without actually applying it to the node."

    [Assignment Mode] is an option that can be selected when the [Enable Advanced Settings] checkbox is checked.
  - [Status]: [Not assigned]

Note

Verification of profiles may fail in some iRMC firmware versions if LDAP is enabled in the iRMC settings, and HTTP is specified as the protocol in [Web I/F URL] on the Details of Node screen. In this case, edit the node information to set HTTPS in [Web I/F URL] as the protocol. For information on editing nodes, refer to "2.2.3 Editing of Datacenters/Floors/Racks/Nodes."

2.4.3 OS Installation Settings

Set a profile for the OS installation.

The following two methods can be used to install an OS.

- Using the PXE boot function

  The PXE boot function is used to install an OS on a server by using Profile Management. It is also used to perform Offline Update for servers or mounted PCI cards by using Firmware Management. For details on the settings to use PXE boot function, refer to "A.1.1 DHCP/PXE Settings in Using Profile Management/Firmware Management."
- Using the ServerView embedded Lifecycle Management function (ISM 2.5.0.010 or later)

  An installation using ServerView embedded Lifecycle Management (hereafter referred to as "eLCM") uses eLCM of iRMC and embedded Installation Management (hereafter referred to as "eIM") provided by eLCM. This function can be used when the installation target servers are PRIMERGY or PRIMEQUEST 3000B.

  To use eLCM, it is recommended to configure the Repository Server. The downloading time for eIM can be reduced by using Repository Server.

Point

For the procedures to configure and check the Repository Server environment, refer to the applicable manuals on the following Fujitsu Manual Server site.

http://manuals.ts.fujitsu.com/index.php?l=en

"ServerView Repository Server Installation and User Guide"

Required preparations for OS installation (Common)

- The OS installation media must be copied to the repository area on ISM-VA in advance. This task is called "import."

  If you are going to import an ISO image of the OS installation media, allocate a virtual disk to the user group.

  For details, refer to "3.7.2 Allocation of Virtual Disks to User Groups."

Required preparations for OS installation (for using PXE boot function)

- The ServerView Suite DVD must be imported on ISM-VA in advance.

  Import the ServerView Suite DVD as a user who belongs to the Administrator group and has an Administrator role or an Operator role. Because the repository is shared by all user groups, you do not need to import the DVD into each user group.

  For details, refer to "2.13.2 Repository Management."

- Use the PXE boot function on the target node. Complete the network connections and the BIOS settings of the target server in advance, so that PXE booting is enabled from the management LAN. Also, a separate DHCP server is required within the network. Set the DHCP server so that target nodes can lease the appropriate IPv4 addresses during the PXE boot.

  For details, refer to "A.1.1 DHCP/PXE Settings in Using Profile Management/Firmware Management."

Required preparations for OS installation (for using eLCM)

- The following preparations are required:
  - Preparing the network connection to the management LAN on the target node

    Set the LAN port that is used to install an OS on the [Profile] tab on the Details of Node screen, or in [Management LAN network port settings] of the profile settings. If it is not set, the first port of the onboard LAN is used.

    You also need a separate DHCP server in the network. Set the DHCP server to lease the appropriate IPv4 address to the target node during the OS installation. Enable the DHCP function in the ISM-VA or run the DHCP server in the same network segment as the target node to be able to lease the appropriate IPv4 address to the LAN port for OS installation. Set the lease period to 60 minutes or longer.

    Example: Scope settings when the ISM-VA connects to 192.168.1.100/24

    - Lease range: 192.168.1.128 - 192.168.1.159
    - Lease period: eight days

  - Preparing an eLCM environment on a target server
  - Downloading eIM to a bootable SD card on iRMC on the target server

    If you use eLCM, the ServerView Suite DVD does not need to be imported on ISM-VA.

    You can use an iRMC settings profile to set a Repository Server that is required for downloading eIM.

    For details, refer to "1. BIOS/iRMC Setting Items of Profiles for PRIMERGY/ PRIMEQUEST3000B Servers" in "Items for Profile Settings (for Profile Management)."

  - Manual retrieval of the node information after completing the eLCM environment settings and eIM download

    For details, refer to "2.2.1.3 Management of node information."

Point

For the procedures to configure and check the eLCM environment, and to download eIM, refer to the applicable manuals on the following Fujitsu Manual Server site.

http://manuals.ts.fujitsu.com/index.php?l=en

- "ServerView embedded Lifecycle Management (eLCM) 1.2 for iRMC S4 Overview"
- "ServerView embedded Lifecycle Management (eLCM) 1.2 for iRMC S5 Overview"

Note

- Only eIM image version 13.19.07 or later can be used with eLCM.
- If you use a server with iRMC S4, the iRMC firmware version that can use eLCM is 9.xxF or later.

Precautions for OS installation (for using PXE boot function)

If there are errors in the network environment settings or the BIOS settings of the target server, the PXE boot may fail and the OS that is already installed on the target server starts. In this case, the server on which the OS would have been installed cannot be shut down from ISM. When the timeout for processing the profile assignment (Task) elapses, processing ends with an error.

To forcibly abort processing for a profile assignment before it ends with a timeout error, cancel the task.

Procedure for specifying scripts to be executed after OS installation (Common)

To execute any specified scripts after installing an OS, you must transfer the script files to the ISM-VA in advance.

1. Prepare the scripts you want to execute after OS installation.
2. Connect to ISM-VA via FTP and transfer the script files.

   In the "ftp" directory, create a freely named subdirectory for the scripts and transfer them into that subdirectory.

   For FTP connections and how to transfer to FTP, refer to "2.1.2 FTP Access."
3. Add or edit a profile to specify the directory name where you stored the script files and the names of the script files to be executed under [Execute Script after Installation].

2.4.4 Virtual IO Management

Virtual IO Management is a function that virtualizes the LAN, FC (Fibre Channel) I/O parameters (MAC and WWN).

- A virtual MAC address can be used instead of the MAC address of the LAN controller.
- A virtual WWN can be used instead of the WWN of the FC controller.
- The virtual MAC address, virtual WWN, network channel allocation, and I/O parameters for network boot can be saved in a profile.

Point

The virtual MAC address and virtual WWN must be unique across all nodes managed with ISM, or in the node group. Because of this, profiles where virtual IO, such as a virtual MAC address and virtual WWN, has been set cannot be assigned to multiple nodes.

Note

- When software that manages virtual IO, such as ServerView Virtual-IO Manager (VIOM), is running, be careful that it does not conflict with ISM.
- To avoid conflict when VIOM is running, make sure that ISM and VIOM do not manage the same node.
- The parameter setting for the UEFI boot mode of the virtual IO is reflected in the CSM Configuration settings of the BIOS. For details on each setting of UEFI boot mode, refer to "4.2 Port Setting" in "Items for Profile Settings (for Profile Management)."
- In the PRIMERGY BX series, when the MMB firmware version is 5.71 or earlier, do not reset the virtual IO settings from MMB.
- For PRIMEQUEST 3000E partitions, expansion partitions are not supported. Only physical partitions can be set up.

- For PRIMEQUEST 3000E partitions, you must set the IP address and a user account for the iRMC partition. For setting procedures, refer to the following site.

  http://manuals.ts.fujitsu.com/

  To display the "Online manuals" page

  1. From the "MANUALS" menu on the left side of the screen, select [x86 Servers] - [PRIMEQUEST Servers].
  2. In the fields under "SELECT" in the middle of the screen, select [PRIMEQUEST 3000 Series] - [Enterprise Model].

  - Setting an iRMC IP address

    "FUJITSU Server PRIMEQUEST 3000 Series Enterprise Model Tool Reference (MMB)" - "2.4.3.1 [IPv4 Console Redirection Setup] window"

  - Setting an iRMC user account

    "FUJITSU Server PRIMEQUEST 3000 Series Enterprise Model Tool Reference (MMB)" - "3.2.78 set irmc user"

  In addition, set the iRMC information in "Edit Node" of the partition.

- For PRIMEQUEST 3000E partitions, disable the CSM settings of the BIOS.
- For PRIMEQUEST 3000E partitions, use UEFI. For the method to set UEFI, refer to "4.2 Port Setting" in "Items for Profile Settings (for Profile Management)."
- For PRIMERGY or PRIMEQUEST 3000E partitions, you must set the boot number of the port of the LAN card to more than one in the virtual MAC address settings. If there are multiple ports that are boot targets (ports other than a LAN card port exist), check if the boot order is correct (as you have specified).

MAC address and WWN virtualization

By managing the virtual IO settings (virtual MAC address, virtual WWN and so on) of servers as profiles, Virtual IO Management can be used by assigning these profiles. When replacing managed servers or PCI cards, using profiles reduces the workload for changing the settings of peripheral devices and makes it easy to re-set network information.

Replacing managed servers or PCI cards that used Virtual IO Management is assumed to be executed according to the following procedure.

Figure 2.7 Replacing a managed server that used Virtual IO Management

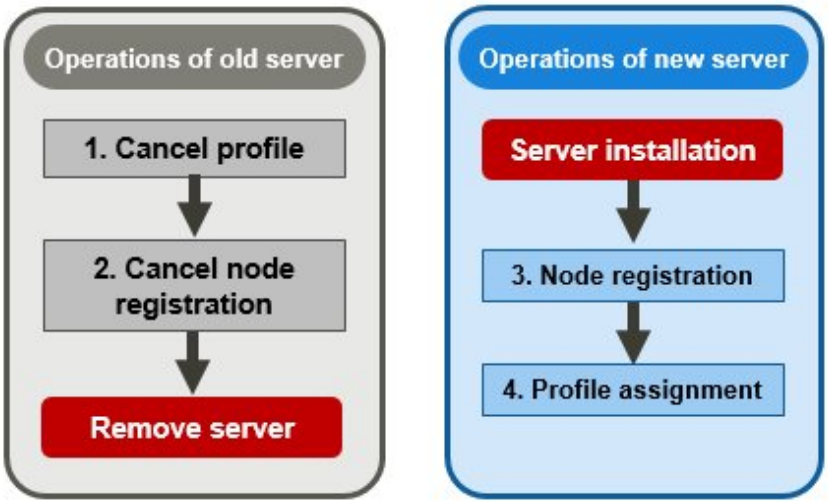
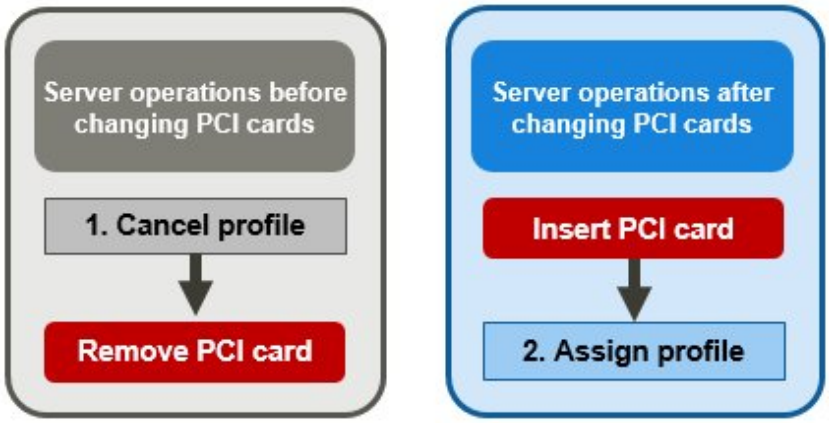


Figure 2.8 Replacing a PCI card that used Virtual IO Management



iRMC AC power OFF recovery for virtual IO

If iRMC loses all power (all electric cable connections are broken, or the data center loses power), iRMC loses the virtual IO settings. Apply the virtual IO settings again when the AC power is restored and iRMC has been booted again.

Required preparations for iRMC AC power OFF recovery for virtual IO

You must set the IP address of ISM as the SNMP trap destination of the server in advance.

Note

- To perform this process, it must be possible to access ISM and iRMC.
- iRMC AC power OFF recovery for virtual IO is enabled only in PRIMERGY.

  For PRIMEQUEST 3000E partitions, set the iRMC account of the partition on the device side again, and then re-assign the profile manually.

Point

During the time until the virtual IO settings have been reassigned, iRMC will regularly send an SNMP trap to ISM, encouraging the reassign of the virtual IO settings. This process can be stopped by disabling the virtual IO management status from the iRMC user interface or the BIOS interface.

An error message may be displayed even if the virtual IO was successfully reassigned. Confirm that the virtual IO was reassigned.

Re-assign the profile if re-assigning is not executed using the recovery function.

2.4.5 Pool Management

The Pool Management function is a function that manages address resources by arranging them into pools. The following main functions are available.

- Set pools of address ranges that are available to users
- Allocate values from the pool as required
- Return values that are no longer required to the pool

Target resources for pools

The target resources for pools are the following virtual addresses.

- Virtual MAC addresses

- Virtual WWN

The Pool Management function is used when the Virtual IO Management function is used to set the virtual addresses above.

When setting the virtual addresses above during the creation of profiles, values can automatically be allocated from the pool range without having to enter the values of the virtual address. You can also select which values are allocated from the set pool.

If you delete a profile to which the above virtual addresses have been allocated, the deallocated virtual address is returned to the pool.

Here, the following operations are described:

- Register pool settings
- Confirm pool settings
- Edit pool settings
- Delete pool settings

Register pool settings

1. From the Global Navigation Menu on the GUI of ISM, select [Structuring] - [Profiles] - [Pool Settings].
2. From the [Actions] button, select [Register].
3. In the "Register Pool" screen, set the required information and select [Register].
   - Pool Type

     Select the type of pool to set.
   - Start Address and End Address

     Set the start address and the end address of the pool range.
   - Authorized user group

     Select a user group that can allocate values from the pool range.

     If you selected [All user groups], any user group can allocate values from the pool range set here.

Confirm pool settings

From the Global Navigation Menu on the GUI of ISM, select [Structuring] - [Profiles] - [Pool Settings] to display the "Pool List" screen.

The pool settings that the user can use are displayed on the "Pool List" screen. You can also confirm the number of addresses that are available and the allocated addresses.

If the number of available addresses is 0, addresses cannot be allocated from the range of this pool. Execute "Register pool settings" or "Edit pool settings" to add pool range.

Edit pool settings

When editing the settings of a pool, only the start address and end address can be edited.

1. From the Global Navigation Menu on the GUI of ISM, select [Structuring] - [Profiles] - [Pool Settings].
2. Select the pool you want to edit. From the [Actions] button, select [Edit].
3. Set the required information in the "Edit Pool" screen, and then select [Register].

Note

If there are allocated addresses, the range of the pool cannot be set such that these addresses are outside of the range. Confirm the allocated addresses when editing.

Delete pool settings

1. From the Global Navigation Menu on the GUI of ISM, select [Structuring] - [Profiles] - [Pool Settings].
2. Select the pool setting to be deleted. From the [Actions] button, select [Delete].
3. Confirm the item to be deleted, and then select [Delete].

2.4.6 Confirmation of Boot Information

You can confirm the boot information of the node set with Virtual IO Management.

1. From the Global Navigation Menu on the GUI of ISM, select [Management] - [Nodes].
2. From [Column Display] on the "Node List" screen, select [Boot Info].

2.5 Log Management

Log Management is a function that is mainly used for the following purposes:

- Collecting Node Logs periodically, according to a specified schedule
- Collecting Node Logs at any suitable time
- Downloading and using collected logs
- Referring and searching with key words on the GUI screen

In ISM, you can set the "Types of logs to be collected" and the "Collection schedule" separately for each node.

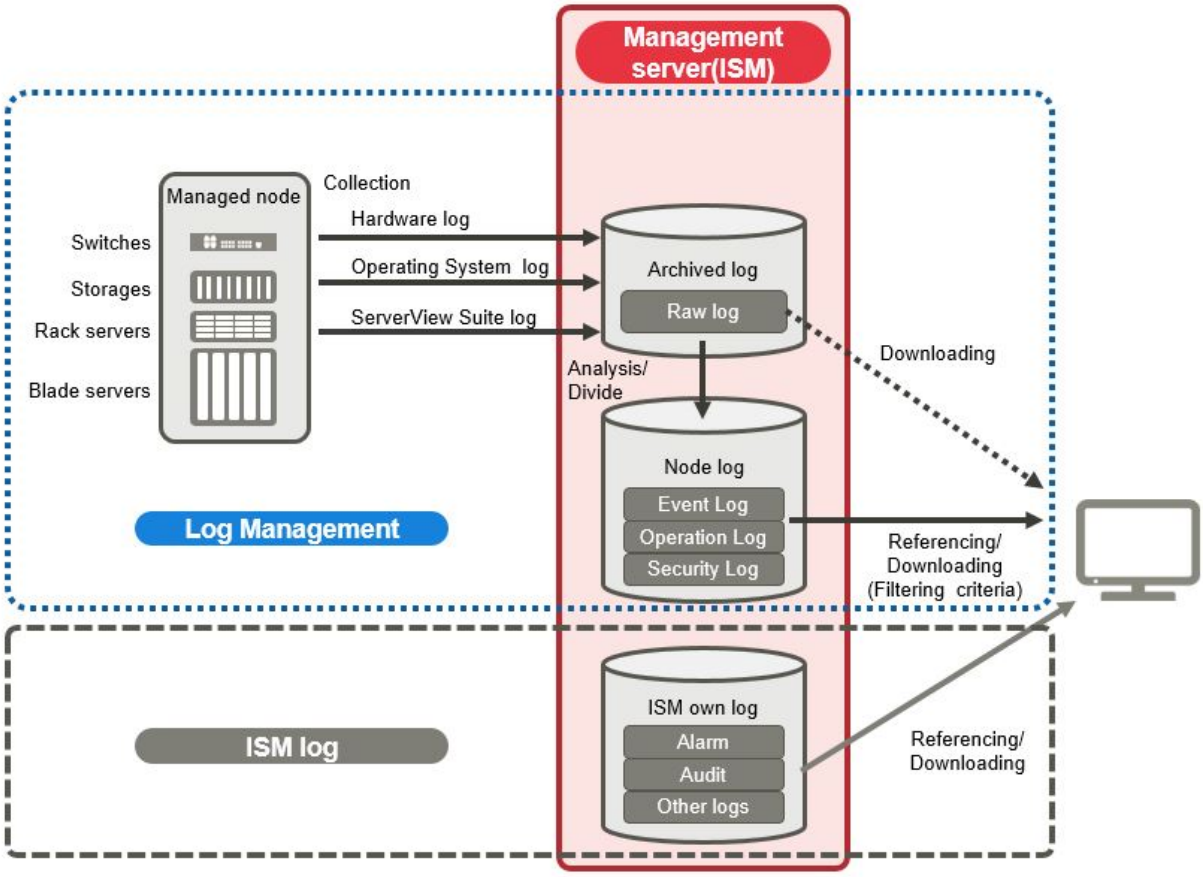
A batch of logs that are collected from nodes according to these settings are called "Archived Logs."

Archived Logs are stored on the management server without any changes to the data format of the log files collected from each node. Through operation on the GUI of ISM, you can download the Archived Logs converted into zip files to the management terminal at an arbitrary timing.

The log files from Archived Logs can be classified as "Event Logs," "Operation Logs," and "Security Logs," according to ISM standards. On the management server, the "Data for log search" (for display in a list or for searching on the GUI) and the "Data for download" are accumulated separately. In ISM, logs with these statuses are collectively called "Node Logs."

These "Node Logs" are displayed as a list on the GUI. You can filter the display by specifying conditions such as their classification; "Event Logs," "Operation Logs," and "Security Logs," as well as the date and time of occurrence. In addition, you can download the filtered log list as a CSV file or zip files, to the management terminal.

Figure 2.9 Image of Log Management



Note

ISM analyzes the formats of Archived Logs to classify them into "Event Logs," "Operation Logs," and "Security Logs." Therefore, do not change the OS defaults of the log message formats of each node.

If, for example, the log message format for a Linux operating system log is changed in the OS system log settings, ISM can no longer recognize the log and, consequently, cannot create a correct Node Log.

Here, the following points are described:

- 2.5.1 Types of Collectable Logs
- 2.5.2 Setting Log Retention Periods
- 2.5.3 Setting Log Collection Targets, Dates and Times
- 2.5.4 Operations for Log Collection
- 2.5.5 Searching Node Logs
- 2.5.6 Downloading Node Logs
- 2.5.7 Downloading Archived Logs
- 2.5.8 Deleting Node Logs
- 2.5.9 Deleting Archived Logs

2.5.1 Types of Collectable Logs

Log Management can collect three types of logs: hardware logs, operating system logs, and ServerView Suite logs. For supported hardware, OSes, and other details, contact your local Fujitsu customer service partner.

Hardware logs

Log Management collects device logs from each managed node.

Type	Node from which to collect log	Type of Archived Log to be collected	Type of Node Log to be analyzed and accumulated
Server	PRIMERGY (except CX1430 M1)	SEL System Report (server with iRMC S4 or later)	SEL
	PRIMEQUEST 3000B		
	IPCOM VX2		
	PRIMERGY CX1430 M1	SEL (binary)	None
Chassis	PRIMERGY BX	Exported results for "show Log/ MgmtBlade LogMgmtBladeAll" command Exported results for "set SystemInfo/ Dump Started=true" command	Exported results for "show Log/MgmtBlade LogMgmtBladeAll" command
	PRIMEQUEST 3000E	SEL Exported results for "opelogview" command Exported results for "selview" command Exported results for "configview" command	SEL
Storage	ETERNUS DX/AF	Exported results for "export log" command Exported results for "show events" command	Exported results for "show events" command
	ETERNUS NR (NetApp)	Exported result for "event log show" command Each file type under the /mroot/etc/log directory	Exported result for "event log show" command
Connection Blade	Ethernet Switch	Exported results for "show tech-support" command	Exported results for "show logging persistent" or "show logging syslog" command (included in exported results for "show tech-support" command)
	Fibre Channel Switch	Exported result for "supportshow" command Each type of file created with the "supportsave" command	Exported result for "supportshow" command
Switches	SR-X	Exported results for "show tech-support" command	Exported results for "show logging syslog" command (included in exported results for "show tech-support" command)
	CFX		
	PSWITCH 2048 T PSWITCH 2048 P PSWITCH 4032 P	Exported results for "show tech-support" command	Exported results for "show logging persistent" command (Included in exported results for "show tech-support" command)

Type	Node from which to collect log	Type of Archived Log to be collected	Type of Node Log to be analyzed and accumulated
	VDX	Various files created with the "copy support" command	Exported results for the "show logging raslog" command Exported results for the "show logging audit" command (included in "<Arbitrary text string as required>.INFRA_USER.txt.gz" file created with the "copy support" command)
	Cisco Catalyst	Exported results for "show tech-support" command	Exported results for "show logging" command (included in exported results for "show tech-support" command)
	Cisco Nexus		

Operating system logs

Log Management retrieves logs for the OSes that are running on the managed servers.

OS for which to retrieve logs	Type of log to be collected	
	Name in OS	Classification in ISM
Windows	Event Log (system log or application log)	Operating system log (Event Log)
	Event Log (security log)	Operating system log (Security Log)
Linux	System log (/var/log/messages)	Operating system log (Event Log)
	System log (/var/log/secure)	Operating system log (Security Log)
VMware ESXi	System log (syslog.log)	Operating system log (Event Log)
IPCOM OS	System log (/var/log/messages)	Operating system log (Event Log)
	System log (/var/log/secure)	Operating system log (Security Log)
	Technical support information	-

Note

Logs for OSes running on virtual machines are exempt from retrieval.

ServerView Suite logs

Log Management retrieves logs for the software (ServerView Suite products) that is running on the managed servers.

Software for which to retrieve logs	Type of Node Log to be collected
ServerView Agents	Exported results for the "PrimeCollect" command
ServerView Agentless Service	Exported results for the "PrimeCollect" command
ServerView RAID Manager	Operation Logs (RAIDLog.xml and snapshot.xml)

Note

- Logs for ServerView Suite products running on virtual machines are exempt from retrieval.
- ServerView Suite logs are exempt from Node Log creation.

2.5.2 Setting Log Retention Periods

You can set the log retention periods separately by log classification; "Event Logs," "Operation Logs," and "Security Logs." Also, you can set the number of generations to retain for unclassified "Archived Logs."

You can set arbitrary values for the log retention periods.

The retention periods for "Event Logs," "Operation Logs," and "Security Logs" are specified in days. Logs with a time stamp older than the specified number of days are deleted. With the default settings, logs are retained for the past 30 days. The available setting range is 1 - 1,830 days (approximately 5 years).

For "Archived Logs," you must set the number of generations for past log collections that are retained. Each collection operation counts as one generation, regardless of whether it was automatic (scheduled) or manual (any time). "Archived Logs" that are older than the specified number of generations are deleted. With the default settings, the past seven generations of logs are retained. The available setting range is 1 - 366 generations.

Point

- The retention periods and the numbers of retained generations for the log classifications; "Event Logs," "Operation Logs," "Security Logs," and "Archived Logs" have no effect on each other.

  For example, if the retention period for "Event Logs," "Operation Logs," and "Security Logs" is set to 30 days each, and the logs for the past one year have accumulated on the target node, executing a log collection will result in the "Archived Log" retaining all records for that year. In contrast, the "Event Log," "Operation Log," and "Security Log" do not store any logs that are older than 30 days.

- Confirm that the retention periods are set to optimum values for your operation environment before you execute a log collection for the first time.

  By default, the retention periods for "Event Logs," "Operation Logs," and "Security Logs" are each set to 30 days.

  When you retrieve an "Archived Log" from a node in your first log collection, any logs that are older than 30 days are deleted without being accumulated them as "Event Logs," "Operation Logs," and "Security Logs."

  Even if you modify the retention period to be longer than 30 days before the second and subsequent log collections, Node Logs older than 30 days are not accumulated.

  If you want to accumulate logs from before the past 30 days, modify the settings for the log retention periods to any value larger than "30 days" before you execute a log collection for the first time.

2.5.3 Setting Log Collection Targets, Dates and Times

By setting log collection on the nodes that are registered in ISM, you can collect logs from the nodes.

Set the following items for the nodes:

- Log Collection Target

  As the log types to be collected, you can specify any combination of "Hardware Log," "Operating System Log," and "ServerView Suite Log."

  For log collection target nodes other than servers, you can only specify "Hardware Log."

  If you select none at all, logs will not be collected.

- Retention Period (required for all items)

  Event Log: Set the maximum number of days for log retention.

  Operation Log: Set the maximum number of days for log retention.

  Security Log: Set the maximum number of days for log retention.

  Archived Log: Set the maximum number of generations for log retention.

For collecting logs from nodes, the following two execution procedures can be used:

- Manual execution at any suitable time
- Automatic execution according to a schedule

To execute log retrievals periodically and automatically according to a schedule, you must set an execution schedule separately for each node.

Note

After retrieving and confirming information from the nodes, ISM judges whether these nodes are valid targets for collecting the three types of log: "Hardware Log," "Operating System Log," and "ServerView Suite Log."

If the Log Collection Target settings do not allow for executing "Hardware Log," "Operating System Log," or "ServerView Suite Log" settings, which should be available, information retrieval from that node may not have completed normally.

- If the settings for "Hardware Log" cannot be executed, confirm the network connections between management servers and nodes and the node property settings (especially network-related items) again. Then execute [Get Node Information] again.
- If the settings for "Operating System Log" and "ServerView Suite Log" cannot be executed, confirm again that the contents of node OS information are correctly registered. Then execute [Get Node Information] again.
- Settings for "ServerView Suite Log" are available only if the OS permits installation of ServerView Suite products (ServerView Agents, ServerView Agentless Service, and ServerView RAID Manager) that support log collection.

To execute log collection periodically, you must set a schedule.

With a schedule set separately for each node, you can collect specific types of logs at specific times and store them in a designated area in ISM-VA.

There are two methods to specify the collection schedule as follows:

- Specify by Day of the Week

  Here, you can specify the time at which to retrieve logs separately for each day of the week. Specify the day of the week and the time to retrieve logs in the format "Every x-day at hh:mm." Alternatively, you can specify in the format "Every n-th x-day of the month at hh:mm."

  Example 1: Log retrieval every Sunday at 23:00

  Example 2: Log retrieval every first Monday of the month at 12:10

  Example 3: Log retrieval every Wednesday at 11:00, and every Friday at 18:00

- Specify by Date

  Here, you can specify the time at which to retrieve logs separately for a specific day or the last day of every month.

  Example 1: Log retrieval on every 10th at 11:00, and on every 20th at 18:00

  Example 2: Log retrieval on the last day of every month at 23:50

The following is a sample setting operation using the GUI.

1. From the Global Navigation Menu on the GUI of ISM, select [Structuring] - [Log Collection].
2. From the [Log Collection] menu, select [Log Collection Settings].
3. Check the checkboxes for the nodes for which to execute the settings. By checking the checkboxes for multiple nodes, you can execute the same settings to the multiple nodes.

4. From the [Actions] button, select [Edit Log Collection Settings].

Point

You can edit the log collection settings by using the same operations on the screens described in the following procedure.

1. From the Global Navigation Menu on the GUI of ISM, select [Management] - [Nodes].
2. Execute one of the following.
   - From the [Column Display] field in the node list, select [Log Collection Settings].
   - From the node list, select [Node Name] of the node, and then select the [Log Collection Settings] tab.

Note

Set the time in the [Edit Log Collection Settings] schedule in the time zone that is set on the ISM-VA.

If you set the time in the time zone that is set on the ISM GUI, regular log collection may not be executed at the expected time.

After setting the schedule, confirm that the expected schedule time has been set in [Next Execution Date].

For the time zone of ISM-VA, check with your ISM administrator.

2.5.4 Operations for Log Collection

Periodical log collection

Periodical log collection collects and accumulates Node Logs periodically, according to a specified schedule.

To have log collections executed periodically, you must set a log collection schedule.

Logs are collected automatically at the times that you set in the schedule.

Note

- With periodical log collection, if a node is in a status that does not allow for log collection at the scheduled starting time, the collection is skipped. Log collection will be executed at the next scheduled date and time.

  Examples of statuses that do not allow for log collection are as follows:

  - Log collection from the node cannot be normally executed (power is off, no network communication available, etc.)
  - ISM is executing a different operation for the node
  - The node is in Maintenance Mode (manual retrieval is possible)
  - ISM is stopped

  Whenever log collection fails, the failure is recorded as an error event (logs starting with message ID "5014") under [Events] - [Events] - [Operation Log] in ISM.

- Depending on the type of node, log collection may take some time to complete. This may cause large differences between the scheduled times for log collection and the time stamps of retained logs.
- After periodical log collection has been started, you cannot cancel it in the middle of the process. Therefore, if maintenance such as firmware updates, profile assignment, etc. for target nodes is planned, and it overlaps with the periodical log collection execution time, maintenance may fail. You should either disable the periodical log collection or change the setting of schedule.

- There is an upper limit to the number of nodes from which logs can be collected simultaneously. If the maximum number of log collections is in progress, any log collection you start after that will not be executed immediately but only after the preceding log collections have finished.
- For log collection executed for nodes where logs are currently being deleted, the log collection will be suspended until log deletion has completed. After log deletion has been completed, log collection will be executed.

Manual log collection

You can collect and accumulate Node Logs at any suitable time.

For details on how to operate it, refer to "5.3 Collect Logs of Managed Nodes" in "Operating Procedures."

Monitoring the amount of disk space used for log storage

Log files are stored in the log storage area of the user group to which the node belongs.

This function serves to monitor the capacities of the log storage areas in the user groups.

The upper limit for the total size (Size restriction) of various log files (for example, Archived Log, Node Log (for download data), and Node Log (for log search data)) stored in ISM and the setting values for monitoring the amount of disk space used (Threshold monitoring) are set in Edit User Group Settings. For details of User Group Settings, refer to "2.7.2 Manage User Groups" in "Operating Procedures."

If the total size of the various log files approaches the upper limit value for the total size, a warning event is recorded under [Events] - [Events] - [Operation Log] tab in the Global Navigation Menu. If the preset value is exceeded the threshold (when an error event was registered), new logs are no longer stored.

To allow new logs to be retrieved after an error event has been registered, you can either manually delete any obsolete logs for the node on which the event occurred or another node that belongs to the same user group, or wait until the free area increases due to automatic deletion of logs for which the storage period has expired.

Condition	Behavior
The total size of log files exceeds the size that is specified for monitoring the amount of disk space used. Example: When the specified upper limit value is 10 GB and the specified value for monitoring the amount of disk space used is 80%, if the total size of the log files exceeds 8 GB, the operation described on the right is executed.	- Log collection is executed. - A warning event is output under [Events] - [Operation Log]. The contents of the displayed messages are as follows: - For Archived Logs During log collection for node (<node name>) Archived Log for the user group (<User group name>) became (xxMB) and exceeded the capacity (xxMB) threshold (xx%) set for log retention. Refer to "2.5.9 Deleting Archived Logs." - For Node Logs (data for download) During log collection for node (<node name>) the Node Log (download data) for the user group (<User group name>) became (xxMB) and exceeded the capacity (xxMB) threshold (xx%) set for log retention. Refer to "2.5.8 Deleting Node Logs." - For Node Logs (data for log searches) During log collection for node (<node name>) the Node Log (data for log search) became (xxMB) and exceeded the capacity (xxMB) threshold (xx%) set for log retention. Refer to "2.5.8 Deleting Node Logs."
The total size of log files exceeds the specified upper limit value. Example:	- Log collection is not executed. - An error event is output under [Events] - [Operation Log]. The contents of the displayed messages are as follows:

Condition	Behavior
When the specified upper limit value is 10 GB the operation described on the right is executed.	- For Archived Logs During log collection for node (<node name>), Archived Log for the user group (<User group name>) exceeded the capacity (xxMB) set for log retention. Refer to "2.5.9 Deleting Archived Logs." - For Node Logs (data for download) During log collection for node (<node name>) the Node Log (download data) for the user group (<User group name>) exceeded the capacity (xxMB) set for log retention. Refer to "2.5.8 Deleting Node Logs." - For Node Logs (data for log searches) During log collection for node (<node name>) the Node Log (data for log search) exceeded the capacity (xxMB) set for log retention. Refer to "2.5.8 Deleting Node Logs."

2.5.5 Searching Node Logs

You can search the accumulated "Node Logs" for logs that contain specific keywords and then display these logs.

The first display after opening the "Node Logs" screen shows a list of "Node Logs" in blocks for each node where they were accumulated.

The following is a sample operation using the GUI for searching logs.

1. From the Global Navigation Menu on the GUI of ISM, select [Structuring] - [Log Collection].
2. From the [Log Collection] menu, select [Node Log Search].
3. Enter a keyword into the search text box on the GUI.

   The logs that contain the keyword you entered are displayed.

The following is a sample operation using the GUI for filtering logs.

1. From the Global Navigation Menu on the GUI of ISM, select [Structuring] - [Log Collection].
2. From the [Log Collection] menu, select [Node Log Search].
3. Select the [Filter] button.
4. Enter the parameters on the "Filter" screen, and then select the [Filter] button.

   The logs that match the condition you entered are displayed.

Point

As a simple function for downloading logs, you can export the contents currently display on the GUI screen as a CSV file. You can export data in CSV format by selecting [Export in CSV Format] from the [Actions] button.

2.5.6 Downloading Node Logs

You can download accumulated Node Logs by specified periods and types. The period is set to the date of the time zone of the ISM-VA.

You can also download logs of multiple nodes collectively.

The downloaded files are compressed into a single zip file.

You can also set a password for the zip file.

The following is a sample operation using the GUI for downloading logs.

1. From the Global Navigation Menu on the GUI of ISM, select [Structuring] - [Log Collection].
2. From the [Log Collection] menu, select the [Log Management] - [Node Log] tab.
3. Check the checkboxes for the target nodes.
4. From the [Actions] button, select [Create Download Files], and follow the instructions on the screen to create a download file.

   The "Result" screen is displayed. Take a memo of the detailed task number that is displayed on this screen.
5. Wait until creation of the download files finishes.

   The creation status can be checked in the download file item at the top of the screen.
   From the top of the Global Navigation Menu, select [Tasks] and check the processing status.

   Under Task Type, [Creating Node Log download file] is displayed.

   For the Task ID, confirm the detailed task number of which you took a memo on the "Result" screen.
6. After the creation of the download file has been completed, select the [Download] button.

Point

- The node download procedure can be executed using the same operations on the screens displayed in the following procedure.
  1. From the Global Navigation Menu on the GUI of ISM, select [Management] - [Nodes].
  2. Execute one of the following.
     - From the [Column Display] field in the node list, select [Log Collection Settings].
     - From the node list, select [Node Name] of the node, and then select the [Log Collection Settings] tab.
- The download files are contained in one zip file even when selecting multiple nodes.

Note

- For the date of the period that you specify in the creation of the download file for the Node Log, specify the date in the time zone of the ISM-VA. If you specify a date in the time zone of the ISM GUI, the Node Log from the expected date may not be downloaded. For the time zone of ISM-VA, check with your ISM administrator.
- ISM can retain only one download file at a time. Therefore, if you execute multiple download operations for logs successively, the previously created download files are deleted.
- You cannot create a download file for a node that is executing log collection. Create a download file after the log collection has completed.

The downloaded logs are saved with the following file name.

- Name of download file

```
NodeLog_<specified download period>.zip
```

The format of <Specified download period> is <Specified Start Date>-<Specified End Date>, with each date displayed as "YYYYMMDD" (year, month, and day).

Example: If you specified the period from November 1, 2017 through November 7, 2017

```
NodeLog_20171101-20171107.zip
```

The folder structure after decompressing the zip file is as follows.

- Folder structure

```
<node name>_<node ID>\<category>\<log type>
```

The format of <category> is "hardware/os."

The format of <log type> is "event/operation/security."

2.5.7 Downloading Archived Logs

Archived Logs can be downloaded. You can also download logs of multiple generations from the same node or logs of multiple nodes collectively. The downloaded files are compressed into a single zip file. You can also set a password for the zip file.

The following is a sample operation using the GUI for downloading logs.

1. From the Global Navigation Menu on the GUI of ISM, select [Structuring] - [Log Collection].
2. From the [Log Collection] menu, select the [Log Management] - [Archived Log] tab.
3. Check the checkboxes for the Archived Logs to be downloaded.
4. From the [Actions] button, select [Create Download Files], and follow the instructions on the screen to create a download file.

   The "Result" screen is displayed. Take a memo of the detailed task number that is displayed on this screen.

   Download can also be executed from the screen displayed if you select [Show Archived Log Files] from the [Actions] button. In this case, check the checkbox for the files to be downloaded.
5. Wait until creation of the download files finishes.

   The creation status can be checked in the download file item at the top of the screen.
   From the top of the Global Navigation Menu, select [Tasks] and check the processing status.

   Under Task Type, [Creating Archive Log download file] is displayed.

   For the Task ID, confirm the detailed task number of which you took a memo on the "Result" screen.
6. After the creation of the download file has been completed, select the [Download] button.

Point

- The download of Archived Log can be executed using the same operations on the screens displayed in the following procedure.
  1. From the Global Navigation Menu on the GUI of ISM, select [Management] - [Nodes].
  2. Execute one of the following.
     - From the [Column Display] field in the node list, select [Log Collection Settings].
     - From the node list, select [Node Name] of the node, and then select the [Log Collection Settings] tab.

- Download files are contained in a single zip file even if multiple nodes are selected or if multiple Archived Logs are selected.

Note

- ISM can retain only one download file at a time. Therefore, if you execute multiple download operations for logs successively, the previously created download files are deleted.
- You cannot create a download file for a node that is executing log collection. Create a download file after the log collection has completed.

The downloaded logs are saved with the following file name.

- Name of download file

```
ArchivedLog_<date when download file was created>.zip
```

The folder structure after decompressing the zip file is as follows.

- Folder structure

```
<node name>_<node ID>\<date and time>_<node name>_<node ID>\<category>
```

<Date and time> is displayed in the format "YYYYMMDDhhmmss" (year, month, day, hours, minutes, and seconds).

The format of <Category> is "hardware/software."

2.5.8 Deleting Node Logs

Node Logs (data for download and data for log search) for which the retention period you set has expired are deleted automatically. However, you can also individually delete any Node Logs manually. In that case, use the node name, the retention period or the log type as filtering conditions, and then use the search results to delete the relevant logs.

Data for download and data for log search are deleted simultaneously if they are for the same target.

The following is a sample operation using the GUI for deleting Node Logs.

1. From the Global Navigation Menu on the GUI of ISM, select [Structuring] - [Log Collection].
2. From the [Log Collection] menu, select the [Log Management] - [Node Log] tab.
3. Check the checkboxes for the target nodes.

   Multiple nodes can be selected.
4. From the [Actions] button, select [Delete Node Log Files] to execute log deletion according to the instructions on the screen.

   The "Result" screen is displayed. Take a memo of the detailed task number that is displayed on this screen.
5. From the top of the Global Navigation Menu, select [Tasks], and check the processing status.

   Under Task Type, [Deleting Log files] is displayed.

   For the Task ID, confirm the detailed task number of which you took a memo on the "Result" screen.

Note

- Deleting Node Logs may take some time to complete. Therefore, the information of a Node Log that you set to be deleted may be displayed on the GUI until the deletion process is complete. In this case, on the "Tasks" screen, confirm in the relevant task that the deletion process has completed, and then open this screen again.

- If you are deleting a large number of Node Logs, deletion may take several minutes or even hours. However, if it is OK to delete all logs for a selected node, in the deletions conditions, select all log types in [Type] and specify the date to perform deletion in [Period], and you can delete in a short time.
- For log deletion executed for nodes where Node Logs are currently being collected, the deletion will be suspended until log collection has been completed. Deletion will be executed after log collection has completed.

2.5.9 Deleting Archived Logs

Archived Logs for which the retention count you set is exceeded are deleted automatically. However, you can also manually delete accumulated Archived Logs individually by specifying any Archived Log or a retention generation.

The following is a sample operation using the GUI for deleting Archived Logs.

1. From the Global Navigation Menu on the GUI of ISM, select [Structuring] - [Log Collection].
2. From the [Log Collection] menu, select the [Log Management] - [Archived Log] tab.
3. Check the checkboxes for the target nodes.

   Multiple nodes can be selected.
4. From the [Actions] button, select [Delete Archived Log Files] to execute deletion according to the instructions on the screen.

   The "Result" screen is displayed. Take a memo of the detailed task number that is displayed on this screen.

   Deletion can also be executed from the screen that is displayed when you select [Show Archived Log Files] from the [Actions] button. In this case, check the checkboxes for the files to be deleted. By checking the checkboxes for multiple files, you can delete them together.
5. From the top of the Global Navigation Menu, select [Tasks], and check the processing status.

   Under Task Type, [Deleting Log files] is displayed.

   For the Task ID, confirm the detailed task number of which you took a memo on the "Result" screen.

Note

- Deleting Archived Logs may take some time to complete. Therefore, the information of an Archived Log that you set to be deleted may be displayed on the GUI until the deletion process is complete. In this case, on the "Tasks" screen, confirm in the relevant task that the deletion process has completed, and then open this screen again.
- For log deletion executed for nodes where logs are currently being collected, the deletion will be suspended until log collection has been completed. Deletion will be executed after log collection has completed.

2.6 Firmware Management

Firmware Management is a function that is mainly used for the following purposes:

- Displaying the firmware versions that are currently running on managed nodes on the GUI of ISM
- Updating the firmware on managed nodes using firmware data
- Confirming the documentation that is supplied with the firmware data
- Updating the firmware on managed nodes using ServerView embedded Lifecycle Management

Firmware Management is available for the following nodes:

- Servers and any mounted PCI cards

- Storage
- Switches

For details on the target nodes, contact your local Fujitsu customer service partner.

Here, the following points are described.

- 2.6.1 Confirmation of Firmware Versions of Nodes
- 2.6.2 Firmware Updates Using Firmware Data
- 2.6.3 Confirmation of Documentation that is supplied with Firmware Data
- 2.6.4 Firmware Update Using ServerView embedded Lifecycle Management
- 2.6.5 Job Management
- 2.6.6 Firmware Baseline

2.6.1 Confirmation of Firmware Versions of Nodes

The following is a sample operation using the GUI.

1. Retrieve the current node information from the applicable node.

   For details on retrieving detailed node information, refer to "2.2.1.3 Management of node information."

2. From the Global Navigation Menu on the GUI of ISM, select [Management] - [Nodes].
3. In the [Column Display] field, select [Firmware].
4. Confirm the [Current Version] field.

   The [Current Version] field displays the currently running firmware version.

2.6.2 Firmware Updates Using Firmware Data

Here, the following points are described.

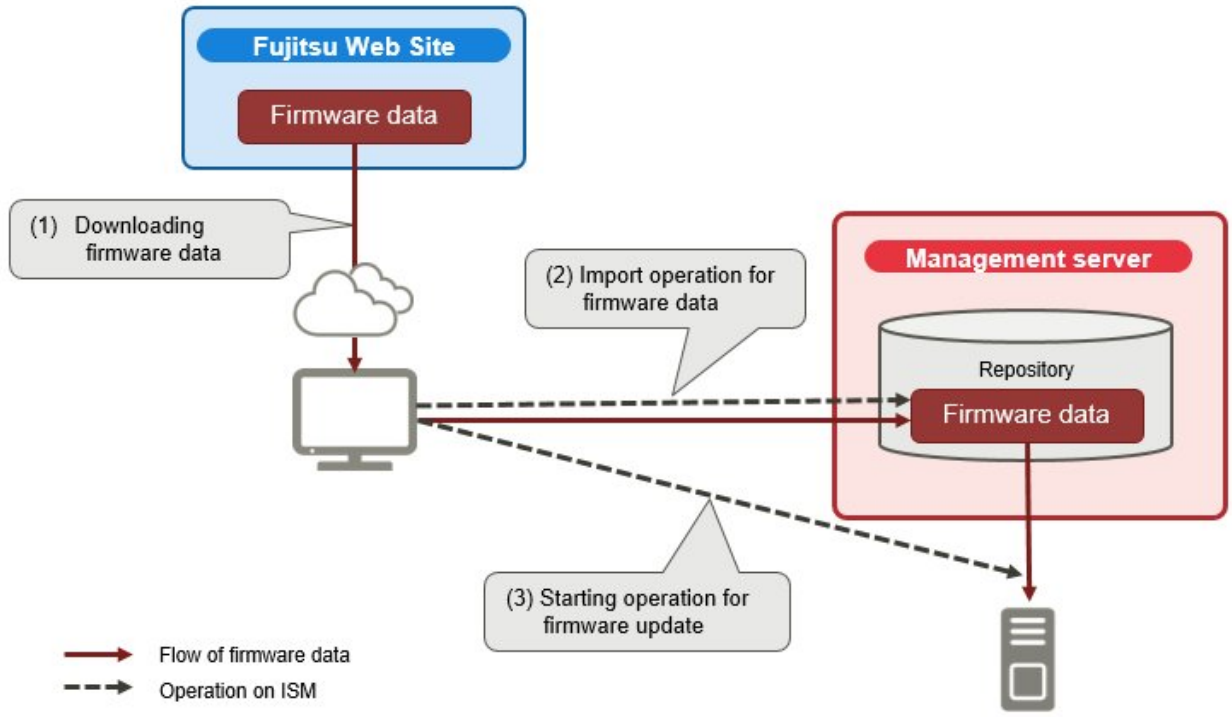
- 2.6.2.1 How to update firmware
- 2.6.2.2 Behavior during updates
- 2.6.2.3 Execution of a script during updates
- 2.6.2.4 Execution of firmware updates

To update firmware using the firmware data, you must import the firmware data into ISM in advance.

Download the firmware data from FUJITSU or another website ((1) in the diagram below), and transfer the data to the repository on ISM-VA ((2) in the diagram below). ISM uses the firmware data that is deployed in the repository to update the target nodes ((3) in the diagram below).

For details on operations to transfer firmware data to the repository, refer to "2.13.2 Repository Management."

Figure 2.10 Workflow for updating firmware using firmware data



2.6.2.1 How to update firmware

With using Update Firmware, two methods for updating the firmware, "Online Update" and "Offline Update," are available.

Online Update

This update procedure is used when the power of the target device is on. When the target of firmware update is a sever (BIOS/iRMC), online update can be executed even if the power is turned off.

This procedure can be used when the target of firmware update is a server (BIOS/iRMC/mounted PCI card/PRIMEQUEST firmware), switch, storage, or PRIMERGY BX Chassis (MMB).

Offline Update

This update procedure is used when the power of the target device is off.

This procedure can be used when the target of firmware update is a server (BIOS/iRMC/with PCI card mounted/PRIMEQUEST firmware).

When executing Offline Update, switch off the power of the server in advance.

Required preparations for using Offline Update

When you execute Offline Update on a server (BIOS/iRMC/mounted PCI card), the following preparations are required.

- The ServerView Suite DVD and the ServerView Suite Update DVD must be copied to the repository area on ISM-VA in advance. This task is called "import."

  If you are going to import an ISO image of the ServerView Suite Update DVD, extend the size of the LVM volume for the user group.

  If you are going to import an ISO image of the ServerView Suite DVD, extend the size of the LVM volume for the system. Once you have imported the ServerView Suite DVD into ISM, you will not need to import it again. (You do not need to import it separately for each user group.)

  For details, refer to "2.13.2 Repository Management."

- Use the PXE boot function on the target node.

  The management LAN used for PXE boot can be set from the [Firmware] tab in the Details of Node screen. You can also execute this setting on the "Node List" screen that is displayed when you select a target node on the "Firmware" screen. If it is not set, the first port of the on-board LAN will be used.

  Complete the network connections and the BIOS settings of the target server in advance, so as to enable PXE booting from the management LAN. Also, a separate DHCP server is required within the network. Set the DHCP server so as to allow the target nodes to lease appropriate IPv4 addresses during the PXE boot.

  For details, refer to "A.1.1 DHCP/PXE Settings in Using Profile Management/Firmware Management."

- Check the boot mode in the BIOS settings (ISM 2.5.0.010 or later).

  Select the same boot mode as the BIOS settings for [Boot Mode] in the "Update Firmware" wizard when you execute Offline Update. If [Boot Mode] is different from the BIOS settings, PXE boot may fail.

The required firmware data may differ between "Online Update" and "Offline Update." Also, the support scope varies depending on the type of device. For details, contact your local Fujitsu customer service partner.

2.6.2.2 Behavior during updates

Depending on the type of target node on which the firmware is updated, the behavior during and after the update differs.

Execute any updates according to the following tables.

Table 2.2 Online Update

Type	Behavior during and after updates
Server (iRMC)	Updates can be executed regardless of whether the server power is on or off.
Server (BIOS)	Updates can be executed regardless of whether the server power is on or off. - If you execute an update with the power on You must reboot the server and turn the power on again in order to switch to the new firmware (BIOS). You can execute the reboot whenever convenient. The firmware is automatically applied when you reboot, and then the power of the server turns off. After the power has turned off, you can switch to the new firmware by turning on the power from the Details of Node screen, etc., in ISM. After you turn on the power, check the following: - The BIOS version of the server has been updated - In the iRMC system event log, no errors have occurred during the update - If you execute an update with the power turned off You must turn on the server power again in order to switch to the new firmware (BIOS). When the firmware update completes, the server power turns on automatically, and then turns off. After the power has turned off, you can switch to the new firmware by turning on the power from the Details of Node screen, etc., in ISM. After you turn on the power, check the following: - The BIOS version of the server has been updated - In the iRMC system event log, no errors have occurred during the update
Server (PRIMEQUEST firmware)	Updates can be executed when the server power is on.
Server (with mounted PCI card)	Updates can be executed on the server if a supported OS is running. The new firmware will run only after a reboot. You can execute the reboot whenever convenient.

Type	Behavior during and after updates
Switch (except CFX, PY CB Eth Switch 10/40Gb 18/8+2) Storage	Execute the firmware update with the node power on. After the firmware update, the node may be rebooted.
Switch (CFX, PY CB Eth Switch 10/40Gb 18/8+2)	Execute the firmware update with the node power on. You must reboot the node in order to switch to the new firmware. You can execute the reboot whenever convenient. Depending on the system configuration, network connections may be broken when rebooting. Take your system configuration into account when rebooting.
PRIMERGY BX Chassis MMB	Execute the firmware update with the node power on. After the firmware update, the node may be rebooted.

Table 2.3 Offline Update

Type	Behavior during and after updates
Server (iRMC)	Updates can be executed with the server power off. During the firmware update, the server may be turned on or restarted, and after the firmware update is complete, the power is turned off. If you select "Turn on the nodes after updating firmware" on the Update Settings screen, the power will be turned on after the completion of the updates. After the firmware update has been completed, the node will automatically be switched over to the new firmware.
Server (BIOS)	
Server (with mounted PCI card)	
Server (PRIMEQUEST firmware)	Updates can be executed with the server power off. During the firmware update, the server may be turned on or restarted, and after the firmware update is complete, the power is turned off. After the firmware update has been completed, the node will automatically be switched over to the new firmware.

2.6.2.3 Execution of a script during updates

You can execute an arbitrary script saved on an external host before or after the firmware updates of target nodes.

You can use this feature when you want to shut down target nodes in advance on which you are executing Offline Update, when you want to reboot target nodes after the completion of Online Update, and other cases.

Macro

The macro (automatic variable) functions displayed below can be used to specify parameters when executing scripts. These macros are automatically replaced with the information of the node.

The details for each macro is as follows.

Macro notation	Overview
$_TRGID	Node ID of a node on which to execute firmware updates
$_TRG	Node name of a node on which to execute firmware updates
$_IPA	IP address of a node on which to execute firmware updates
$_MDL	Model name of a node on which to execute firmware updates
$_OSIP	IP address of the OS on a node on which to execute firmware updates
$_OSTYPE	OS type of a node on which to execute firmware updates
$_PSKIND	Type of a script file

Point

If the OS information is not registered in the node on which to execute firmware updates, "none" is output.

Preparations for executing a remote script

For preparation, refer to "2.3.3 Action Settings" - "Required preparations before using an action" - "Execute Remote Script."

Procedure for registering a script file

1. From the Global Navigation Menu on the GUI of ISM, select [Structuring] - [Firmware].
2. From the menu on the left side of the screen, select [Script].
   The "Script List" screen is displayed.
3. From the [Actions] button, select [Add].
4. Register the remote script file according to the instructions on the screen.
5. On the firmware update screen, select the script to execute during the update.

Point

- On the "Script Settings" screen of Update Firmware, you can set Waiting Time in seconds for Pre-script for Firmware Update and Post-script for Firmware Update.
  - The waiting time of the pre-script for firmware update is the time from when the pre-script is executed to the time the firmware update is executed.
  - The waiting time of the post-script for firmware update is the time from when the firmware update has completed to the time the post-script is executed.
- If you enable "Execute Post-script for Firmware Update when firmware update is failed." on the "Script Settings" screen of Update Firmware, the post-script for a firmware update that has been set will be executed.

  In the following case, the post-script for a firmware update is not executed even when the setting is enabled.
  - The execution of the pre-script for a firmware update has ended abnormally.
  - The firmware update ended abnormally due to an error in the power source status of the target device.

Procedure for testing a script

1. From the Global Navigation Menu on the GUI of ISM, select [Structuring] - [Firmware].
2. From the menu on the left side of the screen, select [Script].
   The "Script List" screen is displayed.
3. From the "Script List" screen, select a script in which to execute the test.
4. From the [Actions] button on the right side of the screen, select [Test].
   The "Script test" screen is displayed.
5. Select the [Test] button on the right side of the screen and execute the test of script.

When executing a test, the macro that is set for the script information will be replaced with the following character string.

Macro	Character string after replacement
$_TRGID	TEST_TRGID
$_TRG	TEST_TRG
$_IPA	TEST_IPA

Macro	Character string after replacement
$_MDL	TEST_MDL
$_OSIP	TEST_OSIP
$_OSTYPE	TEST_OSTYPE
$_PSKIND	TEST_PSKIND

2.6.2.4 Execution of firmware updates

Note

- While an update is in progress, observe the following notes:
  - Do not turn the target node on or off.
  - Do not reboot or reset the target node.
  - Do not interrupt the network connection between ISM and the target node.
  - Do not reboot the management server. Do not power off the management server.
  - Do not delete any import data or firmware data from the repository.
- Before you start any firmware update, confirm the precautions in the documentation that is supplied with the firmware data.
- Firmware data that can be applied on target nodes must be saved, before any update operations.

  For details on how to save the firmware data, refer to "2.13.2 Repository Management."
- As network switches other than CFX are reset after they have been updated, data communication will be temporarily interrupted. If you are using a redundant network, you should update the sections in the redundancy configuration one after another.
- For a VDX switch, you cannot execute a firmware update by specifying VCS Fabric (Brocade VCS Fabric). Execute a firmware update for each VDX fabric switch under it.
- When you execute a firmware update on ETERNUS DX/AF, account information with a Maintainer role must already be registered in ISM.
- When you execute a firmware update for a PCI card, the OS information of the server on which the PCI card is mounted must already be registered in ISM.

  For information on registration of the OS information of the server (node), refer to "2.2.1.5 Registration of node OS information" Also note that firmware updates for PCI cards are supported only for the following OS types:
  - Red Hat Enterprise Linux
  - SUSE Linux Enterprise Server
  - Windows (ISM 2.5.0.010 or later)
- Firmware updates for PCI cards mounted on servers are executed for all mounted cards of the same type.

  If there are multiple cards of the same type, you cannot specify different firmware versions for each card or update only some of the cards. Even if you specify only some cards to be updated, or if you specify different firmware versions for different cards on the ISM screen, the firmware update is executed for all cards of the same type. Therefore, all these cards will be updated to the same latest firmware version.

- To execute a firmware update for PCI cards (FC/CNA/LAN cards) on Linux, QLogic QConvergeConsole CLI must be installed on the OS of the servers on which these PCI cards are mounted.

  For details on the installation of Emulex OneCommand Manager CLI or QLogic QConvergeConsole CLI, refer to "2.13.3 Installation of Emulex OneCommand Manager CLI and QLogic QConvergeConsole CLI."

- For certain nodes and PCI cards, the format of [Current Version] and the format of the version displayed in [Latest (Online)] or [Latest (Offline)] may be different.

  For applicable nodes and PCI cards, and for how they are displayed, contact your local Fujitsu customer service partner.

- For some PCI cards, the current version cannot be displayed, therefore, it is displayed as " - ."

  In this case, all versions of firmware that have been imported for the applicable PCI card will be targets for updates. The latest version among all firmware versions that are imported for the applicable card will be displayed as the latest version.

- Cisco switches (Catalyst or Nexus) do not manage firmware data by models.

  The format of the version entered on the firmware data import screen is arbitrary.

  If the entered versions are different from the current version, all firmware will be the update targets. For [Latest (Online)], the version that is determined as the latest is displayed.

- Certain nodes require that firmware updates be executed in stages. Refer to the documentation that is supplied with the firmware data.

- After using Online Update to update the server BIOS and the PCI card mounted on a server, the old firmware will continue to run even after the update process has finished in ISM. In order to switch operation to the new firmware, execute the following procedure.

  - If you update a PCI card mounted on a server, you must reboot the server in order to switch to the new firmware. You can execute the reboot whenever convenient.

  - If you execute an update of the server BIOS with the power on, you must reboot the server and turn the power on again in order to switch to the new firmware (BIOS). You can execute the reboot whenever convenient. The firmware is automatically applied when you reboot, and then the power of the server turns off. After the power has turned off, you can switch to the new firmware by turning on the power from the Details of Node screen, etc., in ISM.

  - If you execute an update of the server BIOS with the power turned off, you must turn the server power on again in order to switch to the new firmware (BIOS). As soon as the firmware update completes, the server power turns on automatically, and then turns off. After the power has turned off, you can switch to the new firmware by turning on the power from the Details of Node screen, etc., in ISM.

- If processing for the firmware update cannot start normally, or if an update fails, ISM's update processing usually ends with an error. In some cases, however, such as when a target node stops responding while an update is in progress, timeout errors are not discovered.

  If processing takes significantly longer than the presumed time for the task, confirm the status of the target node directly. If there are any errors, cancel the firmware update task in ISM.

  For information on approximate processing times for firmware updates, refer to the information released on the web.

- There is an upper limit to the number of nodes that firmware update can be executed simultaneously. This upper limit is 50 for the whole of ISM-VA. If firmware update is executed on a specified number of nodes exceeding the upper limit, the firmware update is first executed on the set maximum number of nodes. Then, when the update is complete for the first set of nodes, the update will be executed on the remaining nodes.

  If a firmware update is executed while the maximum number of firmware updates is already running, the update will be executed after the first firmware updates have completed.

- For Offline Update for the server (BIOS/iRMC/mounted PCI card), use the PXE boot function. In [Boot Mode] on the "Update Firmware" screen, [Manufacturing Settings] is selected by default and PXE boot is executed in the following mode by ISM:

  - For a server with iRMC S4 or earlier: LegacyBIOS compatible mode

  - For a server with iRMC S5: UEFI boot mode

  If the BIOS settings for the server is different from the above, PXE boot may fail. In this case, select the same boot mode as the BIOS settings for the server in [Boot Mode] on the "Boot Mode" screen (ISM 2.5.0.010 or later).

1. From the Global Navigation Menu on the GUI of ISM, select [Structuring] - [Firmware].

2. Set the nodes to be updated to Maintenance Mode.

    a. Select a node name to display the "Node Information" screen.

    b. Set the target node to Maintenance Mode with the [Switch Maintenance Mode] button.

3. Confirm the [Current Version] column, the [Latest (Online)] column, and the [Latest (Offline)] column of the nodes to be updated.

4. Select [Online Update] or [Offline Update] in the [Update Mode:] column, and check the checkbox for the firmware to be updated.

5. From the [Actions] button, select [Update Firmware].

6. Execute the operations according to the instructions on the screen.

    - To specify a date and time for firmware updates

      On the "Update Settings" screen, select [Update firmware at the specified time], and specify the date and time for execution. Check the operation status on the "Jobs" screen since it is registered as an ISM job. The job ID is displayed in the "List of Jobs" field in the result confirmation dialog box that is displayed after execution. If you select [Structuring] - [Jobs] on the GUI of ISM, a list of jobs is displayed. Identify the job based on its job ID.

    - To start firmware updates immediately

      On the "Update Settings" screen, select [Update firmware immediately]. After the update is started and the task is registered as a "Task" in ISM, confirm its current status on the "Tasks" screen. After executing, the "Task Details" field in the dialog box for confirmation of the result displays the task ID.

      The following tasks types are registered under Firmware Update tasks:

        - Online Update: Updating firmware

        - Offline Update: Updating firmware (Offline mode)

      When you select [Tasks] from the top of the Global Navigation Menu on the GUI of ISM, the Task List is displayed. Identify the applicable task by its task ID and task type.

7. After confirming that the relevant task has completed, release the Maintenance Mode on the target node.

Point

- The firmware update can also be executed using the same operations from the screens displayed in the following procedure.

    1. From the Global Navigation Menu on the GUI of ISM, select [Management] - [Nodes].

    2. Execute one of the following.

        - From the [Column Display] field in the "Node List" screen, select [Firmware].

        - From the "Node List" screen, select the target [Node Name], and then select the [Firmware] tab.

- To specify a date and time for firmware updates, you must enable the Workflow service in advance. Refer to "4.11 ISM-VA Service Control" and execute "Enable internal service individually" and "Start of internal service individually."

- If you selected [Switch to the 'Maintenance Mode' when updating firmware.] on "Update Settings" screen in the "Update Firmware" wizard, Maintenance Mode will be set just before the firmware update, and Maintenance Mode will be released just after the update has been completed. Use this setting when you specify a date and time for firmware updates.

2.6.3 Confirmation of Documentation that is supplied with Firmware Data

Use one of the following procedures to confirm the documentation that is supplied with the firmware.

Point

- The update procedures in ISM are different from those described in the documentation that is supplied with the firmware data.

- The procedure for Online Update for the iRMC/BIOS of a server differs from the "Online Update" of the documents supplied with the firmware data. For Online Update for the iRMC/BIOS of a server, the processing corresponding to "Remote update" is executed. The firmware data is transferred from the FTP server in ISM-VA by using the iRMC web interface of the target server.

If selecting the node registered in ISM to confirm the documentation

1. From the Global Navigation Menu on the GUI of ISM, select [Structuring] - [Firmware].
2. From the menu on the left side of the screen, select [Update].
3. Select the [Current Version] field, the [Latest (Online)] field, or [Latest (Offline)] field of the node whose documentation you want to confirm.

   The "Firmware Document" screen is displayed.
4. In the [Document] field, select the document and confirm the documentation.

Point

The operations can be executed using the same operations from the screens displayed in the following procedure.

1. From the Global Navigation Menu on the GUI of ISM, select [Management] - [Nodes].
2. From the node list, select the target [Node Name], and then select the [Firmware] tab.

   The following procedure is the same as the above.

If selecting the imported firmware data to confirm the documentation

1. From the Global Navigation Menu on the GUI of ISM, select [Structuring] - [Firmware].
2. From the menu on the left side of the screen, select [Import], and then select [Firmware Data].
3. Select the "Version" field of the node whose documentation you want to confirm.

   The firmware document list screen is displayed.
4. In the [Document] field, select the document and confirm the documentation.

If confirming the documentation during update of the firmware

1. From the Global Navigation Menu on the GUI of ISM, select [Structuring] - [Firmware].
2. Check the checkbox for the node to be updated. From the [Actions] button, select [Update Firmware].
3. From the pull-down menu, select the update version and import data, and then select the [Next] button.
4. In the [Document] field, select the document and confirm the documentation.

Point

The operations can be executed using the same operations from the screens displayed in the following procedure.

1. From the Global Navigation Menu on the GUI of ISM, select [Management] - [Nodes].
2. Execute one of the following.
   - From the [Column Display] field in the node list, select [Firmware].
   - From the node list, select the target [Node Name], and then select the [Firmware] tab.
3. From the [Actions] button, select [Update Firmware].

   The following procedure is the same as the above.

2.6.4 Firmware Update Using ServerView embedded Lifecycle Management

This is the firmware update that uses ServerView embedded Lifecycle Management (hereafter referred to as "eLCM").

This procedure can be used when the target for the firmware update is a server (BIOS/iRMC/mounted PCI card).
In this procedure, you do not need to import the firmware data mentioned in "2.6.2 Firmware Updates Using Firmware Data" into ISM.

The required firmware data is downloaded from a Repository Server or from the Fujitsu web site to the bootable SD card on iRMC of the update target server by eLCM during the firmware update. After downloading, eLCM creates ISO from the firmware data downloaded on the SD card and updates the firmware of the server with the created ISO.

To use eLCM, it is recommended to structure Repository Server. The processing time can be reduced by using the firmware data.

Point

- The firmware of all components mounted on the server (BIOS/iRMC/mounted PCI card) will be updated.
- Only Offline Update is available.
- The firmware version after the update depends on the environment of the Repository Server or the state of the Fujitsu web site.
- For the procedures to structure and check the eLCM environment, refer to the applicable manuals on the following Fujitsu Manual Server site.

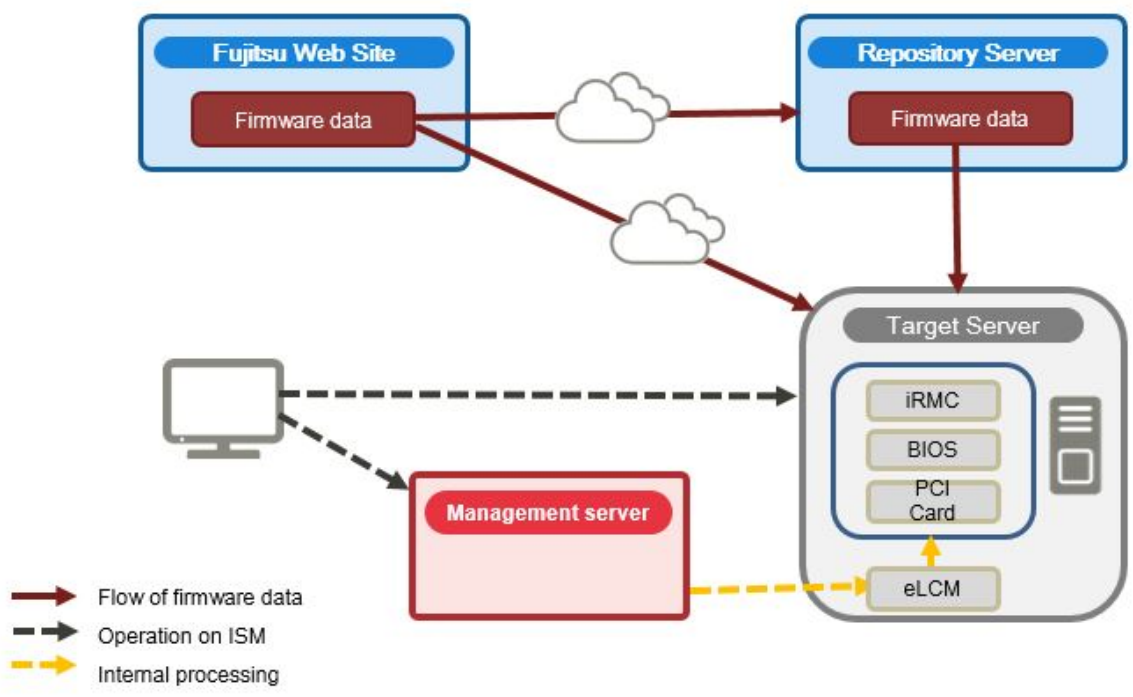
  http://manuals.ts.fujitsu.com/index.php?l=en

  - "ServerView embedded Lifecycle Management (eLCM) 1.2 for iRMC S4 Overview"
  - "ServerView embedded Lifecycle Management (eLCM) 1.2 for iRMC S5 Overview"
- For the procedures to structure and check the Repository Server environment, refer to the applicable manuals on the following Fujitsu Manual Server site.

  http://manuals.ts.fujitsu.com/index.php?l=en

  - "ServerView Repository Server Installation and User Guide"

Figure 2.11 Workflow for updating firmware using eLCM



Required preparations for firmware updates using eLCM

- Structuring Repository Server (Recommended)
- Setting a firmware update target server to be able to use eLCM
- Turning off the power of the firmware update target server

For details on the preparation to use eLCM, refer to the applicable manuals on the following Fujitsu Manual Server site.

http://manuals.ts.fujitsu.com/index.php?l=en

- "ServerView embedded Lifecycle Management (eLCM) 1.2 for iRMC S4 Overview"
- "ServerView embedded Lifecycle Management (eLCM) 1.2 for iRMC S5 Overview"

2.6.4.1 Behavior during updates using eLCM

For details, refer to "Table 2.3 Offline Update" in "2.6.2.2 Behavior during updates."

2.6.4.2 Execution of a script during updates

You can execute an arbitrary script saved on an external host before or after the firmware updates of target nodes.

You can use this feature when you shut down the firmware update target nodes in advance.

For details on scripts, refer to "2.6.2.3 Execution of a script during updates."

2.6.4.3 Execution of firmware updates

For the precautions for firmware updates, refer to "2.6.2.4 Execution of firmware updates."

1. From the Global Navigation Menu on the GUI of ISM, select [Management] - [Nodes].
2. Select the target node name.
3. From the [Actions] button, select [Enable Maintenance Mode].

   The target node is set into Maintenance Mode.
4. From the [Column Display:] field in the "Node List" screen, select [Firmware].
5. Select [eLCM Offline Update] in the [Update Mode:] field, and check the checkbox for the node to be updated.
6. From the [Actions] button, select [Update Firmware].
7. Follow the instructions on the screen to execute the operation.

   - To update the firmware by specifying the date and time

     On the "Update Settings" screen, Select [Update firmware at the specified time], and specify the date and time for execution. Check the operation status on the "Jobs" screen since it is registered as an ISM job. The job ID is displayed in the "List of Jobs" field in the result confirmation dialog box that is displayed after execution. If you select [Structuring] - [Jobs] on the GUI of ISM, a list of jobs is displayed. Identify the job based on its job ID.

   - To start firmware updates immediately

     On the "Update Settings" screen, select [Update firmware immediately]. After the update is started, and the task is registered as a "Task" in ISM, confirm its current status on the "Tasks" screen. After the update is complete, the "Task Details" field in the dialog box for confirmation of the result displays the task ID.

     When you select [Tasks] from the top of the Global Navigation Menu on the GUI of ISM, the Task List is displayed. Identify the applicable task by its task ID and task type.
8. After confirming that the relevant task has completed, release the Maintenance Mode on the target node.

Point

- Firmware updates using eLCM can be performed from the screen that is displayed by using the following procedure.

  1. From the Global Navigation Menu on the GUI of ISM, select [Structuring] - [Firmware].
  2. In the [Update Mode:] field on the "Update" screen, select [eLCM Offline Update].

- To specify a date and time for firmware updates, you must enable the workflow service in advance. Refer to "4.11 ISM-VA Service Control," and execute "Enabling of internal service individually" and "Start of internal service individually."
- If you selected [Switch to the 'Maintenance Mode' when updating firmware.] on "Update Settings" screen in the "Update Firmware" wizard, Maintenance Mode will be set just before the firmware update, and Maintenance Mode will be released just after the update has been completed. Use this setting when you specify a date and time for firmware updates.

2.6.5 Job Management

If Update Firmware is executed by specifying the date and time, the process is managed as a job.

The status of each job is displayed in a list on the "Jobs" screen, not on the operating screen.

The following operations are also performed on the "Jobs" screen:

- Canceling an executing process
- Deleting a process before execution
- Deleting a completed process

Note

The number of jobs has an upper limit. You cannot register more than 100 jobs in the whole of ISM-VA. Delete unnecessary jobs so as not to exceed the upper limit.

2.6.6 Firmware Baseline

Firmware Baseline is a function that compares the firmware versions between the managed node and the assigned firmware. This function displays whether the node is operating with the intended firmware version in comparison to the firmware version that is assigned by the user. This supports users to integrate the operation environment as intended.

Firmware Baseline definitions are the definitions of the firmware version that should be applied to the nodes. Firmware Baseline compares this definition to the firmware version of the managed nodes and determines if the firmware is compatible, incompatible, or non-comparable to the definition. You can select incompatible nodes and perform batch firmware updates to the defined version for multiple nodes.

Status of Firmware Baseline

The comparison results between the components and component versions defined in the Firmware Baseline definition and the components and component versions of managed nodes are shown as follows.

Compatible

Firmware versions of all components match

Incompatible

Firmware versions of some components or all components do not match

Non-comparable (N/A)

One of the following statuses:

- Some or all of the components defined in the Firmware Baseline definition do not exist in the managed nodes

- The firmware version of some or all of the components of the managed nodes is missing

  In this case, check the target component and the Firmware Baseline definition. If the firmware version of the target components cannot be retrieved, delete the definitions of the target components in the Firmware Baseline definition.

If there are "Incompatible" components and "Non-comparable" components in the node, the node status is displayed as "Incompatible."

For information on the devices (components) that can be managed with Firmware Baseline, contact your local Fujitsu customer service partner.

Here, the following points are described.

- 2.6.6.1 Creating Firmware Baseline definitions
- 2.6.6.2 Assigning Firmware Baseline definitions
- 2.6.6.3 Releasing Firmware Baseline definition assignments
- 2.6.6.4 Firmware update using Firmware Baseline definitions
- 2.6.6.5 Editing Firmware Baseline definitions
- 2.6.6.6 Deleting Firmware Baseline definitions

2.6.6.1 Creating Firmware Baseline definitions

To integrate the firmware versions applied to the managed nodes, create definitions of the firmware version for each model with Firmware Baseline.

There are two procedures to create a Firmware Baseline definition:

- Automatically create a Firmware Baseline definition when importing firmware data from the ServerView Suite DVD
- Create a Firmware Baseline definition manually using the firmware managed in the repository

The following is an example of creating a Firmware Baseline definition automatically when importing firmware data from the ServerView Suite DVD.

1. From the Global Navigation Menu on the GUI of ISM, select [Structuring] - [Firmware].
2. From the menu on the left side of the screen, select [Import].
3. From the [Actions] button, select [Import DVD].
4. Follow the instructions on the screen to execute the import.

The following shows an example of using the firmware managed in the repository create a Firmware Baseline definition manually.

1. From the Global Navigation Menu on the GUI of ISM, select [Structuring] - [Firmware].
2. From the menu on the left side of the screen, select [Baseline].
3. From the [Actions] button, select [Create].
4. Perform the operations according to the instructions on the screen.

Point

- All firmware versions for the components defined in the Firmware Baseline definition are targets for comparison. If there are unnecessary definitions, the node will not become compatible. Correct the Firmware Baseline definitions as necessary.

- It is recommended that you use ServerView Suite Update DVD to create Firmware Baseline definitions. If you are managing firmware for models that are not included on the ServerView Suite Update DVD, create the Firmware Baseline definition manually, or edit it.
- If you create a Firmware Baseline definition manually, register the firmware in the repository in advance. For details, refer to "2.13.2.1 Storing and deleting firmware data."

2.6.6.2 Assigning Firmware Baseline definitions

Assign the created Firmware Baseline definitions to the nodes. By selecting a Firmware Baseline definition and assigning it to the target node, you can compare the firmware versions of the target node and the version defined in the Firmware Baseline definition.

The following shows an example of Firmware Baseline definition assignment.

1. From the Global Navigation Menu on the GUI of ISM, select [Structuring] - [Firmware].
2. From the menu on the left side of the screen, select [Baseline].
3. Select the target baseline from the Baseline List.
4. From the [Actions] button, select [Assign to Nodes].
5. Execute the operations according to the instructions on the screen.

Note

- When using the ServerView Suite Update DVD to automatically create Firmware Baseline definition, select whether to assign Firmware Baseline definitions for managed nodes during import automatically. If a Firmware Baseline definition already has been assigned, this Firmware Baseline definition will be overwritten.
- When assigning Firmware Baseline definitions for nodes registered with Auto Discovery of Nodes, it fails to assign if the model name of the registered node is different from the model name defined in the Firmware Baseline. Change the model name of the node to the model name of the Firmware Baseline definition.

2.6.6.3 Releasing Firmware Baseline definition assignments

When you assign a Firmware Baseline definition to a node that has already been assigned a different Firmware Baseline definition, you must release the assignment first. Then you can assign a different Firmware Baseline definition to the node whose assignment has been released.

The following shows an example of the release of Firmware Baseline definition assignment.

1. From the Global Navigation Menu on the GUI of ISM, select [Structuring] - [Firmware].
2. From the menu on the left side of the screen, select [Baseline].
3. Select the target baseline from the Baseline List.
4. From the [Actions] button, select [Release from Nodes].
5. Execute the operations according to the instructions on the screen.

2.6.6.4 Firmware update using Firmware Baseline definitions

For nodes that has been determined to be incompatible, use Firmware Baseline to update the firmware version to match the version defined in the Firmware Baseline definition.

Note

Firmware updates are executed using the firmware data that has been imported in advance. Updates using eLCM cannot be executed.

The following shows an example of firmware update using the Firmware Baseline definition.

1. From the Global Navigation Menu on the GUI of ISM, select [Structuring] - [Firmware].
2. From the menu on the left side of the screen, select [Baseline].
3. Select the target baseline from the Baseline List.
4. From the [Actions] button, select [Update Firmware].
5. Execute the operations according to the instructions on the screen.

2.6.6.5 Editing Firmware Baseline definitions

When adding or deleting models from the created Firmware Baseline definition, or changing the defined firmware version, edit the Firmware Baseline definition.

The following shows an example of editing Firmware Baseline definitions.

1. From the Global Navigation Menu on the GUI of ISM, select [Structuring] - [Firmware].
2. From the menu on the left side of the screen, select [Baseline].
3. Select the target baseline from the Baseline List.
4. From the [Actions] button, select [Edit].
5. Execute the operations according to the instructions on the screen.

2.6.6.6 Deleting Firmware Baseline definitions

The following shows an example of deleting Firmware Baseline definitions.

1. From the Global Navigation Menu on the GUI of ISM, select [Structuring] - [Firmware].
2. From the menu on the left side of the screen, select [Baseline].
3. Select the target baseline from the Baseline List.
4. From the [Actions] button, select [Delete].
5. Execute the operations according to the instructions on the screen.

Point

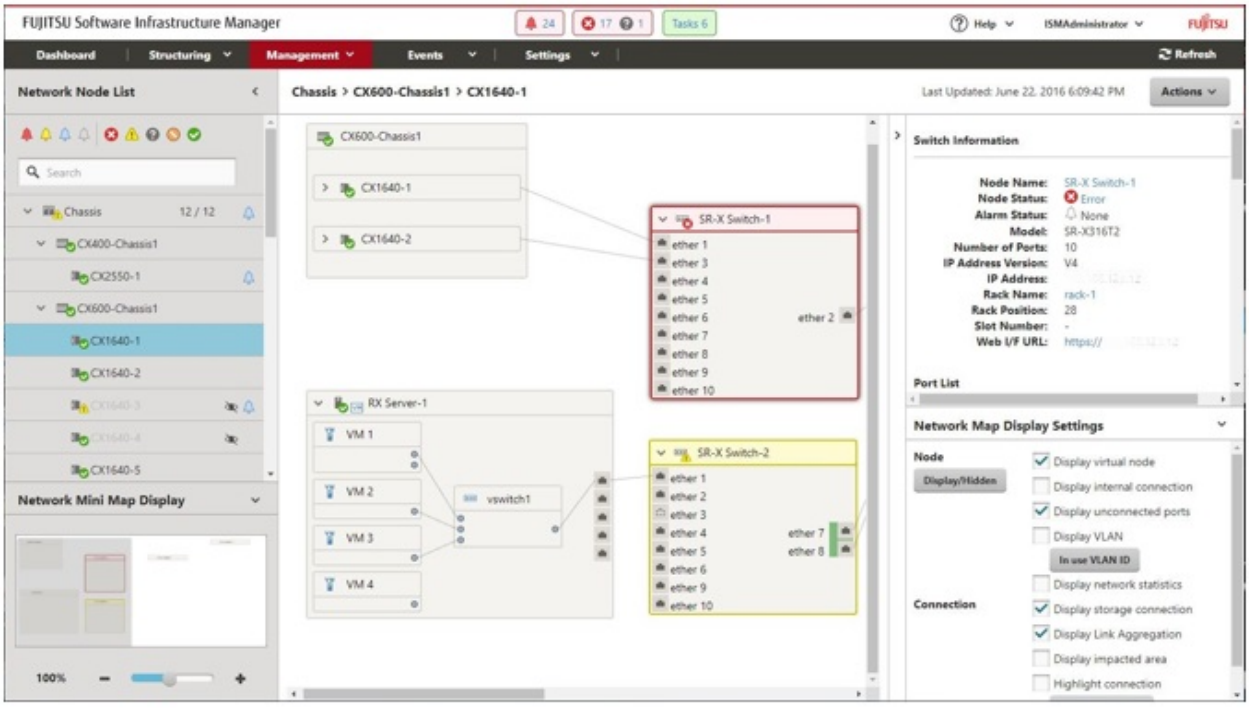
If you delete a Firmware Baseline definition, Firmware Baseline definition assignment is released.

2.7 Network Management

Network Management is a function that is mainly used for the following purposes:

- Confirming information on physical network connections and port information between managed nodes on the Network Map
- Confirming the changes in the information on network connections between managed nodes
- Confirming the virtual connections on the Network Map between the physical ports of a managed node and its virtual machines, virtual switches, and virtual routers
- Confirming the statistical information of the network of the managed nodes on the Network Map
- Confirming the VLAN and Link Aggregation settings for network switches, and changing these settings

Figure 2.12 Network Map



Here, the following points are described.

- 2.7.1 Display of Network Connection Information
- 2.7.2 Updates of Network Management Information
- 2.7.3 Confirmation of Information on Changes in Network Connections
- 2.7.4 Setting of Reference Information for Changes in Network Connections
- 2.7.5 Display of Network Statistics Information
- 2.7.6 Confirmation of VLAN and Link Aggregation Settings
- 2.7.7 Change of VLAN Settings
- 2.7.8 Change of Link Aggregation Settings
- 2.7.9 Manual Setting of Network Connection Information

2.7.1 Display of Network Connection Information

You can graphically confirm the network connections between managed nodes in the Network Map. Easy operations allow you to display detailed information for each managed node, including the current statuses of their ports. Also, you can confirm the connection relationships between servers, network switches, and storage on a single screen.
You can also confirm the virtual connection relationships between the physical ports of a managed node and the virtual ports of its virtual components (virtual switches, virtual machines, and virtual routers).

1. From the Global Navigation Menu on the GUI of ISM, select [Management] - [Network Map].

   A list of the nodes that can be displayed on the Network Map is displayed as a tree structure in the Network Node List on the left side of the screen.

   By selecting the [<] icon, you can hide the Network Node List at the left edge of the screen.

2. From the Network Node List, select the nodes that are the network connection points you want to confirm.

   When opening the network map, the node at the top of the Network Node List is selected.

   The Network Map is displayed at the center of the screen.

Switch the Network Map display

The information displayed on the Network Map can be switched using the "Network Map Display Settings" pane.

Display Setting Name	Description
Display virtual node	Switch the display of virtual nodes (virtual machines, virtual switches, virtual routers, and CNA ports) displayed on the Network Map ON and OFF.
Display internal connection	Switch the display of internal connections (fabric internal switches, BX chassis internal connections) on the Network Map ON and OFF.
Display storage connection	Switch the display of the ports and connections used for the connections with the storage on the Network Map ON and OFF.
Display Link Aggregation	Switch the display of Link Aggregation settings on the Network Map ON and OFF.
Display impacted area	Switch the display the area that is affected by an error on the Network Map ON and OFF. For the connections with a node where an error or failure has occurred, the edge of the next connected node as well as the connected port are displayed in yellow. If virtual networks are constructed on the connected node, the affected virtual networks will also be displayed in yellow.
Display unconnected ports	Switch the display of ports whose links are down on the Network Map ON and OFF.
Highlight connection	Switch the display highlights function on the Network Map ON and OFF. If you select a managed node or its ports with the highlight connection function on, its connections are highlighted. If you select [Clear all Highlight], all the displayed highlights are cleared.
Display VLAN	Switch the display of the VLAN highlight display on the Network Map ON and OFF. The nodes and ports whose VLAN ID setting matches the VLAN ID that is entered in the text box are highlighted in green. From the [In use VLAN ID] button, you can display a list of and confirm the VLAN IDs set to the nodes displayed on the Network Map.
Display network statistics	Switch the display of the network statistics display on the Network Map ON and OFF. Detected ports or connections with values that exceed the threshold values are displayed in orange (critical threshold value exceeded) or yellow (warning threshold value exceeded). For the threshold settings, "2.3.2 Monitoring of Network Statistics Information." You can select which monitoring item to display from the list in the selection box displayed when you check this item.

Display Setting Name	Description
[Display/Hidden] button (ISM 2.5.0.010 or later)	Switch to display/hide nodes displayed on the Network Map. You can also display/hide nodes by selecting the or icon that is displayed on the right side of the Network Node List or the node name in the Network Map.

Saving the Network Map display settings (ISM 2.5.0.010 or later)

You can save the Network Map display settings. The saved display settings are used to display the Network Map when you display the "Network Map" screen the next time.

You can save the Network Map display settings with the following procedure.

1. From the Global Navigation Menu on the GUI of ISM, select [Management] - [Network Map].
2. From the [Actions] button, select [Network Information Preserve].

   The Network Map display settings are saved.

Point

- You can return the display settings to the initial settings by selecting [Network Information Relocate] from the [Actions] button.
- The Network Map displays the nodes that have a connection relationship with the nodes you selected in the Network Node List. By selecting the node name on the Network Map, the extended display of the ports within the node is displayed.
- The Network Map display settings are saved for each user.

Note

- LLDP (Link Layer Discovery Protocol) is used for retrieving information on physical network connections. If your nodes do not support LLDP or if LLDP is disabled, the information for connections that actually exist cannot be retrieved. For information on whether a node supports LLDP and on how to confirm whether the LLDP settings of the node are enabled or disabled, confirm the technical specifications of each target node.
- The displayed Network Map shows either the status retrieved when you last executed [Update network information] or the status at the point of the periodical update of network management information, which is performed by ISM once a day. In order to confirm the most recent status after registering nodes, modifying any connections, or after an error, execute [Update network information] from the [Actions] button.
  Also, whenever the hardware configuration of a node has been changed, execute [Get Node Information], and then [Update network information] on the Details of Node screen for the target node. The periodical update of network management information starts at 4:00 AM local time.
- To display the connection relationships between the virtual switches and the virtual machines, you must register the OS information of the cloud management software and of the managed target nodes to ISM. For cloud management software registration, refer to "2.13.6 Management of Cloud Management Software." For OS information registration, refer to "2.2.1 Registration of Datacenters/Floors/Racks/Nodes."
- For managed nodes, the display of the link status of the ports with teaming (bonding) settings, and the display of the connections of those ports with virtual switches are supported.

2.7.2 Updates of Network Management Information

Executable user	Administrator group			Other groups		
	Admin	Operator	Monitor	Admin	Operator	Monitor

The network connection information is updated periodically to the latest information. You can also update it at any time. The following procedure shows how to update the network management information.

1. From the Global Navigation Menu on the GUI of ISM, select [Management] - [Network Map].
2. From the [Actions] button, select [Update network information].
3. Select the [Update Network Information] button.

Note

You cannot retrieve network connection information or set this information for any node while a network management information update is in progress. Execute the operation again when processing for the information update is complete.

Point

- Update the node information for each managed node before updating the network management information. For retrieving node information, refer to "2.2.1.3 Management of node information."
- Depending on the number of managed nodes, updating the network management information may take some time to complete.
  - To confirm that the information update is complete, check for an event in the Operation Log under Tasks that indicates completion of the information update.
  - The latest update time of the network management information is displayed in the upper right part of the Network Map. The time displayed here is the time when the last information update processing was completed.
- A periodical update of the network management information is executed once a day at 4:00 AM local time.
- You can maintain updates of the latest network management information by executing the command after updating the information for each node.

2.7.3 Confirmation of Information on Changes in Network Connections

On the Network Map, you can confirm any status changes in network connections that occurred after a set reference point in time. The available types of status change are "added" and "deleted."

- Added

  "Added" is displayed for connections that were recently added and other newly discovered connections. "Added" connections are displayed as bold lines on the Network Map.

- Deleted

  "Deleted" is displayed for disconnections and previously discovered connections that were removed in the meantime. "Deleted" connections are displayed as bold dashed lines on the Network Map.

Using this function, you can easily see any changes in network connections, discover at an early stage when any positions in the network are disconnected, and identify these positions.

You can also use the following operating procedure for confirming information on changes in network connections in list format.

1. From the Global Navigation Menu on the GUI of ISM, select [Management] - [Network Map].

   A list of the nodes that can be displayed on the Network Map is displayed as a tree structure in the Network Node List on the left side of the screen.

2. From the Network Node List, select the nodes that are the network connection points you want to confirm.

   When opening the Network Map, the node at the top of the Network Node List is selected.

The Network Map is displayed at the center of the screen.

3. From the [Actions] button, select [Confirm connection status change].

   You can confirm "added" and "deleted" connection information separately.

Point

The currently set "Reference Point" can be confirmed in the date and time in [Last Update] in the "Connection status change List" screen.

Note

Selecting the [Refresh] button under the "Connection status change List" screen updates the reference point and deletes the information on changes.

2.7.4 Setting of Reference Information for Changes in Network Connections

The displayed information on changes in network connections is based on the changes ("Added" and "Deleted") after a given reference point. You can modify the reference point. The reference point is set when the configuration of network connections is changed, etc. As soon as you modify the reference point in time and refresh the display, it shows only the changes in the network connection information ("Added" and "Deleted") that were made after that point in time.

You can use the following operating procedure for modifying the reference point in time.

1. From the Global Navigation Menu on the GUI of ISM, select [Management] - [Network Map].

   A list of the nodes that can be displayed on the Network Map is displayed as a tree structure in the Network Node List on the left side of the screen.

2. From the Network Node List, select the nodes that are the network connection points you want to confirm.

   When opening the Network Map, the node at the top of the Network Node List is selected.

   The Network Map is displayed at the center of the screen.

3. From the [Actions] button, select [Confirm connection status change]. The date and time of the latest refresh is the reference point in time that is currently set.

4. Select the [Refresh] button.

   A confirmation screen is displayed.

5. Confirm the contents and select the [Yes] button.

   The reference point is updated to the time when you executed the operation.

2.7.5 Display of Network Statistics Information

Each type of statistic information (traffic, and so on) for the port of the network switch can be checked visually on the Network Map.

1. From the Global Navigation Menu on the GUI of ISM, select [Management] - [Network Map].

   A list of the nodes that can be displayed on the Network Map is displayed as a tree structure in the Network Node List on the left side of the screen.

2. From the Network Node List, select the nodes that are the network connection points you want to confirm.

   When opening Network Map, the node at the top of the Network Node List is selected.

   The Network Map is displayed at the center of the screen.

3. Check the [Display network statistics] checkbox in the "Network Map Display Settings" pane, and select the monitoring items for the network statistics information that you want to check.

   For each monitoring item of the network statistics information, the ports or connections that exceed the threshold value are displayed in orange (critical threshold value exceeded) or yellow (warning threshold value exceeded). For the threshold settings, "2.3.2 Monitoring of Network Statistics Information."

Point

To check the past statistic information (traffic, and so on), from "Port Information," which is displayed when selecting the port of the network switch, select "Network Statistics Information" - the "[Graph] button. The [Graph] button is displayed when the values of each monitoring item for the network statistics information have been retrieved.

2.7.6 Confirmation of VLAN and Link Aggregation Settings

You can visually confirm the current settings of VLANs and Link Aggregations on the Network Map.

1. From the Global Navigation Menu on the GUI of ISM, select [Management] - [Network Map].

   A list of the nodes that can be displayed on the Network Map is displayed as a tree structure in the Network Node List on the left side of the screen.

2. From the Network Node List, select the nodes that are the network connection points you want to confirm.

   When opening Network Map, the node at the top of the Network Node List is selected.

   The Network Map is displayed at the center of the screen.

3. Execute the following procedure for the item you want to confirm.

   - VLAN

     Check the [Display VLAN] checkbox in the "Network Map Display Settings" pane, and then enter the VLAN ID you want to display in the VLAN ID text box.

     The ports assigned to the VLAN ID as well as its connections are shown in green on the Network Map.

   - Link Aggregation

     Select the node name of a node on the Network Map.

     The ports in the node are extended and displayed, and the Link Aggregation settings are displayed.

Point

- Selecting [In use VLAN ID] on the "Network Map Display Settings" pane allows you to check the VLAN information that is already used.
- Use the [Display Link Aggregation] on the "Network Map Display Settings" pane to switch the display of the link aggregation settings on the Network Map ON and OFF.
- Depending on the network switch, other names than Link Aggregation (EtherChannel, etc.) may be used. Link Aggregation is used as the general term for this in ISM.

2.7.7 Change of VLAN Settings

You can change the VLAN settings of a network switch.

1. From the Global Navigation Menu on the GUI of ISM, select [Management] - [Network Map].
2. From the Network Node List, select the node that serves as the point of the network connection that you want to set up.

   When opening the Network Map, the node at the top of the Network Node List is selected.

   The Network Map is displayed at the center of the screen.
3. From the [Actions] button, select [Set Multiple VLANs].
4. Check the checkboxes for the respective ports for which you want to set the same VLAN ID, and select the [Setting] button on the top right side.
5. Enter the VLAN ID you set, edit the contents, and then select the [Confirm] button.
6. Confirm the changed contents of the setting, and then select the [Register] button.

   The VLAN settings are changed.

Point

VLAN settings can be changed also on a node basis. From the [Actions] button, select [Set VLAN].

Note

- Depending on the VLAN settings, VLAN setting assignment may take some time to complete. Refresh the screen after you have completed VLAN settings. You can confirm the current progress of VLAN settings assignment on the "Tasks" screen. For details, refer to "2.13.4 Task Management."
- VLAN settings have their own specifications and therefore may differ depending on the models of network switches. Execute settings after confirming the device specifications.
- The number of VLAN IDs that can be set for a port is up to one hundred (100).
- There exists reserved VLAN IDs depending on the models of network switches. You cannot change the settings of reserved VLAN IDs. Check the specifications of the respective nodes.

2.7.8 Change of Link Aggregation Settings

You can change the Link Aggregation settings of a network switch.

The following is a sample operation of adding link aggregation settings.

1. From the Global Navigation Menu on the GUI of ISM, select [Management] - [Network Map].
2. From the Network Node List, select the node that serves as the point of the network connection that you want to set up.

   When opening the Network Map, the node at the top of the Network Node List is selected.

   The Network Map is displayed at the center of the screen.

3. From [Actions] button, select [Set Link Aggregation].
4. Select the name of the target node for which you want to create a Link Aggregation, and select the [Add] button of Link Aggregation Setting.
5. Enter the LAG Name and Mode, check the checkbox for the port to set for Link Aggregation, and then select the [Confirm] button.
6. Confirm the Link Aggregation settings, and select the [Register] button.

Note

- Link Aggregation settings have their own specifications and therefore may differ depending on the models of network switches. Execute settings after confirming the device specifications.
- The LAG Name that can be set differs depending on the models of networks switches. For the scope of the LAG Name that can be set, check the specifications of the respective nodes.
- You cannot set Link Aggregation between ports having different VLAN IDs. Be sure to confirm that these ports have the same VLAN settings to change the Link Aggregation settings.
- When you create a Multi-Chassis Link Aggregation between different nodes, you must change Link Aggregation settings for the respective switches. To set Multi-Chassis Link Aggregation, you must execute the settings for the peer link connection between nodes and the settings for the managed nodes in advance.
- The name of Multi-Chassis Link Aggregation (MLAG, vPC, etc.) as well as pre-settings will differ depending on the type of the network switch. Execute settings after confirming the device specifications.

2.7.9 Manual Setting of Network Connection Information

Whenever you cannot retrieve the connection information on physical networks automatically, you can set this information manually. The following operating procedure shows how to set the connection information manually.

1. From the Global Navigation Menu on the GUI of ISM, select [Management] - [Network Map].

   A list of the nodes that can be displayed on the Network Map is displayed as a tree structure in the Network Node List on the left side of the screen.

2. From the Network Node List, select the nodes that are the network connection points you want to confirm.

   When opening the Network Map, the node at the top of the Network Node List is selected.

   The Network Map is displayed at the center of the screen.

3. From the [Actions] button, select [Edit Connection].
4. Select the ports at both ends for which you want to execute the settings, and then select the [Add] button.

   Note

   After selecting the [Add] button, if you want to cancel the settings that you executed manually, select the [Clear] button.

5. After adding all the connection information you want to set, select the [Save] button.
6. Confirm that the edited contents are correct, and then select the [Save] button.

2.8 Power Capping

For the devices mounted in racks, Power Capping is used to keep them from exceeding the set upper limit value for power consumption.

Beforehand, register the control information and Power Capping Policy for each node in the rack, and start power capping operations by enabling Power Capping Policy.

Point

There are the following four types of Power Capping Policy:

- Custom 1, Custom 2

  Power Capping Policy for normal operations. Two types can be operated and switched between.

- Schedule

  Policy that is only enabled on the specified day/time.

- Minimum

  Control where power consumption is kept to a minimum.

Note

Power Capping cannot be used in ISM for PRIMEFLEX.

2.8.1 Adding/Editing Power Capping Setting

Node power settings

Set the power information and operation priority for each node.

Power Capping is executed from a node with low operation priority.

The current power consumption value can be confirmed if the device supports retrieval of its power consumption value, and if the Power Capping status is [Stopped Power Capping] or [Power Capping].

If the node cannot execute Power Capping, the maximum power consumption value is alternated as a fixed value.

Power Capping Policy

Set the upper limit value for power consumption for each policy.

Set the operation schedule for a schedule policy.

2.8.2 Enabling/Disabling Power Capping

Switch Power Capping Policy between enabled and disabled.

Point

Each Power Capping Policy can be enabled independently but if minimum is set, minimum is prioritized and used. If multiple policies other than minimum are enabled, the policy with the lowest upper limit value for power consumption is used.

Note

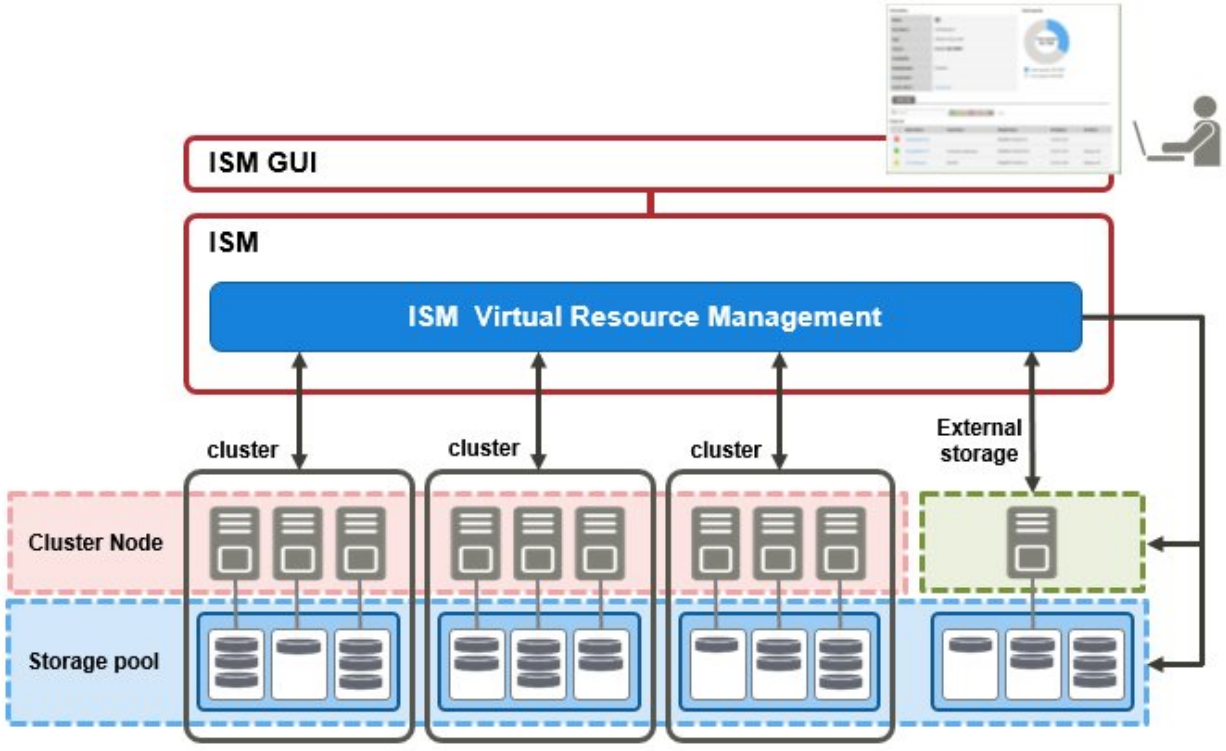
- For racks with an existing Power Capping Setting, you must change Power Capping Setting when a node is added. If the settings are not changed, the power consumption per rack will be greater than the set upper limit value.
  It is recommended that you review the upper limit value of the Power Capping Setting in the rack even for nodes that have been deleted.
  When migrating nodes, you must take actions accordingly for each rack before and after migration.
- The upper limit value is the power capping target value. Normally the upper limit is set with some margin so that the actual power consumption is below. If the upper limit value is set low, the power consumption may exceed it.
- If using the PRIMERGY RX/TX S7 series, set a numerical value higher than the sum total of the minimum power consumption value of the PRIMERGY RX/TX S7 series.
  The minimum power consumption value of the devices can be checked in the [Power Consumption] - [Current Consumption] - [Current Overall Power Consumption] column in the iRMC web interface.
- If changing the date and time of ISM-VA to past dates or times, the power consumption value displayed in [Rack Information] in the "Rack Details" screen, and the average power consumption value and average intake air temperature value in the [Monitoring] tab in the Details of Node screen will not be displayed correctly.
  When the date and time set in ISM-VA passes, these values will be displayed correctly again.

2.9 Virtual Resource Management

Virtual Resource Management is a function to manage and monitor the items managed as virtual resources.

The following is the environment configuration for operating this function.

Figure 2.13 Configuration of the operating environment for Virtual Resource Management



Note

For pre-settings for Virtual Resource Management, refer to "A.1.2 Pre-settings for Virtual Resource Management."

2.9.1 Supported Virtual Resources

The following are the virtual resources that are supported by this function.

Software environment

Software environments that can be operated by Virtual Resource Management depend on the type of SDS (Software Defined Storage) and its version. Also, the hypervisor and cloud management software differ depending on the type of SDS.

The following are the software environments supported by Virtual Resources Management.

Note: Y = Supported, N = Not supported

Software environment (SDS)			Hypervisor	Cloud management software	Supported/Not supported
VMware vSAN	5.x		VMware ESXi 5.x	vCenter Server Appliance 5.x	N
	6.x	6.2	VMware ESXi 6.0 Update2	vCenter Server Appliance 6.0 Update2	Y
		6.5	VMware ESXi 6.5	vCenter Server Appliance v6.5	Y
		6.6	VMware ESXi 6.5 [Note 1]	vCenter Server Appliance 6.5 [Note 1]	Y
		6.6.1	VMware ESXi 6.5 Update1	vCenter Server Appliance 6.5 Update1	Y
		6.6.1 U2	VMware ESXi 6.5 Update2	vCenter Server Appliance 6.5 Update2	Y
		6.7	VMware ESXi 6.7	vCenter Server Appliance 6.7	Y
		Other than the above			N
Microsoft Storage Spaces			Windows Server 2012 Hyper-V	Microsoft Failover Cluster	N
				Microsoft System Center 2012	N
Microsoft Storage Spaces Direct			Windows Server 2016 Hyper-V	Microsoft Failover Cluster	Y
				Microsoft System Center 2016	N
			Windows Server 2019 Hyper-V	Microsoft Failover Cluster	Y
				Microsoft System Center 2019	N

[Note 1]: For VMware vSAN 6.6, VMware ESXi 6.5d or later and vCenter Server Appliance 6.5d or later are required.

You must enable CredSSP authentication in advance. For pre-settings for Virtual Resource Management, refer to "A.1.2 Pre-settings for Virtual Resource Management."

ETERNUS Storage

ISM GUI attribute information, status, and other information regarding ETERNUS Storage are displayed.

For information on the devices supported by Virtual Resources Management, contact your local Fujitsu customer service partner.

The display of thin provisioning pool for ETERNUS is not supported.

The volume used by thin provisioning pool is not reflected even when a RAID group is built-in to thin provisioning pool.

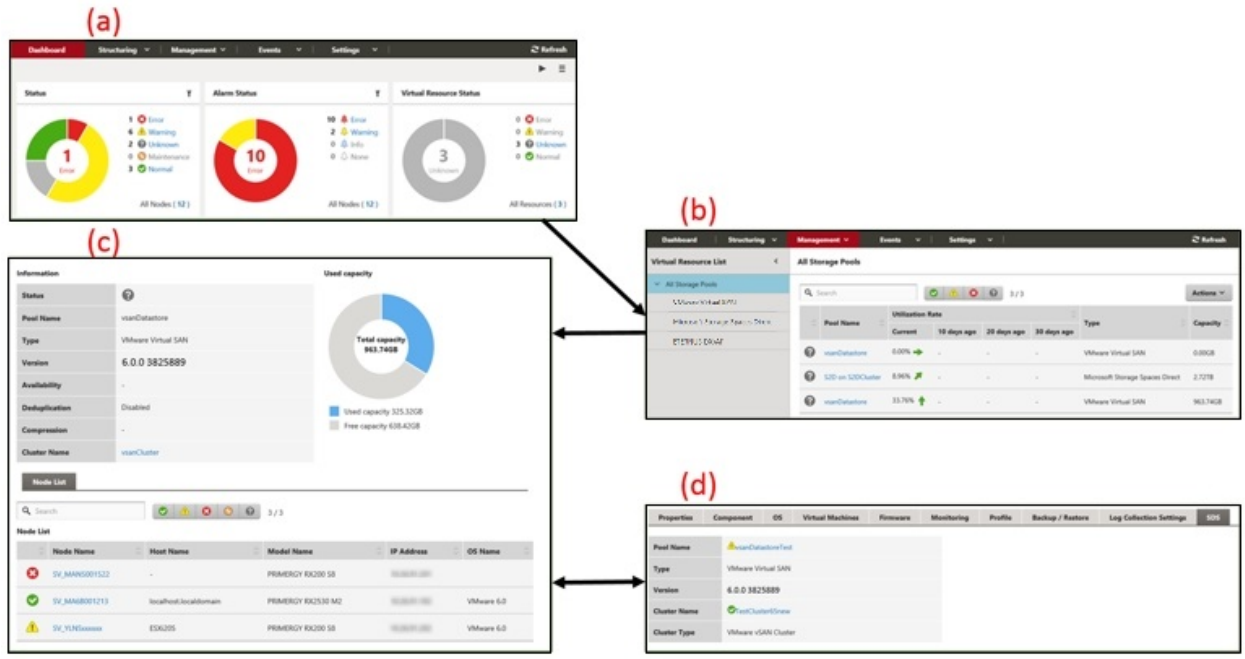
For reference and management of thin provisioning pool, use ETERNUS web GUI.

2.9.2 GUI for Virtual Resource Management

Virtual Resource Management is equipped with a management GUI.

The following displays the functions of each GUI screen and the mutual display relationships.

Figure 2.14 GUI for Virtual Resource Management



(a) Display of virtual resources widget

The status of the virtual resources is displayed in a widget on the ISM Dashboard.

(b) Display of virtual resources list

Displays a list for the statuses of the virtual resources.

The resource utilization status is also displayed by the color and direction of the arrows.

(c) Display of virtual resources detailed information

Detailed information, such as virtual resource setting information and utilization rate, is displayed.

The physical nodes configuring the virtual resources are displayed, and related screens can be displayed.

For vSAN, the ESXi version and build number is displayed in "Version." From this version and build number, the vSAN version can be checked from the following website.

https://kb.vmware.com/s/article/2150753

(d) Display of virtual resource information on node information ([SDS] tab)

The [SDS] tab that displays virtual resource information on the Details of Node screen is displayed.

If you select the [SDS] tab, the virtual resource information related to nodes on vSAN or Microsoft Storage Spaces Direct is displayed.

For vSAN, the ESXi version and build number is displayed in "Version." From this version and build number, the vSAN version can be checked from the following website.

https://kb.vmware.com/s/article/2150753

2.9.3 Operation of Virtual Resource Management

The following describe how to operate Virtual Resource Management.

- 2.9.3.1 Monitoring of the utilization status of storage pools

- 2.9.3.2 Identification of the errors in storage pools
- 2.9.3.3 Updates of virtual resource information

Point

Before monitoring with ISM, you must register the virtual resource environment to ISM. Registration is executed with the following procedures.

1. Confirm that nodes configuring the storage pool (cluster) are already registered in ISM.

   For details on how to register nodes and to confirm the information, refer to "2.2 Node Management."

2. Confirm that cloud management software is already registered in ISM.

   For details on how to register cloud management software and to confirm the information, refer to "2.13.6 Management of Cloud Management Software."

3. Refresh the virtual resource information.

   For details on how to update, refer to "2.9.3.3 Updates of virtual resource information."

   The Storage Pool information is displayed on the virtual resource GUI.

2.9.3.1 Monitoring of the utilization status of storage pools

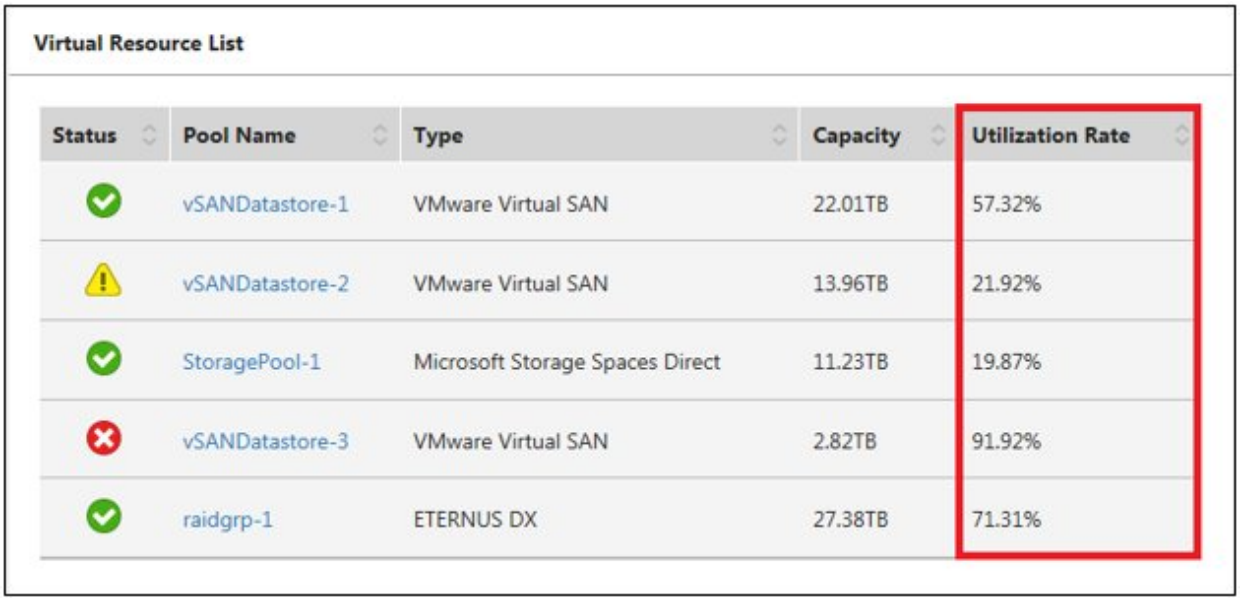
Executable user	Administrator group			Other groups		
	Admin	Operator	Monitor	Admin	Operator	Monitor

Here the procedure for monitoring the utilization status of storage pools is described.

1. From the Global Navigation Menu on the GUI of ISM, select [Dashboard] to display the virtual resource widget "Virtual Resource List."

   For how to add the widget, refer to the ISM online help.

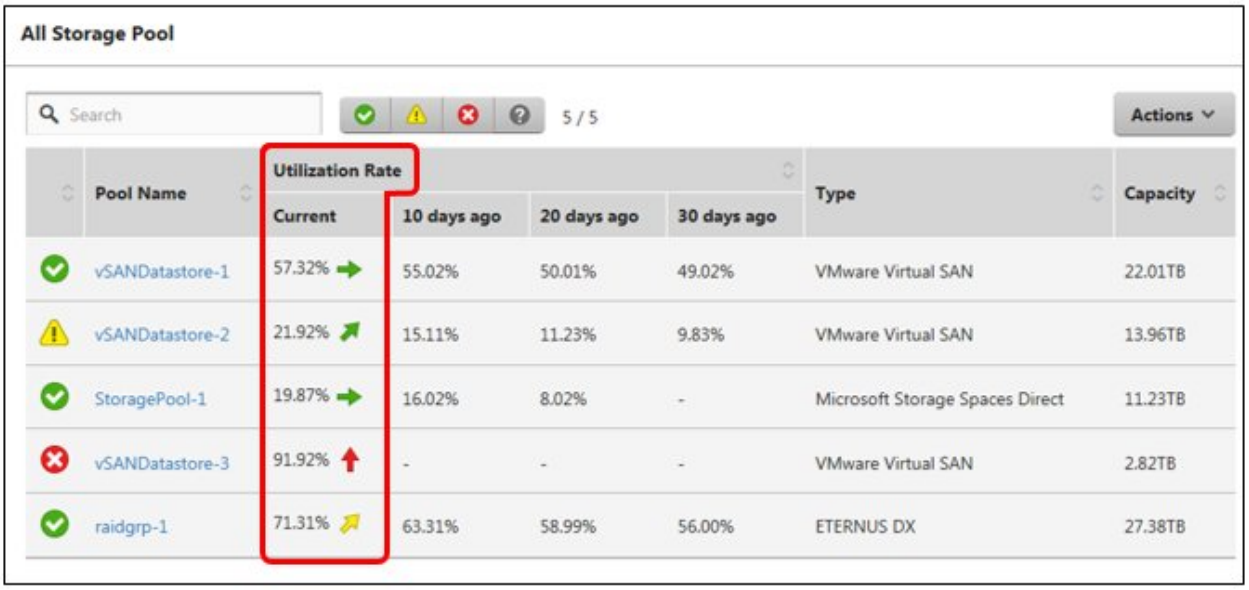
   - Refer to "Utilization Rate" for the current utilization rate of the storage pools.



   - A more detailed utilization rate status can be checked on the Virtual Resources List screen.

     The current utilization rate can be determined from the direction and color of the arrows.

From the Global Navigation Menu on the GUI of ISM, select [Management] - [Virtual Resource]. The list of virtual resources that can be managed with ISM displays the various types of resources in a tree and list form.



The utilization rate is interpreted in the following way:

- Color of the arrow

  Displays the current total utilization rate.

  Green: Less than 70% is utilized.

  Yellow: Between 70% and 90% is utilized

  Red: More than 90% is utilized

- Direction of the arrow

  The utilization rate displays an increase rate compared to the utilization rate 10 days earlier.

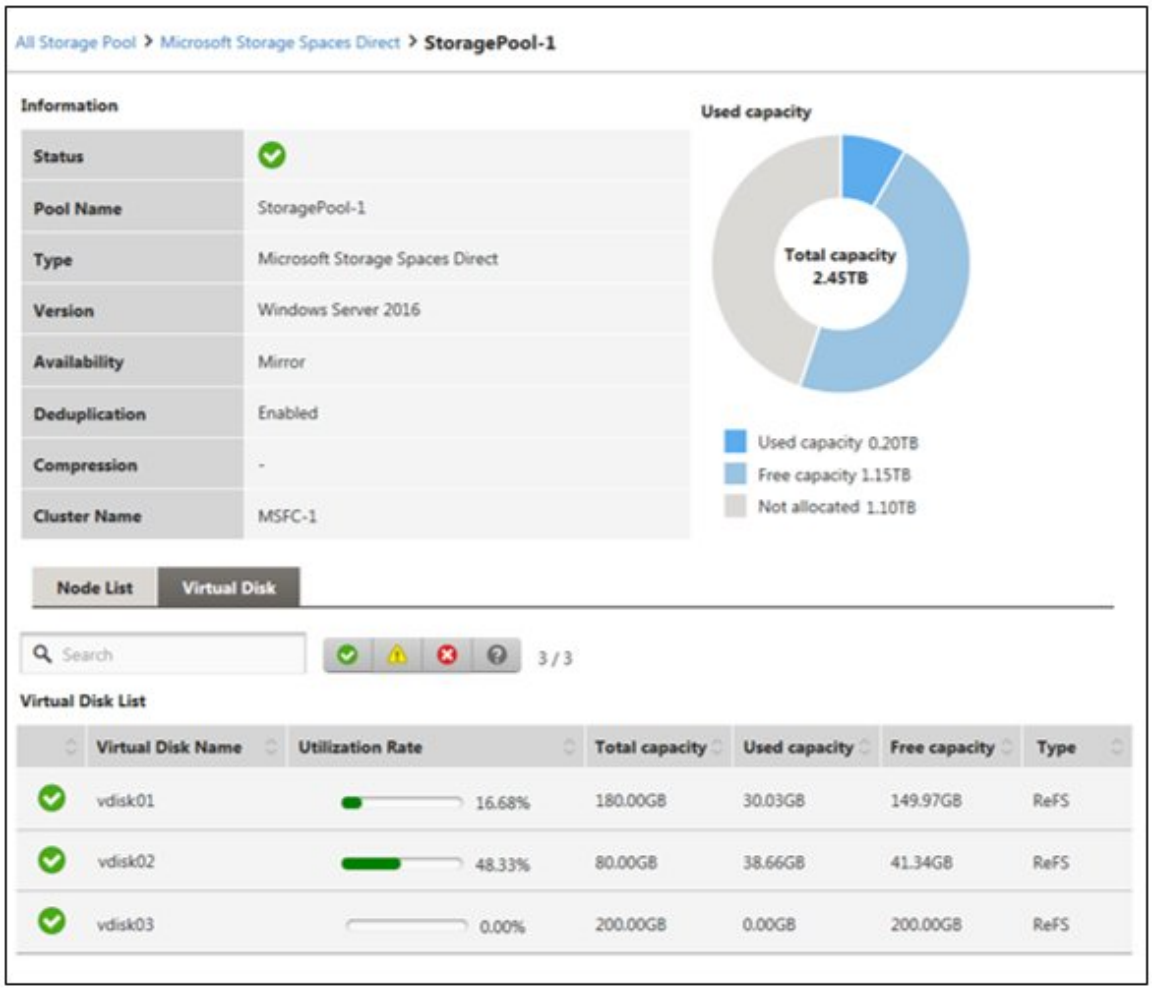
  Sideways: The utilization rate is steady, is increasing slightly (the utilization rate is increasing less than 5%) or is decreasing

  Diagonal upwards: The utilization rate is increasing (the utilization rate is increasing between 5% - 15%)

  Upwards: The utilization rate is increasing sharply (the utilization rate is increasing more than 15%)

2. If you want to check detailed information, selecting a pool name displays the Detailed Information screen, where you can check the currently used capacity and available capacity in [Used capacity].

   For Microsoft Storage Spaces Direct, in addition to the capacity information of the storage pools, you can also check the capacity information of the virtual disks created on the storage pools.



   The classification of the capacity information displayed in the pie chart of the utilization rate status for Storage Spaces Direct is described below:

   - Used capacity: Displays the total used capacity of the virtual disks created on the storage pool.
   - Free capacity: Displays the total free capacity of the virtual disks created on the storage pool.
   - Not allocated: Displays the capacity that has not been allocated to a storage pool or where virtual disks have not been created.

   Also, if you select the [Virtual Disk] tab, a list of the disks that exist on the storage pools and their used capacity and other information is displayed.

   For details on the displayed contents, refer to the ISM online help.

Point

The redundancy settings for the virtual disks is reflected in the capacity information in the [Virtual Disk] tab.

The capacity value displayed in the [Used capacity] pie chart takes the redundancy of the capacity of each virtual disk into account.

3. Execute the following procedure if there is not sufficient capacity available:

   - Add storage.

     The nodes configuring the storage pool are displayed in the node list. If there is not sufficient available capacity, there is a risk this limits the available space in the storage made up by the nodes.

     The insufficient available capacity can be mitigated by adding nodes to the disk, or by adding new nodes.

   - Execute the required maintenance operations if an error is found in the nodes.

     If the statuses shown in the node list show any errors, the storage capacity of this node cannot be used, and capacity may become insufficient.

     Check the incident for the node in Event Log and take appropriate actions.

2.9.3.2 Identification of the errors in storage pools

The following describes the procedure for discovering errors and identifying their causes in storage pools.

Step 1

Refresh the information of the virtual resources.

From the [Actions] menu, select [Refresh Virtual Resource Information]. For details, refer to "2.9.3.3 Updates of virtual resource information."

The virtual resource information on the GUI is refreshed to the latest. If an error has occurred, the displayed status will change.

Step 2

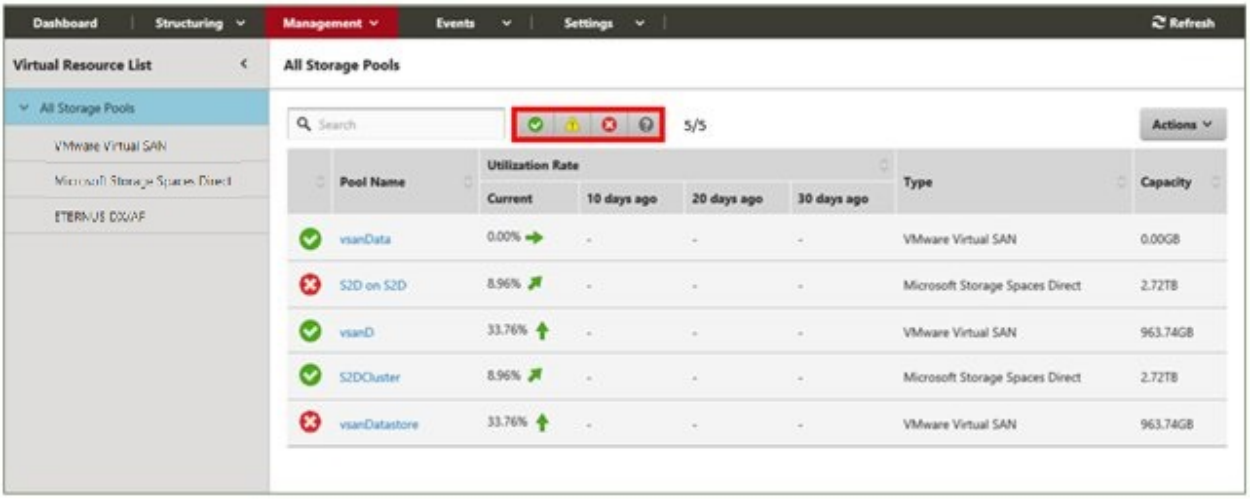
Discover and identify errors.

Resource errors can be checked from the Virtual Resources List screen. If displaying the "Virtual Resource Status" widget on the Dashboard, any resource errors are displayed in the widget.

(1) When identifying the place of an error from the Virtual Resources List screen

1. From the Global Navigation Menu on the GUI of ISM, select [Management] - [Virtual Resource].

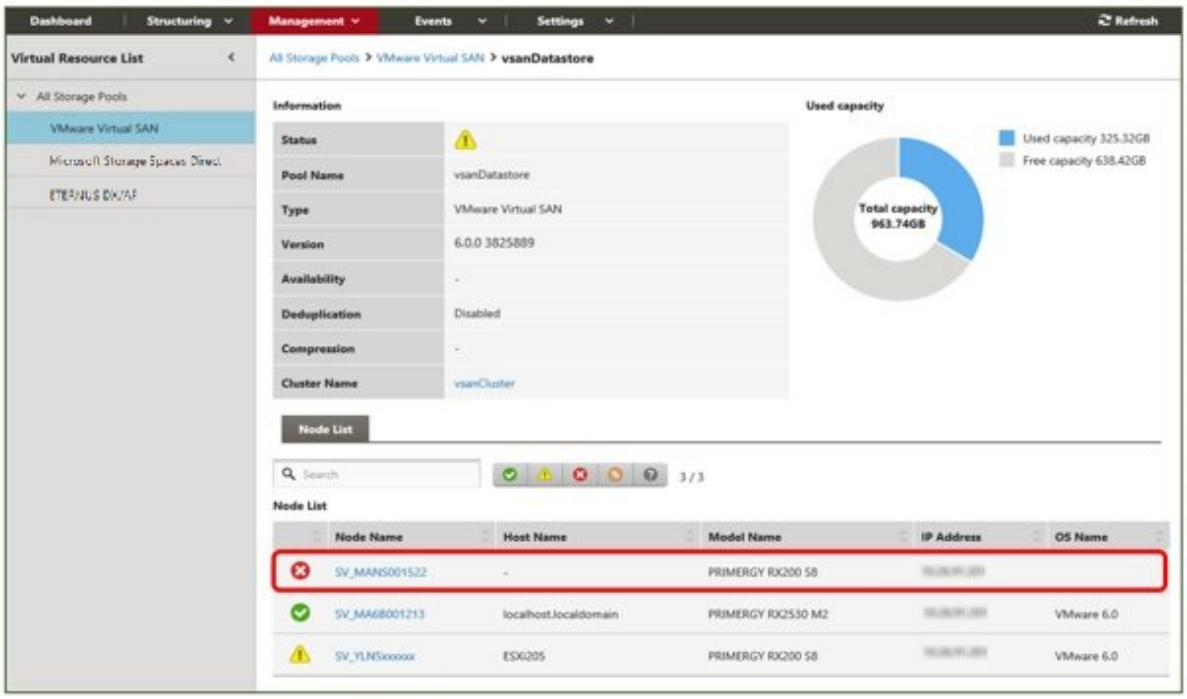
   The Virtual Resources List screen is displayed.



   Virtual resources with the selected status can be filtered out with the status filter icon at the top of the screen.

2. Select the pool name.

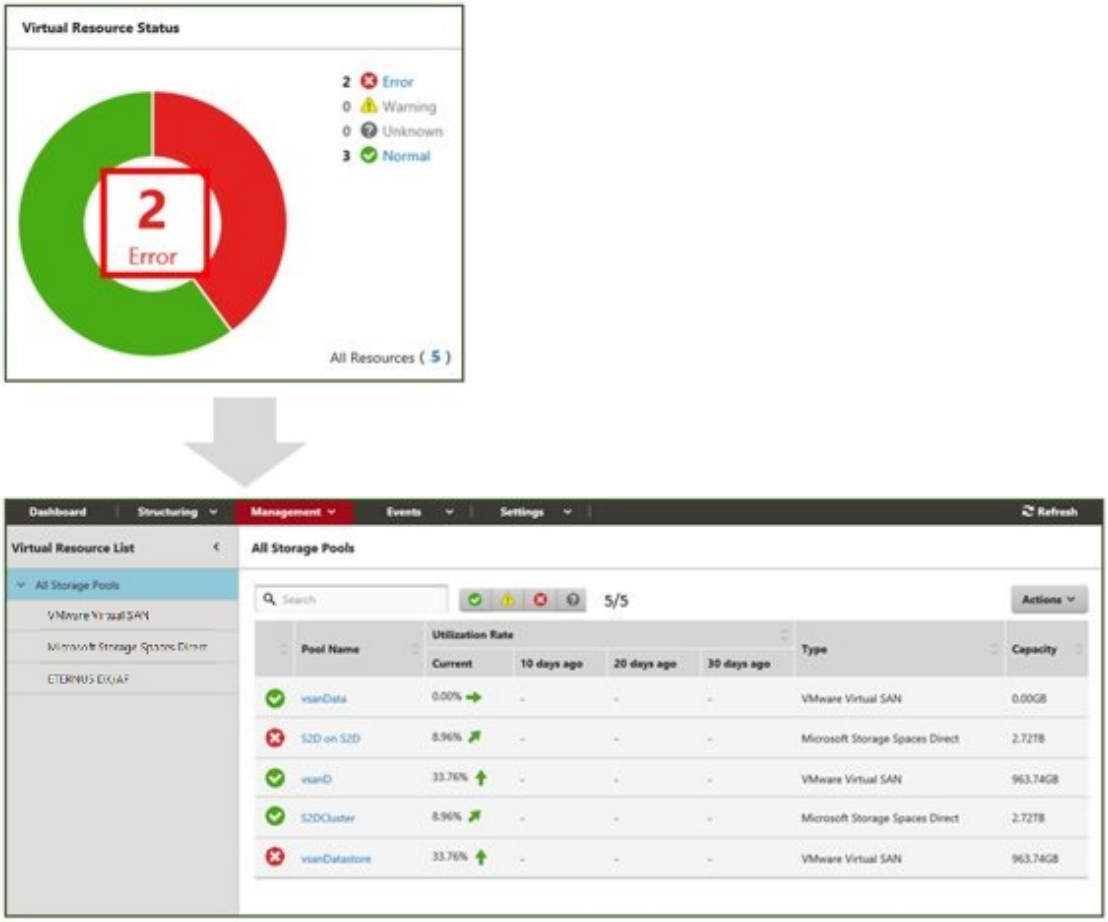
   When the virtual resources detailed information screen is displayed, check the node names for which errors are displayed in the "Node List."



(2) When identifying the place of an error from Dashboard

1. Select the number displayed in the middle of the "Virtual Resource Status" widget on the ISM Dashboard.

   A resource list of the error statuses will be displayed.



2. Select the pool name.

   When the virtual resources detailed information screen is displayed, check the device names for which errors are displayed in the "Node List."

Step 3

Check the details of the error that occurred.

(1) If an error is displayed for the virtual resource

If the storage pool status displays an error, the following situations are probable.

Layer where the error status occurred	Status
Physical layer	An error occurred in the storage pool because of a problem with a physical component (HDD, SSD, or node). Depending on the type of SDS, it will be in one of the following states: - If it is vSAN, an error has occurred in the health of vSAN - If it is Microsoft Storage Spaces Direct, an error has occurred on the nodes or physical disks configuring the storage pool - If it is ETERNUS, an error has occurred on the RAID groups, physical disks, or ETERNUS devices

Layer where the error status occurred	Status
Virtual layer	An error has occurred in the virtual resource layer (data store).

The following are statuses of storage pools according to each status.

Status	Icon displayed in the ISM GUI	Status
Error		An error has occurred in the storage pool, and continued usage is not possible.
Warning		An error has occurred in the storage pool, but continued usage is possible.
Unknown		An error has occurred in the storage pool, and its status cannot be confirmed.
Normal		The storage pool status is normal.

Point

If the capacity of the storage pool is reduced by an error in the physical or virtual layer, whether it can continue to be used as a storage pool can be determined by the "Error" status.

The details of an error and where it occurred can be confirmed as follows.

Point

For details on how to identify the detailed error location and its corrective actions, or to recover from the error, execute procedures following the manual for the relevant storage pool.

For vSAN

The status of the storage view the vSAN datastore and the "Health" of the vSAN are checked on either the ISM GUI or in the VMware vCenter web Client.

1. From the virtual resources list on the ISM GUI or from the details screen, check "Pool Name" and "Cluster Name."
2. Sign in to VMware vCenter Server Web Client and in the [Storage Views] tab, check the status of the displayed pool name previously checked in step 1.

   If it is operating normally, there is no mark, and any errors are marked in red.
3. In "Hosts and Clusters," select the node name checked in step 1.
4. From the [Monitor] tab, select [Virtual SAN] - [Health].

   Refer to the "Test result" of the vSAN health and identify the error contents.

Execute the following after recovering from an error.

1. Sign in to the VMware vCenter Server Web Client, and select the cluster name in "Hosts and Clusters."
2. From the [Monitor] tab - [Virtual SAN] - [Health], select [Retest] in the displayed Virtual SAN health screen, and then check that the test result that was "Failed" has changed to "Passed."
3. Select the [Storage Views] tab, and from the displayed datastore list, check that the status of the vSAN datastore is normal.
4. On the Virtual Resource list screen on the ISM GUI, select [Refresh Virtual Resource Information] from the [Actions] button, and check that the status has returned to normal.

Microsoft Storage Spaces Direct

From the ISM GUI or the server manager on the management server, check the status of the storage pool and the status of the physical disk.

1. From the virtual resources list or the details screen on the ISM GUI, check the "pool name."
2. Open the server manager on the management server, select [File and Storage Services] - [Storage Pool], and check the status of the storage pool name checked in step 1. Check the physical disks displaying errors from "Physical Disks."

Execute the following after recovering from an error.

1. Open the server manager on the management server, select [File and Storage Services] - [Storage Pool], and check that the storage pool and the physical disk are operating normally.

   Since the displayed information may be old, select the [Refresh] button on the screen, and check after refreshing the information.
2. On the Virtual Resource list screen on the ISM GUI, select [Refresh Virtual Resource Information] from the [Actions] button, and check that the status has returned to normal.

ETERNUS Storage

Open the ETERNUS web GUI with a web browser, check the statuses of RAID groups and physical disks.

You can confirm the URL of the ETERNUS web GUI in the node information that is displayed by selecting the ETERNUS device name in the "Node Lists" on the Virtual Resources details screen.

After recovering from the error, on the Virtual Resource list screen in ISM GUI, select [Refresh Virtual Resource Information] from the [Actions] button and check that the status has returned to normal.

(2) If the node error is displayed in the "Node list"

Check the details of the error in the ISM Event Log.

1. From the Global Navigation Menu on the GUI of ISM, select [Events] - [Events].

   The "Event List" screen is displayed.
2. Check the error contents by entering "Node name" into the search box, and search for events for the entered node.

2.9.3.3 Updates of virtual resource information

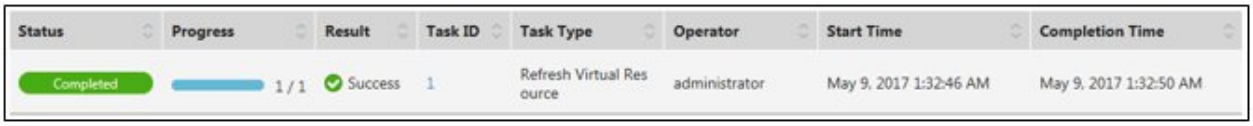
From the virtual resources list screen, execute [Refresh Virtual Resource Information] from the [Actions] button.

Point

- Since the information displayed on the GUI may be old, make sure to refresh it when checking the status of the virtual resources.

  The refresh process is registered in ISM tasks.

If the displayed information remains old, check if the task of task type "Refresh Virtual Resource" on the "Tasks" screen of ISM GUI is "Completed."



- The virtual resource information is periodically and automatically refreshed as follows (tasks are not displayed).
  - All virtual resource information is automatically refreshed every day at AM 0:00 of local time.
  - The virtual resource statuses are automatically refreshed every three minutes.

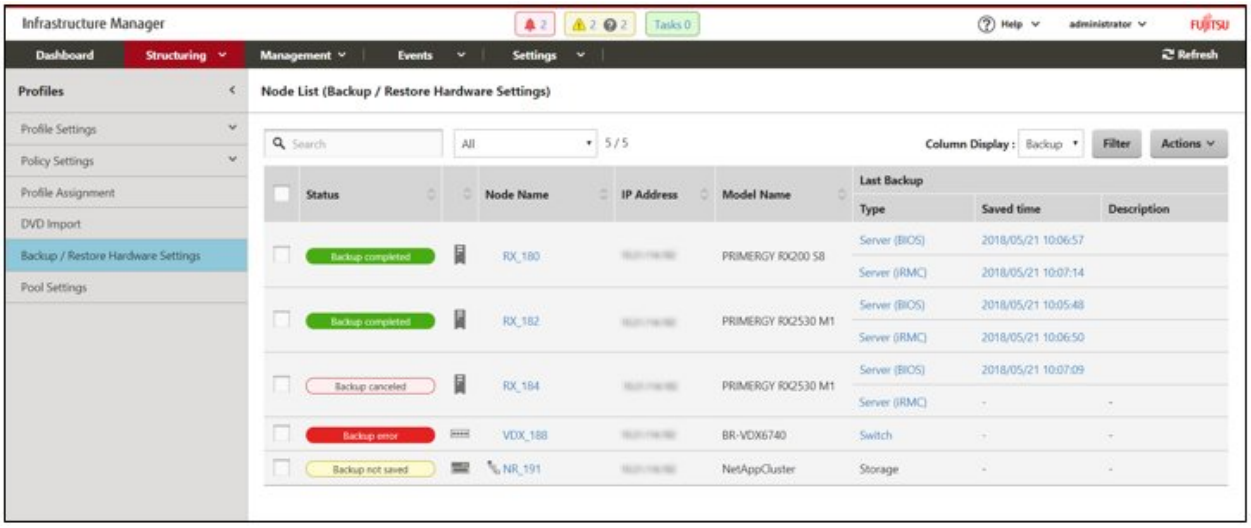
2.10 Backup/Restore Hardware Settings

This function saves the hardware settings as a file, and can then export the saved file. The target hardware settings are the following:

- BIOS/iRMC settings of PRIMERGY and PRIMEQUEST 3000B
- Switch settings of VDX

The exported files can be imported to a separate ISM, and the imported BIOS/iRMC settings can be applied to PRIMERGY or PRIMEQUEST 3000B, and the switch settings file can be applied to VDX.

Figure 2.15 "Backup/Restore Hardware Settings" screen sample (GUI)



Point

- The files for hardware settings are saved separately for BIOS and iRMC.
- When backing up the BIOS hardware settings, turn off the power of the server in advance.
- When backing up the switch settings, turn on the power of the hardware in advance.

2.10.1 Backup of the File of Backup Hardware Settings

Retrieve the hardware settings backup from the specified node.

1. From the Global Navigation Menu on the GUI of ISM, select [Structuring] - [Profiles].
2. From the menu on the left side of the screen, select [Backup / Restore Hardware Settings].
3. Select a node. From the [Actions] button, select [Backup Hardware Settings].

   The "Backup Hardware Settings" screen is displayed.
4. When backing up the BIOS hardware settings, turn off the power of the server in advance, select the [Get power status] button, and check that the power status has returned to "Off."
5. Check the checkboxes for the [Server (BIOS)], [Server (iRMC)], or [Switch] to which the settings will be backed up, and then select the [Execute] button.

Point

You can select multiple nodes and hardware settings, and back them up collectively.

Note

Backing up of hardware settings may fail in some iRMC firmware versions if LDAP is enabled in the iRMC settings, and HTTP is specified as the protocol in [Web I/F URL] on the Details of Node screen. In this case, edit the node information to set HTTPS in [Web I/F URL] as the protocol. For information on editing nodes, refer to "2.2.3 Editing of Datacenters/Floors/Racks/Nodes."

2.10.2 Export of the File of Backup Hardware Settings

Export the specified, already registered backup file.

1. From the Global Navigation Menu on the GUI of ISM, select [Structuring] - [Profiles].
2. From the menu on the left side of the screen, select [Backup / Restore Hardware Settings].
3. Select a node. From the [Actions] button, select [Export (Backup file)].
4. Following the on-screen instructions, select the file, and then select the [Execute] button.

Point

You can select multiple nodes and hardware settings, and export them collectively.

2.10.3 Addition of Profiles from the File of Backup Hardware Settings

Convert the specified, already registered backup to a profile and add it.

1. From the Global Navigation Menu on the GUI of ISM, select [Structuring] - [Profiles].
2. From the menu on the left side of the screen, select [Backup / Restore Hardware Settings].
3. Select a node. From the [Actions] button, select [Add Profile From Backup].
4. Following the "Add Profile From Backup" wizard, enter the setting items.

Point

- You can select multiple nodes and add profiles collectively.
- This function can only be used for PRIMERGY/PRIMEQUEST 3000B server backups.

Note

The setting items for iRMC, [Proxy Server] - [Password], are not set. Set the items manually after adding a profile from the backup.

2.10.4 Addition of Policies from the File of Backup Hardware Settings

Convert the specified, already registered backup to a policy and add it.

1. From the Global Navigation Menu on the GUI of ISM, select [Structuring] - [Profiles].
2. From the menu on the left side of the screen, select [Backup / Restore Hardware Settings].
3. Select a node. From the [Actions] button, select [Add Policy From Backup].
4. Following the "Add Policy From Backup" wizard, enter the setting items.

Point

- You can select multiple nodes and add policies collectively.
- This function can only be used for PRIMERGY/PRIMEQUEST 3000B server backups.

Note

The setting items for iRMC, [Proxy Server] - [Password], are not set. Set the items manually after adding a profile from the backup.

2.10.5 Import of the File of Backup Hardware Settings

Import an exported backup file.

1. From the Global Navigation Menu on the GUI of ISM, select [Structuring] - [Profiles].
2. From the menu on the left side of the screen, select [Backup / Restore Hardware Settings].
3. Select a node. From the [Actions] button, select [Import].
4. Select an option in [File selection method].
   - Local

     Import a backup file stored locally.
   - FTP

     Import a backup file from the FTP server of ISM-VA.

You must transfer the backup file to the "/<User group name>/ftp" directory of ISM-VA in advance.

For FTP connections and how to transfer to FTP, refer to "2.1.2 FTP Access."

5. Specify the backup file to be imported in [File], and then start the import with the [Execute] button.

Point

- The files you transferred to the FTP server of ISM-VA are no longer required after the import has finished. Use an FTP command to delete them.
- You can select multiple nodes and import collectively.

2.10.6 Restoration of the File of Backup Hardware Settings

Apply the hardware settings of the specified, already registered backup on the node.

1. From the Global Navigation Menu on the GUI of ISM, select [Structuring] - [Profiles].
2. From the menu on the left side of the screen, select [Backup / Restore Hardware Settings].
3. In the [Column Display] field on the "Node List" screen, select [Restore].
4. Select a node. From the [Actions] button, select [Restore Hardware Settings].
5. Following the on-screen instructions, select the file, and then select the [Execute] button.

Point

Multiple nodes can be selected and restored to.

Note

- When you restore to VDX, execute the restoration after initializing the setting items. If the setting items are not initialized before the restoration, the contents of the backup may not be applied.

  For VDX, the following setting items cannot be restored:

  - License information
  - Switch mode
  - Chassis/host name
  - Password
  - Management port
  - NTP server setting
  - Date and time settings (clock set command)

  Confirm the contents of the settings after restoring and set the items that could not be restored on the device side.

- Restoration of hardware settings may fail in some iRMC firmware versions if LDAP is enabled in the iRMC settings, and HTTP is specified as the protocol in [Web I/F URL] on the Details of Node screen. In this case, edit the node information to set HTTPS in [Web I/F URL] as the protocol. For information on editing nodes, refer to "2.2.3 Editing of Datacenters/Floors/Racks/Nodes."

2.10.7 Deletion of the File of Backup Hardware Settings

Delete the specified, already registered backup.

1. From the Global Navigation Menu on the GUI of ISM, select [Structuring] - [Profiles].
2. From the menu on the left side of the screen, select [Backup / Restore Hardware Settings].
3. Select the link in the [Last Backup] field of the node you want to delete.
4. Select the hardware settings to be deleted. From the [Actions] button, select [Delete].

Point

You can select multiple hardware settings backup files and delete them collectively.

2.11 Packet Analysis of Virtual Network

This function visualizes the traffic status of the virtual network.

Based on the retrieved information, tendencies in the communication volume can be checked for each port, each network, and each host. Also, by checking the communication quality, it becomes easier to find locations with errors and communication quality can be improved.

Point

A virtual machine that analyzes traffic in a virtual environment is called an "Analysis VM."

2.11.1 Support Targets

The following is the hypervisors and cloud management software supported by this function.

Item		Hypervisor	Cloud management software
VMware	5.x	VMware ESXi 5.5	vCenter Server 5.5
			vCenter Server Appliance 5.5
	6.x	VMware ESXi 6.0	vCenter Server 6.0
			vCenter Server Appliance 6.0
		VMware ESXi 6.5	vCenter Server 6.5
			vCenter Server Appliance 6.5
		VMware ESXi 6.7	vCenter Server 6.7
			vCenter Server Appliance 6.7
Redhat	7.x	Redhat Enterprise Linux 7.2 (KVM) [Note 1]	OpenStack
		Redhat Enterprise Linux 7.3 (KVM)	
		Redhat Enterprise Linux 7.4 (KVM)	
		Redhat Enterprise Linux 7.5 (KVM)	
		Redhat Enterprise Linux 7.6 (KVM)	

[Note 1]: Display of traffic information and communication quality information with Analysis VM is not supported.

Note

- To monitor virtual network adapters, some settings may be required for hypervisor or cloud management software to be used in advance.
- For operational performance using OpenStack, contact your local Fujitsu customer service partner.

2.11.2 Check of Analysis VM

This function supports the following ISM version and Analysis VM versions.

ISM version	Infrastructure Manager Analysis VM for KVM	Infrastructure Manager Analysis VM for VMware
ISM 2.4.0 or later	V1.1.1	V1.1.0

To use this function, the following resources must be added to the hypervisor on the host on which Analysis VM is running.

Additional number of CPU cores	Additional memory capacity	Additional disk capacity
2 cores or more	8 GB or more	40 GB or more

2.11.3 Display Item of Packet Analysis of Virtual Network

This function visualizes the following information of the virtual network. The data retention period is one month or less.

Table 2.4 Information of performance statistics retrieved from the monitored host

Display item	Description
CPU usage	Displays the utilization rate of the physical CPU on the target host.
CPU usage of VM vCPU	Displays the utilization rate of the virtual CPUs for each virtual machine operating on the target host.
CPU usage of virtual network adapter [Note 1]	Displays the CPU utilization rate per virtual network adapter.
Traffic information of virtual network adapter [Note 1]	Displays the volume of the sent and received packets, the number of error packets, and the number of dropped packets for each virtual network adapter.

[Note 1]: The upper limit of the number of virtual adapters that can be monitored by the function is 1000.

Table 2.5 Packet analysis results showing information on details and quality of communication

Monitoring targets of Analysis VM	Description
Port traffic information	Displays the sent and received packet information for each TCP/UDP port.
Network traffic information	Displays the sent and received packet information for each subnet.
Host traffic information	Displays the sent and received packet information for each host.
Host quality information	Displays the communication quality of TCP (number of losses, delay time, etc.) for each host.

2.11.4 Function difference of Packet Analysis of Virtual Network

The following are the function difference between Packet Analysis of Virtual Network for VMware and for KVM.

Functions supported	Display item	VMware	KVM
Information of performance statistics retrieved from the monitored host	CPU usage	Y [Note 1]	Y
	CPU usage of VM vCPU	Y	Y

Functions supported	Display item	VMware	KVM
	CPU usage of virtual network adapter	Y [Note 2]	Y
	Traffic information of virtual network adapter	Y [Note 3]	Y
Packet analysis results showing information on details and quality of communication	Port traffic information	Y	Y
	Network traffic information	Y	Y
	Host traffic information	Y	Y
	Host quality information	Y	Y

[Note 1]: Information of process CPU utilization cannot be displayed.

[Note 2]: Information of CPU scheduler cannot be displayed.

[Note 3]: Only the number of dropped packets can be displayed.

Note

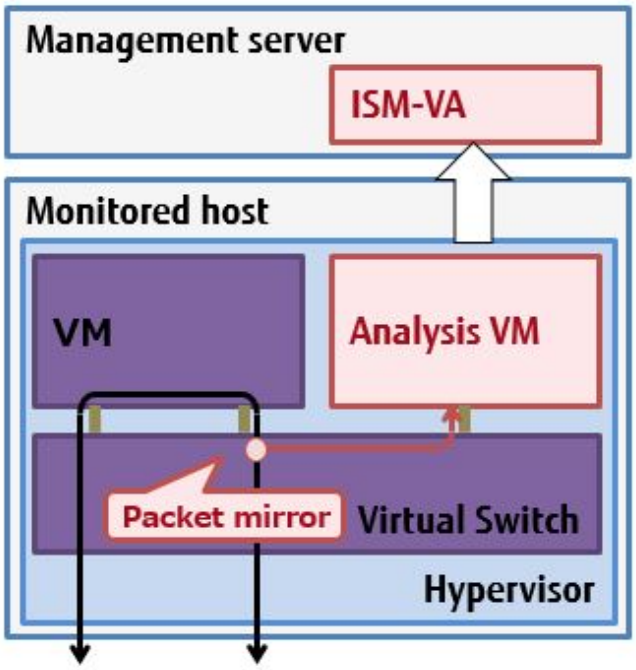
Xen cannot be used.

2.11.5 Operation of Packet Analysis of Virtual Network

To use Packet Analysis of Virtual Network, deploy Analysis VM manually to the hypervisor on the monitoring target host. Analysis VM analyzes actual packets on the virtual switch in order to retrieve the information that is required to specify the cause of a decrease in the communication performance. The targets for retrieval are as follows.

- Performance information by port number (TCP/UDP), by terminal (VM), or by session.
- Quality degradation information such as traffic volume, the number of packet loss, or the volume of traffic delay.

Figure 2.16 Image of operation of Packet Analysis of virtual network



Point

- Analysis VM only analyzes the captured header information of the packet (L2, L3, L4 headers).
- After analyzing the header information, the captured header information is discarded without being saved, meaning that no information is saved.

2.11.6 Display Items of Bottleneck Analysis for Virtual Networks

Bottleneck Analysis for virtual networks analyzes the causes of performance degradation based on the information retrieved by Packet Analysis of Virtual Network and displays the results of the analysis.

Items that are displayed as potential causes are as follows.

Table 2.6 Potential causes that are displayed by (OpenStack) Bottleneck Analysis

Cause	Description
Packet transfer process overload	Packet loss in communication with an analysis target VM may have been caused by the packet transfer process overload.
VM overload	Packet loss in communication with an analysis target VM may have been caused by the analysis target VM overload.
Packet transfer process resource conflict	Packet loss in communication with an analysis target VM may have been caused by the effects of other processes.
VM resource conflict	Packet loss in communication with an analysis target VM may have been caused by the effects of other processes.
Buffer shortage of virtual adapter	Packet loss in communication with an analysis target VM may have been caused by insufficient buffer for a packet queue of the virtual adapter.
Buffer shortage of VM	Packet loss in communication with an analysis target VM may have been caused by insufficient buffer for a packet queue of an analysis target VM.

Table 2.7 Potential causes that are displayed by (VMware) Bottleneck Analysis

Cause	Description
Transmit thread overload	Packet loss in communication with an analysis target VM may have been caused by a high utilization rate of CPU by transmitting threads.
VM overload	Packet loss in communication with an analysis target VM may have been caused by a high utilization rate of CPU of an analysis target VM.
Transmit thread resource conflict	Packet loss in communication with an analysis target VM may have been caused by the effects of other processes.
VM resource conflict	Packet loss in communication with an analysis target VM may have been caused by the effects of other processes.
Insufficient transmission buffer size of virtual NIC	Packet loss in communication with an analysis target VM may have been caused by insufficiency of the transmission buffer size of the virtual NIC.
Insufficient receive buffer size of virtual NIC	Packet loss in communication with an analysis target VM may have been caused by insufficiency of the receiving buffer size of the virtual NIC.

2.12 Functions of ISM for PRIMEFLEX

The ISM for PRIMEFLEX function is the ISM with the Virtualized Platform Expansion function added. In addition to the functions of ISM, the following functions are provided.

- 2.12.1 Cluster Management
- 2.12.2 Cluster Creation
- 2.12.3 Cluster Expansion
- 2.12.4 Rolling Update
- 2.12.5 Node Disconnection/Reintegration (ISM 2.5.0.010 or later)

Note

ISM Power Capping cannot be used in ISM for PRIMEFLEX.

2.12.1 Cluster Management

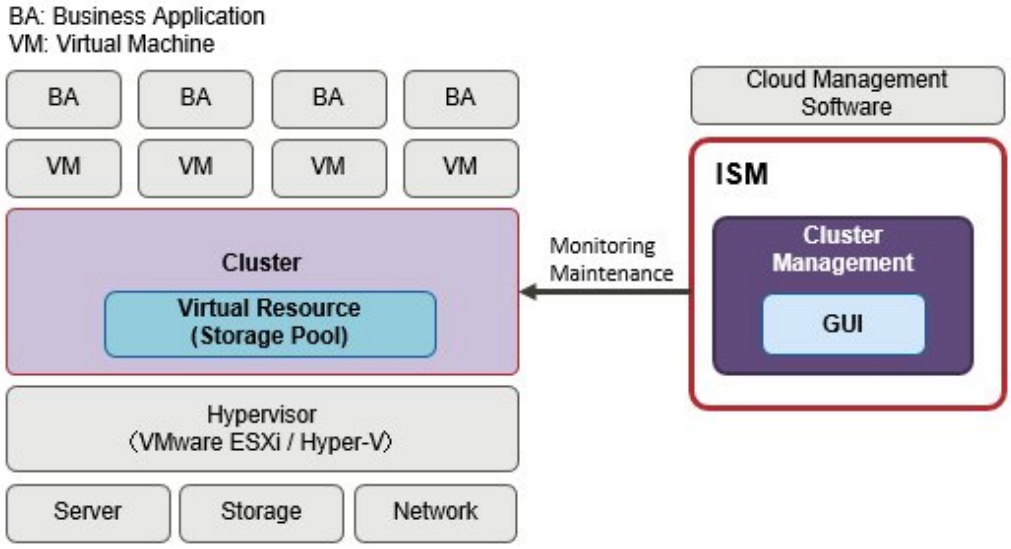
This function can be used only when the ISM operation mode is "Advanced for PRIMEFLEX."

Cluster Management provides functions to manage clusters in link with ISM.

By allowing for monitoring in link with the statuses of the hardware (nodes) in a cluster and for monitoring storage pools and other virtual storage environments (Software Defined Storage, hereafter referred to as "SDS"), these functions can be used to for the smooth maintenance of clusters and determining the addition (provisioning) of resources.

For the types of clusters that can be managed and their requirements, refer to "2.12.1.2 Environments supported by Cluster Management."

Figure 2.17 Overview of the Cluster Management operation



Cluster Management provides various GUIs for cluster management that are linked with the ISM GUI and features the following functions:

- List of clusters and summary display, including cluster statuses
- Display of detailed cluster information

  For the cluster configuration information, information such as the following is displayed.

  - Information of the nodes configuring the cluster
  - Information of the virtual resources in the cluster
  - Parameter setting information of Cluster Creation and Cluster Expansion

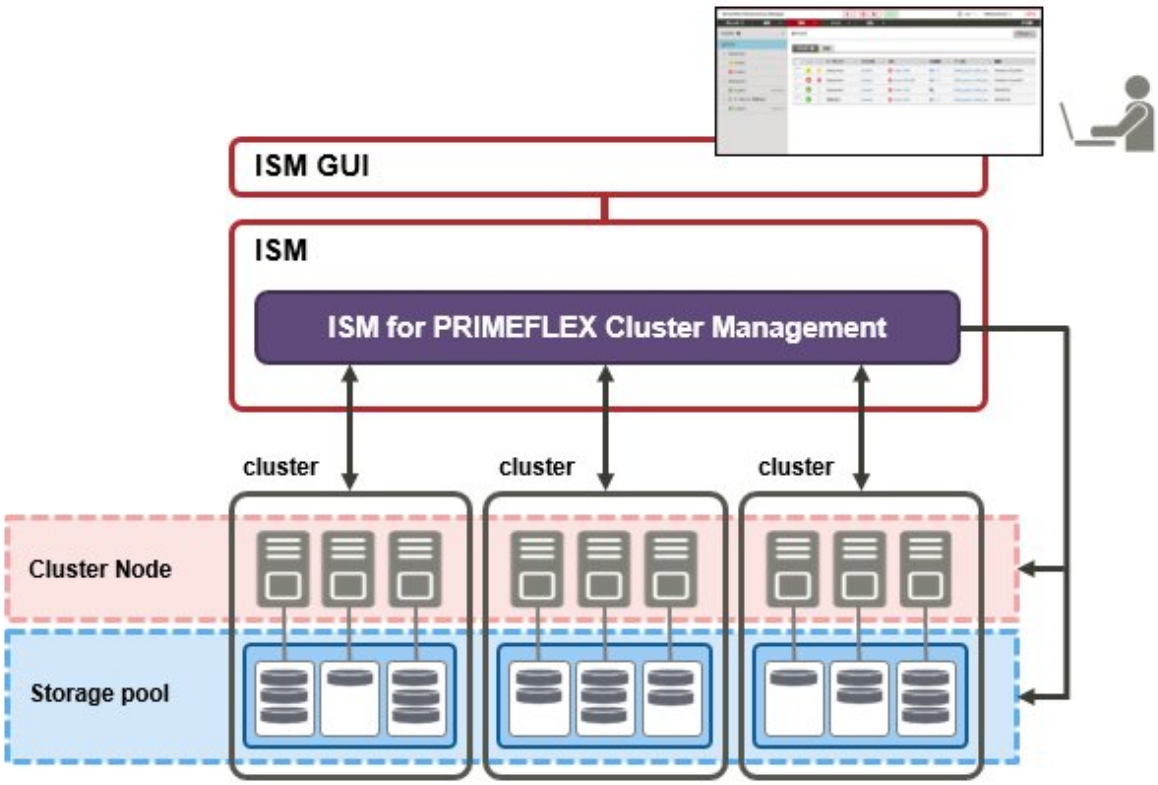
- A widget that is available to monitor the clusters from Dashboard

2.12.1.1 Cluster Management GUI

Cluster monitoring and management can be used from the ISM GUI.

The following is the environment configuration for operating Cluster Management.

Figure 2.18 Configuration of the operating environment for Cluster Management



The following displays the functions of each screen and their mutual display relationships.

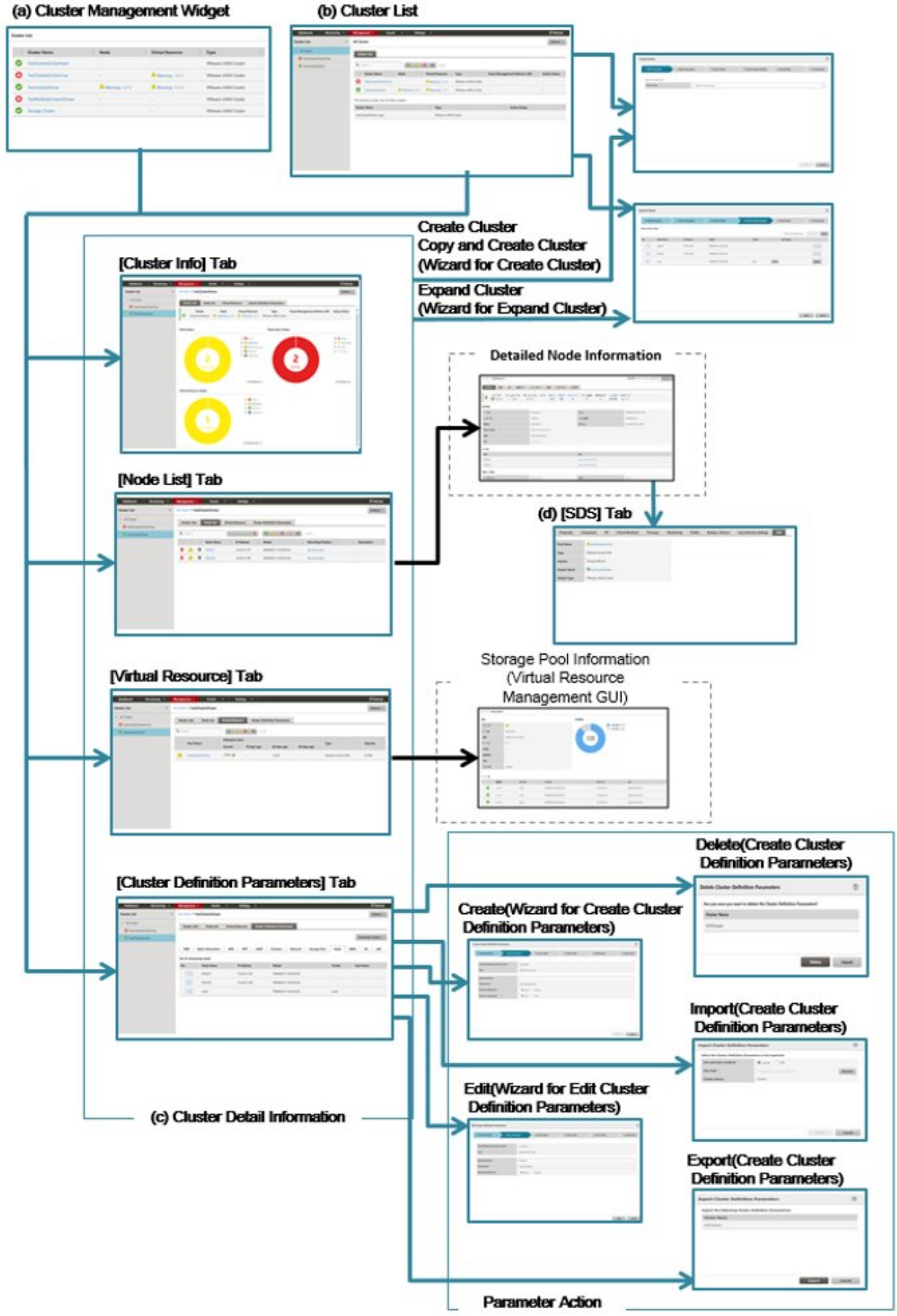
The Cluster Management GUI ((a) - (d) in the Figure 2.19 Cluster Management GUI) displays various kinds of information on the clusters.

More detailed information can be checked, linked with node information (the "Node List" screen) and virtual resource information (virtual resource GUI).

For more information on the node list and the GUI for Virtual Resource Management, refer to "2.9.2 GUI for Virtual Resource Management."

For descriptions of the GUI display items, refer to the ISM online help.

Figure 2.19 Cluster Management GUI



(a) Cluster Management Widget

On the ISM Dashboard, the Cluster Management widget is displayed.

It is possible to check cluster information and states monitored on ISM from the widget.

For details, refer to "Operation in link with Dashboard."

(b) Cluster List

A list of the clusters is displayed.

When you select a cluster name, the management screen "(c) Cluster Detail Information" is displayed.

(c) Cluster Detail information

Information for the cluster and the components that configure the cluster is displayed by switching tabs.

For details on the screens displayed as tabs, refer to "Details of Cluster screen (tab display screen)."

(d) Cluster information on node information ([SDS] tab)

The [SDS] tab that displays virtual resource information on the Details of Node screen is displayed.

When you select the [SDS] tab, the nodes and the related information are displayed. For details, refer to "Operation in link with node information ([SDS] tab)."

The following describes the contents of the Cluster Management GUI.

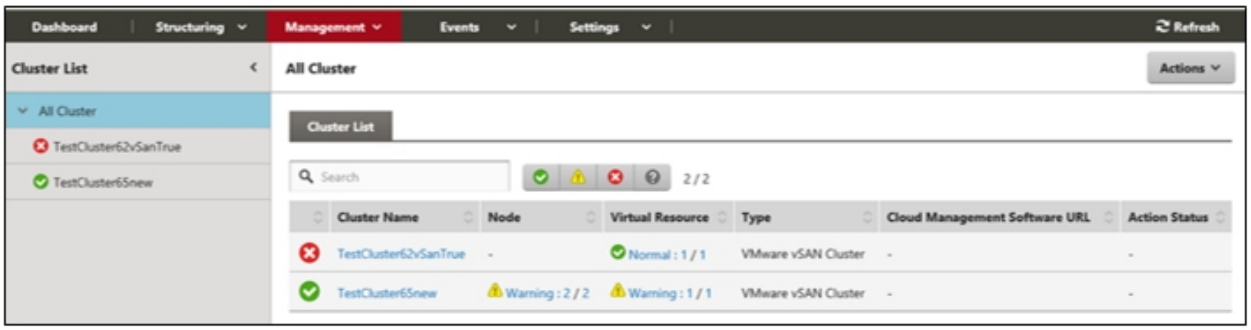
Cluster List screen

From the Global Navigation Menu on the ISM GUI, select [Management] - [Cluster] to display the "Cluster List" screen.

A list of the clusters that can be managed by ISM is displayed.

The list shows the status of each cluster and the components that configure the cluster.

Figure 2.20 Cluster List screen



Details of Cluster screen (tab display screen)

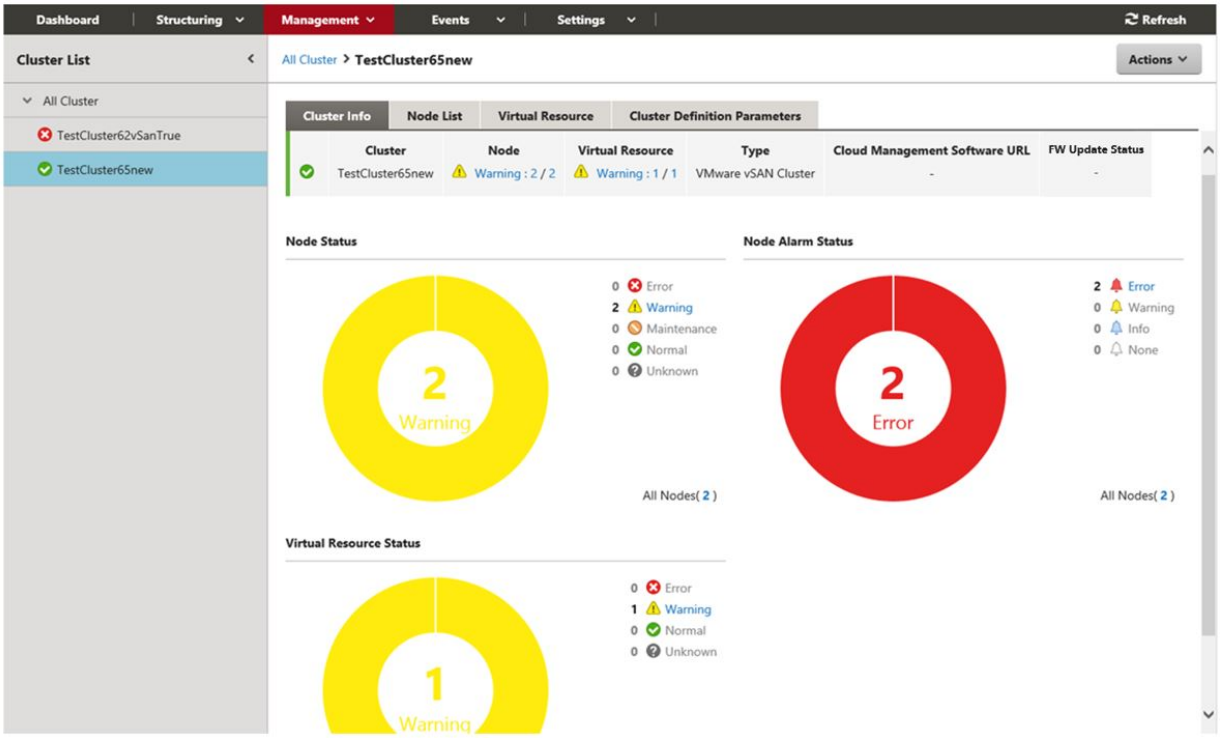
Selecting a cluster name on the cluster list screen opens the Details of Cluster screen for the selected cluster, allowing you to check the information on the nodes and the components that configure the cluster.

This screen displays the resource settings, utilization statuses, lists of nodes that configure the resources, and other cluster management information.

[Cluster Info] tab

Displays summary information on the clusters and the components that configure each cluster.

Displays cluster information (cluster names), node states (statuses, alarms), and the states of virtual resources.



[Node List] tab

A list of the information of the nodes configuring the cluster is displayed. A status of the node, its position and other information is displayed.

If you select a node, you move to the Details of Node screen, where you can check the hardware information, detailed node status information, and configuration information.

For description of the Details of Node screen, refer to the ISM online help.

[Virtual Resource] tab

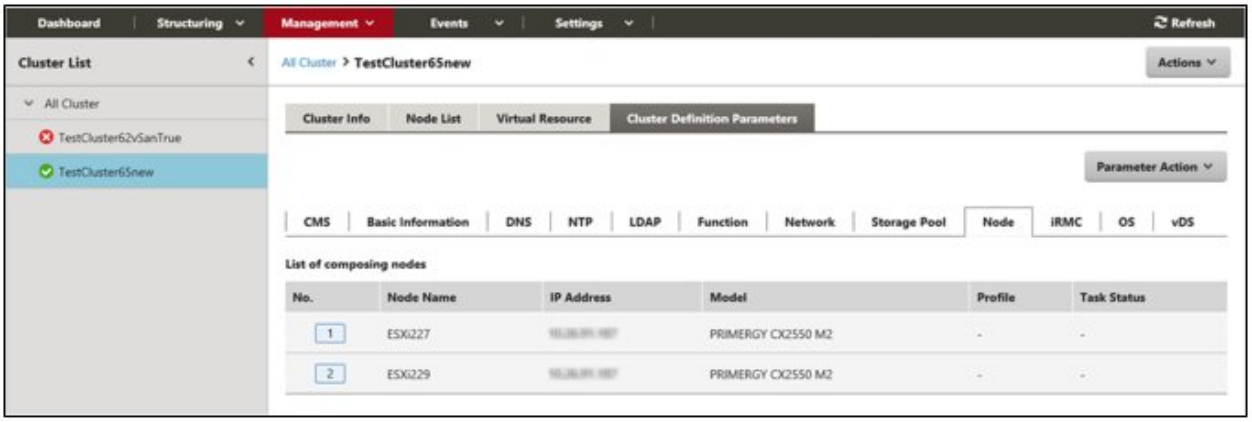
A list of the information of the SDS storage pools created in the cluster is displayed.

Selecting a storage pool name displays the storage pool information screen of the GUI for Virtual Resource Management.

For descriptions of the GUI for virtual Resource Management, refer to "2.9.2 GUI for Virtual Resource Management" or to the ISM online help.

[Cluster Definition Parameters] tab

Displays parameters referred to when creating clusters and when adding servers to clusters.



The parameter information can be referred to by switching between the following tabs.

For information on the displayed information, refer to "ISM for PRIMEFLEX Parameter List" or refer to the ISM online help.

Tab name	Description
CMS	The information of the cloud management software is displayed.
Basic information	The cluster name and other basic information of the cluster is displayed.
DNS	The DNS information of the cluster is displayed.
NTP	The NTP information of the cluster is displayed. [Note 1]
LDAP	The LDP information of the cluster is displayed.
Function	The setting information of vSAN and vSphere is displayed. [Note 1]
Network	The network information of the cluster is displayed. [Note 2]
Storage pool	The storage pool information of the cluster is displayed.
Node	The information of the nodes configuring the cluster is displayed.
iRMC	The setting information of the user of iRMC is displayed.
OS	The setting information of the local user of the OS is displayed.
vDS	The setting information of the virtual distributed switch (vDS: virtual Distributed Switch). [Note 1]
Virtual switch	The setting information of the virtual switch is displayed. [Note 3]

[Note 1]: Displayed if the cluster type is "VMware vSAN Cluster."

[Note 2]: Unique information is displayed if the cluster type is "VMware vSAN Cluster" or "Microsoft Failover Cluster."

[Note 3]: Displayed if the cluster type is "Microsoft Failover Cluster."

The following parameter operations can be executed from the [Parameter Action] button.

Select the [Parameter Action] button, select a menu item, and follow the wizard or screen that is displayed to enter the setting values.

For the setting items in the wizard, refer to "ISM for PRIMEFLEX Parameter List." In addition, for detailed information on setting procedures, refer to the ISM online help.

- Create

  The "Create Cluster Definition Parameters" wizard is displayed and you can create new parameters.

- Edit

  The "Edit Cluster Definition Parameters" wizard is displayed and you can edit the parameters.

- Delete

  "Delete Cluster Definition Parameters" screen is displayed and parameters can be deleted.

- Import

  "Import Cluster Definition Parameters" screen is displayed and parameters can be imported.

- Export

  "Export Cluster Definition Parameters" screen is displayed and parameters can be exported.

Actions menu

Selecting the [Actions] button on the top right side of the screen displays the following menu and allows you to execute operations for the cluster.

- Refresh Cluster Information

  Selecting this menu item retrieves the cluster information and refreshes the information.

  Refer to "2.12.1.3 Refreshing cluster information" for details on how to execute the operations.

- Create Cluster

  Selecting this menu item opens the "Create Cluster" wizard. Follow the wizard to create a cluster.

  For details, refer to "2.12.2 Cluster Creation." For the procedure, refer to "Operating Procedures."

- Copy and Create Cluster

  Selecting this menu item opens the "Create Cluster" wizard. Follow the wizard to create a cluster reference.

  For details, refer to "2.12.2 Cluster Creation." For the procedure, refer to "Operating Procedures."

- Expand Cluster

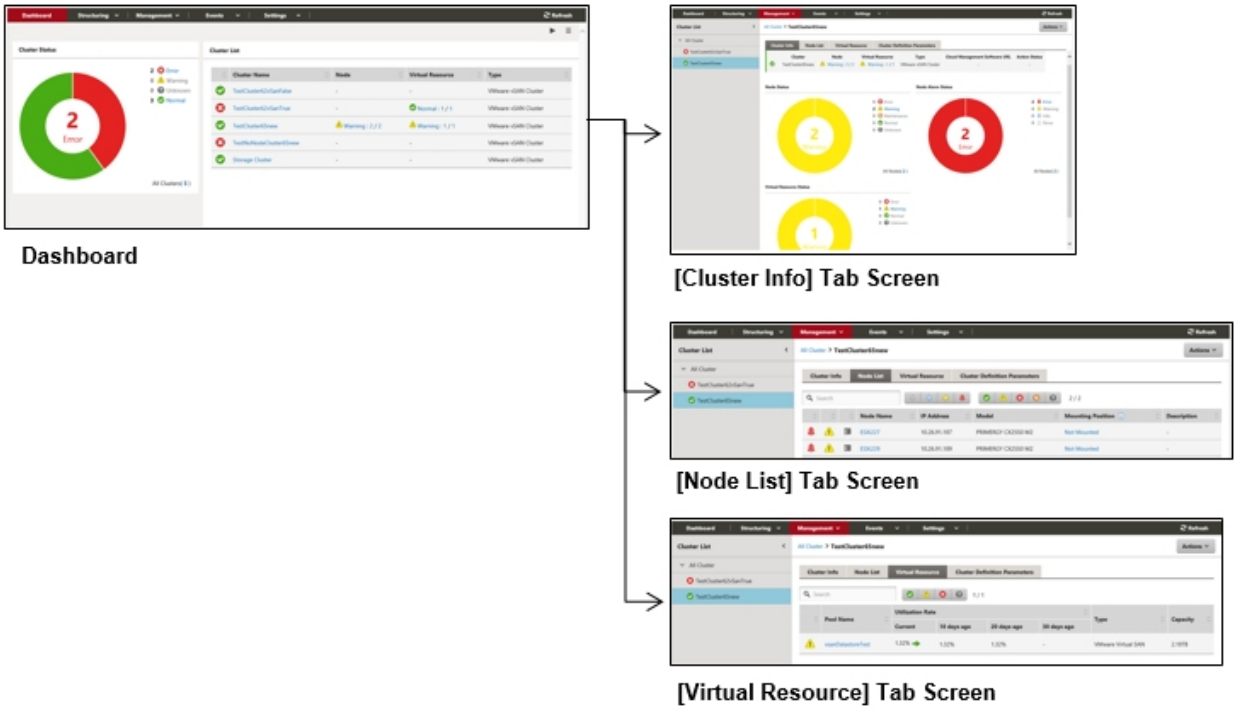
  Selecting this menu item opens the "Expand Cluster" wizard. Follow the wizard to add servers to the cluster.

  For details, refer to "2.12.3 Cluster Expansion." For the procedure, refer to "Operating Procedures."

Operation in link with Dashboard

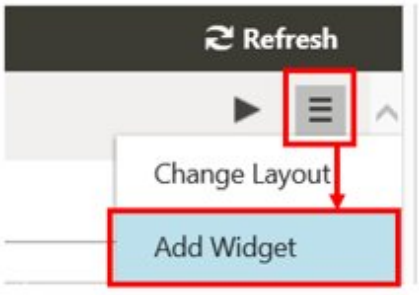
By adding the information display screen (widget) related to Cluster Management to the ISM Dashboard, you can, with just one click on the Dashboard, display the information on clusters and components that configure each cluster (nodes and storage pools) for which you want to check the details.

Figure 2.21 Operation in link with Dashboard



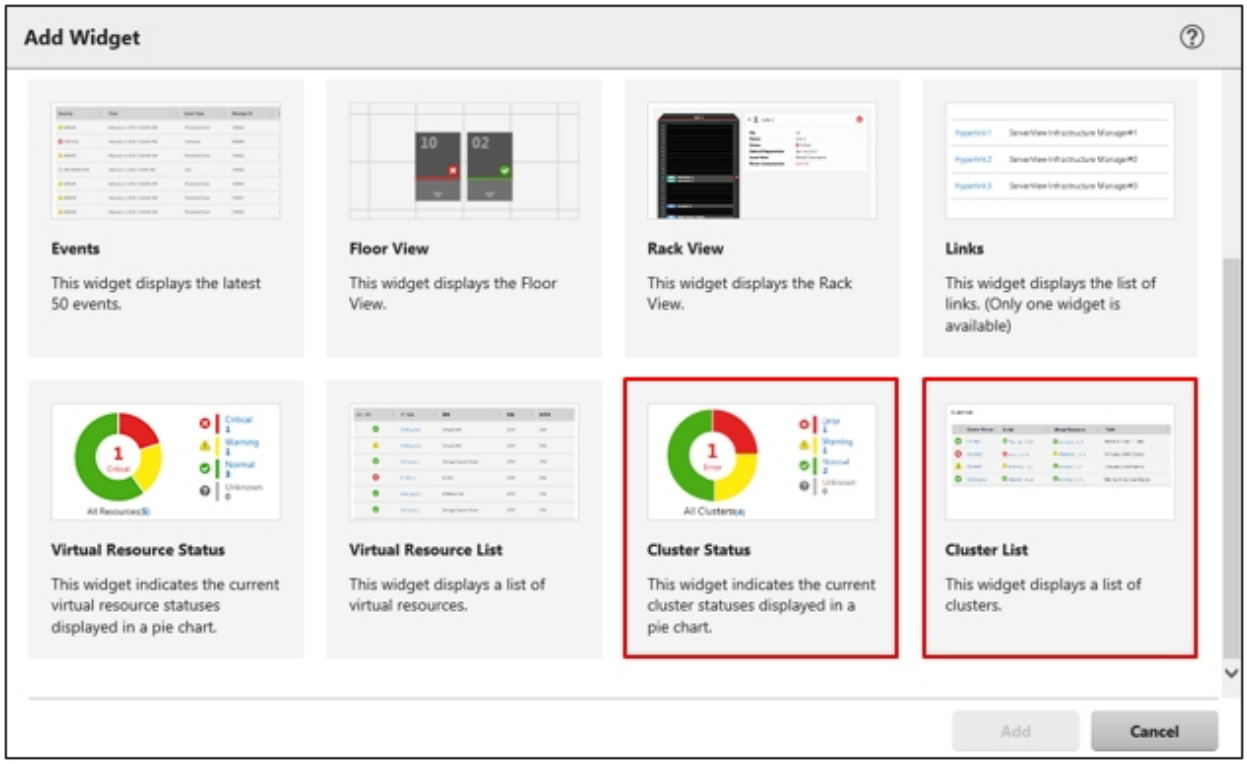
The procedure for adding widgets to the ISM Dashboard is as follows.

1. From the [☰] at the top of the screen, select [Add Widget].

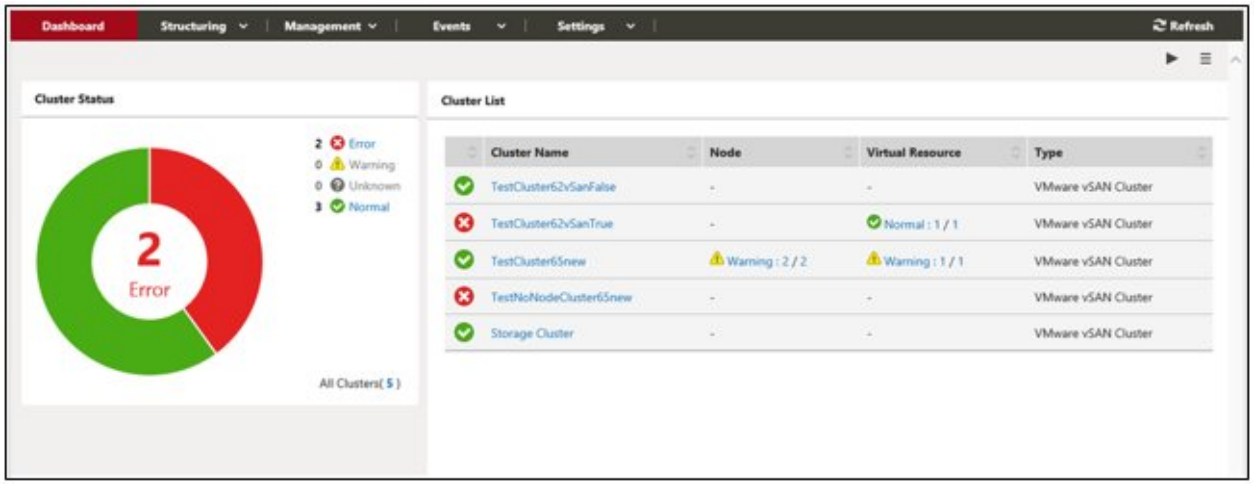


A menu for adding widgets is displayed.

2. "Cluster Status" and "Cluster List" are widgets for displaying clusters. Select either one, and select the [Add] button.



The widget you selected is displayed on the Dashboard.



Operation in link with node information ([SDS] tab)

You can embed Virtual Resource Management information into the Details of Node screen in order to link these types of information to each other.

1. From the Global Navigation menu on the GUI of ISM, select [Management] - [Nodes], and then select a node name on the "Node List" screen.

   On the Details of Node screen, the [SDS] tab is displayed.

   The [SDS] tab is displayed only for nodes that are configured by SDS (not for nodes that are not configured by SDS).

2. Select the [SDS] tab.

   The SDS information related to each node is displayed.

The storage pool name and the cluster name that configure the SDS are displayed.

Selecting the cluster name displays the cluster information screen.

Selecting the pool name displays a screen with the detailed information on the storage pool.

For a description of the screen, refer to "2.9.2 GUI for Virtual Resource Management."

2.12.1.2 Environments supported by Cluster Management

Cluster Management supports the following environments.

- VMware Virtual SAN Cluster
- Microsoft Failover Cluster

VMware Virtual SAN Cluster

VMware Virtual SAN cluster (hereafter referred to as "vSAN cluster") is a system configured with multiple servers that have VMware ESXi installed as a hypervisor.

vCenter Server Appliance (hereafter referred to as "vCenter Server") is used as the management software, and Cluster Management collects cluster information from vCenter Server to display it on the ISM GUI.

In the vSAN cluster, the storage mounted on each server is aggregated to configure the "vSAN Storage Pool" virtual storage. The vSAN storage pool can be monitored from ISM.

The following are the requirements for vSAN cluster environments.

Item	Requirement
Hypervisor	- VMware ESXi 6.0 Update 2 - VMware ESXi 6.5 - VMware ESXi 6.5 Update 1 - VMware ESXi 6.7
Cloud management software	- vCenter Server Appliance 6.0 Update 2 - vCenter Server Appliance 6.5 - vCenter Server Appliance 6.7
SDS	- VMware Virtual SAN 6.2 - VMware Virtual SAN 6.5 - VMware Virtual SAN 6.6 - VMware Virtual SAN 6.6.1

Microsoft Failover Cluster

Microsoft Failover Cluster is a system configured with multiple servers that have Windows Server installed.

Cluster Management collects cluster information from the Windows Server OS to display it on the ISM GUI.

In each cluster, the "Storage Pool" virtual storage of Storage Spaces Direct is configured by aggregating the physical storages mounted on each server. The storage pool can be monitored from ISM.

The following are the requirements for Microsoft Failover Cluster environments.

Item	Requirement
OS	- Windows Server 2016 - Windows Server 2019
Role and function	The following roles and functions must be installed on the nodes configuring the cluster. - Hyper-V - Microsoft Failover Cluster
Hypervisor	Hyper-V
SDS	Microsoft Storage Spaces Direct
Other	- It must be possible to monitor OSes and clusters from ISM - CredSSP authentication must be enabled on the nodes configuring the cluster

Note

The following is required for Microsoft Failover Cluster:

- Pre-settings to enable OS monitoring from ISM for each node
- Pre-settings to enable failover cluster monitoring from ISM
- CredSSP authentication must be enabled on every node

For details on how to set it, refer to "3.9.2 Pre-settings for Microsoft Storage Spaces Direct/PRIMEFLEX for Microsoft Azure Stack HCI."

For the setup procedures for the monitoring target OS, refer to "B.2 Setting Procedure for Monitoring Targets (OS: Windows)" or "B.7 Setting Procedure for Monitoring Targets (Cloud Management Software: Microsoft Failover Cluster)."

2.12.1.3 Refreshing cluster information

To retrieve information on the virtualized platform on the ISM GUI or to refresh the displayed contents, you must refresh the information from the ISM GUI.

If you are checking the virtual resources from the Cluster Management GUI, refresh the displayed contents.

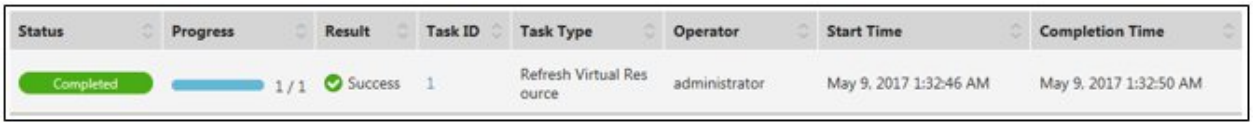
From the [Actions] button, execute [Refresh Cluster Information].

The cluster information is displayed on the ISM GUI. For the displayed information, refer to "2.12.1.1 Cluster Management GUI."

Point

- Since the information displayed on the GUI may be old, make sure to refresh it when checking the status of the clusters.
- The refreshed cluster information is registered in the ISM tasks.

  At the top of the Global Navigation Menu on the GUI of ISM, select [Tasks], and check the tasks whose type is "Refresh Virtual Resource."



  Until the status of the task becomes "Completed," the refreshing of the display has not been completed.

After checking that the status has become "Completed," refresh the ISM GUI screen (select the refresh button in the upper left part of the screen).

- The information on the GUI is automatically refreshed every day at AM 0:00 of local time.
- The statuses of the clusters displayed on the GUI are refreshed every three minutes.

2.12.1.4 Management and monitoring of clusters

Monitoring and operation of clusters can be executed by using Cluster Management.

The following types of monitoring can be executed using Cluster Management.

- Monitoring of clusters
- Monitoring of the nodes configuring the cluster
- Monitoring of virtual resources on a cluster

Monitoring of clusters

From the Global Navigation Menu on the ISM GUI, select [Management] - [Cluster] to display the "Cluster List" screen.

The list of clusters managed by ISM is displayed.

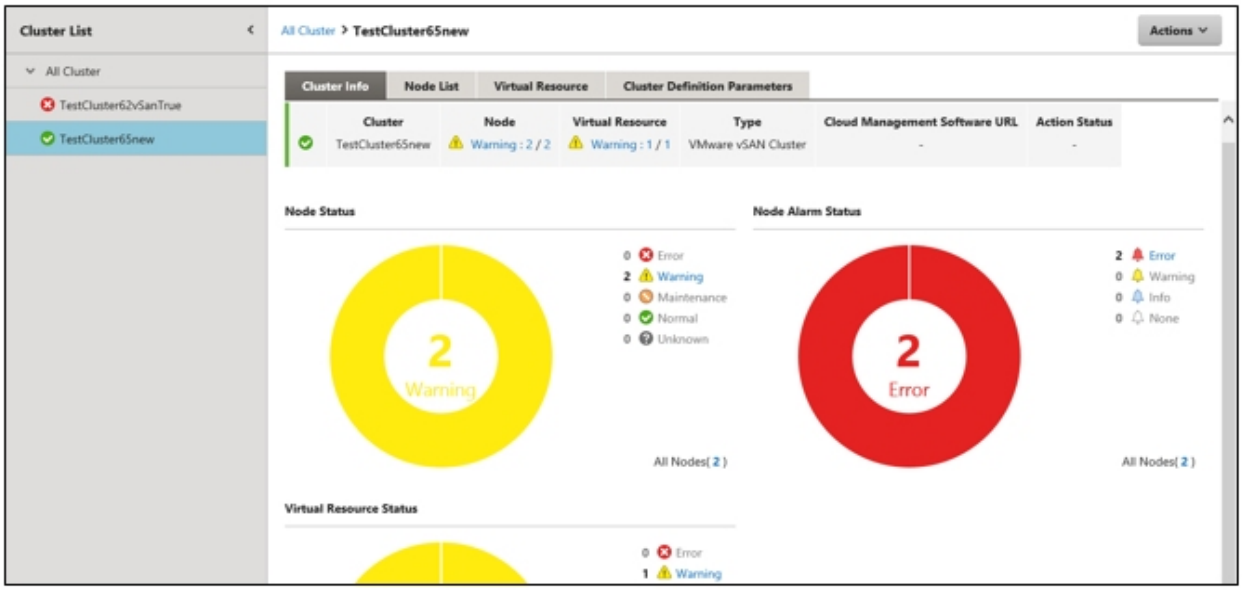
In addition to cluster statuses, the statuses of the nodes configuring the cluster and the storage pool configured in the cluster can be checked.

When you select a cluster name, the display moves to the details of cluster screen.

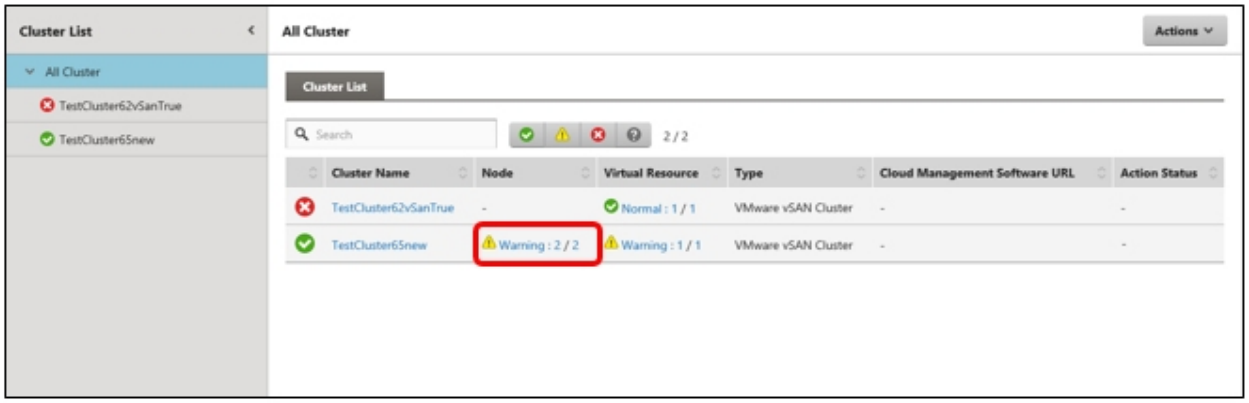
In the details screen, information such as a summary related to the cluster ([Cluster Info] tab screen), nodes configuring the cluster, virtual resources, and Cluster Definition Parameters is displayed.

For nodes configuring the cluster, you can check the information on the [Node List] tab screen.

Also, the storage pool configured in the cluster can be checked on the [Virtual Resource] tab screen.



On the "Cluster List" screen, the number of errors for the nodes and virtual resources is displayed.



The number displaying the errors is displayed in the following format.

```
[Number of managed targets in error statuses] / [Total number of managed targets]
```

[Number of managed targets in error statuses] displays the number of targets in the most severe status.

The following shows the severity of error statuses.

Status	Displayed Icon	Severity	Description
Error		High	Fatal errors have occurred in the monitoring targets. This is displayed with the highest priority of all statuses.
Warning		Medium	Errors have occurred in the monitoring targets. This is displayed with priority if there are no "Error" targets.
Unknown		Low	The status of the monitoring targets is unknown. This is displayed with priority if there are no "Error" or "Warning" targets.
Normal		-	This is the normal state with no errors in the monitoring targets. In the "Cluster List" screen, it is displayed as "-."

When you select a number for the Nodes or the managed Virtual Resources on the "Cluster List" screen, you move to the tab screen display on the Details of Cluster screen.

The targets in error statuses are filtered and displayed.

By knowing which components that compose the cluster are in an error status, you can quickly determine whether the cluster operation is robust.

In addition, monitoring from the Cluster Management widget in the ISM Dashboard can be executed.

For the Cluster Management widget, refer to "2.12.1.1 Cluster Management GUI" - "Operation in link with Dashboard."

Monitoring of the nodes configuring the cluster

When selecting the [Node List] tab, a list of the nodes that configure the cluster is displayed.

For the contents of the screen, refer to "2.12.1.1 Cluster Management GUI" - "[Node List] tab." In addition, for detailed information on displayed information, refer to the ISM online help.

For detailed information on nodes, use the node list information of ISM.

When selecting a node name, you move to the details screen of the node list and can check the detailed information about hardware configurations and their states. For information on the node list, refer to the ISM online help.

Monitoring of virtual resources on a cluster

When selecting the [Virtual Resource] tab, the SDS storage pool configured in the cluster is displayed.

Information such as storage pool states, storage utilization is displayed.

For the contents of the screen, refer to "2.12.1.1 Cluster Management GUI" - "[Virtual Resource] tab." In addition, for detailed information on displayed information, refer to the ISM online help.

When selecting a storage pool name, you move to the details screen of the virtual resource GUI and can check the detailed information about the storage pool.

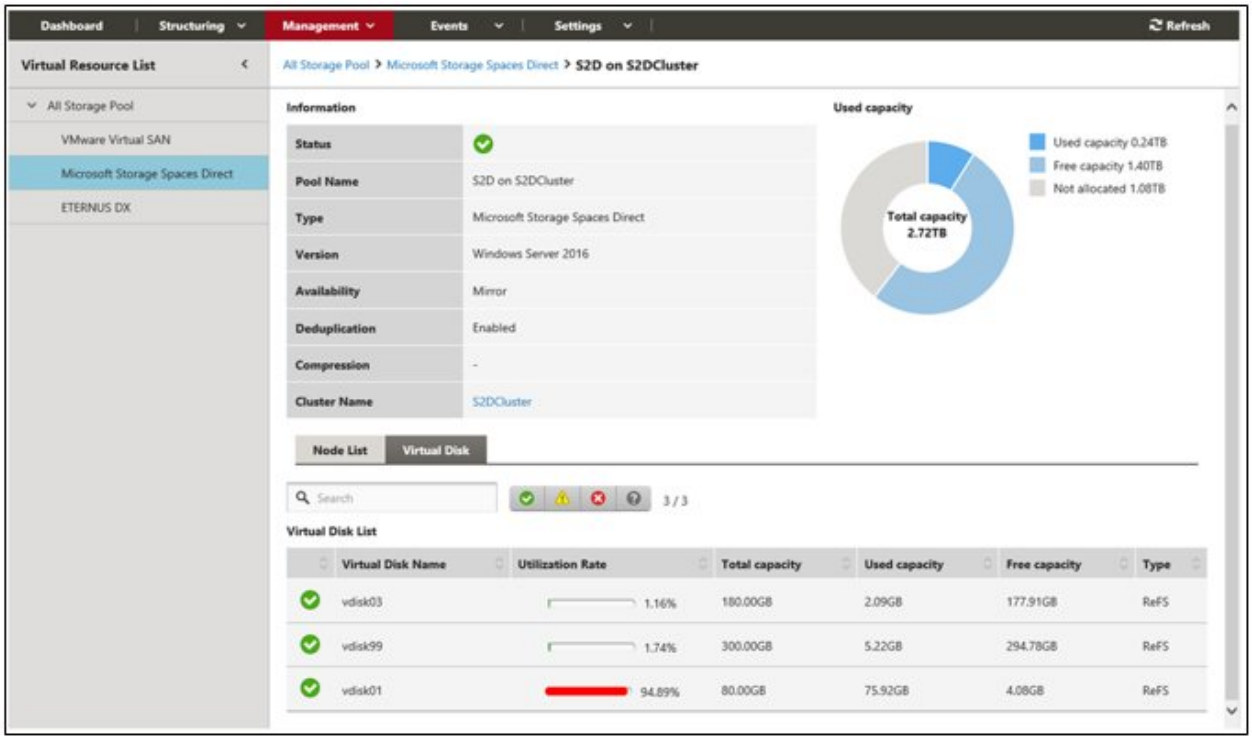
For virtual resource monitoring, refer to "2.9 Virtual Resource Management."

2.12.1.5 Virtual disk monitoring for PRIMEFLEX for Microsoft Storage Spaces Direct/ PRIMEFLEX for Microsoft Azure Stack HCI

Selecting a pool name on the Virtual Resources Management GUI displays the Detailed Information screen, where you can check the currently used capacity and available capacity in [Used capacity].

For details on how to use the Virtual Resources Management GUI, refer to "2.9 Virtual Resource Management."

For PRIMEFLEX for Microsoft Storage Spaces Direct/PRIMEFLEX for Microsoft Azure Stack HCI, in addition to the capacity information of the storage pools, you can also check the capacity information of the virtual disks created on the storage pools.



The meaning of the capacity information displayed in the Storage Spaces Direct utilization status pie chart is described below:

- Used capacity: Displays the total used capacity of the virtual disks created on the storage pool.
- Free capacity: Displays the total free capacity of the virtual disks created on the storage pool.
- Not allocated: Displays the capacity that has not been allocated to a storage pool or where virtual disks have not been created.

Also, if you select the [Virtual Disk] tab, a list of the disks that exist on the storage pools and their used capacity and other information is displayed.

For details on the displayed contents, refer to the ISM online help.

Point

The redundancy settings for the virtual disks is reflected in the capacity information in the [Virtual Disk] tab.

The capacity value displayed in the Used capacity pie chart takes the redundancy of the capacity of each virtual disk into account.

2.12.2 Cluster Creation

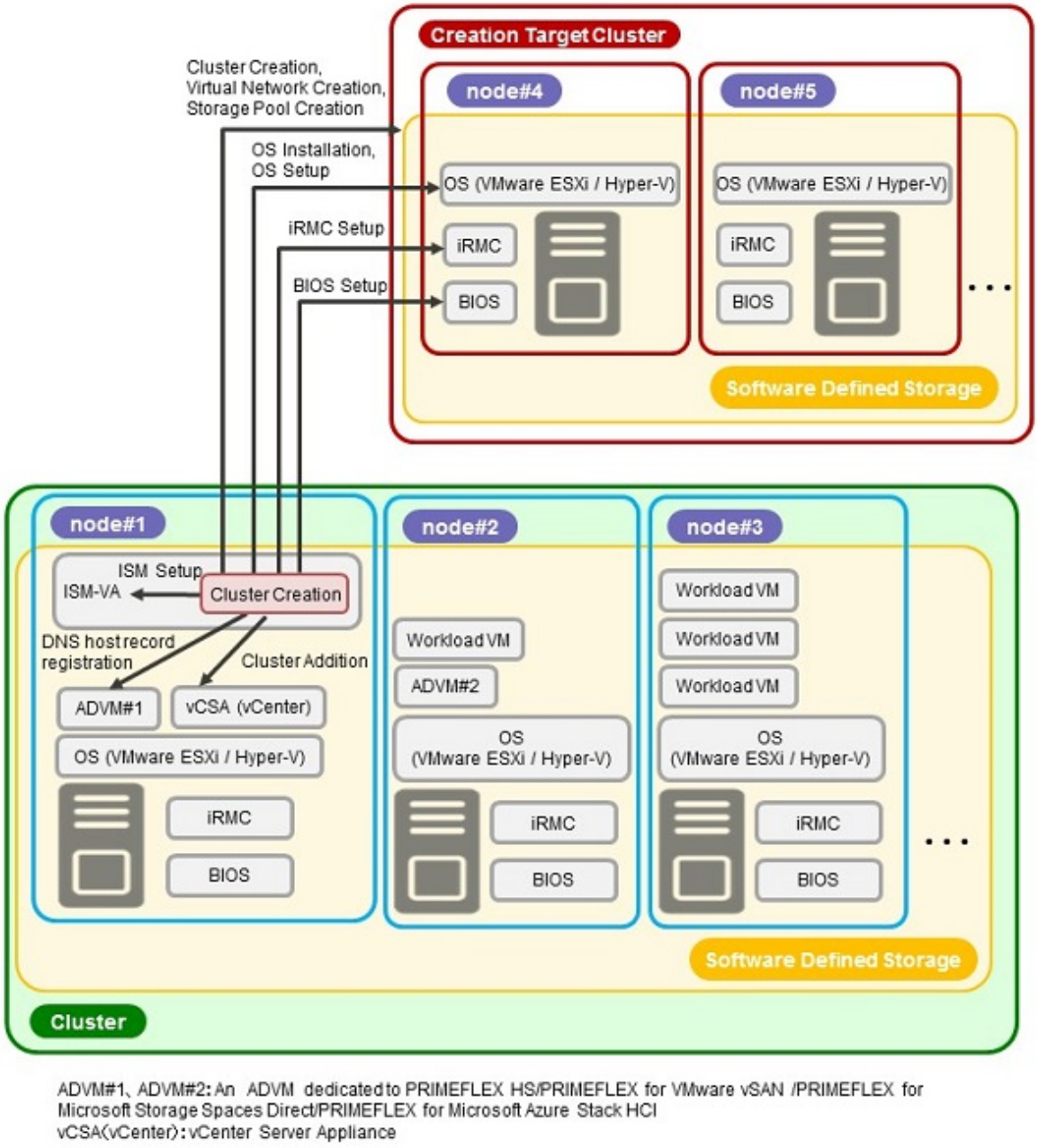
This function can be used only when the ISM operation mode is "Advanced for PRIMEFLEX."

Cluster Creation is a function that creates new clusters to expand the resources of the virtual platform environments of PRIMEFLEX HS/ PRIMEFLEX for VMware vSAN or PRIMEFLEX for Microsoft Storage Spaces Direct/PRIMEFLEX for Microsoft Azure Stack HCI. This function links with Profile Management in ISM and reduces the workload of the user by automating the operations for the cluster creation and installing an OS on the target server and adding the server to the cluster.

Cluster Creation is a function that is mainly used for the following purposes:

- Creation of new clusters
- Creation of virtual networks for the new clusters
- Creation of storage pools for the new clusters
- Installation and setup of the OS of the servers for creating new clusters
- Addition of servers for creating new clusters to the new cluster environment

Figure 2.22 Overview of Cluster Creation operation



2.12.2.1 Automatic setting item

By using Cluster Creation, the following items are set automatically.

Table 2.8 PRIMEFLEX for VMware vSAN automatic setting item list

Automatic setting item	Description
OS installation	- Install the OS of the servers for creating a new cluster - Execute the system date and time settings for the servers for creating a new cluster - Apply OS patches for the servers for creating a new cluster
DNS host record registration	- Register DNS for the ESXi servers for creating a new cluster (Do not register when using a configuration that does not use the ADVM of the PRIMEFLEX configuration)
OS settings	- Enable and start the ESXi shell

Automatic setting item	Description
	- Enable and start the SSH service - Apply the VMware SMIS Provider (only set for PRIMERGY M4 series and VMware ESXi 6.5) - Enable the ixgben driver (only set for PRIMERGY M4 series, VMware ESXi 6.5 and VMware ESXi 6.5 Update 1) - Add local administrator users - Set a host name to FQDN - Enable SSL v3 - Disable IPv6 - Set an IP address for secondary DNS servers - Set a DNS suffix - Set an IP address for the NTP server - Set a firewall for the NTP client - Execute the NTP client service - Set the power management settings of the host to high performance - Restart OS - Add an adapter to virtual distributed switch (virtual distributed switch for workload/virtual distributed switch for management) - Set an NIC to virtual distributed switch (virtual distributed switch for workload/virtual distributed switch for management) - Set an NIC to the Management Network - Set Active Directory authentication settings for ESXi of the servers for creating a new cluster (Set only if you are using PRIMEFLEX configuration ADVM or a link with Active Directory using AD server in your environment) - Disable and stop the ESXi shell - Disable and stop the SSH service
iRMC Settings	- Create local users (pflocaladmin) - Change the admin user password - Set Active Directory authentication settings for iRMC of the servers for creating a new cluster (Set only if you are using PRIMEFLEX configuration ADVM or a link with Active Directory using AD server in your environment) - Reset iRMC for the servers for creating a new cluster
Add servers to the cluster	- Register the servers for creating a new cluster to the virtual distributed switch for management - Register the servers for creating a new cluster to the virtual distributed switch for workload - Execute the settings for the virtual distributed switch - Set up the capacity device of SSD (When using an All-Flash environment) - Add disk groups - Add the servers for creating a new cluster to the cluster
ISM settings	- Change the password of the admin user of iRMC registered in ISM

Automatic setting item	Description
	- Change the web interface URL of iRMC registered in ISM - Set the collection targets and collection date and time for ISM Log Management
Cluster Creation	- Create a cluster
Virtual Network creation	- Create a virtual distributed switch (virtual distributed switch for workload/virtual distributed switch for management) - Enable NIOC - Create and set port groups - Set NIOC of a virtual distributed switch (virtual distributed switch for workload/virtual distributed switch for management)
Storage pool creation	- Enable vSAN - Set deduplication and compression
Refresh Virtual Resource	- Refresh cluster information

Table 2.9 PRIMEFLEX for Microsoft Storage Spaces Direct/PRIMEFLEX for Microsoft Azure Stack HCI automatic setting items list

Automatic setting item	Description
OS installation	- Install the OS of the servers for creating a new cluster

OS settings	- Enable the remote connection function
	- Enable Basic authentication
	- Enable CredSSP authentication
	- Register root certificates (cer file) and a personal certificate (pfx file) prepared in advance
	- Set https listeners
	- Open the port for https listeners
	- Create local users (pflocaladmin)
	- Execute the settings for the servers for creating a new cluster
	  - Install Hyper-V
	  - Set MAC address range
	  - Install Windows Server back up
	  - Install a failover cluster
	  - Create virtual switches
	  - Create the VM network adapter
	  - Set a VLAN for the VM network adapter
	  - Switch over the network adapter of the management LAN
	  - Disable IPv6 (Set only for PRIMERGY M4 series)
	  - Enable IPv6 (Set only for PRIMERGY M5 series)
	  - Set the primary DNS server
	  - Set the secondary DNS server
	  - Disable SR/IOV for the Intel, Mellanox, and Cavium LAN drivers
	  - Enable VMQ for the Intel, Mellanox, and Cavium LAN drivers

Automatic setting item	Description
	- Set VMQ for the management LAN port - Set NetAdapterRSS/RDMA for the management LAN port (Set only for PRIMERGY M5 series) - Set VMQ for the production LAN port - Set NetAdapterRSS/RDMA for the production LAN port (Set only for PRIMERGY M5 series) - Disable QoS for the Intel, Mellanox, and Cavium LAN drivers - Set NetworkDirect for the Cavium LAN driver (Set only for PRIMERGY M5 series)
iRMC settings	- Create local users (pflocaladmin) - Change the admin user password - Set Active Directory authentication of iRMC for the servers creating a new cluster - Reset iRMC for the servers for creating a new cluster
Add servers to the cluster	- Add the servers for creating a new cluster to the failover cluster
ISM settings	- Change the password of the admin user of iRMC registered in ISM - Change the web interface URL of iRMC registered in ISM - Change the account of the OS registered in ISM. - Set the collection targets and collection date and time for ISM Log Management
Cluster Creation	- Verify a cluster - Create a cluster
Virtual Network creation	- Execute cluster network settings
Storage pool creation	- Enable Storage Spaces Direct - Execute Journal Settings for the virtual disk - Execute the Storage Tier Settings
Refresh Virtual Resource	- Add CMS information of a new cluster

2.12.2.2 Link with Profile Management

Profile Management in ISM executes the hardware settings (BIOS, iRMC) and OS installation settings for the server.

Cluster Creation links with Profile Management and automates the cluster creation process.

By selecting a profile created in advance from the "Create Cluster" wizard, profiles can be assigned, and hardware settings and OS installation can be done when executing Cluster Creation.

After profile assignment has been completed, the OS setup script is executed by "Executing Script after Installation," which is one of the functions of Profile Management. Afterward, for the target cluster, execute the process for registering the servers for creating a new cluster.

Point

The OS setup script is a script that executes the settings required to connect to the OS of the servers for creating a new cluster during the Cluster Creation process.

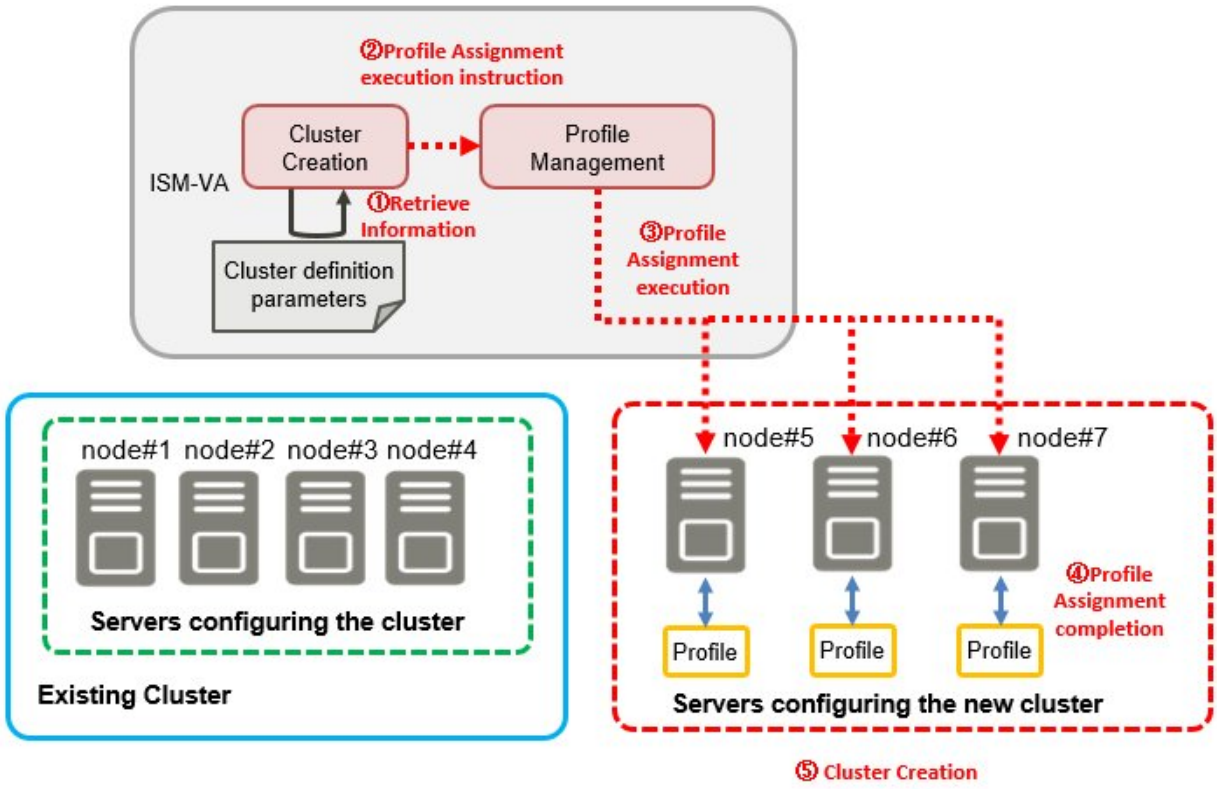
Note

- Create the profiles, before executing Cluster Creation.

- The OS setup script used by Execute Script after Installation is automatically specified when executing Cluster Creation. During profile creation, do not specify anything in the "Executing Script after Installation" item. If it is specified, it will be overwritten by the OS setup script when executing Cluster Creation.

A relationship diagram of Cluster Creation and Profile Management is shown below.

Figure 2.23 Relations of Cluster Creation and Profile Management



2.12.2.3 Cluster Definition Parameters

The Cluster Definition Parameters are the parameters used when executing Cluster Creation. The setting information for the new clusters or nodes configuring clusters can be retained. When creating clusters, enter the parameters for the part of the new cluster and execute.

If you want to store Cluster Definition Parameters in a device external to ISM (Management terminal), for example, you can export/import Cluster Definition Parameters as a text file written in JSON format. For detailed procedures, refer to "6.9 Export/Import/Delete Cluster Definition Parameters" in "Operating Procedures."

Note

If you import and use Cluster Definition Parameters, you need to edit them.

For details of the Cluster Definition Parameters, refer to "ISM for PRIMEFLEX Parameter List."

2.12.2.4 Task list

Cluster Creation is executed from the "Create Cluster" wizard. The processing of the cluster creation is registered as an ISM task. Confirm the current status of the task on the "Tasks" screen.

If you select [Tasks] from the top of the Global Navigation Menu on the ISM GUI, the task list will be displayed on the "Tasks" screen. The task name of Cluster Creation is "Cluster Creation." If you select a [Task ID] in the task list whose task type is "Cluster Creation," the task information and subtask list are displayed in the "Tasks" screen. The subtask lists are displayed for each server configuring a new cluster.

Each processing name displayed in the message column of the subtask list in the following format and task details are shown below.

```
<Processing name>:<Setting item name>
```

Table 2.10 PRIMEFLEX for VMware vSAN subtask processing list

Processing name	Task details
Prep Check	Check the execution requirements for creating a new cluster.
OS Installation	Install the OS on the servers for creating a new cluster.
DNS Settings	Register the DNS host record on the servers for creating a new cluster.
iRMC Settings	Execute the iRMC settings and the ISM settings for the servers for creating a new cluster.
OS Settings	Execute the OS settings for the servers for creating a new cluster.
Cluster Settings	Execute the cluster settings (first-half settings) for the servers for creating a new cluster.
Ism Settings	Execute the ISM settings for the servers for creating a new cluster.
Cluster Creation	Create a new cluster.
Virtual Network Creation	Create a virtual network for the new cluster.
Storage Pool Creation	Create a storage pool of the new cluster.
Cluster Settings	Execute the cluster settings (second-half settings) for the servers for creating a new cluster.
Cluster Post Settings	Execute the cluster settings (post-settings) for the servers for creating a new cluster.
ResourceList Registration	Refresh the new cluster information.
ESXi Host Post Settings	Execute the OS settings (post-settings) for the servers for creating a new cluster.

Refer to "Table 2.8 PRIMEFLEX for VMware vSAN automatic setting item list" for the task details.

Table 2.11 PRIMEFLEX for Microsoft Storage Spaces Direct/PRIMEFLEX for Microsoft Azure Stack HCI subtask processing list

Processing name	Task details
Prep Check	Check the execution requirements for creating a new cluster.
OS Installation	Install the OS on the servers for creating a new cluster.
iRMC Settings	Execute the iRMC settings and the ISM settings for the servers for creating a new cluster.
OS Settings	Execute the OS settings for the servers for creating a new cluster.
Cluster Settings	Execute the cluster settings for the servers for creating a new cluster.
Ism Settings	Execute the ISM settings for the servers for creating a new cluster.
Cluster Creation	Create a new cluster.
Virtual Network Creation	Create a virtual network for the new cluster.
Kerberos Delegation	Configure the Kerberos delegation for the new cluster.
Storage Pool Creation	Create a storage pool of the new cluster.
ResourceList Registration	Refresh the new cluster Information.

Refer to "Table 2.9 PRIMEFLEX for Microsoft Storage Spaces Direct/PRIMEFLEX for Microsoft Azure Stack HCI automatic setting items list" for the task details.

2.12.3 Cluster Expansion

This function can be used only when the ISM operation mode is "Advanced for PRIMEFLEX."

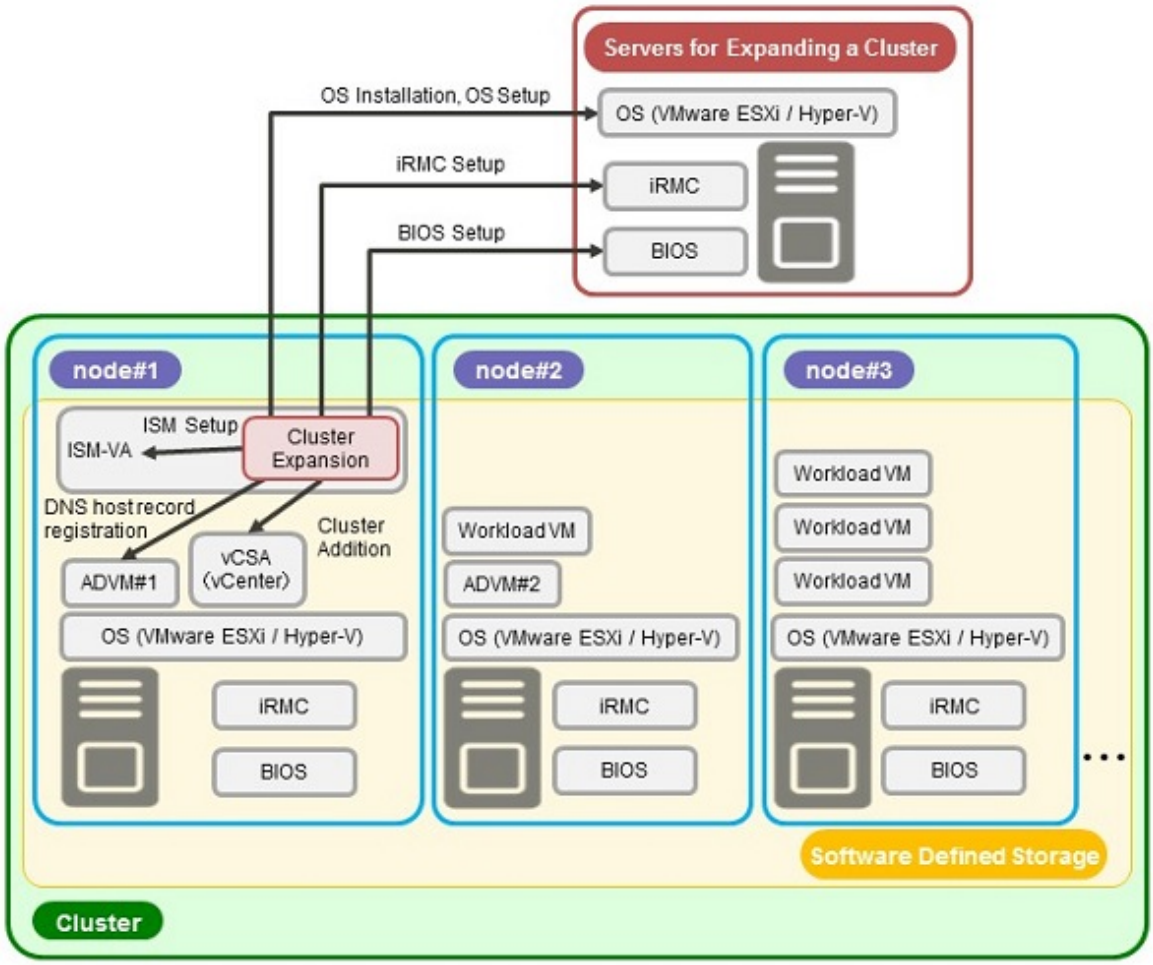
Cluster Expansion is a function that increases resources by adding new servers to the virtual platforms of PRIMEFLEX HS/PRIMEFLEX for VMware vSAN or PRIMEFLEX for Microsoft Storage Spaces Direct/PRIMEFLEX for Microsoft Azure Stack HCI when the storage resources of VMware vSAN or Microsoft Storage Spaces Direct are being depleted. This function links with Profile Management in ISM

and reduces the workload of the user by automating the operations from installing an OS on the target server to adding the server to the cluster.

Cluster Expansion is a function that is mainly used for the following purposes:

- Installing and setting an OS on the server for expanding a cluster
- Adding the servers for expanding a cluster to the existing cluster

Figure 2.24 Overview of Cluster Expansion operation



ADVM#1、ADVM#2: An ADVM dedicated to PRIMEFLEX HS/PRIMEFLEX for VMware vSAN/PRIMEFLEX for Microsoft Storage Spaces Direct/PRIMEFLEX for Microsoft Azure Stack HCI
vCSA(vCenter): vCenter Server Appliance

2.12.3.1 Automatic setting item

By using Cluster Expansion, the following items are set automatically.

Table 2.12 PRIMEFLEX HS/PRIMEFLEX for VMware vSAN automatic setting items list

Automatic setting item	Description
OS installation	- Install OSes on the servers for expanding a cluster - Execute the system date and time settings for the servers for expanding a cluster - Apply OS patches for the servers for expanding a cluster
DNS host record registration	- Register DNS for the ESXi servers for expanding a cluster (Do not register if the configuration does not use ADVM of PRIMEFLEX configuration)
OS settings	- Enable and start the ESXi shell

Automatic setting item	Description
	- Enable and start the SSH service - Apply the VMware SMIS Provider (only set for PRIMERGY M4 series and VMware ESXi 6.5) - Enable the ixgben driver (only set for PRIMERGY M4 series, VMware ESXi 6.5 and VMware ESXi 6.5 Update 1) - Add local administrator users - Set a host name to FQDN - Enable SSL v3 - Disable IPv6 - Set an IP address for secondary DNS servers - Set a DNS suffix - Set an IP address for the NTP server - Set a firewall for the NTP client - Execute the NTP client service - Set the power management settings of the host to high performance - Restart OS - Add an adapter to virtual distributed switch (virtual distributed switch for workload/ virtual distributed switch for management) - Set an NIC to virtual distributed switch (virtual distributed switch for workload/virtual distributed switch for management) - Set an NIC to the Management Network - Set Active Directory authentication settings for ESXi of the servers for expanding a cluster (Set only if you are using PRIMEFLEX configuration ADVM or a link with Active Directory using AD server in your environment)
iRMC Settings	- Create local users (pflocaladmin) - Change the admin user password - Set Active Directory authentication settings for iRMC of the servers for expanding a cluster (Set only if you are using PRIMEFLEX configuration ADVM or a link with Active Directory using AD server in your environment) - Reset the iRMC settings of the servers for expanding a cluster
Add servers to the cluster	- Register the servers for expanding a cluster to the virtual distributed switch for management - Register the servers for expanding a cluster to the virtual distributed switch for workload - Execute the settings for the virtual distributed switch - Set up the capacity device of SSD (when using an All-Flash environment) - Add disk groups - Add the servers for expanding a cluster to the cluster
ISM settings	- Change the password of the admin user of iRMC registered in ISM - Change the web interface URL of iRMC registered in ISM - Set the collection targets and collection date and time for ISM Log Management

Table 2.13 PRIMEFLEX for Microsoft Storage Spaces Direct/PRIMEFLEX for Microsoft Azure Stack HCI automatic setting items list

Automatic setting item	Description
OS installation	- Install OSes on the servers for expanding a cluster

OS settings	- Enable the remote connection function
	- Enable Basic authentication
	- Enable CredSSP authentication
	- Register root certificates (cer file) and a personal certificate (pfx file) prepared in advance
	- Set https listeners
	- Open the port for https listeners
	- Create local users (pflocaladmin)
	- Execute the settings for the servers for expanding a cluster
	  - Install Hyper-V
	  - Set MAC address range
	  - Install Windows Server back up
	  - Install a failover cluster
	  - Create virtual switches
	  - Create the VM network adapter
	  - Set a VLAN for the VM network adapter
	  - Switch over the network adapter of the management LAN
	  - Disable IPv6 (Set only for PRIMERGY M4 series)
	  - Enable IPv6 (Set only for PRIMERGY M5 series)
	  - Set the primary DNS server
	  - Set the secondary DNS server
	  - Enable VMQ for the Intel, Mellanox, and Cavium LAN drivers
	  - Disable SR/IOV for the Intel, Mellanox, and Cavium LAN drivers
	  - Set VMQ for the management LAN port
	  - Set NetAdapterRSS/RDMA for the management LAN port (Set only for PRIMERGY M5 series)
	  - Set VMQ for the production LAN port
	  - Set NetAdapterRSS/RDMA for the production LAN port (Set only for PRIMERGY M5 series)
	  - Disable QoS for the Intel, Mellanox, and Cavium LAN drivers
	  - Set NetworkDirect for the Cavium LAN driver (Set only for PRIMERGY M5 series)

iRMC settings	- Create local users (pflocaladmin) - Change the admin user password - Set Active Directory authentication of iRMC for the servers for expanding a cluster
Add servers to the cluster	- Add the servers for expanding a cluster to the failover cluster

Automatic setting item	Description
ISM settings	- Change the password of the admin user of iRMC registered in ISM - Change the web interface URL of iRMC registered in ISM - Change the account of the OS registered in ISM - Set the collection targets and collection date and time for ISM Log Management

2.12.3.2 Link with Profile Management

Cluster Expansion links with Profile Management and automates the expansion process.

By selecting a profile created in advance from the "Expand Cluster" wizard, profiles can be assigned, and hardware settings and OS installation can be executed when executing Cluster Expansion.

After profile assignment has been completed, the OS setup script is executed by the "Executing Script after Installation," which is one of the functions of Profile Management. Afterward, for the target cluster, execute the process for registering the servers for expanding the cluster for the target cluster.

Point

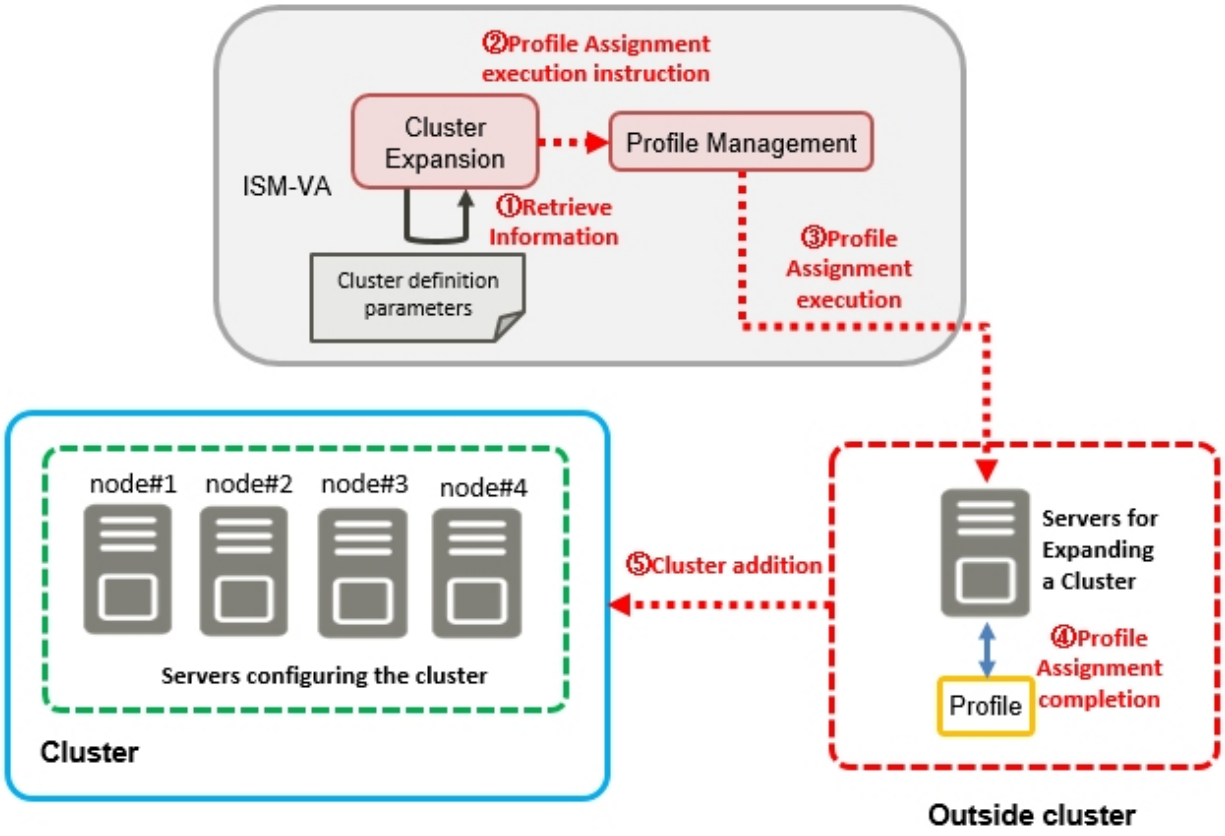
The OS setup script is a script that executes the settings required to connect to the OS of the servers for expanding a cluster during the Cluster Expansion process.

Note

- Create the profiles before executing Cluster Expansion.
- The OS setup script used in Executing Script after Installation is specified automatically when executing Cluster Expansion. During profile creation, do not specify anything in the "Executing Script after Installation" item. If it is specified, it will be overwritten by the OS setup script during Cluster Expansion.

A relationship diagram of Cluster Expansion and Profile Management is shown below.

Figure 2.25 Relations of Cluster Expansion and Profile Management



2.12.3.3 Cluster Definition Parameters

The Cluster Definition Parameters are the parameters used when executing Cluster Expansion. The setting information for the clusters or nodes configuring clusters to be expanded can be retained. Enter the parameters for the parts of the servers for expanding a cluster and execute.

If you want to store Cluster Definition Parameters in a device external to ISM (Management terminal), for example, you can export/import Cluster Definition Parameters as a text file written in JSON format. For detailed procedures, refer to "6.9 Export/Import/Delete Cluster Definition Parameters" in "Operating Procedures."

Note

If you import and use Cluster Definition Parameters, you need to edit them.

For details of the Cluster Definition Parameters, refer to "ISM for PRIMEFLEX Parameter List."

2.12.3.4 Task list

Cluster Expansion is executed from the "Expand Cluster" wizard. The processing of the cluster expansion is registered as an ISM task. Confirm the current status of the task on the "Tasks" screen.

If you select [Tasks] from the top of the Global Navigation Menu on the ISM GUI, the task list will be displayed on the "Tasks" screen. The task name of Cluster Expansion is "Cluster Expansion." If you select a [Task ID] in the task list whose task type is "Cluster Expansion," the task information and subtask list are displayed in the "Tasks" screen. The subtask lists are displayed for each server expanding a cluster.

Each processing name displayed in the message column of the subtask list in the following format and the task details are shown below.

```
<Processing name>:<Setting item name>
```

Table 2.14 PRIMEFLEX HS/PRIMEFLEX for VMware vSAN subtask processing list

Processing name	Task details
Prep Check	Check the execution requirements for expanding a cluster.
OS Installation	Install an OS on the servers for expanding a cluster.
DNS Settings	Register DNS host record on the servers for expanding a cluster.
iRMC Settings	Execute the iRMC settings and ISM settings for the servers for expanding a cluster.
OS Settings	Execute the OS settings and ISM settings for the servers for expanding a cluster.
Cluster Settings	Execute the cluster settings for the servers for expanding a cluster.
Ism Settings	Execute the ISM settings for the servers for expanding a cluster.
ESXi Host Post Settings	Execute the OS settings (post-settings) for the servers for expanding a cluster.

Refer to "Table 2.12 PRIMEFLEX HS/PRIMEFLEX for VMware vSAN automatic setting items list" for task details.

Table 2.15 PRIMEFLEX for Microsoft Storage Spaces Direct/PRIMEFLEX for Microsoft Azure Stack HCI subtask processing list

Processing name	Task details
Prep Check	Check the execution requirements for expanding a cluster.
OS Installation	Install an OS on the servers for expanding a cluster.
iRMC Settings	Execute the iRMC settings and ISM settings for the servers for expanding a cluster.
OS Settings	Execute the OS settings and ISM settings for the servers for expanding a cluster.
Cluster Settings	Execute the cluster settings for the servers for expanding a cluster.
Ism Settings	Execute the ISM settings for the servers for expanding a cluster.

Refer to "Table 2.13 PRIMEFLEX for Microsoft Storage Spaces Direct/PRIMEFLEX for Microsoft Azure Stack HCI automatic setting items list" for task details.

2.12.4 Rolling Update

This function can be used only when the ISM operation mode is "Advanced for PRIMEFLEX."

Rolling Update is a function that uses vMotion or Live Migration on the virtual machines to update firmware or apply patches for ESXi (ISM 2.5.0.010 or later) for the clusters structuring the virtualized platform without stopping operations.

This function reduces the workload of the customer by updating firmware or applying an ESXi patch to all servers configuring a cluster automatically. Firmware updates can be automatically executed by linking with Firmware Management of ISM.

Point

- You can use vMotion in the PRIMEFLEX HS/PRIMEFLEX for VMware vSAN environment.
- You can use Live Migration in the PRIMEFLEX for Microsoft Storage Spaces Direct/PRIMEFLEX for Microsoft Azure Stack HCI environment.

Note

Before executing Rolling Update, you must select an evacuation server from the target cluster for the virtual machine.

The following is the firmware data supported by Rolling Update.

Type	Update method
Server (iRMC)	Online Update
	Offline Update
Server (BIOS)	Online Update
	Offline Update
Server (LAN/CNA/SAS cards) [Note 1]	Offline Update

[Note 1]: LAN/CNA/SAS cards that are supported on PRIMEFLEX HS/PRIMEFLEX for VMware vSAN or PRIMEFLEX for Microsoft Storage Spaces Direct/PRIMEFLEX for Microsoft Azure Stack HCI are applicable.

For information on the devices (components) that can be used with LAN/CNA/SAS cards, contact your local Fujitsu customer service partner.

Note

- Among the firmware data imported in advance, the latest firmware will be applied.

  If the firmware data of Online Update and Offline Update have been imported, the firmware of Online Update will be applied. If the firmware data for both Online Update and Offline Update is included on the UpdateDVD, Online Update will be given priority over Offline Update.

- Even when there are some nodes on which Update Firmware of Firmware Management ends in an error, if the status of the cluster is normal, any node updated normally will reboot and the firmware will be applied.

The following shows the availability of the ESXi patch files that support Rolling Update.

Note: Y = Supported, N = Not supported

Type	Availability
Modification patch	Y
Offline bundle	N
Driver	N

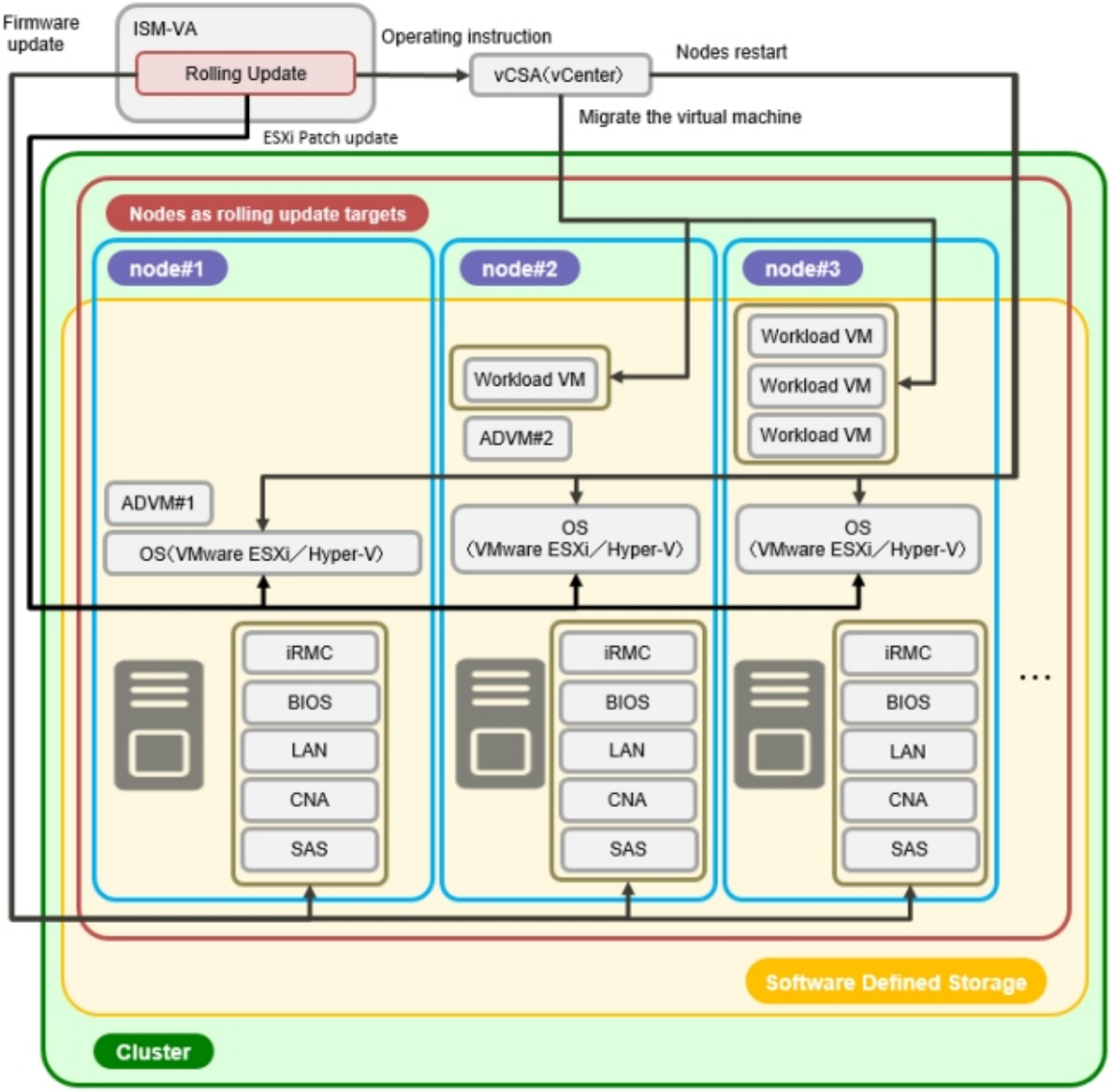
Note

- The ESXi patch file specified in the "Rolling Update" wizard is applied.

  Use the zip file downloaded from the VMware website for ESXi updates.

- Even when there are some nodes whose ESXi modification patch application failed, if the cluster status is normal, any node that successfully completed ESXi patch application process will reboot and the ESXi modification patch will be applied.

Figure 2.26 Overview of Rolling Update operation



ADVM#1、ADVM#2: An ADVM dedicated to PRIMEFLEX HS/PRIMEFLEX for VMware vSAN/PRIMEFLEX for Microsoft Storage Spaces Direct/PRIMEFLEX for Microsoft Azure Stack HCI
vCSA(vCenter): vCenter Server Appliance

2.12.4.1 Operation in link with Firmware Management

Rolling Update operates in link with Firmware Management and automates rolling updates for firmware.

Among the firmware data imported in advance, the latest firmware will be applied.

If the firmware data of Online Update and Offline Update have been imported, the firmware of Online Update will be applied.

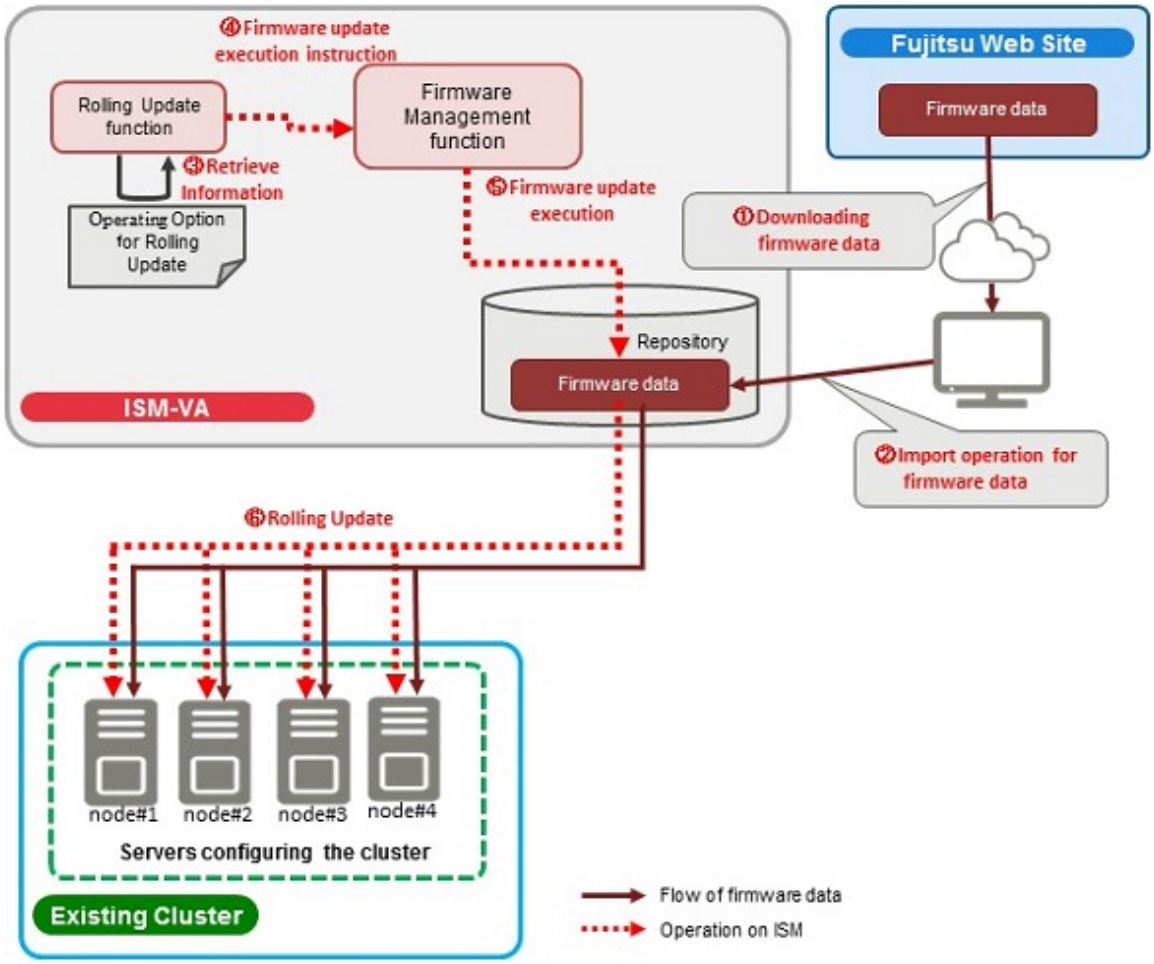
Note

Before executing Rolling Update, import the firmware data into ISM.

For the firmware data import, refer to "2.13.2 Repository Management."

The following chart shows the relationship between Rolling Update and Firmware Management.

Figure 2.27 Relationship between Rolling Update and Firmware Management



2.12.4.2 Task list

Rolling Update is executed from the "Rolling Update" wizard. The processing of the Rolling Update is registered as an ISM task. Confirm the current status of the task on the "Tasks" screen.

If you select [Tasks] from the top of the Global Navigation Menu on the ISM GUI, the task list will be displayed on the "Tasks" screen. The task name of Rolling Update is "Rolling Update." If you select a [Task ID] in the task list whose task type is "Rolling Update," the task information and a subtask list are displayed on the "Tasks" screen. The subtask list is displayed for every firmware update target node and for every patch application target node for the ESXi update.

Each processing name displayed in the message column of the subtask list in the following format and task details are shown below.

```
<Processing name>:<Setting item name>
```

Table 2.16 Online update subtask processes list

Processing name	Setting item name	Setting item contents
Rolling Update Prep Check (Confirm preparations for executing Rolling Update)	1. Prep Check	1. Check the conditions for executing Rolling Update
Rolling Update Presetting (Execute the presetting for Rolling Update)	1. Enable Ssh and ESXishell 2. File transfer to OS 3. Check Dry Run	1. Enable the SSH service and ESXi shell 2. Transfer an ESXi patch file to the target node. 3. Check the ESXi patch application
Rolling Update	1. Migrate VM to Another Node & Set Maintenance Mode	1. Migrate the VM that is running on the target node to a temporary node [Note 1]

Processing name	Setting item name	Setting item contents
(Execute firmware updates, ESXi patch application, and restart on the firmware update target nodes)	2. Migrate VM to Another Node & Set Maintenance Mode 3. Update Firmware (online) 4. Update ESXi Patch 5. Reboot Node 6. Shutdown Node 7. Boot Node 8. Unset Maintenance Mode & Migrate VM to Target Node 9. Unset Maintenance Mode & Migrate VM to Target Node 10. Post Check	2. Set the node to Maintenance Mode 3. Apply the firmware data Online 4. Apply the ESXi patch [Note 2] 5. Reboot the node [Note 3] 6. Shutdown the node 7. Start the node 8. Release the Maintenance Mode of the node 9. Return the VM that has been migrated to a temporary node to the target node [Note 1] 10. Check the post-requirements of Rolling Update
Refresh Resource Information (Retrieves cloud management software information and node information)	1. Refresh Resource Information 2. Refresh Virtual Inventory	1. Retrieve the cloud management software information 2. Retrieve the node information

[Note 1]: This is not executed when DRS is enabled in a vSAN cluster.

[Note 2]: This is executed for a vSAN cluster.

[Note 3]: This is executed when Online Update for firmware (BIOS) and Offline Update for LAN/CNA/SAS cards are performed.

Table 2.17 Offline update subtask processes list

Processing name	Setting item name	Setting item contents
Rolling Update Prep Check (Confirm preparations for executing Rolling Update)	1. Prep Check	1. Check the conditions for executing Rolling Update.
Rolling Update Presetting (Execute the presetting for Rolling Update)	1. Enable Ssh and ESXishell 2. File transfer to OS 3. Check Dry Run	1. Enable the SSH service and ESXi shell 2. Transfer an ESXi patch file to the target node. 3. Check the ESXi patch application
Rolling Update (Execute firmware updates, ESXi modification patch application, and restart on the update target nodes)	1. Migrate VM to Another Node & Set Maintenance Mode 2. Migrate VM to Another Node & Set Maintenance Mode 3. Update ESXi Patch 4. Reboot Node 5. Shutdown Node 6. Update Firmware (offline) 7. Boot Node 8. Unset Maintenance Mode & Migrate VM to Target Node 9. Unset Maintenance Mode & Migrate VM to Target Node	1. Migrate the VM that is running on the target node to a temporary node [Note 1] 2. Set the node to Maintenance Mode 3. Apply the ESXi patch [Note 2] 4. Reboot the node [Note 3] 5. Shutdown the node 6. Apply the firmware data offline 7. Start the node 8. Release the Maintenance Mode of the node 9. Return the VM that has been migrated to a temporary node to the target node [Note 1] 10. Check the post-requirements of Rolling Update

Processing name	Setting item name	Setting item contents
	10. Post Check	
Refresh Resource Information (Retrieves cloud management software information and node information)	1. Refresh Resource Information 2. Refresh Virtual Inventory	1. Retrieve the cloud management software information 2. Retrieve the node information

[Note 1]: This is not executed when DRS is enabled in a vSAN cluster.

[Note 2]: This is executed for a vSAN cluster.

[Note 3]: This is executed when Online Update for firmware (BIOS) and Offline Update for LAN/CNA/SAS cards are performed.

2.12.5 Node Disconnection/Reintegration (ISM 2.5.0.010 or later)

This function can be used only when the ISM operation mode is "Advanced for PRIMEFLEX."

Node Disconnection/Reintegration is a function that disconnects and reintegrates one node at a time without stopping operations even if maintenance requires the servers to be shut down for clusters structuring the virtualized platform of PRIMEFLEX for VMware vSAN.

This function reduces the workload of the user by automating a part of the maintenance tasks that involves restarting servers such as the replacement of an expansion board.

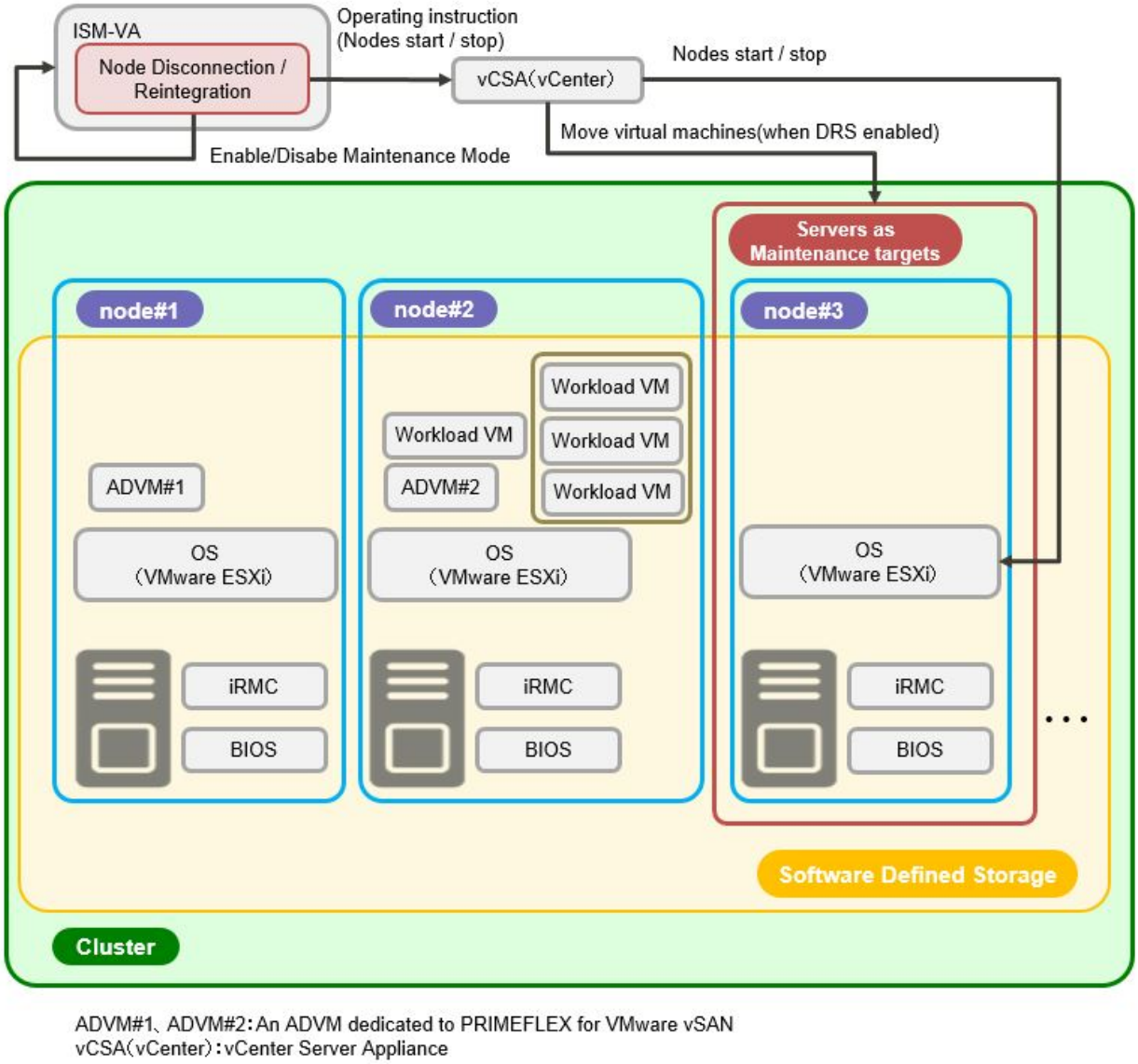
Node Disconnection/Reintegration automates the following series of operations (except for "3. Executing Maintenance"):

1. Setting ISM Maintenance mode
2. Stopping maintenance target servers
3. Executing Maintenance (manual operation)
4. Starting maintenance target servers
5. Releasing ISM Maintenance mode

Note

The virtual machines on the maintenance target servers are migrated automatically if DRS is enabled. If DRS is disabled, migrate all virtual machines on the maintenance target servers to other nodes manually before executing Node Disconnection/Reintegration. If there are virtual machines on the maintenance target servers, the maintenance target servers cannot be stopped.

Figure 2.28 Overview of Node Disconnection/Reintegration operation



ADVM#1、ADVM#2:An ADVM dedicated to PRIMEFLEX for VMware vSAN
vCSA(vCenter):vCenter Server Appliance

Note

In PRIMEFLEX HS and PRIMEFLEX for Microsoft Storage Spaces Direct/PRIMEFLEX for Microsoft Azure Stack HCI, Node Disconnection/Reintegration cannot be used.

2.12.5.1 Task list

Node Disconnection/Reintegration is executed from the Cluster Management GUI. The process for Node Disconnection/Reintegration is registered as an ISM task. Confirm the current status of the task on the "Tasks" screen.

If you select [Tasks] from the top of the Global Navigation Menu on the ISM GUI, the task list is displayed on the "Tasks" screen. The task name for Node Disconnection/Reintegration is "Node Disconnection" or "Node Reintegration." If you select a [Task ID] in the task list whose task type is "Node Disconnection," or "Node Reintegration," the task information and subtask list are displayed on the "Tasks" screen. The subtask lists are displayed for each cluster to which Node Disconnection/Reintegration is applied.

Each process name displayed in the message column of the subtask list in the following format and the task details are shown below.

```
<Processing name>:<Setting item name>
```

Table 2.18 Node Disconnection subtask process list

Process name	Setting item name	Setting item details
Node Disconnection (Execute the maintenance settings for the node disconnection target server and stop the target server)	1. Target Server VM Existence Check 2. Enabling ISM Maintenance Mode 3. Target Server Turn On LED 4. Enabling Maintenance Mode 5. Stopping Target Server	1. Make sure there are no VMs on the target server 2. Set the target server to Maintenance Mode 3. Turn on the LED of the target server 4. Set the target server to ESXi Maintenance Mode 5. Stop the target server

Table 2.19 Node Reintegration subtask process list

Process name	Setting item name	Setting item details
Node Reintegration (Start the node reintegration target server and release Maintenance Mode)	1. Starting Target Server 2. Disabling Maintenance Mode 3. Disabling ISM Maintenance Mode 4. Target Server Turn Off LED	1. Start the target server 2. Release ESXi Maintenance Mode for the target server 3. Release ISM Maintenance Mode for the target server 4. Turn off the LED of the target server

2.13 Functions of ISM Operating Platform

This section describes the functions configuring the ISM operating platform.

- 2.13.1 User Management
- 2.13.2 Repository Management
- 2.13.3 Installation of Emulex OneCommand Manager CLI and QLogic QConvergeConsole CLI
- 2.13.4 Task Management
- 2.13.5 ISM-VA Management
- 2.13.6 Management of Cloud Management Software
- 2.13.7 Shared Directory Management
- 2.13.8 Link with ISM
- 2.13.9 Linking with Other Software

2.13.1 User Management

ISM users are managed as follows:

- A unique login name and a password are assigned to each user.
- Depending on the privileges, called "user roles," the methods for accessing nodes and execution of the various functions may be restricted.
- By grouping users (hereafter referred to as "user groups"), you can restrict the scope of access to each function separately by user group.
- By grouping nodes (hereafter referred to as "node groups") and associating them with user groups, you can restrict the scope of nodes that can be accessed by users.

The relationship between user groups and node groups is displayed in "Figure 2.29 Relationships between user groups, node groups, and roles."

Here, the following points are described.

- Types of user groups and access scope of users belonging to each group
- Types of user roles and operations executable by users having these roles
- Security policy settings
- Creating required users after initial setup of ISM
- Operations under User Management
- Operating in Link with Microsoft Active Directory or LDAP

Types of user groups and access scope of users belonging to each group

You can define the access scope of users belonging to a user group by associating user groups with node groups.

User group name	Managed nodes	Access scope
Administrator group	Manage all nodes	The administrator group has access to all nodes and node-related resources (such as logs). This user group is for the overall management of ISM.
Group other than Administrator	Manage all nodes	The administrator group has access to all nodes and node-related resources (such as logs). This user group is for the overall management of ISM.
	Nodes in the selected node group	Groups other than the administrator group have access to only those nodes and node-related resources (such as logs) that are within the node groups with which their own user group is associated.
	No managed nodes	There are not any nodes or node-related resources (such as logs).

Point

In the subsequent descriptions, consider user groups for which "Manage all nodes" is specified as the managed nodes to be Administrator group.

Note

If "Manage all nodes" is set as the managed nodes, the setting cannot be changed. Also, if "Nodes in the selected node group" or "No managed nodes" is set as the managed nodes, the setting cannot be changed to "Manage all nodes."

Types of user roles and operations executable by users having these roles

The types of operations that can be executed by users on nodes within their access scope are defined by their user roles as follows.

User role	Type of access
Administrator role	Administrators can add, modify, delete, and view nodes, users, and all kinds of settings.
Operator role	Operators can modify and view nodes and all kinds of settings. They are not able to manage users.
Monitor role	Monitors can view nodes and all kinds of settings. They are not able to manage users or to add, delete, or modify any nodes.

Point

- For information on setting changes that can and cannot be made by operators, refer to the information (icon indications) in the various functions that are provided in this manual. For information on the icon indications, refer to the description below.
- In the subsequent descriptions, users belonging to an Administrator group and having an Administrator role will be referred to as an "ISM administrator."

In order to describe the access rights of users, the user group to which a user belongs and the user role they have within the group are classified and indicated with icons as follows.

User group to which the user belongs	User role held by user	Can execute	Cannot execute
Administrator group	Administrator role	Admin	
	Operator role	Operator	Operator
	Monitor role	Monitor	Monitor
Other groups (groups other than Administrator)	Administrator role	Admin	Admin
	Operator role	Operator	Operator
	Monitor role	Monitor	Monitor

The attributes of users who can execute operations are shown as follows.

Example:

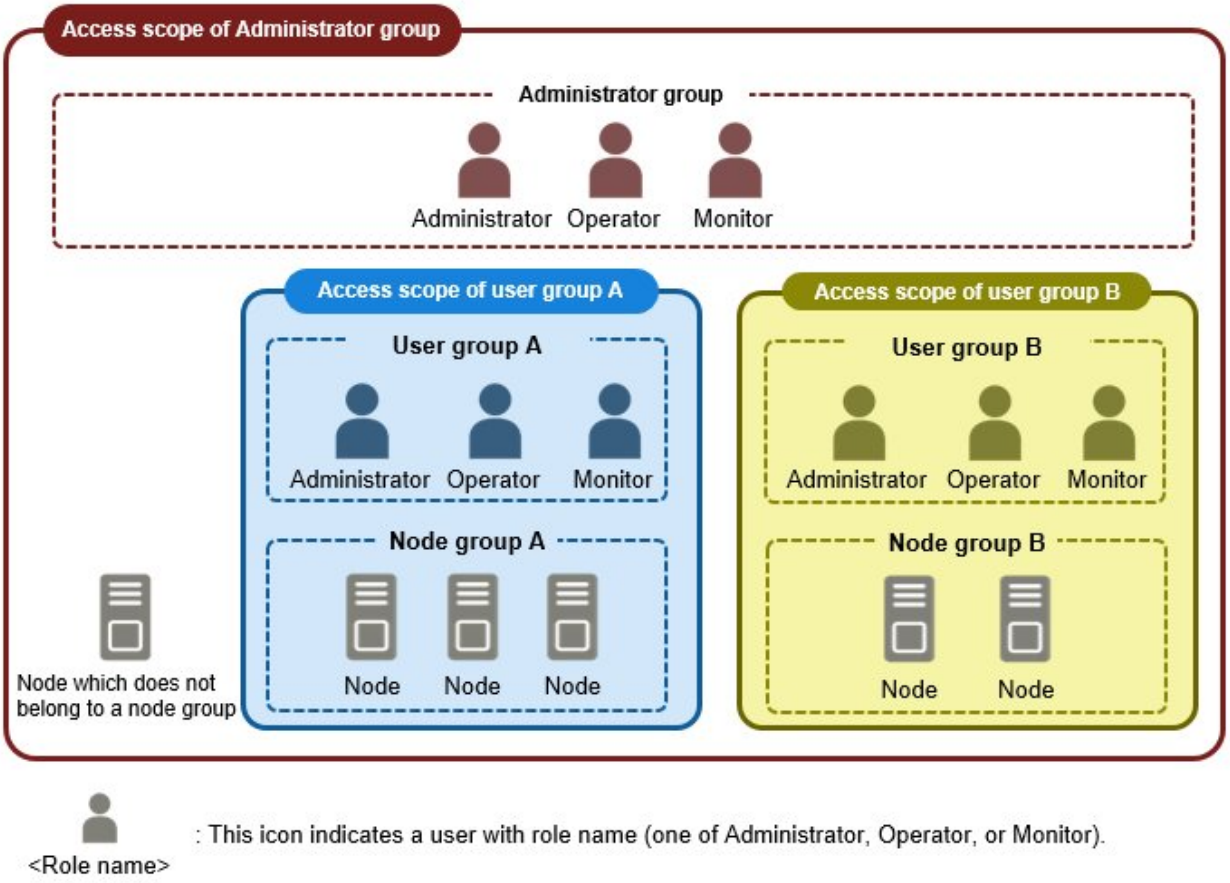
- In the example above, users with the following combinations of groups and roles can execute the operations:
  - Users who belong to the Administrator group and have an Administrator role or Operator role
  - Users who belong to a group other than an Administrator group and have an Administrator role or Operator role
- Users with a Monitor role cannot execute the respective functions, as indicated by the gray icons.

Note

Users who belong to an Administrator group and have an Administrator role are special users (ISM administrator) who can manage the whole of ISM.

Users who belong to an Administrator group and have an Operator or Monitor role have a different access scope than users who have the same roles in a non-Administrator group. However, the types of operations they can execute are the same.

Figure 2.29 Relationships between user groups, node groups, and roles



Security policy settings

Execute the security policy settings with the following procedure.

1. From the Global Navigation Menu on the GUI of ISM, select [Settings] - [Users].
2. From the menu on the left side of the screen, select [Security Policy].
3. Select the [Edit] button to set the security policy.

For the security policy, there is the user password policy and the login policy.

You can set passwords handled in User Management and login restrictions.

You can set one security policy for the whole of ISM. Setting a firm security policy allows for more secure operation. The setting items are described below.

User Password Policy

Item	Parameter	Operations after settings
Use Past Password	- Allowed (recommended) - Past n passwords prohibited (1 ≤n ≤24)	These items are checked when a password is set on the "Add User" screen and "Edit User Settings" screen.

Item	Parameter	Operations after settings
Password Length	1 - 32 (byte) (recommended: 8 (bytes))	
Password Character Type	- No restrictions (recommended) - Use at least n character classes from among number, lowercase letter, uppercase letter, and special character (2 ≤n ≤4)	
Same Password as User Name	- Allowed - Prohibited (recommended)	
Prohibited Strings [Note 1]	Up to a maximum of 256 can be specified	
Period of Validity	- Indefinitely - 1 - 365 (days) (recommended: 90 (days))	If logging in with a setting other than "Indefinitely," operation is as follows: - When the expiration date is reached The Action after Expiration is executed. - When the expiration date is within two weeks away Warning messages are output. - For an administrator A warning message will be output if the initial password has not been changed.
Action after Expiration	- Show warning message - Account lockout indefinitely (recommended)	

[Note 1]: Set a password that cannot be used. Passwords that match the set character string are forbidden.

Point

If you select the [Default] button, the recommended values in the table above will be set.

Note

- Precautions for users that already exist, when updating to ISM V2.5 from a patch earlier than the ISM 2.0.0.d patch, are shown below:
  - When you applied the patch, the expiration date for the passwords will be calculated from the time of the update.
  - The user password policy is set as follows:
    - Password Length: 1 (byte)
    - Password Character Type: No restrictions
    - Same Password as User Name: Allowed
    - Period of Validity: Indefinitely
    - Action after expiration: Show warning message

- Precautions for when [Period of Validity] is set to other than "Indefinitely" and [Action after Expiration] is set to "Account lockout indefinitely" are shown below:
  - The login restrictions are limited to logging in to ISM. Be careful, since log in to FTP or ISM-VA is not restricted.
  - The first login to ISM succeeds after the password expiry date has passed. Change the password at this time. If the password is not changed, the login will be locked indefinitely.
  - When login has been locked indefinitely, if the password is reset by the ISM administrator, the lock is removed.
  - ISM administrators cannot be locked-out indefinitely. Only warning messages are output.

Login Policy

Item	Parameter	Description
Session Time	2 - 60 (minutes) (Default: 30 minutes)	The length of time after which the session will time out if there is no activity.
Account Lockout Threshold	6 - 256 (times) (Default: 6 times)	Specifies the number of failed operations that lock the account and the length of time that the account is locked. The following are the operations that lock the account. - Consecutive failed logins - Consecutive failed input of the current password that is required when changing the password If the account is locked, login will be prohibited.
Account Lockout Time	1 - 1440 (minutes) (Default: 30 minutes)	

Note

- The number of consecutive failed logins will be reset in the following condition:
  - If login succeeded
  - If the lock-out time since the last failed login has passed
- The number of consecutive failed input of the current password, which is required when the password is changed will be reset in the following condition:
  - When the current password specification succeeded
  - If the lock-out time since the last failed input has passed

Creating required users after initial setup of ISM

Point

In the default settings of ISM, only one user (ISM administrator) with an [Administrator Role] in [Administrator Groups] is registered.

User Name	Password	User Group Name	User Role	Usage
administrator	admin [Note]	Administrator	Administrator	Overall management of ISM

[Note]: Change the password before operating.

Create a user with the following procedure.

1. As an ISM administrator, log in to ISM-VA.

2. Create one or more node groups.

   For details, refer to "2.7.4.1 Add node groups" in "Operating Procedures."

3. Register the nodes that belong to each node group. (You can also register more nodes later.)

   For details, refer to "2.7.4.2 Edit node groups" in "Operating Procedures."

4. Create one or more user groups.

   For details, refer to "2.7.2.1 Add user groups" in "Operating Procedures."

5. Register the users that belong to each user group.

   For details, refer to "2.7.1.1 Add users" in "Operating Procedures."

Operations under User Management

User Management is a function that is mainly used for the following purposes:

- Managing ISM users
- Managing user groups
- Authenticating ISM users
- Operating in link with Microsoft Active Directory or LDAP
- Managing node groups

The target of operation in User Management vary with the operating user.

Operating user	Target of operation
Users who belong to an Administrator group and have an Administrator role	Operations can be performed for all existing user groups.
Users who belong to groups other than Administrator groups and have an Administrator role	Operations can be performed only for the user group to which the operating user belongs.

Note

Modifying groups

Before you change the affiliation of a node from one node group to another or release a node from a node group, complete the following operations:

- If any tasks are being executed on the relevant node, wait until they have completed.
- If any profile was applied to the relevant node, release the profile.
- Delete any schedules for log collection from the relevant node.
- Delete any saved logs that were retrieved from the relevant node.
- Delete any alarm settings of the relevant node.
- For profiles that were set by users who belong to a user group, these users will no longer be able to view and modify the profile settings. In this case, the profile must be deleted by a user belonging to an Administrator group.
- If you forgot to delete any saved logs, revert the node temporarily to the former user group in order to delete the logs.

Deleting User Groups

For profiles and log-related operations that were set by users who belong to a user group, these users will no longer be able to view and modify the settings for profiles and log-related operations. In this case, modify the settings as a user belonging to an Administrator group.

Before you delete a user group, complete the following operations:

- Release any profiles assignments you have made.

- Delete all profiles, profile groups, policies, and policy groups that are included in the user group.
- Delete all imported OS media, ServerView Suite DVD data from the repository.
- Delete any schedules for log collection.
- Delete any saved logs.

Changing user group names

Before you change the name of a user group, make sure that none of the following tasks are currently being executed:

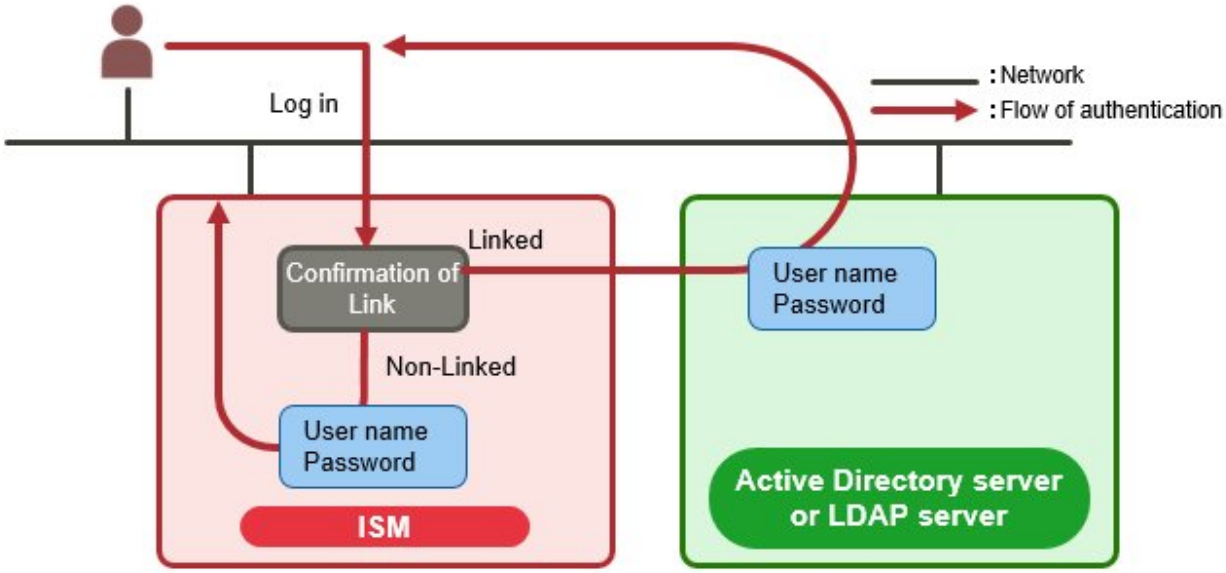
- Firmware data import operations
- Firmware update operations

Operating in Link with Microsoft Active Directory or LDAP

By linking ISM with Microsoft Active Directory or LDAP, you can integrate the management of users and passwords of multiple services.

The following diagram gives an overview of a linked configuration.

Figure 2.30 Image of ISM in link with Microsoft Active Directory/LDAP



1. Log in as a user.
   - If the user is a target of linked operations:

     Authentication is executed with Microsoft Active Directory or LDAP.
   - If the user is not a target of linked operations:

     Authentication is executed with ISM.

Note

- The administrator user cannot operate in link with Microsoft Active Directory or LDAP.
- Users whose user authentication method is "Infrastructure Manager(ISM)" cannot operate in link with Microsoft Active Directory or LDAP.
- You must set up a DNS server in ISM in advance if setting an FQDN name as the Microsoft Active Directory name or LDAP server name.

- If you cannot connect to the directory server with the content specified in [Settings] - [Users] - [LDAP Server Setting], an error will occur in the directory server information and setting will not be possible.
- A primary and a secondary servers can be specified as directory servers for password authentication. In the case that two servers are specified, if the currently used server cannot respond, the other server will be used.
- Directory servers for link with the Microsoft Active Directory Group can be specified up to five.
- Precautions for setting an SSL certificate are as follows:
  - For the SSL certificate, set it after uploading it to the Administrator/ftp directory in advance.
  - After setup, delete the uploaded SSL certificate, since it is no longer required.
  - Specify the URL set in the SSL certificate for the LDAP server name.
- The precautions for using SSL to connect to the directory server are as follows:
  - Specify the LDAP user name starting with ldaps://.
  - For the port number, specify the port number for SSL communication (for example 636).
  - Install an SSL certificate.
- When you change the password of the users specified by bind DN on the directory server, the change is not reflected in the settings of ISM. Change the password by in the LDAP server settings on ISM.

2.13.2 Repository Management

The repository is a location used with ISM to store various kinds of resources. The resources are related to the user groups. The repository is mainly used for the following purposes:

- Storing of firmware data and the ServerView Suite Update DVD that are used for firmware updates

  Used in "2.6 Firmware Management."
- Storing of OS installation media that are used for installing OSes

  Used in "2.4 Profile Management."
- Storing of ServerView Suite DVD data that is used for installing OSes and Offline Update

  Used in "2.4 Profile Management" and "2.6 Firmware Management."

Note

If the disk space in a repository is not enough, saving the data for Repository Management will be failed. Refer to the following and allocate a sufficient disk space to the repository.

- 3.2.1.2 Estimation of the required disk space for repositories
- 3.7 Allocation of Virtual Disks
- "2.7.2 Manage User Groups" in "Operating Procedures."

2.13.2.1 Storing and deleting firmware data

Storing firmware data

There are two procedures to save the firmware that are applied to the managed nodes in the repository:

- Importing ISO image files of firmware data that is provided on DVD into the repository

- Importing firmware data that is released on the FUJITSU website for each node into the repository

The firmware data to be used varies with the type of firmware update target. Prepare the DVD or firmware data shown in the following table. If the data is in DVD format, prepare the respective ISO image files.

Target firmware	Firmware type	Firmware data to be used/Location from which to retrieve
iRMC of PRIMERGY	iRMC	ServerView Suite Update DVD (11.15.09 version or later) [Note 1] Or the firmware data that can be downloaded from the following website: http://support.ts.fujitsu.com/ [Note 2] http://support.ts.fujitsu.com/globalflash/ManagementController/
BIOS of PRIMERGY	BIOS	ServerView Suite Update DVD (11.15.09 version or later) [Note 1] Or the firmware data that can be downloaded from the following website: http://support.ts.fujitsu.com/ [Note 2] http://support.ts.fujitsu.com/globalflash/SystemBoard/
PCI Card	FC	ServerView Suite Update DVD (11.15.09 version or later) [Note 1] Or the firmware data that can be downloaded from the following website: http://support.ts.fujitsu.com/globalflash/FibreChannelController/
	CNA	ServerView Suite Update DVD (11.15.09 version or later) [Note 1] Or the firmware data that can be downloaded from the following website: http://support.ts.fujitsu.com/globalflash/LanController/
	SAS	ServerView Suite Update DVD (11.15.09 version or later) [Note 1] Or the firmware data that can be downloaded from the following website: http://support.ts.fujitsu.com/globalflash/ScsiController/
	RAID	ServerView Suite Update DVD (11.15.09 version or later) [Note 1] Or the firmware data that can be downloaded from the following website: http://support.ts.fujitsu.com/globalflash/ScsiController/
	LAN	ServerView Suite Update DVD (11.15.09 version or later) [Note 1] Or the firmware data that can be downloaded from the following website: http://support.ts.fujitsu.com/globalflash/LanController/
PRIMEQUEST	Server firmware	The firmware data that can be downloaded from the following website: http://support.ts.fujitsu.com/ [Note 2]
PRIMERGY BX Chassis MMB	MMB	The firmware data that can be downloaded from the following website: http://support.ts.fujitsu.com/ [Note 2] http://support.ts.fujitsu.com/globalflash/BladeSystem/
Network Switch Basic software	LAN Switch (SR-X model)	Contact your local Fujitsu customer service partner.
	LAN Switch (VDX model)	The firmware data that can be downloaded from the following website: http://support.ts.fujitsu.com/
	LAN Switch (CFX model)	Contact your local Fujitsu customer service partner.

Target firmware	Firmware type	Firmware data to be used/Location from which to retrieve
	LAN Switch (PY CB Eth Switch model)	The firmware data that can be downloaded from the following website: http://support.ts.fujitsu.com/ http://support.ts.fujitsu.com/globalflash/BladeSystem/
	LAN Switch (Cisco Systems Nexus series, Cisco Systems Catalyst series)	Contact your local Fujitsu customer service partner.
	FC Switch	The firmware data that can be downloaded from the following website: http://support.ts.fujitsu.com/ [Note 2]
Storage Controller	ETERNUS DX/AF	The firmware data that can be downloaded from the following website: http://support.ts.fujitsu.com/

[Note 1]: To obtain the ServerView Suite Update DVD image, contact your local Fujitsu customer service partner.

[Note 2]: Download Flash File.

For importing the firmware data from DVD

1. From the Global Navigation Menu on the GUI of ISM, select [Structuring] - [Firmware].
2. From the menu on the left side of the screen, select [Import].
3. From the [Actions] button on the [Import Data List] tab, select [Import DVD].
4. Select an option in [File selection method].
   - Local

     Import an ISO image stored locally.
   - FTP

     Import an ISO image from the FTP server of ISM-VA.

     You must transfer the ISO image to the "/<User group name>/ftp" directory in ISM-VA in advance.

     For FTP connection and how to transfer to FTP, refer to "2.1.2 FTP Access."
   - Shared Directory

     Import ISO image from a shared directory.

     You must mount the shared directory where the ISO image to be imported is saved in advance.

     For the shared directory settings and method for mounting it, refer to "2.13.7 Shared Directory Management."
5. Specify the ISO image in [File Path].
6. Import the ISO image to select the [Apply] button.

   The DVD import may take some time to complete. After starting the import, the operation is registered as an ISM task. Confirm the current status of the task on the "Tasks" screen.

   When you select [Tasks] from the top of the Global Navigation Menu on the GUI of ISM, the Task List is displayed.

Point

- The files you transferred to the FTP server of ISM-VA are no longer required after the import has finished. Use an FTP command to delete them.

- When you select "FTP" in [File selection method], if you check the [Delete source file] checkbox, the import source file on the FTP server will be deleted after the import has been completed.
- When you select "Shared Directory" in [File selection method], if you check the [Unmount shared directory] checkbox, the shared directory is unmounted after the import has been completed.

For importing the firmware data downloaded from the Fujitsu web site

1. From the Global Navigation Menu on the GUI of ISM, select [Structuring] - [Firmware].
2. From the menu on the left side of the screen, select [Import].
3. From the [Actions] button on the [Import Data List] tab, select [Import Firmware].
4. Select an option in [File selection method].
   - Local

     Import firmware data stored locally.
   - FTP

     Import firmware data from the FTP server of ISM-VA.

     You must transfer the firmware data to the "/<User group name>/ftp" directory in ISM-VA in advance.

     For FTP connections and how to transfer to FTP, refer to "2.1.2 FTP Access."
5. Specify the firmware data to be imported in [File Path].
6. Select the firmware type in [Type].
7. Select the firmware model in [Model Name].
8. Select the method for retrieving the version of the firmware in [Version], and then execute import with the [Apply] button.
   - Get automatically

     Version information is retrieved from the firmware when importing.
     With this option, the firmware in the following table can be imported. If it cannot be imported, select "Enter manually" and execute the import.

Type	Model name
iRMC	- PRIMERGY (server with iRMC S4 or S5) - PRIMEQUEST 3800B
BIOS	- PRIMERGY (server with iRMC S3, S4, or S5) - PRIMEQUEST 3800B [Note 1]

     [Note 1]: Only items that are in Offline mode are imported.
   - Enter manually

     Enter the firmware version manually when importing.
     Use the table below to enter the versions.

Type	Model name	Version
iRMC	RX100 S8, CX2550 M1, BX920 S4, TX2550 M4, PRIMEQUEST 3800B etc.	iRMC and SDR versions [Note 1]
BIOS	RX100 S8, CX2550 M1, BX920 S4, TX2550 M4, PRIMEQUEST 3800B etc.	BIOS version [Note 1]
MMB	BX900 S2	Firmware version [Note 1]
PRIMEQUEST	PRIMEQUEST 2400S3 etc.	Version of the firmware of PRIMEQUEST [Note 1]

Type	Model name	Version
FC	LPe1250, LPe12002, MC-FC82E	BIOS and FW versions [Note 2]
	LPeXXX except for LPe1250 and LPe12002, MC-FC162E	Firmware version [Note 2]
	QLEXXX	BIOS version [Note 2]
CNA	OCe10102, OCe14102 or MC-CNA112E	Firmware version [Note 1]
SAS	PSAS CP200i, PSAS CP400i, PSAS CP400e	Firmware version [Note 1]
RAID	PRAID CP400i, PRAID EP420e, PY SAS RAID Mezz Card 6Gb etc.	Firmware version [Note 1]
LAN	MCX415, MCX416 etc.	Firmware version [Note 1]
LAN Switch	SR-X model	Version of basic software [Note 1]
	VDX model	Firmware version [Note 1]
	CFX model	Firmware version [Note 1]
	PY CB Eth Switch/IBP 1Gb 36/12	Firmware version [Note 1]
	PY CB Eth Switch/IBP 10Gb 18/8	Firmware version [Note 1]
	PY CB Eth Switch 10/40 Gb 18/8+2	Firmware version [Note 1]
	Cisco Systems Nexus series	Version of NX-OS [Note 1]
	Cisco Systems Catalyst series	Version of IOS [Note 1]
FC Switch	Brocade FC Switch	Version of basic software [Note 2]
ETERNUS DX/AF	ETERNUS DX/AF model	Firmware version [Note 1]

[Note 1]: For information on the version, refer to the release notes.

[Note 2]: For information on the version, refer to the release notes or the file name.

Point

- If you select "Local" in [File selection method], specify the zip file where the firmware data is saved in [File Path] to import.

  If the firmware data is provided in zip format, decompress the file once. Then, compress the files that were created by the decompression again in zip format, and import them.

- If you select "FTP" in [File selection method], transfer the folder where the firmware data is saved to the FTP server of ISM-VA, and then specify the transferred folder in [File Path] to import it.

  If the firmware data is provided in zip format, decompress the file. Transfer the folder created by decompressing to ISM-VA and import it.

- If you are saving files on the FTP server of ISM-VA, use the FTP command or FTP client software (such as ffftp or WinSCP) to transfer them. In this case, set it so that the character encoding is converted with UTF-8. Do not use Windows Explorer, because the character encoding is not handled correctly.

- When you select "FTP" in [File selection method], if the import is not executed correctly or if the imported file is not displayed, execute the following procedure.

  1. Delete the imported firmware data and the files transferred to the FTP server on ISM-VA.
  2. Review the character encoding conversion settings.
  3. Execute the import again.

- The files you transferred to the FTP server of ISM-VA are no longer required after the import has finished. Use an FTP command to delete them.

- If you select "BIOS" in [Type], multiple options, such as "RX2530 M4_A1" or "RX2530 M4_C1," may be displayed for the same model in the [Model Name] option.

  In this case, you must check which type of firmware data the node whose firmware you are updating is using, and adjust your selection accordingly.

  Also, acquire and import firmware data of the same type as the firmware data used on the firmware update target.

  You can check what type of firmware data a node registered in ISM is using.

  1. From the Global Navigation Menu on the GUI of ISM, select [Management] - [Nodes].
  2. In the [Column Display] field on the "Node List" screen, select [Firmware].
  3. Check the [Firmware Name] column.

Deleting firmware data from repository

The following is a sample operation using the GUI.

1. From the Global Navigation Menu on the GUI of ISM, select [Structuring] - [Firmware].
2. From the menu on the left side of the screen, select [Import].
3. Execute one of the following:
   - If firmware data from the DVD was stored in the repository.
     a. Select the [Import Data List] tab.
     b. Check the checkboxes for the data to be deleted, and then select [Delete] from the [Actions] button.
     c. Execute the operations according to the instructions on the screen.
   - If firmware data downloaded from the FUJITSU website was stored in the repository.
     a. Select the [Firmware Data] tab.
     b. Check the checkboxes for the data to be deleted, and then select [Delete] from the [Actions] button.
     c. Execute the operations according to the instructions on the screen.

2.13.2.2 Storing and deleting OS installation files

Storing OS installation files

As Profile Management uses the OS installation media you imported to the repository for installing OSes, the OS installation media are not directly used after the import.

To import the data, execute the following procedure.

1. Prepare an ISO image of the OS installation media. For ESXi, prepare a FUJITSU custom image.
2. From the Global Navigation Menu on the GUI of ISM, select [Structuring] - [Profiles].
3. From the menu on the left side of the screen, select [DVD Import].
4. From the [Actions] button, select [Import DVD].
5. Select an option in [File selection method].
   - Local

     Import an ISO image stored locally.

- FTP

  Import an ISO image from the FTP server of ISM-VA.

  You must transfer the ISO image to the "/<User group name>/ftp" directory in ISM-VA in advance.

  For FTP connection and how to transfer to FTP, refer to "2.1.2 FTP Access."

- Shared Directory

  Import an ISO image from a shared directory.

  You must mount the shared directory where the ISO image is saved in advance.

  For the shared directory settings and method for mounting it, refer to "2.13.7 Shared Directory Management."

6. Specify the ISO image in [File Path].
7. Select the appropriate OS type in [Media Type], and then execute import with the [Apply] button.

Point

- The files you transferred to the FTP server of ISM-VA are no longer required after the import has finished. Use an FTP command to delete them.
- When you select "FTP" in [File selection method], if you check the [Delete source file] checkbox, the import source file on the FTP server will be deleted after the import has been completed.
- When you select "Shared Directory" in [File selection method], if you check the [Unmount shared directory] checkbox, the shared directory is unmounted after the import has been completed.

Deleting OS installation files from the repository

The procedure for deletion is as follows.

1. From the Global Navigation Menu on the GUI of ISM, select [Structuring] - [Profiles].
2. From the menu on the left side of the screen, select [DVD Import].
3. Check the checkboxes for the data to be deleted, and then select [Delete] from the [Actions] button.
4. Execute the operations according to the instructions on the screen.

2.13.2.3 Storing and deleting ServerView Suite DVD

Storing ServerView Suite DVD

When Profile Management installs an OS, it retrieves the programs for controlling the target node as well as the driver, application, and other files to be installed on the target node from the ServerView Suite DVD.

Import the ServerView Suite DVD that supports the target node and the OS to be installed in advance.

To import the data, execute the following procedure.

1. Prepare an ISO image of "ServerView Suite DVD."
2. From the Global Navigation Menu on the GUI of ISM, select [Structuring] - [Profiles].
3. From the menu on the left side of the screen, select [DVD Import].
4. From the [Actions] button, select [Import DVD].

5. Select an option in [File selection method].

   - Local

     Import an ISO image stored locally.

   - FTP

     Import an ISO image from the FTP server of ISM-VA.

     You must transfer the ISO image to the "/<User group name>/ftp" directory in ISM-VA in advance.

     For FTP connection and how to transfer to FTP, refer to "2.1.2 FTP Access."

   - Shared Directory

     Import an ISO image from a shared directory.

     You must mount the shared directory where the ISO image is saved in advance.

     For the shared directory settings and method for mounting it, refer to "2.13.7 Shared Directory Management."

6. Specify the ISO image in [File Path].
7. Select [ServerView Suite DVD] in [Media Type], and then execute import with the [Apply] button.

Point

- The files you transferred to the FTP server of ISM-VA are no longer required after the import has finished. Use an FTP command to delete them.
- When you select "FTP" in [File selection method], if you check the [Delete source file] checkbox, the import source file on the FTP server will be deleted after the import has been completed.
- When you select "Shared Directory" in [File selection method], if you check the [Unmount shared directory] checkbox, the shared directory is unmounted after the import has been completed.

Deleting ServerView Suite DVD data from the repository

The procedure for deletion is as follows.

1. From the Global Navigation Menu on the GUI of ISM, select [Structuring] - [Profiles].
2. From the menu on the left side of the screen, select [DVD Import].
3. Check the checkboxes for the data to be deleted, and then select [Delete] from the [Actions] button.
4. Execute the operations according to the instructions on the screen.

2.13.3 Installation of Emulex OneCommand Manager CLI and QLogic QConvergeConsole CLI

Note

- To update the firmware of a PCI card on Linux, the Emulex OneCommand Manager CLI or the QLogic QConvergeConsole CLI must be installed in the OS of the target server, and the PCI card information must be retrievable. For information on how to install and operate these CLIs, refer to the manuals for Emulex OneCommand Manager CLI and for QLogic QConvergeConsole CLI.

  For PCI cards that require installation of Emulex OneCommand Manager CLI and QLogic QConvergeConsole CLI, contact your local Fujitsu customer service partner.

- For executing a firmware update of a PCI card on Linux, the lspci command must be executable under Linux on the target server.

You should use the latest versions of the Emulex OneCommand Manager CLI or the QLogic QConvergeConsole CLI, respectively.

For information on the latest versions, contact your local Fujitsu customer service partner.

2.13.4 Task Management

In ISM, any processing that takes time is managed as a "Task." You can view the current status of all tasks at once on the "Tasks" screen instead of the respective operating screens of each task.

Also, use the "Tasks" screen to abort (cancel) any ongoing processing.

On the "Tasks" screen, you can view processing of the tasks shown in the following table.

Function	Type of processing
Firmware Management	Import of firmware data Firmware updates
Profile Management	Import of OS installation media Assignment of profiles Reassignment of profiles Release of profiles
Log Management	Collection of logs Deletion of logs Creation of download file
Network Management	Change of VLAN settings
Virtual Resource Management	Refreshing of virtual resource information

Procedure to display the "Tasks" screen

1. From the top of the Global Navigation Menu on the ISM GUI, select [Tasks].

2.13.5 ISM-VA Management

ISM-VA Management is a function used for installing, service operations, and maintenance of ISM.

Here, the following points are described.

- Functions for use when installing ISM
- Functions for use in maintenance

The commands you can use with ISM-VA Management are described in "2.13.5.1 List of commands in ISM-VA Management."

Functions for use when installing ISM

Function name	Overview of function
Initial Setup	This function is for the basic setup from a hypervisor console after installing ISM-VA. - Network settings - Time settings - Initial locale settings
License Settings	This function enables the ISM license key.
Certificate Activation	This function manages the certificates for access from a web browser.

Functions for use in maintenance

Function name	Overview of function
ISM-VA Service Control	This function can stop and restart ISM-VA as well as control the services that run internally.
Basic Settings	This function can modify the settings for ISM-VA after installation. - Network settings - Time settings - Locale setting - Virtual disk settings - Modification of host names
Maintenance	This function can execute maintenance. - Confirmation of versions - Application of Patches - Collection of Archived Logs - Switching of debug flags

2.13.5.1 List of commands in ISM-VA Management

The following list shows the commands in ISM-VA Management.

Console management menu

Function	Command
ISM-VA Basic Settings Menu	ismsetup

Network settings

Function	Command
Display of network devices	ismadm network device
Modification of network settings	ismadm network modify
Display of network settings	ismadm network show

Time settings

Function	Command
Display of time settings	ismadm time show
Display of available time zones	ismadm time list-timezones
Time zone setting	ismadm time set-timezone
Setting of date and time	ismadm time set-time
Enable/Disable NTP synchronization	ismadm time set-ntp
Adding of NTP server	ismadm time add-ntpserver
Removal of NTP server	ismadm time del-ntpserver

Locale and keymap settings

Function	Command
Display of locale and keymap	ismadm locale show
Display of available locales	ismadm locale list-locales
Locale setting	ismadm locale set-locale
Display of available keymaps	ismadm locale list-keymaps
Keymap setting	ismadm locale set-keymap

License settings

Function	Command
Display of licenses	ismadm license show
Registration of licenses	ismadm license set
Deletion of licenses	ismadm license delete

Certificate activation

Function	Command
Deployment of SSL server certificates	ismadm sslcert set
Display of SSL server certificates	ismadm sslcert show
Export of SSL server certificates	ismadm sslcert export
Creation of self-signed SSL server certificates	ismadm sslcert self-create

ISM-VA service control

Function	Command
Restart of ISM-VA	ismadm power restart
Stop of ISM-VA	ismadm power stop
Modification of destination port number of ISM	ismadm service modify
Display of list of internal services	ismadm service show
Start of internal services individually	ismadm service start
Stop of internal services individually	ismadm service stop
Restart of internal services individually	ismadm service restart
Display of status of internal services individually	ismadm service status
Enabling of internal services individually	ismadm service enable
Disabling of internal services individually	ismadm service disable

Virtual disk settings

Function	Command
Adding of LVM volume	ismadm volume add
Allocation of LVM volume to user group	ismadm volume mount
Cancellation of allocation of LVM volume to user group	ismadm volume umount
Display of volume settings	ismadm volume show
Extension of LVM volume size	ismadm volume extend

Function	Command
Extension of size of LVM system volume	ismadm volume sysvol-extend
Removal of LVM volume	ismadm volume delete

Maintenance

Function	Command
Collection of Archived Logs	ismadm system snap
Display of system information	ismadm system show
Application of Patches	ismadm system patch-add
Application of plug-in	ismadm system plugin-add
Upgrade of ISM-VA	ismadm system upgrade
Modification of host names	ismadm system modify
Switching the ISM RAS Log mode	ismadm system set-debug-flag
Backup of ISM	ismadm system backup
Restoration of ISM	ismadm system restore
ISM-VA statistics information display	ismadm system stat

Settings for core file collection directory

Function	Command
Display of collection directory	ismadm system core-dir-show
Collection directory settings	ismadm system core-dir-set
Clear collection directory	ismadm system core-dir-reset

Alarm notification settings

Function	Command
Registration of certificate for alarm notification mails	ismadm event import
Display of certificate for alarm notification mails	ismadm event show
Deletion of certificate for alarm notification mails	ismadm event delete

MIB file settings

Function	Command
Registration of MIB files	ismadm mib import
Display of MIB files	ismadm mib show
Deletion of MIB files	ismadm mib delete

Security settings

Function	Command
SSL/TLS enable status display	ismadm security show-tls
SSL/TLS enable setting	ismadm security enable-tls

Settings for linking with other software

Function	Command
Registration of certificate for link with other software	ismadm security import-software-cert
Display of certificate for link with other software	ismadm security show-software-cert
Deletion of certificate for link with other software	ismadm security delete-software-cert

Note

ISM-VA must be restarted if the time interval settings were returned to a past time.

2.13.6 Management of Cloud Management Software

To use the functions that link with cloud management software, register cloud management software with ISM.

The following cloud management software is supported:

- VMware vCenter Server 5.5
- VMware vCenter Server 6.0
- VMware vCenter Server 6.5
- VMware vCenter Server 6.7
- Microsoft System Center 2012
- Microsoft System Center 2012R2
- Microsoft System Center 2016
- Microsoft System Center 2019
- Microsoft Failover Cluster (Windows Server 2012) [Note 1]
- Microsoft Failover Cluster (Windows Server 2012R2) [Note 1]
- Microsoft Failover Cluster (Windows Server 2016) [Note 1]
- Microsoft Failover Cluster (Windows Server 2019) [Note 1]
- KVM (Red Hat Enterprise Linux)
- KVM (SUSE Linux Enterprise)
- IPCOM OS 1.x
- OpenStack (Red Hat Enterprise Linux)

[Note 1]: For Microsoft Failover Cluster, only virtual machines registered for cluster roles are displayed.

2.13.6.1 Registering cloud management software

The following is the operation procedure for registering new cloud management software.

1. From the Global Navigation Menu on the GUI of ISM, select [Settings] - [General] - [Cloud Management Software].
2. From the [Actions] button, select [Register].

3. Enter the information that is required for registration.

   - Cloud Management Software Name

     Set a name that is unique across the whole of ISM system.

   - IP Address

     Set the IP address of the cloud management software.

     Register the cluster virtual IP address in the case of Microsoft Failover Cluster.

     For OpenStack, set the IP address of the controller node.

   - Type

     Select the type of cloud management software to be registered.

     Also specify the version of Windows Server in the case of Microsoft Failover Cluster.

     Note

     If Microsoft Failover Cluster was specified, you must set the domain name in [Account Information].

   - Account Information

     Set the domain name, account name, and password for the cloud management software.

     Enter the domain name by using uppercase letters.

     Point

     If the type of cloud management software is OpenStack, the project that registered the user will become the main project.

   - URL

     Set the URL for accessing the web management screen for the cloud management software.

     If a cloud management software that provides a web management function was specified in [Type], the URL used to access the web management screen must be set.

   - User Group Name

     Select the name of the user group to be managed.

4. Select the [Register] button.

   The registered cloud management software is displayed on the "Cloud Management Software List" screen.

2.13.6.2 Retrieving information from cloud management software

In ISM, the following information running on the nodes can be retrieved.

- Virtual Machine Information

  The virtual machine information retrieved from the cloud management software can be confirmed on the [Virtual Machines] tab of the Details of Node screen.

- Virtual Switch Information

  The virtual switch information retrieved from the cloud management software can be confirmed on the "Network Map" screen.

  This information can be retrieved if the type of cloud management software is VMware vCenter Server, System Center, Microsoft Failover Cluster, or OpenStack. KVM is not supported.

- Virtual Router Information

  The virtual router information retrieved from the cloud management software can be confirmed on the "Network Map" screen.

  This information can be retrieved if the type of cloud management software is OpenStack. VMware vCenter Server, System Center, Microsoft Failover Cluster, and KVM are not supported.

Note

ISM manages information of virtual machines, virtual switches, and virtual routers by linking information of the registered cloud management software and OS information of the nodes. Execute the settings respectively to retrieve virtual machine, virtual switch, and virtual router information.

ISM retrieves virtual machine, virtual switch, and virtual router information in 24 hour cycles. Follow the procedure below to manually retrieve the information at any time.

1. Retrieve node information for nodes that are managed with the cloud management software.
2. From the Global Navigation Menu on the GUI of ISM, select [Settings] - [General] - [Cloud Management Software].
3. Retrieve information using one of the following procedures:

   - If retrieving information from all cloud management software, select [Get Cloud Management Software Info], and then select [Run].
   - If limiting the items to be retrieved, select the cloud management software to be retrieved, and then select [Get Info] - [Run] from the [Actions] button.

   As soon as retrieval of the information is complete, a log with the Message ID "10021503" is exported to the [Events] - [Events] - [Operation Log]. If there is cloud management software where information could not be retrieved, a log will additionally be exported in [Events] - [Events] - [Operation Log]. Confirm that an error has not been exported, and then confirm the information of the virtual machine, virtual switch, or virtual router.

Note

- If both System Center and the Microsoft Failover Cluster registered in System Center is registered in ISM, ISM will retrieve information from System Center, but information will not be retrieved from Microsoft Failover Cluster.
- In an environment using Microsoft Failover Cluster, if you delete a virtual machine from the Hyper-V manager, also delete this virtual machine from the failover cluster manager role.

2.13.6.3 Editing cloud management software

The following is the operation procedure for editing cloud management software information registered in ISM.

1. From the Global Navigation Menu on the GUI of ISM, select [Settings] - [General] - [Cloud Management Software], and then select the target cloud management software on the displayed "Cloud Management Software List" screen.
2. From the [Actions] button, select [Edit].
3. Edit the information.

Item	Description
Cloud Management Software Name	Set a name that is unique across the whole of ISM system.
IP Address	Set the IP address of the cloud management software.

Item	Description
	For Microsoft Failover Cluster, set the virtual IP address of the cluster. For OpenStack, set the IP address of the controller node.
Account Information	Set the Domain Name, Account Name, Password and Port Number of the cloud management software. Specify the domain name with capital characters.
URL	If the cloud management software provides a web management function, set an URL to access the web management screen.
User Group Name	Select a User Group Name to manage.

4. Execute [Register] to apply the changes.

2.13.6.4 Deleting cloud management software

The following is the operation procedure for deleting cloud management software registered in ISM.

1. From the Global Navigation Menu on the GUI of ISM, select [Settings] - [General] - [Cloud Management Software], and then select the target cloud management software on the displayed "Cloud Management Software List" screen.
2. From the [Actions] button, select [Delete].
3. Execute [Delete] to delete the cloud management software.

2.13.7 Shared Directory Management

Add a shared directory for use when importing a DVD.

2.13.7.1 Adding shared directories

The following displays the procedure for adding a new shared directory.

1. From the Global Navigation Menu on the GUI of ISM, select [Settings] - [General] - [Shared Directory].
2. From the [Actions] button, select [Register].
3. Enter the required information.

Item	Description
Host Name/IP Address	Set the IP address or host name of the shared directory.
Domain	Set the domain name of the shared directory. Set the domain name in capital letters.
Shared directory path	Set the path of the shared directory.
Type	Set the shared directory type from SMB/CIFS, NFS.
Account Name	Set the account name of the shared directory.
Password	Set the password of the shared directory.
User Group Name	Select the user group that the shared directory information belongs to.

4. Select the [Register] button.

   The added shared directory is displayed in the "Shared directory list" screen.

Note

- The information of up to five shared directories can be added to each user group.
- If the shared directory cannot be mounted with the set shared directory information, an error will occur.

2.13.7.2 Editing shared directories

The following is the operation procedure for editing shared directory information registered in ISM.

1. From the Global Navigation Menu on the GUI of ISM, select [Settings] - [General] - [Shared Directory].
2. Execute one of the following:
   - Check the checkbox for the shared directory you want to edit, and then select [Edit] from the [Actions] button.
   - Select the shared directory you want to edit, and select [Edit] from the [Actions] button on the displayed information screen.
3. Edit the information.

Item	Description
Host Name/IP Address	Set the IP address or host name of the shared directory.
Domain	Set the domain name of the shared directory. Set the domain name in capital letters.
Shared directory path	Set the path of the shared directory.
Type	Set the shared directory type from SMB/CIFS, NFS.
Account Name	Set the account name of the shared directory.
Password	Set the password of the shared directory.

4. Select [Apply] to apply the changes.

Note

Shared directories that are mounted cannot be edited.

2.13.7.3 Deleting shared directories

The following is the operation procedure to delete shared directories registered in ISM.

1. From the Global Navigation Menu on the GUI of ISM, select [Settings] - [General] - [Shared Directory].
2. Execute one of the following:
   - Check the checkboxes for the shared directories you want to delete, and then select [Delete] from the [Actions] button.
   - Select the shared directories you want to delete, and then select [Delete] from the [Actions] button on the displayed information screen.
3. Select [Delete].

Note

Shared directories that are mounted cannot be deleted.

2.13.7.4 Mounting shared directories

The following is the operating procedure for mounting shared directory information registered in ISM.

1. From the Global Navigation Menu on the GUI of ISM, select [Settings] - [General] - [Shared Directory].
2. Execute one of the following:
   - Check the checkboxes for the shared directories you want to mount, and then select [Mount] from the [Actions] button.
   - Select the shared directories you want to mount, and then select [Mount] from the [Actions] button on the displayed information screen.

Note

- The following displays the privileges of the mounted directory:
  - Mount as read only.
  - SMB/CIFS

    Mount with the same user privilege as the privilege of the user group that created the shared directory information.
  - NFS

    Mount using root privilege.
- In the following cases, the directory is unmounted:
  - ISM-VA was restarted or stopped
  - The ISM service was stopped
- The following operations cannot be executed for a user group that has mounted shared directory information:
  - Changing the user group name
  - Deleting the user group

2.13.7.5 Unmounting shared directories

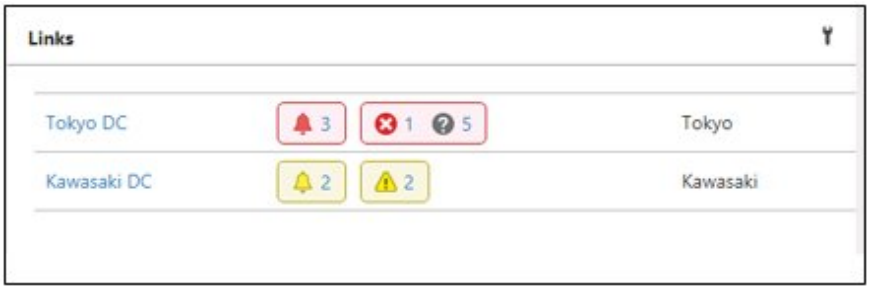
The following is the operating procedure for unmounting shared directory information registered in ISM.

1. From the Global Navigation Menu on the GUI of ISM, select [Settings] - [General] - [Shared Directory].
2. Execute one of the following:
   - Check the checkboxes for the shared directories you want to unmount, and then select [Unmount] from the [Actions] button.
   - Select the directories you want to unmount, and then select [Unmount] from the [Actions] button on the displayed information screen.

2.13.8 Link with ISM

2.13.8.1 Link display for the status information of other ISM installations

In ISM, the status information (Alarm Status/Status) of other ISM installations can be displayed on the Dashboard.



For details on status (Alarm Status/Status), refer to "2.1.1 GUI."

The following describes the operating procedure to display the status of other ISM installations on the Dashboard.

1. Set a user who wants to display the status of other ISM installation on the Dashboard.

   This user must also be registered in the other ISM installations with the same user name and password.

   a. Log in to ISM as a user who belongs to an Administrator group and has an Administrator role.

   b. Edit the user on whose Dashboard you want to display the status of other ISM installations by making the following settings:

      - In [Link with ISM], select [Set this user as a link user]
      - Password

2. Register the CA certificates of the other ISM installations to display.

   For details, refer to "Registration of certificates" in "2.13.8.2 Certificate management for links to other ISM installations."

3. Add [Links] to the Dashboard on the GUI.

   a. From the Global Navigation Menu on the GUI of ISM, select [Dashboard].

      If [Links] is displayed, proceed to Step f.

      If [Links] is not displayed, use the following steps to add the link.

   b. From [☰] at the top of the screen, select [Add Widget].

   c. From the displayed [Add Widget], select [Links], and then select the [Add] button.

   d. From [☰], select [Change Layout].

   e. Select [Save] on [Edit Mode].

   f. Select [🔧] of [Links] displayed on the Dashboard.

   g. Set the following in the "Widget settings: Links" screen:

      - Name: set the name you want to display in the widget.
      - URL: set the URL of the other ISM in the following way.

        https://<IP address of the target ISM or FQDN name>:<port number>

      - Description: Specify a description (comment) as you like.

For the procedure to add widgets, and details on the widget contents, refer to the ISM online help.

2.13.8.2 Certificate management for links to other ISM installations

CA certificates used to access other ISM installations are added in the link function of the widget.

Registration of certificates

The following describes the operating procedure for adding new certificates.

1. From the Global Navigation Menu on the GUI of ISM, select [Settings] - [General] - [CA Certificate].
2. From the [Actions] button, select [Register].
3. Enter the required information:
   - Action after completion

     Select whether to delete the source file.
   - File Path

     Upload the CA certificate of the other ISM installation that you want to access, and set the uploaded file.
   - Host Name/IP Address

     Set the host name or IP address of the other ISM installation that you want to access.
4. Select the [Register] button.

   The results screen is displayed, and the registered certificate is displayed in the "CA Certificate List" screen.

Note

- The certificate to register is the CA certificate. Regarding CA certificates, refer to "4.7.5 Download of CA Certificates."
- ISM does not check the availability of access to the other ISM installations with the registered certificate.

Deleting certificates

The following is the operation procedure for deleting certificates registered in ISM.

1. From the Global Navigation Menu on the GUI of ISM, select [Settings] - [General] - [CA Certificate].
2. Execute one of the following.
   - Check the checkboxes for the certificates you want to delete, and then select [Delete] from the [Actions] button.
   - Select the certificates you want to delete, and then select [Delete] from the [Actions] button on the displayed information screen.
3. Execute [Delete] to delete the certificates.

Note

Certificates can be deleted also if you are using the link function of the widget.

2.13.9 Linking with Other Software

From ISM, you can link with other software and display the information managed by the software in widgets on the Dashboard on the ISM GUI.

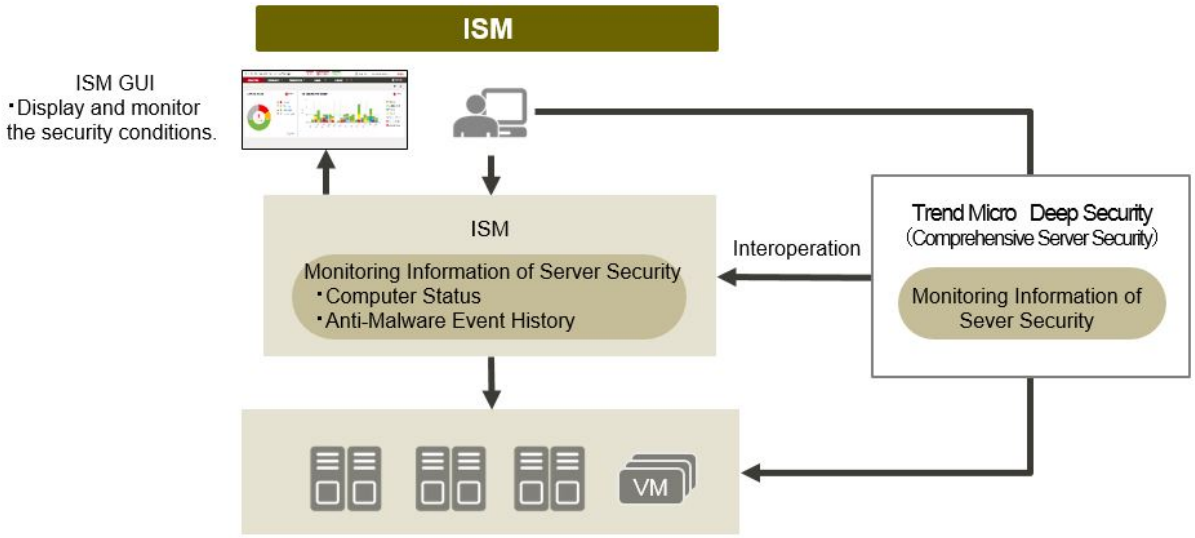
The following is the software that can be linked:

- Trend Micro Deep Security v10.0 or later

  An integrated server security software. Provides integrated security monitoring for physical machines and virtual machines.

  Link with Deep Security Manager, which is the management module of Trend Micro Deep Security, to monitor the security status of the devices managed in ISM.

Figure 2.31 Image of link with Trend Micro Deep Security



The followings are the widgets that can be displayed on the Dashboard on the ISM GUI:

- Computer Status widget

  Displays graphs of the security status of the computers managed by Deep Security Manager. If you select a graph, the Deep Security Manager GUI opens and you can check detailed information.

- Anti-Malware Event History widget

  Displays chronological graphs of Anti-Malware Event History of Deep Security Manager. If you select a graph, the Deep Security Manager GUI opens and you can check detailed information.

Figure 2.32 Deep Security link widget

2.13.9.1 Preparations in advance for Deep Security link

Note

You must make preparations in advance for Deep Security. For details, refer to the documentation on Trend Micro's website. Note that you cannot use ISM links if the IP address of the Deep Security Manager is an IPv6 link local address.

1. Execute the following settings from the Deep Security Manager web GUI.

   a. Set the user account for Deep Security Manager.

      Set the "Allow Access to web services API" in the access type of the user role.

   b. Confirm the time zone of Deep Security Manager.

      Select the user properties from the user name of the top of the screen. Take note of the displayed time zone.

   For details, refer to the documentation on the use of Deep Security REST API on Trend Micro's website.

2. Retrieve Deep Security Manager certificate.

   Export the certificate from the web browser. Select "Base 64 encoded X.509(.CER)" for the format of the export file.

   ### Point

   The following is the export procedures for each web browser. Display the web GUI of Deep Security Manager in a web browser, and then use the following procedures to export:

   - For Internet Explorer

     1. Select the key icon in the address field, and then select "View certificates."
     2. From the [Details] tab, select [Copy to File].
     3. The Certificate Export Wizard opens. Specify the following and export:
        - "Base 64 encoded X.509(.CER)(S)" in "Export File Format"
        - File name and save location in "File to Export"

   - For Google Chrome

     1. Select the key icon in the address field, and then select "Certificates."
     2. From the [Details] tab, select [Copy to File].
     3. The Certificate Export Wizard opens. Specify the following and export:
        - "Base 64 encoded X.509(.CER)(S)" in "Export File Format"
        - File name and save location in "File to Export"

   - For FireFox

     1. Select the key icon in the address field. Select the host name of Deep Security Manager (IP address or FQDN), and then select [Show Details].
     2. Select [Show Certificates], and then select the [Details] tab.
     3. Select [Export]. Specify the following in "Save Certificate as File" and export:
        - The file type as "X.509 Certificates (PEM)"
        - File name and save location

   ### Note

   Make sure to select "Base 64 encoded X.509(.CER)" for the format of the export file. Certificates in other formats cannot be used.

3. Upload a certificate file to ISM-VA.

   For details on upload procedures, refer to "2.8 Upload Files to ISM-VA" in "Operating Procedures." When uploading, specify "Certificate for link with other software" for the file type.

4. Register a certificate in ISM-VA.

   From the console, log in to ISM-VA as administrator and execute the following commands.

   The execution example differs depending on the type of host name of Deep Security Manager (IP address or FQDN).

   - For IPv4 address

   ```
   # ismadm security import-software-cert -software TrendMicroDeepSecurity -type ipv4 -server
   <IPv4 address of Deep Security Manager> -file <Certificate file name>
   ```

   - For IPv6 address

   ```
   # ismadm security import-software-cert -software TrendMicroDeepSecurity -type ipv6 -server
   <IPv6 address of Deep Security Manager> -file <Certificate file name>
   ```

   - For FQDN

   ```
   # ismadm security import-software-cert -software TrendMicroDeepSecurity -type fqdn -server
   <FQDN of Deep Security Manager> -file <Certificate file name>
   ```

   Example: If the host name of Deep Security Manager is in IPv4 format as "192.168.100.5," and the certificate file name is "DSManager.pem1"

```
# ismadm security import-software-cert -software TrendMicroDeepSecurity -type ipv4 -server
192.168.100.5 -file DSManager.pem1
```

2.13.9.2 Procedure to link with Deep Security

1. Log in to the GUI of ISM and open the Dashboard screen.
2. Select [Language] from the user name displayed on the top right of the screen.
3. Set the same time zone as is set for Deep Security Manager.
4. From the [☰] at the top right side of the screen, select [Add Widget].
5. From the "Add Widget" screen, select the [Other widgets] pane.

   [Link widgets with Trend Micro Deep Security] is displayed on the "Other Widgets" screen.

6. Select the [Deep Security Computer Status] pane or the [Deep Security Anti-Malware Event History] pane, and then select the [Add] button.
7. When displaying the Trend Micro widget for the first time, set the Deep Security Manager information. In the displayed screen, enter the following.

Item	Entered contents
Host Name	IP address or FQDN of Deep Security Manager
Account Name	User account of Deep Security Manager
Password/Password (for confirmation)	Password of Deep Security Manager
Port Number	Port number of Deep Security Manager Default is 4119. When changing from 4119, enter the changed port number.

8. After entering the information, select the [Apply] button.

   If the information of Deep Security Manager has already been registered, a list of the registered Deep Security Managers will be displayed. Check the Deep Security Manager displayed by the widget and select the [Apply] button.

The widget is displayed on the Dashboard.

For descriptions of the contents displayed in the widget, refer to the ISM online help.

Point

- If there is a problem with the display of the Cooperated widgets with Trend Micro Deep Security, a message is displayed in the widget. The following are the messages displayed and their contents.

Message	Action
Register a certificate.	The certificate for Deep Security Manager has not been registered. Execute the procedures in "2.13.9.1 Preparations in advance for Deep Security link" and register the certificate in ISM.
Certificate file does not exist. Re-register a certificate.	The certificate file is not the certificate file of Deep Security Manager. Refer to "2.13.9.1 Preparations in advance for Deep Security link" and retrieve a certificate again, then register it in ISM.
Certificate file is not valid. Check the certificate file.	The certificate has expired or is not valid for other reasons. Refer to "2.13.9.1 Preparations in advance for Deep Security link" and retrieve a certificate again, then register it in ISM.
Login failed. Management software returned an error.	There is a problem with the connection to Deep Security Manager. The following are possible causes: - There is an error in the Deep Security user name or password entered on the ISM GUI. - There is an error in the format of the certificate file. Or the host information in the certificate file is not the host name of the connection target Deep Security. - There is an error in the communication with Deep Security. - The number of Deep Security sessions exceeds the number allowed. For details on the cause, check the Deep Security system event.

If the error is not solved, or if messages other than the ones above are displayed, collect maintenance data for ISM and contact your local Fujitsu customer service partner.

- Whenever you select the link to the Deep Security link widget and the logon screen of Deep Security Manager is displayed, be sure to log on. Also, do not log out after you have logged on.

  If you do not follow the note mentioned above, the following symptoms may occur. In this case, execute operations mentioned in the Action column below.

Symptom	Action
The Deep Security Manager screen turns white.	Enter the following URL in the address bar of the window in which the Deep Security Manager screen is displayed. https://<IP address of Deep Security Manager>:<Port number of Deep Security Manager> Log on to Deep Security Manager from the displayed logon screen.
The Deep Security Manger screen is displayed in the window that the GUI of ISM has been displayed.	If you select the [Back] button of the browser, the GUI of ISM is displayed. If you select the link in the widget, the logon screen for Deep Security Manager is displayed. Log on to Deep Security Manager.

- After you log on to Deep Security Manager from the logon screen of Deep Security Manager, the Dashboard screen for Deep Security Manager may be displayed. In this case, select the link in the widget again. Detailed information will be displayed.

Chapter 3 Installation of ISM

This chapter describes how to install ISM.

Point

When structuring a virtualized platform system using ISM for PRIMEFLEX, refer to the following references for the procedure to install ISM:

- For structuring a vSAN model

  "3. Installation of Virtualized Platform System" in "FUJITSU Integrated System PRIMEFLEX for VMware vSAN V1 Installation Guide," or "FUJITSU Integrated System PRIMEFLEX for VMware vSAN V2 Installation Guide."

- For structuring an S2D model

  "3. Installation of Virtualized Platform System" in "FUJITSU Integrated System PRIMEFLEX for Microsoft Storage Spaces Direct V1 Installation Guide"

- For structuring a MAS HCI model

  "3. Installation of Virtualized Platform System" in "FUJITSU Integrated System PRIMEFLEX for Microsoft Azure Stack HCI V1 Installation Guide"

3.1 Workflow for Installing ISM

This section describes the workflow for installing ISM.

(1) Installation design

To prepare for installation of ISM, the following tasks must be performed:

- Disk Resource Estimation
- Repository Setup
- Network Design
- Node Name Setup
- User setup

For details on the operations, refer to "3.2 Installation Design for ISM."

(2) Installation of ISM-VA

Install ISM-VA on a management server.

For information on the installation procedure, refer to "3.3 Installation of ISM-VA."

(3) Setup of ISM-VA environment

Set up the operating environment of the installed ISM-VA.

For the contents of the environment setup procedure, refer to "3.4 Environment Settings for ISM-VA."

(4) Registration of license

Register the license that is required for using ISM.

For information on the tasks required to register the license, refer to "3.5 Registration of Licenses."

(5) Registration of users

Register the ISM users.

For information on the tasks to register users, refer to "3.6 Registration of Users."

(6) Allocation of virtual disks

Allocate virtual disks in order to extend the disk capacities of ISM-VA.

Refer to "3.7 Allocation of Virtual Disks" to allocate virtual disks to the whole of ISM-VA and Administrator user groups.

Note

After installation of ISM-VA, immediately execute virtual disk allocation for Administrator groups according to the procedure described in "3.7.2 Allocation of Virtual Disks to User Groups."

(7) Registration of cloud management software

Register new cloud management software to manage the virtual machines and virtual switches of the managed node.

For details on registering the cloud management software, refer to "2.13.6 Management of Cloud Management Software." In addition, for pre-settings required to use Management of Cloud Management Software, refer to "Appendix B Settings for Monitoring Target OS and Cloud Management Software."

(8) Pre-Settings for Virtual Resource Management

Refer to "3.8 Pre-Settings for Virtual Resource Management."

(9) Pre-Settings for Cluster Management

To use Cluster Management in ISM for PRIMEFLEX, you must set it up in advance.

For details on how to set it, refer to "3.9 Pre-Settings for Cluster Management."

3.2 Installation Design for ISM

Designing the installation in advance is important for having ISM operate smoothly. Design the following items.

- 3.2.1 Disk Resource Estimation
- 3.2.2 Network Design
- 3.2.3 Node Name Setup
- 3.2.4 User Design

3.2.1 Disk Resource Estimation

Upon using ISM, estimate the usage of the disk space described in the table below and allocate additional disk space beforehand.

Usage	Data to be stored	Calculation procedure for capacity	Type	
			System area	User area
Log archive	Logs collected by Log Management and files archived upon being downloaded "2.5 Log Management"	Calculate according to the number of nodes that collect logs, the types of logs collected, collection frequency, and storage period "3.2.1.1 Estimation of the required disk space for log storage "	Y [Note 1]	Y
Repository (Excludes ServerView Suite DVD)	DVD images and firmware data "2.4 Profile Management" "2.6 Firmware Management"	Calculate according to the number of DVDs to import and the volume of firmware data	Y [Note 1]	Y

Usage	Data to be stored	Calculation procedure for capacity	Type	
			System area	User area
		"3.2.1.2 Estimation of the required disk space for repositories"		
Repository (Only ServerView Suite DVD)	DVD image "2.4 Profile Management" "2.6 Firmware Management"	Calculate according to the number of DVDs to import "3.2.1.2 Estimation of the required disk space for repositories"	Y	-
Node management data	Data utilized by ISM for internal operation	Calculate according to the number of managed nodes "3.2.1.3 Estimation of the required disk space for node management data "	Y	-
ISM RAS Logs	Logs used for investigation when failures occur	Calculate according to the number of managed nodes "3.2.1.4 Estimation of the required disk space for ISM RAS log "	Y	-
Maintenance data	Files taken when archiving ISM RAS logs "4.5 Collection of Maintenance Data"	Calculate according to the generations to store the number of managed nodes and the documents "3.2.1.5 Estimation of required disk space for maintenance data "	Y [Note 1]	Y [Note 2]
ISM Backup/Restore	ISM Backup file "4.4.2 Backup/restoration of ISM with the ISM-VA Management Command"	Calculate according to the number of managed nodes "3.2.1.6 Estimation of required disk space for ISM Backup/Restore"	Y [Note 1]	Y [Note 2]

[Note 1]: If a user group is allocated with an area, the allocated area is used in the user group. In user groups not allocated with an area, a system area is used.

[Note 2]: They are exported to the repository area of the Administrator user group.

Note

- Disk capacity cannot be expanded when operating ISM-VA. Therefore, low disk space during operation affects the operation of log collection for Log Management as well as of repositories and backups. Consequently, it is important to estimate the disk capacity beforehand to make sure sufficient space is available.

  Create a virtual disk that has the required disk space estimated and allocate it to ISM-VA.

  For creating a virtual disk and allocating it to a system area, refer to "3.7.1 Allocation of Virtual Disks to Entire ISM-VA."

  For creating a virtual disk and allocating it to a user group, refer to "3.7.2 Allocation of Virtual Disks to User Groups."

- In order to avoid insufficient disk space, operations should be structured to periodically delete repositories, backups, and other unnecessary data.

- Current use of the disk space can be checked with the following procedure.

  1. From the console, log in to ISM-VA as an administrator.
  2. Check the disk utilization rate.

     ```
     ismadm volume show -disk -r
     ```

     Check /dev/mapper/centos-root.

     Example:

```
# ismadm volume show -disk -r
Filesystem               Size  Used Avail Use% Mounted on
/dev/mapper/centos-root   31G  4.2G   27G  14% /
devtmpfs                 3.9G     0  3.9G   0% /dev
tmpfs                    3.9G  4.0K  3.9G   1% /dev/shm
tmpfs                    3.9G  225M  3.7G   6% /run
tmpfs                    3.9G     0  3.9G   0% /sys/fs/cgroup
/dev/sda1                497M  172M  326M  35% /boot
tmpfs                    783M     0  783M   0% /run/user/1005
tmpfs                    783M     0  783M   0% /run/user/0
tmpfs                    783M     0  783M   0% /run/user/1001

  PV         VG     Fmt  Attr PSize  PFree
  /dev/sda2  centos lvm2 a--  19.51g    0
  /dev/sda3  centos lvm2 a--  15.00g    0
#
```

3.2.1.1 Estimation of the required disk space for log storage

The required disk space for logs exported through Log Management depend on the number of managed nodes and on the period or frequency of log retention. You must estimate the disk space for the potential number of future additional node installations.

In addition, when downloading logs, you must estimate in the same way the disk space to be used.

For information on how to estimate the required disk space for logs that are exported with Log Management, refer to "A.3.2 General Standards for Disk Usage in Using Log Management."

3.2.1.2 Estimation of the required disk space for repositories

Repositories must be prepared in ISM-VA in order to operate functions such as Profile Management or Firmware Management. The following data is stored in a repository:

- Firmware data
- OS image files
- Work files

The disk space required for repositories vary according to the type of OS to be installed for the managed nodes and the number of Update DVDs to be imported. Normally a disk space of 10 GB or more will be used. Refer to the table below to estimate the required disk space.

Usage	Operation	Required disk space
Storage of firmware data	Import the Update DVD	Approximately 7 GB per Update DVD
	Import of other firmware data	Depends on data to be imported.
File storage for OS installation media	Import the Windows installation media	Approximately 3 to 8 GB per OS type Only the OS type to be installed with Profile Management must be imported.
	Import the VMware ESXi installation media	Approximately 0.5 GB per OS type Only the OS type to be installed with Profile Management must be imported.
	Import the Linux installation media	Approximately 4 GB per OS type
Storage of ServerView Suite DVD	Import the ServerView Suite DVD	Approximately 8 GB per ServerView Suite DVD
Creation and storage of files for work	None	Approximately 0.5 GB
Collection and storage of core files	Setting of ismadm system core-dir	Approximately 1 GB

Point

- By correlating user groups and node groups, you can operate ISM separately for each node group. To use this feature, prepare a separate repository for each user group. In this case, you must estimate the required disk space for all items other than Server View Suite DVD for the repositories only for the number of user groups.
- The ServerView Suite DVDs are stored in the system area. Depending on the number of ServerView Suite DVDs to be used, you must estimate the required disk space on the LVM volume in the system area.

3.2.1.3 Estimation of the required disk space for node management data

Estimate the required disk space for the data area for node management depending on the number of nodes to be managed in ISM-VA.

The following table shows the required disk space for the number of managed nodes and the data area for node management.

Number of managed nodes	Required disk capacity	
	When not monitoring the network statistics information	When monitoring the network statistics information
100 nodes or less	20 GB	25 GB
400 nodes or less	80 GB	100 GB
1000 nodes or less	200 GB	250 GB

For information on the network design, refer to "2.7 Network Management."

3.2.1.4 Estimation of the required disk space for ISM RAS log

Change the ISM RAS log levels and estimate the required disk space depending on the number of nodes to be managed in ISM-VA.

The following table shows the required disk space for the number of managed node and the log area.

Number of managed nodes	ISM RAS log level	Required disk capacity
100 nodes or less	small (default)	10 GB
400 nodes or less	medium	40 GB
1000 nodes or less	large	100 GB

For details on how to switch the log level, refer to "4.5.1.2 Switching the ISM RAS Log level."

3.2.1.5 Estimation of required disk space for maintenance data

Change the ISM RAS log levels and estimate the required disk space depending on the number of nodes to be managed in ISM-VA.

The following table shows the required disk space for the number of managed node and the maintenance data area.

Number of managed nodes	ISM RAS log level	Required disk capacity
100 nodes or less	Small (default)	15 GB
400 nodes or less	Medium	50 GB
1000 nodes or less	Large	120 GB

For details on how to switch the log level, refer to "4.5.1.2 Switching the ISM RAS Log level."

3.2.1.6 Estimation of required disk space for ISM Backup/Restore

Estimate the disk space required for ISM Backup/Restore depending on the number of nodes to be managed in ISM-VA.

The following table shows the required disk space for the number of managed node and ISM Backup/Restore.

Number of managed nodes	Required disk capacity
100 nodes or less	15 GB
400 nodes or less	60 GB
1000 nodes or less	150 GB

3.2.2 Network Design

ISM uses the following two types of management LAN to manage servers.

Connect the network used in ISM to the following two types of management LANs:

- Networks connected to iRMC Management LAN

  This type of network is mainly used for controlling servers or executing BIOS, iRMC, MMB, or virtual IO settings.

- Networks connected to the onboard LAN or LAN card

  This type of network is mainly used for OS installation and for establishing connections after OS installation.

In addition, network connections are required for managing switches and storage devices. These can be either divided into physical and logical connections or used as one single integrated connection.

Note

ISM-VA starts by default while the IP address "192.168.1.101" remains enabled. Make sure not to overlap with the IP addresses of the other devices within the network.

You can avoid overlapping IP addresses by following the procedure below to change an IP address if an overlapped IP address is found.

1. Install ISM-VA on a hypervisor other than the one in the actual environment.
2. Change the IP address of ISM-VA.
3. Create a backup according to the procedure in "4.4 Backup and Restoration of ISM-VA."
4. Restore the ISM-VA that was backed up with hypervisor in the actual environment, according to the procedure described in "Restoration of ISM-VA with the Import Function."

Point

- It is recommended that you prepare separate networks for service use (production LANs) in addition to these management LANs.
- By correlating user groups and node groups, you can operate ISM separately for each node group. To do so, design separate networks for each node group. You can also set firewalls around the network of each node group in order to separate data communication between groups and there by prevent viewing and manipulation of nodes that belong to other node groups.
- You can define only one network interface for ISM. If you are going to configure multiple networks, configure the router to enable communication between the networks.

3.2.3 Node Name Setup

Determine naming rules for nodes and profiles that will be required for node registration.

When you register a node, give it a unique name.

A maximum of 64 characters can be used to set the node name.

Note, however, that you cannot use the following characters:

slashes (/), backslashes (\), colons (:), asterisks (*), question marks (?), double quotations ("), angle brackets (<>), or pipelines (|)

3.2.4 User Design

Set appropriate user roles and user groups according to the actual tasks and functions of each user. It is recommended that you execute the user settings according to the actual tasks and functions of each user within the framework, setting up user roles according to such tasks as installation, monitoring, or maintenance of nodes, and setting up user groups organization-wise for only the actual users of each node resource.

If you are going to operate nodes separately for each user group, you should define a node that is operated and managed by a given user group as a node group, and then correlate the user group with the node group. In this case, create a user with an Administrator role within the user group.

For details on user groups and users, refer to "2.13.1 User Management."

In order to ensure security in Node Management, it is also recommended that you design operations so that users are removed as soon as they have become obsolete, that passwords must be changed at regular intervals, and so on.

For information on how to execute settings for user roles and user groups and on how to change passwords, refer to the ISM online help.

3.3 Installation of ISM-VA

The ISM software is supplied with a media pack of the products related to FUJITSU Software Infrastructure Manager.

Install ISM-VA according to the installation destination.

The following procedures describe how to install ISM-VA on Microsoft Windows Server Hyper-V, VMware vSphere Hypervisor, and KVM.

- 3.3.1 Installation on Microsoft Windows Server Hyper-V
- 3.3.2 Installation on VMware vSphere Hypervisor
- 3.3.3 Installation on KVM

3.3.1 Installation on Microsoft Windows Server Hyper-V

For installation, use the zip file that is included on the DVD media. For details on selecting installation destinations and network adapters that are to be specified midway through installation, refer to the Hyper-V manuals.

1. Deploy the zip file that is included on the DVD media in a temporary deployment location on the Windows server to be used as the Hyper-V host.
2. Start Hyper-V Manager, right-click on the Windows server to be used as the Hyper-V host, and then select [Import Virtual Machine].
3. On the "Select Folder" screen, select the directory in which you deployed the file in Step 1.

   The directory to be selected is the parent directory of the directories "Snapshots," "Virtual Hard Disks," and "Virtual Machines."
4. On the "Choose Import Type" screen, select [Copy the virtual machine (create a new unique ID)], and then select [Next].
5. On the "Choose Destination" and "Choose Folders" screens, select the import destination for ISM-VA. A default location is displayed, but you can change it to another one as required.
6. On the "Connect Network" screen, select the virtual switch to be used by ISM-VA, and then select [Next].
7. Select [Finish] to finish the import wizard.
8. When the import of ISM-VA is complete, convert the virtual hard disk to a fixed capacity. For details on how to convert, refer to the Hyper-V manual.

3.3.2 Installation on VMware vSphere Hypervisor

For installation, use the ovf file and vmdk file that are included in the DVD media.

The ovf file to be used differs depending on whether you install VMware ESXi directly or install with VMware vCenter.

- Direct installation on VMware ESXi

  Use ISM<Version>.ovf.

- Installation via VMware vCenter

  User ISM<Version>_vcenter.ovf.

  If you install ISM-VA via VMware vCenter, you can execute network settings for ISM-VA during the installation.

Procedures differ depending on the version of VMware ESXi. Refer to the specific reference for your version.

- Installation on VMware ESXi 5.5 or VMware ESXi 6.0
- Installation on VMware ESXi 6.5 or later

Installation on VMware ESXi 5.5 or VMware ESXi 6.0

1. Start vSphere Client, and then select [Deploy OVF Template] from the [File] menu.
2. On the source selection screen, select the ovf file that is included on the DVD media, and then select [Next].
3. On the "Storage" screen, specify the location where the virtual machine is saved, and then select [Next].
4. On the "Disk Format" screen, select [Thick Provision Lazy Zeroed] or [Thick Provision Eager Zeroed], and then select [Next].
5. On the "Network Mapping" screen, select the network to be used by ISM, and then select [Next].
6. Select [Finish] to finish deployment of OVF templates.

Installation on VMware ESXi 6.5 or later

1. Start the vSphere Client (HTML5), right-click on the [Host] of the navigator, and then select [Create/Register VM].
2. On the "Select creation type" screen, select [Deploy a virtual machine from an OVF or OVA file], and then select [Next].
3. On the "Select OVF and VMDK files" screen, specify an arbitrary name for the virtual machine, then set deployment for the ovf file included on the DVD and select [Next].
4. On the "Select storage" screen, select the datastore to deploy to and select [Next].
5. On the "Deployment options" screen, select the network being used, select "Thick" for Disk provisioning and then select [Next].
6. On the "Ready to complete" screen, confirm the settings and then select [Finish] to complete deployment.

Point

If you install ISM-VA with VMware vCenter on VMware ESXi, you can set the following network items during deployment of the OVF file (OVF template).

Table 3.1 List of network setting items

Item	Description
01 IP Address	An ISM-VA IP address
02 Netmask	Subnet mask or prefix length (Example: 255.255.255.0 or 24)
03 Gateway	Default gateway
04 Hostname	ISM-VA host name (You must specify the FQDN if using DNS)
05 Primary DNS	Primary DNS (optional setting)
06 Secondary DNS	Secondary DNS (optional setting)

3.3.3 Installation on KVM

For installation, use the tar.gz file that is included in the DVD media.

1. Transfer the tar.gz file to any suitable directory on the KVM host and decompress it there.

```
# tar xzvf ISM<Version>_kvm.tar.gz
ISM<Version>_kvm/
ISM<Version>_kvm/ISM<Version>_kvm.qcow2
ISM<Version>_kvm/ISM<Version>.xml
```

   The <Version> part shows the number according to the ISM-VA version.

2. Copy the files in the decompressed directory to their respective designated locations.

   a. Copy the qcow2 file to /var/lib/libvirt/images.

```
# cp ISM<Version>_kvm.qcow2 /var/lib/libvirt/images
```

   b. Copy the xml file to /etc/libvirt/qemu.

```
# cp ISM<Version>.xml /etc/libvirt/qemu
```

   Point

   When installing SUSE Linux Enterprise Server, edit the xml file with vi directly before or after copying to change the <emulator> portion.

   Before change

```
<emulator>/usr/libexec/qemu-kvm</emulator>
```

   After change

```
<emulator>/usr/bin/qemu-system-x86_64</emulator>
```

3. Specify the xml file to register ISM-VA.

```
# virsh define /etc/libvirt/qemu/ISM<Version>.xml
```

4. Select [Virtual Machine Manager] to open Virtual Machine Manager.
5. In Virtual Machine Manager, select ISM-VA, and then select [Open].
6. On the ISM-VA Virtual Machine screen, select [Details] from the [View] menu.
7. On the details screen for ISM-VA Virtual Machine, select [NIC] and the virtual network or host device to which to connect ISM-VA, and then select [Apply].

3.4 Environment Settings for ISM-VA

Execute the initial setup after installing ISM-VA.

3.4.1 First Start of ISM-VA

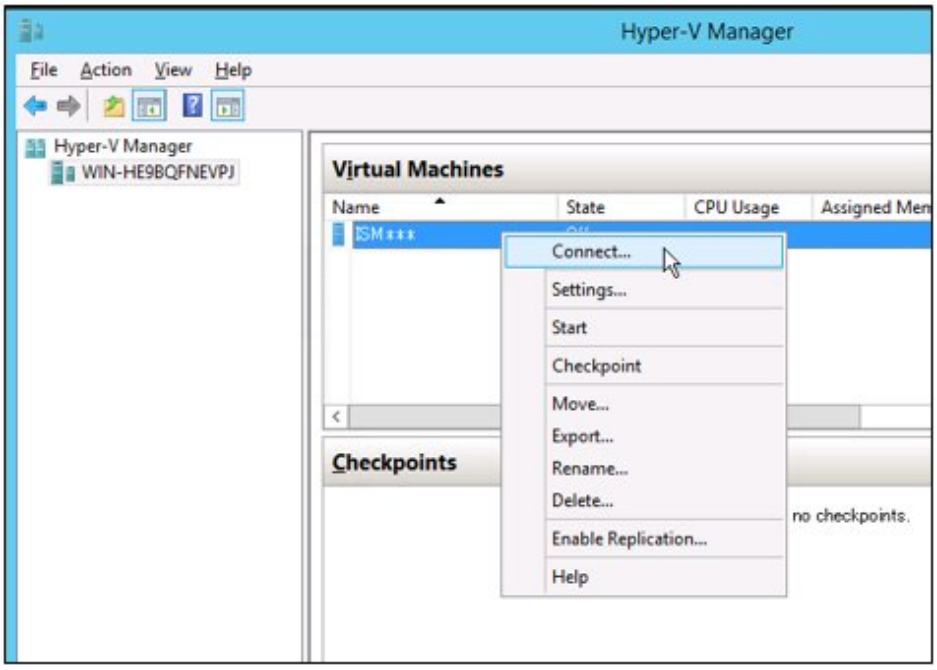
Use the respective function of the hypervisor on the installation destination to start ISM-VA. Start ISM-VA as a host OS user with administrator privileges.

The following procedures describe how to start ISM-VA from Microsoft Windows Server Hyper-V, VMware vSphere Hypervisor, and KVM.

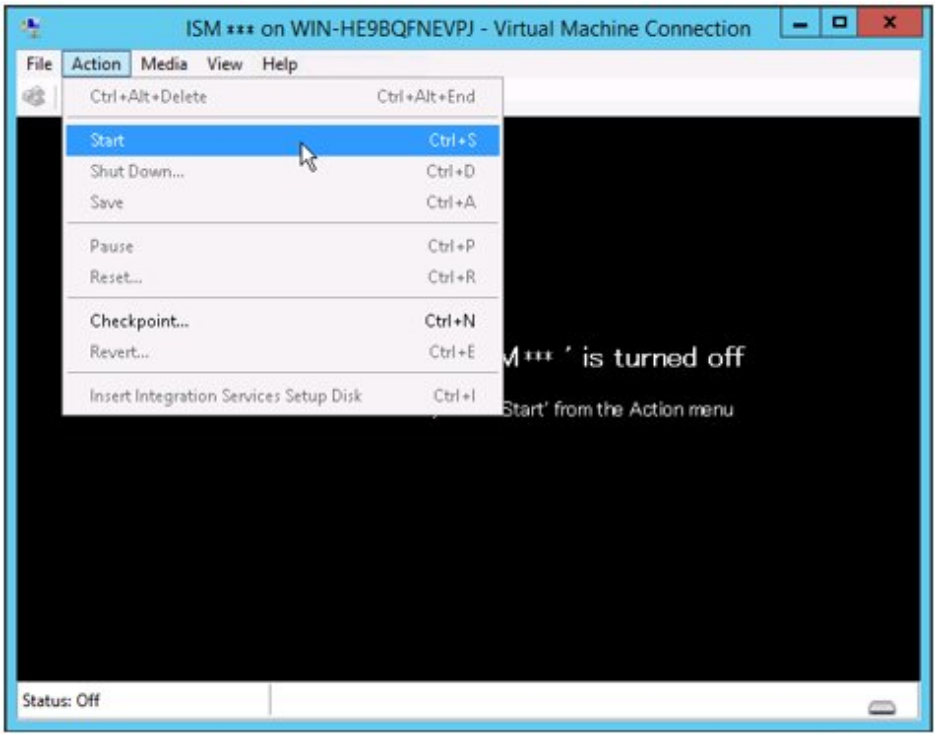
- 3.4.1.1 For ISM-VA running on Microsoft Windows Server Hyper-V (First Time)
- 3.4.1.2 For ISM-VA running on VMware vSphere Hypervisor (First Time)
- 3.4.1.3 For ISM-VA running on KVM (First Time)

3.4.1.1 For ISM-VA running on Microsoft Windows Server Hyper-V (First Time)

1. In Hyper-V Manager, right-click on the installed ISM-VA, and then select [Connect].



2. On the "Virtual Machine Connection" screen, select [Start] from the [Action] menu to start ISM-VA.



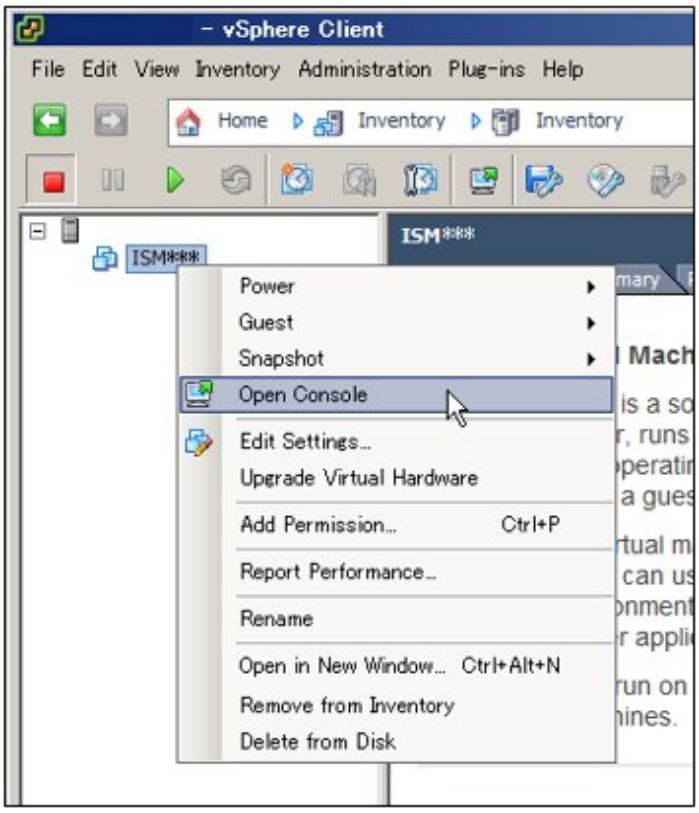
3.4.1.2 For ISM-VA running on VMware vSphere Hypervisor (First Time)

Procedures differ depending on the version of VMware ESXi. Refer to the specific reference for your version.

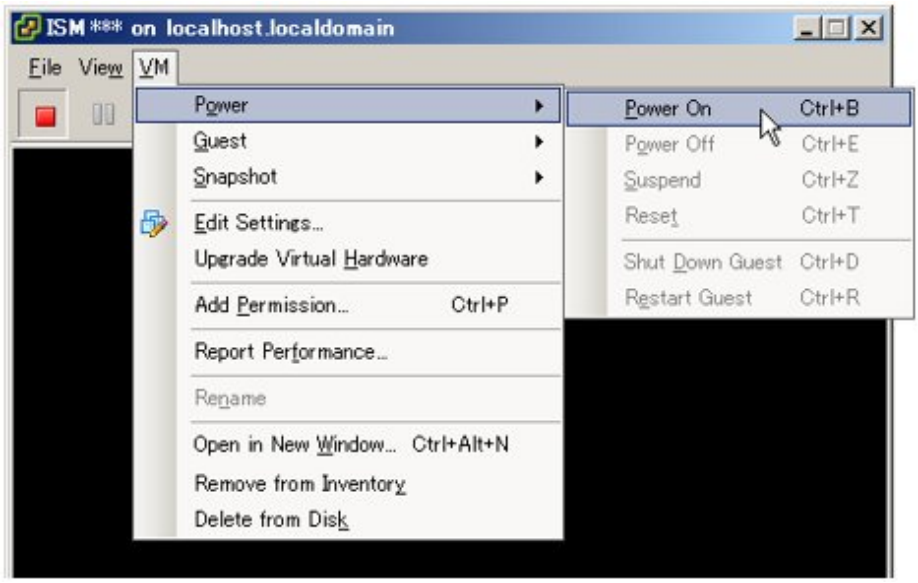
- VMware ESXi 5.5 or VMware ESXi 6.0
- VMware ESXi 6.5 or later

VMware ESXi 5.5 or VMware ESXi 6.0

1. In vSphere Client, right-click on the installed ISM-VA, and then select [Open Console].

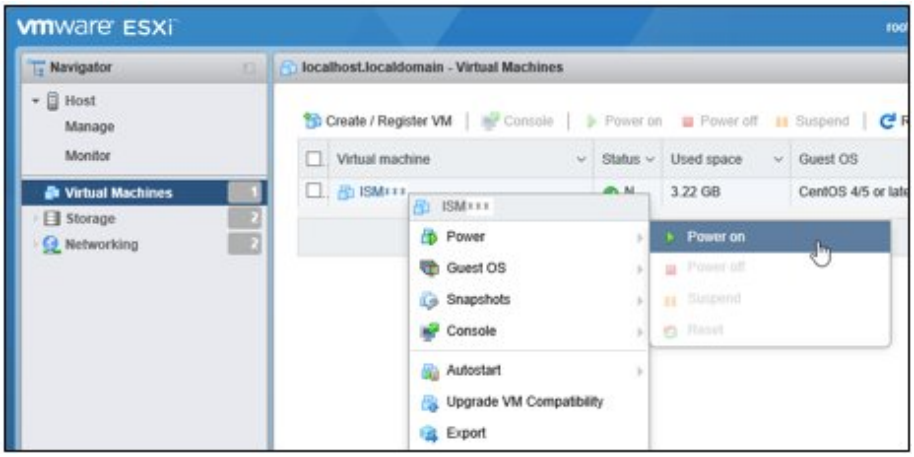


2. On the "Console" screen, select [Power] - [Power On] from the [VM] menu to start ISM-VA.

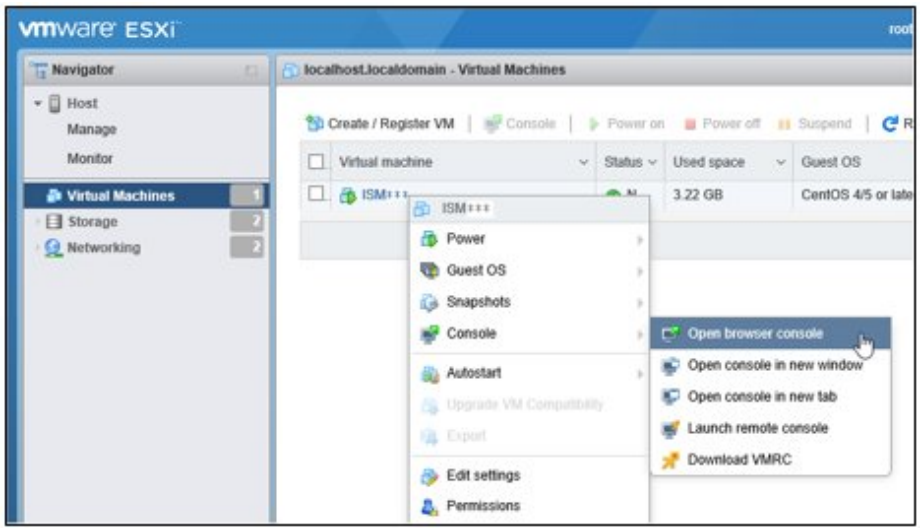


VMware ESXi 6.5 or later

1. In vSphere Client (HTML5), right-click on the installed ISM-VA, and then select [Power on].



2. Right-click on the installed ISM-VA, and then select [Open browser console] or another console.



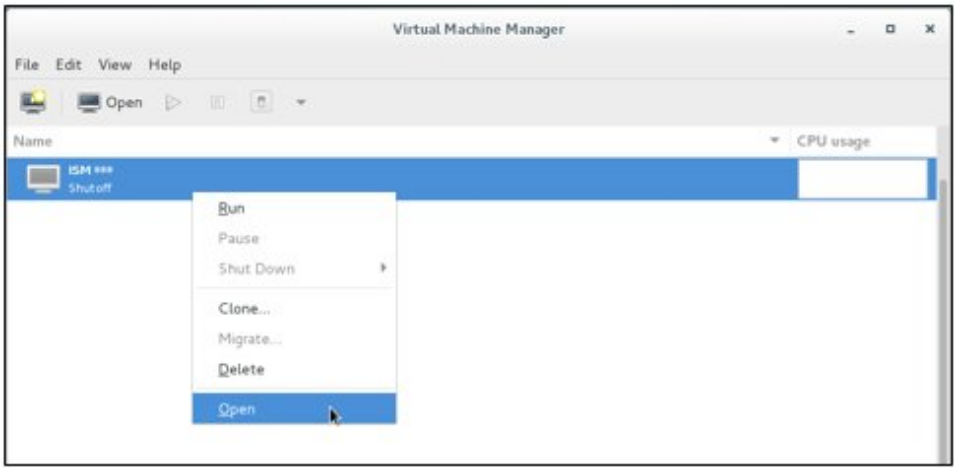
Point

The following message may be displayed when starting ISM-VA, but the ISM-VA settings are optimized to operate on VMware ESXi 5.5/6.0/6.5/6.7, and so this is not a problem.

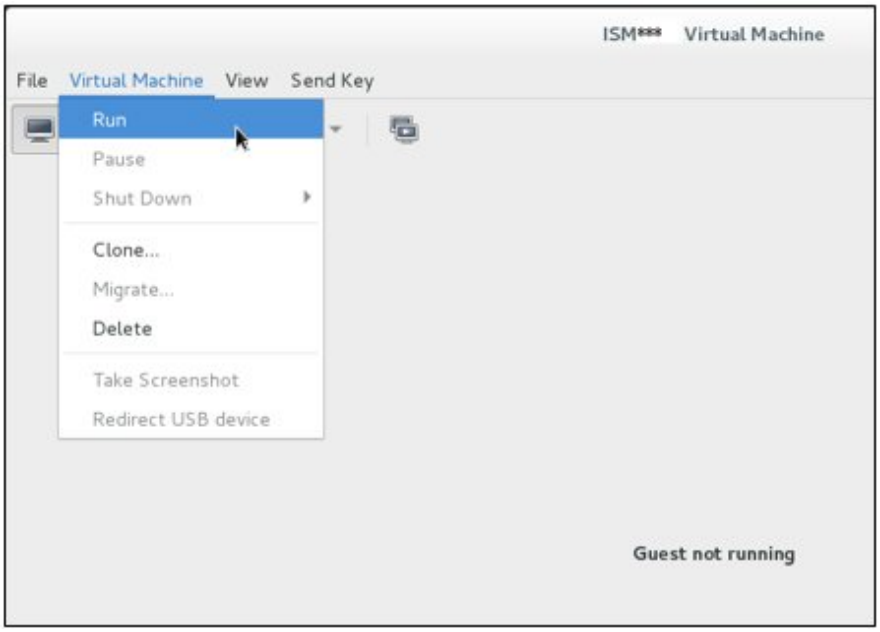
```
The configured guest OS (CentOS 4/5 or later (64-bit)) for this virtual machine does not match the guest that is currently running (CentOS 7 (64-bit)). You should specify the correct guest OS to allow for guest-specific optimizations.
```

3.4.1.3 For ISM-VA running on KVM (First Time)

1. In Virtual Machine Manager, right-click on the installed ISM-VA, and then select [Open].



2. On the "ISM-VA Virtual Machine" screen, select [Run] from the [Virtual Machine] menu to start ISM-VA.



3.4.2 Initial Setup of ISM-VA

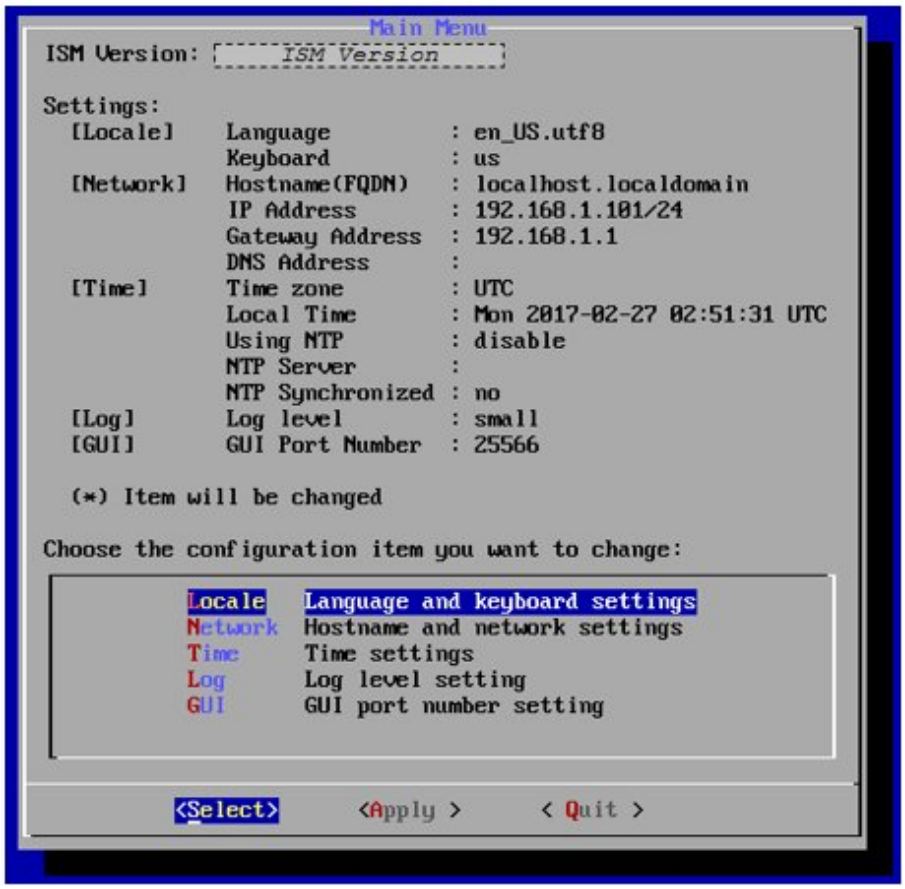
After starting ISM-VA, use the console basic setting menu or the ismadm commands to execute the basic settings for ISM-VA.

3.4.2.1 Initial setup using the Basic Setting Menu

1. Use the administrator account and the default password to log in to the console.
   - Administrator account: administrator
   - Default password: admin
2. Execute the following command to start the basic setting menu.

```
# ismsetup
```

The screen below is displayed.



3. Execute the ISM-VA settings.

   The following items can be set on the basic setting menu:

   - Locale
   - Network
   - NTP server
   - Log level
   - Web GUI port number

   For details on the basic setting menu, refer to "4.2 ISM-VA Basic Settings Menu."

   When domain environment settings are required, execute Step 5 in "3.4.2.2 Initial setup using the ismadm command."

3.4.2.2 Initial setup using the ismadm command

1. Use the administrator account and the default password to log in to the console.

   - Administrator account: administrator
   - Default password: admin

2. From the console, execute the network settings.

   - Confirm the LAN device names

```
# ismadm network device
DEVICE  TYPE      STATE      CONNECTION
eth0    ethernet  connected  eth0
lo      loopback  unmanaged  --
```

- Set networks and host names

```
# ismadm network modify <LAN device name> ipv4.method manual ipv4.addresses <IP address>/
<Maskbit> ipv4.gateway <Gateway IP address> +ipv4.dns <DNS server>

# ismadm system modify -hostname  <Host name (FQDN)>
```

Example of command execution:

```
# ismadm network modify eth0 ipv4.method manual ipv4.addresses 192.168.1.101/24 ipv4.gateway
192.168.1.1 +ipv4.dns 192.168.1.2

You need to reboot the system to enable the new settings.
Immediately reboots the system. [y/n]:

# ismadm system modify -hostname ismva2.domainname
You need to reboot the system to enable the new settings.
Immediately reboots the system. [y/n]:
```

When command execution is complete, a confirmation message is displayed, prompting whether you want to reboot the system. Enter "y" to reboot the system.

When executing the network settings and the host name settings at the same time, only reboot once after executing the latter settings.

Operations after executing the network/host name settings can be operated in the same way from both the hypervisor console as well as another console via SSH. However, access via SSH is recommended as it provides good operability.

Point

If you install VMware vSphere Hypervisor version ISM-VA via VMware vCenter, you can omit this network setting by executing the network setting during the installation.

3. From the console, set the System Locale and the Keymap.

Use the following procedure to confirm the current settings.

```
# ismadm locale show
            System Locale: LANG=ja_JP.UTF-8
            VC Keymap: jp
            X11 Layout: jp
```

Use the following commands to change the current settings.

- Locale setting

```
# ismadm locale set-locale LANG=<Locale name>
```

Example of command execution:

```
# ismadm locale set-locale LANG=en_US.utf8
```

- Display of available <Locale name>

```
# ismadm locale list-locales
```

- Keymap setting

```
# ismadm locale set-keymap <Keymap name>
```

Example of command execution:

```
# ismadm locale set-keymap us
```

- Display of available <Keymap name>

```
# ismadm locale list-keymaps
```

Table 3.2 Keymap list

Language	Keymap Name
Japanese	jp
English	us
German	de-nodeadkeys
Chinese	cn
Korean	kr
Filipino	ph

Any modifications to System Locale become effective only after restarting ISM-VA.

4. From the console, set the date and time.

Use the following procedure to confirm the current settings.

```
# ismadm time show
       Local time: Thursday 2016-06-09 16:57:40 JST
   Universal time: Thursday 2016-06-09 07:57:40 UTC
         Time zone: Asia/Tokyo (JST, +0900)
       NTP enabled: no
  NTP synchronized: no
   RTC in local TZ: no
        DST active: n/a

NTP Servers:
506 Cannot talk to daemon
```

Use the following commands to change the current settings.

- Time zone setting

```
# ismadm time set-timezone <Time zone>
```

Example of command execution:

```
# ismadm time set-timezone America/New_York
```

- Display of available time zones

```
# ismadm time list-timezones
```

- Setting of date and time

```
# ismadm time set-time <Date> <Time>
```

Example of command execution:

```
# ismadm time set-time 2016-06-09 17:10:00
```

- Enable/Disable NTP synchronization

Enable

```
# ismadm time set-ntp 1
```

Disable

```
# ismadm time set-ntp 0
```

- Add/Remove NTP server

  Add NTP server

```
# ismadm time add-ntpserver <NTP server>
```

  Remove NTP server

```
# ismadm time del-ntpserver <NTP server>
```

5. From the console, set the domain environment.

   This setting is not required if you do not use the domain environment.

   - Adding of domain setting information

```
# ismadm kerberos add -d <Domain Name> -r <Realm> -n <Controller Name>
```

     Example of command execution:

```
# ismadm kerberos add -d sample.local -r SAMPLE.LOCAL -n adsvr.sample.local
```

   - Display of domain setting information

```
# ismadm kerberos show
```

   - Undoing the latest change to the domain setting information

```
# ismadm kerberos restore
```

     You cannot undo two or more changes.

   - Initialization of domain setting information

```
# ismadm kerberos init
```

3.5 Registration of Licenses

There are following two types of licenses:

- Server licenses

  These licenses are required for using ISM.

- Node licenses

  These licenses are related to the number of nodes that can be registered in ISM. You cannot register a number of nodes that exceeds the number of licenses you have registered with ISM-VA Management. If you want to register additional nodes in ISM, register additional node licenses beforehand.

ISM requires the registration of both server licenses and node licenses. Register the licenses with ISM-VA Management after installing ISM-VA.

For details on the types of licenses for ISM, refer to "1.2 Product System and Licenses" in "First Step Guide."

There are two procedures to register licenses, the first is to register from the console, and the second is to register from the GUI in a web browser.

3.5.1 Procedure to Register from the Console

To register licenses, from the console, log in to ISM-VA as an administrator.

1. Register the server licenses.

```
# ismadm license set -key <License key>
```

2. Register the node licenses.

```
# ismadm license set -key <License key>
```

3. Confirm the results of license registration.

```
# ismadm license show
```

Example of command execution:

```
# ismadm license show
Operation Mode : Advanced
#  [Type]  [Edition]  [#Node]  [Exp.Date]  [Reg.Date]  [Licensekey]
1  Server  Adv.             -           -  2019-08-01  **********************==
2  Node    Adv.            10           -  2019-08-01  **********************==
```

Table 3.3 Description on the command output

Item	Description
[Operation Mode]	Displays one of the following ISM Operation Modes: - Essential - Advanced - Advanced for PRIMEFLEX
[Type]	Displays "Server" for a server license and "Node" for a node license.
[Edition]	Displays one of the following types of the license: - Adv.: ISM license - I4P: ISM for PRIMEFLEX license
[#Node]	Displays the number of nodes that can be managed on that license. Always displays a "-" if the license type is "Server."
[Exp.Date]	Displays the expiration date of the license. Always displays a "-" if it is unlimited.
[Reg.Date]	Displays the date and time when the license was registered.
[Licensekey]	Displays the character string of the registered license key.

4. Restart ISM-VA.

```
# ismadm power restart
```

3.5.2 Register from the Operating GUI of a Web Browser

Implement "3.4.2 Initial Setup of ISM-VA" in advance.

1. Restart ISM-VA.
2. Start the GUI operating in a web browser.
3. From the GUI, log in as an administrator.

   The "Fujitsu End User Software License Agreement" screen is displayed.
4. Check the contents, and then check the [Above contents are correct.] checkbox.
5. Select the [Agree] button.
6. From the Global Navigation Menu on the GUI of ISM, select [Settings] - [General].
7. From the menu on the left side of the screen, select [License].
8. From the [Actions] button, select [Register].

   The "Register License" screen is displayed.

9. Register the license key.

    a. Specify the license key in the entry field.

    b. Select the [Add] button to add entry fields if adding other license keys.

    c. Repeat Step a to b to register all licenses, and then select the [Apply] button.

10. From the [Actions] button, select [Restart ISM-VA] to restart ISM-VA.

Point

- To register additional licenses, repeat Step 6 to 9 above.
- To delete the licenses registered, select the target licenses, and from the [Actions] button, select [Delete].

3.6 Registration of Users

Register the users required in order to operate ISM.

For details on how to register users, refer to "2.13.1 User Management."

3.7 Allocation of Virtual Disks

Virtual disks are resources for adding ISM-VA disk capacities. The storage of logs, repositories, and backups requires large capacities of disk resources. In addition, these capacities vary with the respective operating procedures and scales of managed nodes. Allocating large-volume resources to virtual disks allows for avoiding any effects on ISM-VA from disk capacities or increased loads. Securing sufficient space on virtual disks ensures smooth operation of logs, repositories, and backups.

Virtual disks can be allocated to the entire ISM-VA or to user groups.

Point

For detailed procedures for the virtual disk creation and connection method, refer to "Operating Procedures."

3.7.1 Allocation of Virtual Disks to Entire ISM-VA

The following example uses the Administrator user group to show you the procedure for allocating virtual disks.

1. After stopping ISM-VA, create a virtual disk on the hypervisor settings screen and connect it to ISM-VA (virtual machine).

   Create the virtual disks so as to be controlled by SCSI controllers.

2. After starting ISM-VA, from the console, log in to ISM-VA as an administrator.

3. Stop the ISM service temporarily in order to allocate virtual disks.

```
# ismadm service stop ism
```

4. Confirm that the virtual disks you added in Step 1 are correctly recognized.

   Example:

```
# ismadm volume show -disk
Filesystem               Size  Used  Avail Use% Mounted on
/dev/mapper/centos-root   16G  2.6G   13G   17% /
devtmpfs                 1.9G     0  1.9G    0% /dev
tmpfs                    1.9G  4.0K  1.9G    1% /dev/shm
tmpfs                    1.9G  8.5M  1.9G    1% /run
tmpfs                    1.9G     0  1.9G    0% /sys/fs/cgroup
/dev/sda1                497M  170M  328M   35% /boot
tmpfs                    380M     0  380M    0% /run/user/1001
```

```
/dev/sdb                                          (Free)

  PV         VG     Fmt  Attr PSize  PFree
  /dev/sda2  centos lvm2 a--  19.51g    0
```

In this example, /dev/sdb is recognized as an area that was added but is not yet in use.

5. Allocate the added virtual disks to the system volume of the whole of ISM-VA.

```
# ismadm volume sysvol-extend -disk /dev/sdb
```

6. Confirm the virtual disk settings.

   Confirm that the newly added volume (/dev/sdb) is set for use by the system volume (centos).

```
# ismadm volume show -disk
Filesystem                Size  Used  Avail Use% Mounted on
/dev/mapper/centos-root    26G  2.5G   23G   10% /
devtmpfs                  1.9G     0  1.9G    0% /dev
tmpfs                     1.9G  4.0K  1.9G    1% /dev/shm
tmpfs                     1.9G  8.5M  1.9G    1% /run
tmpfs                     1.9G     0  1.9G    0% /sys/fs/cgroup
/dev/sda1                 497M  170M  328M   35% /boot
tmpfs                     380M     0  380M    0% /run/user/1001
tmpfs                     380M     0  380M    0% /run/user/0

  PV         VG       Fmt  Attr PSize  PFree
  /dev/sda2  centos   lvm2 a--  19.51g    0
  /dev/sdb1  centos   lvm2 a--  10.00g    0
```

7. Restart ISM-VA.

```
# ismadm power restart
```

3.7.2 Allocation of Virtual Disks to User Groups

The following example uses the Administrator user group to show the procedure for allocating virtual disks.

1. After stopping ISM-VA, create a virtual disk on the hypervisor settings screen, and then connect it to ISM-VA (virtual machine).

   Create the virtual disks so as to be controlled by SCSI controllers.

2. After starting ISM-VA, from the console, log in to ISM-VA as an administrator.

3. Stop the ISM service temporarily in order to allocate virtual disks.

```
# ismadm service stop ism
```

4. Confirm that the virtual disks you added in Step 1 are correctly recognized.

   Example of command execution:

```
# ismadm volume show -disk
Filesystem                Size  Used  Avail Use% Mounted on
/dev/mapper/centos-root    16G  2.6G   13G   17% /
devtmpfs                  1.9G     0  1.9G    0% /dev
tmpfs                     1.9G  4.0K  1.9G    1% /dev/shm
tmpfs                     1.9G  8.5M  1.9G    1% /run
tmpfs                     1.9G     0  1.9G    0% /sys/fs/cgroup
/dev/sda1                 497M  170M  328M   35% /boot
tmpfs                     380M     0  380M    0% /run/user/1001
/dev/sdb                                          (Free)

  PV         VG     Fmt  Attr PSize  PFree
  /dev/sda2  centos lvm2 a--  19.51g    0
```

In this example, /dev/sdb is recognized as an area that was added but is not yet in use.

5. Create an additional volume name for Administrator group with an arbitrary name (Example: "adminvol"), and correlate it with the newly added virtual disk (/dev/sdb).

```
# ismadm volume add -vol adminvol -disk /dev/sdb
Logical volume "/dev/mapper/adminvol-lv" created.
```

6. Enable the additional volume (in the following example "adminvol") you created in Step 5 so that it can be actually used by the Administrator group.

```
# ismadm volume mount -vol adminvol -gdir /Administrator
```

7. Confirm the virtual disk settings.

   Confirm that the newly added volume (/dev/sdb) is set for use by the Administrator group.

```
# ismadm volume show -disk
Filesystem                Size  Used  Avail Use% Mounted on
/dev/mapper/centos-root    16G  2.6G   13G   17% /
devtmpfs                  1.9G     0  1.9G    0% /dev
tmpfs                     1.9G  4.0K  1.9G    1% /dev/shm
tmpfs                     1.9G  8.6M  1.9G    1% /run
tmpfs                     1.9G     0  1.9G    0% /sys/fs/cgroup
/dev/sda1                 497M  170M  328M   35% /boot
tmpfs                     380M     0  380M    0% /run/user/1001
tmpfs                     380M     0  380M    0% /run/user/0
/dev/mapper/adminvol-lv   8.0G   39M  8.0G    1% 'RepositoryRoot'/Administrator

  PV         VG       Fmt  Attr PSize  PFree
  /dev/sda2  centos   lvm2 a--  19.51g    0
  /dev/sdb1  adminvol lvm2 a--   8.00g    0
```

8. Restart ISM-VA.

```
# ismadm power restart
```

3.8 Pre-Settings for Virtual Resource Management

Virtual Resource Management is to monitor the resources of the virtualized platform.

Management and monitoring of the virtual resource can be executed from each management screen of the virtual resource on the GUI of ISM.

For descriptions on the contents and displayed items of the GUI for Virtual Resource Management, refer to the ISM online help.

Note

- For pre-settings for Virtual Resource Management, refer to "A.1.2 Pre-settings for Virtual Resource Management."
- For the pre-settings for PRIMEFLEX for Microsoft Storage Spaces Direct/PRIMEFLEX for Microsoft Azure Stack HCI, also execute Step 5 in "B.7.1 Settings When Using a Domain User Account" for clusters.

3.9 Pre-Settings for Cluster Management

This section describes the settings required in advance for operation management of Cluster Management.

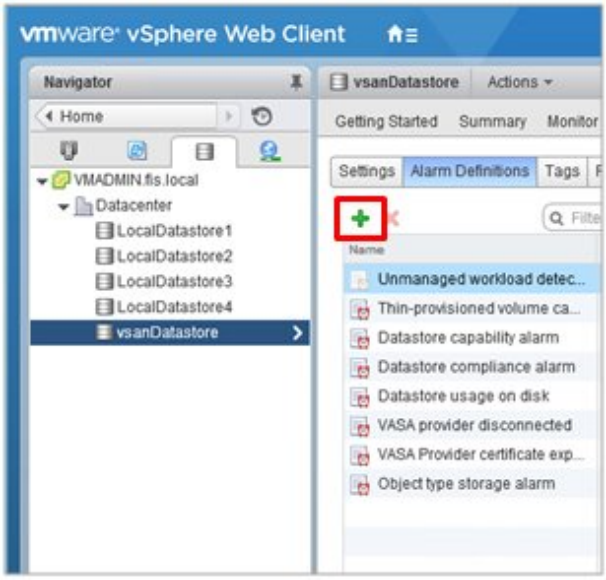
3.9.1 Pre-Settings for vSAN

A vSAN alarm must be specified to detect a datastore error when the network connection between the vSAN hosts become disconnected. The following procedure describes how to add vSAN alarm definitions.

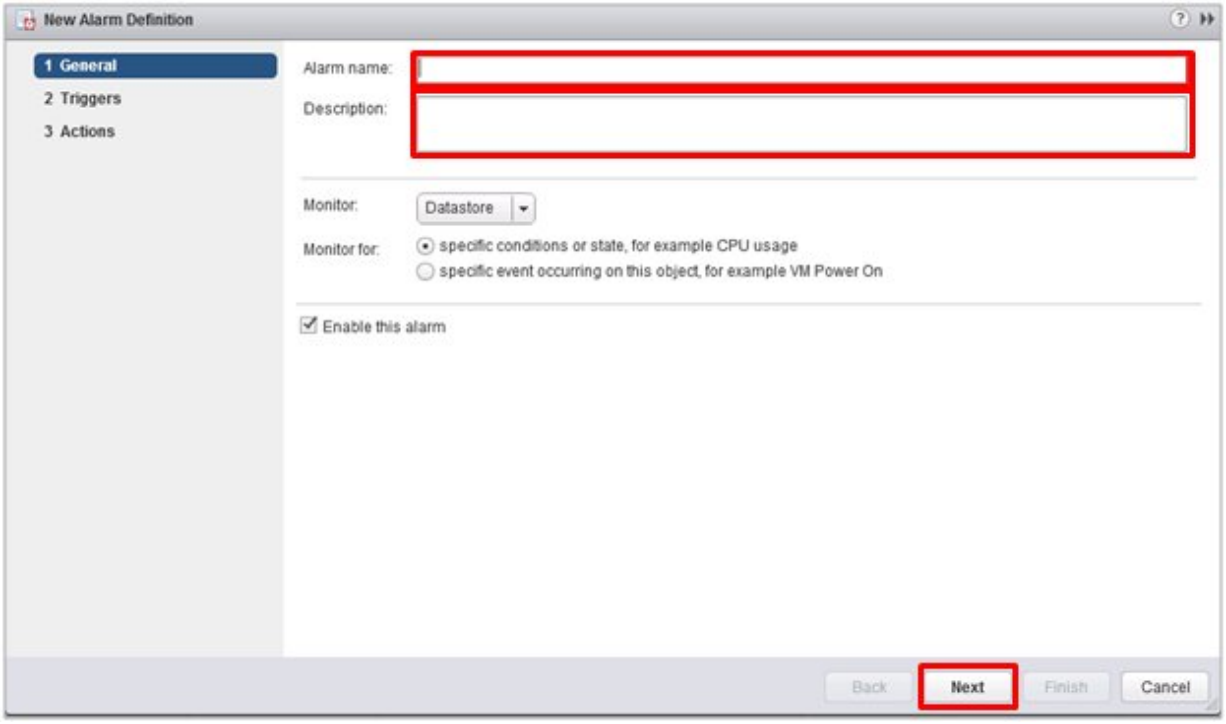
1. Display the vSphere Web Client screen, select storage from [Home] - [Navigator], and then select the created vSAN datastore.

   The following example is for the settings when a name of the vSAN datastore is "vsanDatastore."

   From the [Manage] tab on the right side of the displayed screen, select [Alarm Definition] (for vCenter Server Appliance v6.0 Update 2), and then select [+]. Alternatively, from the [Monitor] tab, select [Issues] - [Alarm Definition] (for vCenter Server Appliance v6.5), and then select [+].

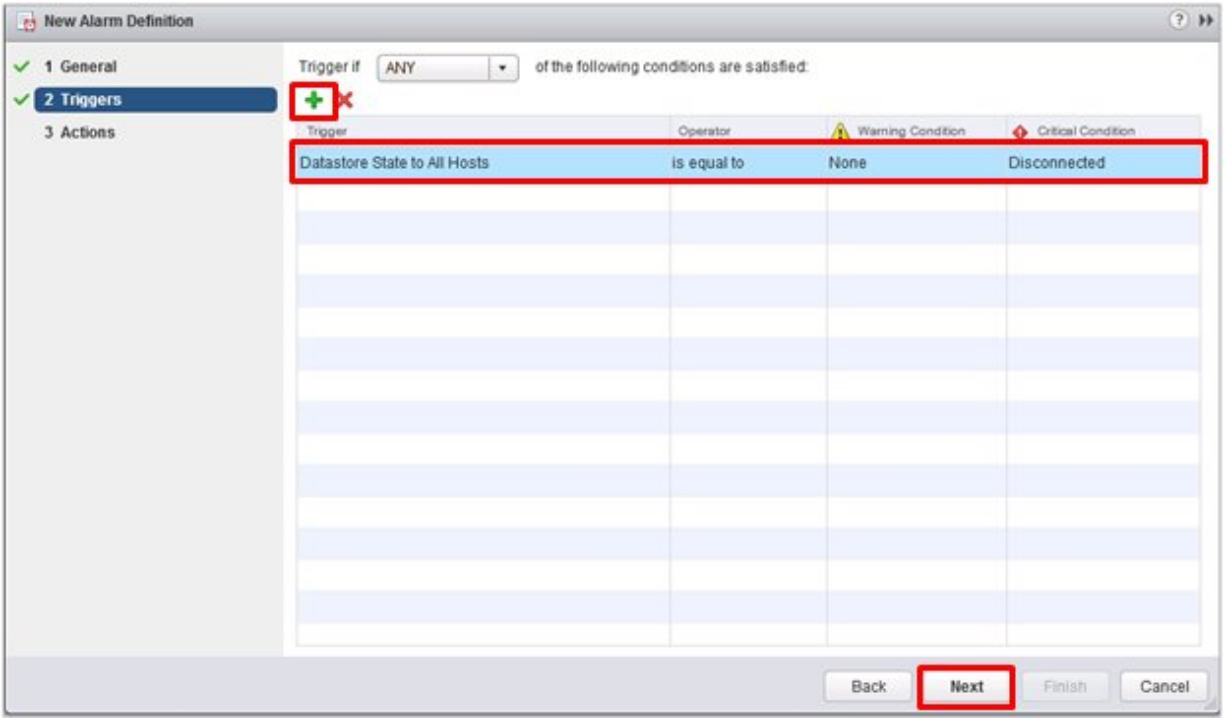


2. When the wizard screen is displayed, enter "Alarm name" and "Description" according to the following table, and then select the [Next] button.



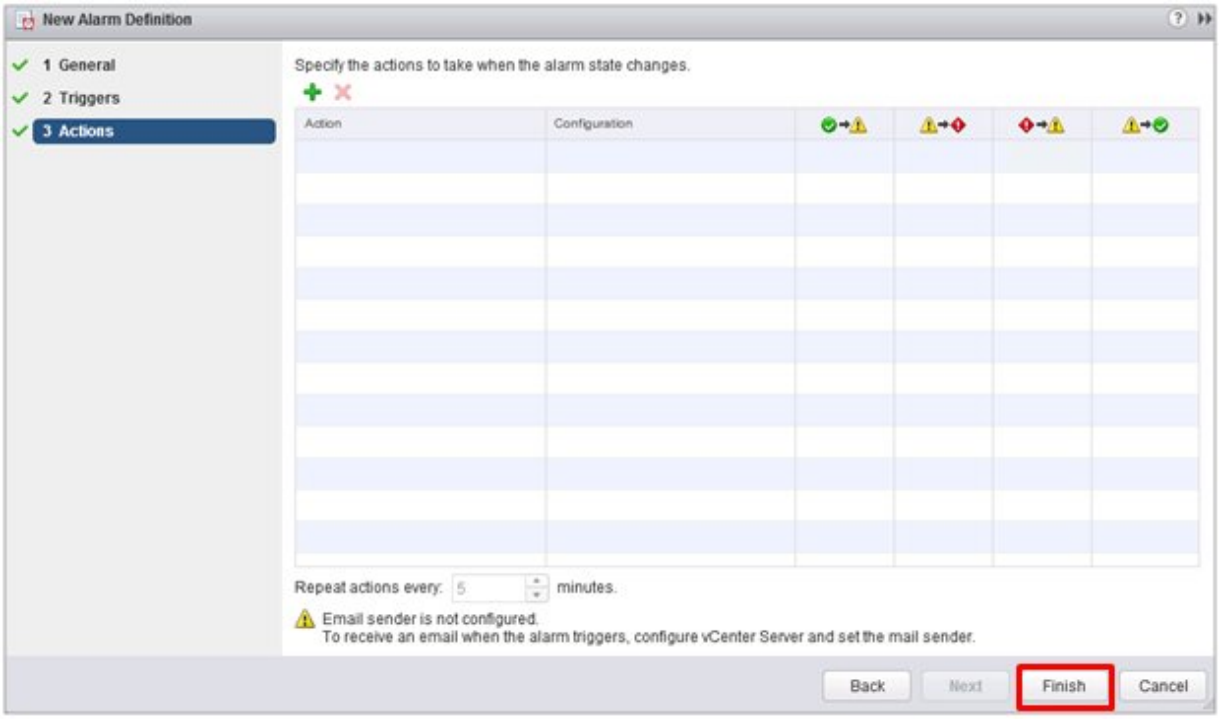
Item	Entered contents
Alarm name	Network disconnection between hosts
Description	Alarm for when the network between hosts is disconnected

3. Select [+] on the following screen, and then set each item according to the following table. Then, select the [Next] button.

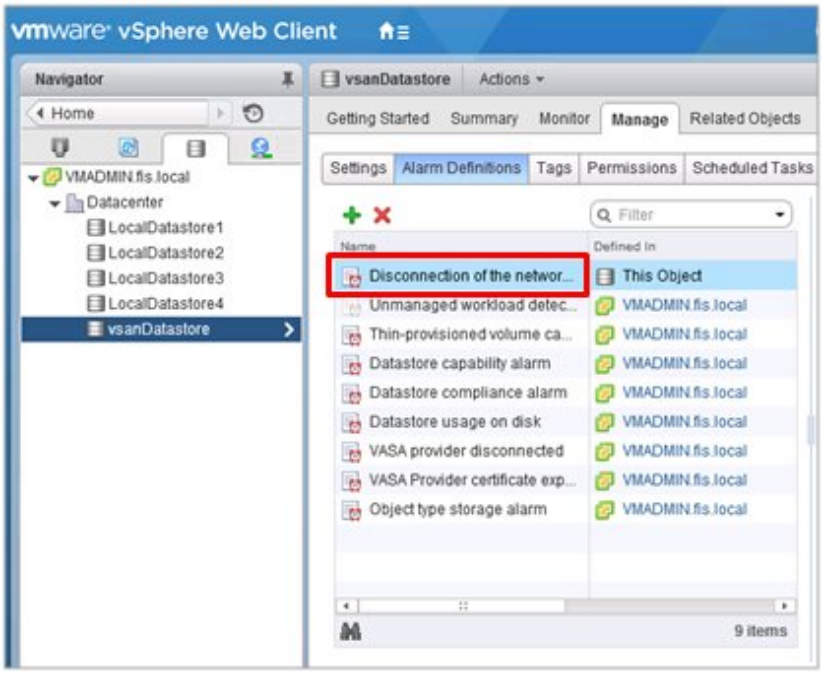


Item	Parameter
Trigger	Datastore State to All Hosts
Operator	is equal to
Warning Condition	None
Critical Condition	Disconnected

4. Action is not required to be set. Select the [Finish] button or the [Close] button.



The new definition is added to the alarm definitions when completed.



3.9.2 Pre-settings for Microsoft Storage Spaces Direct/PRIMEFLEX for Microsoft Azure Stack HCI

To manage the operation of PRIMEFLEX for Microsoft Storage Spaces Direct/PRIMEFLEX for Microsoft Azure Stack HCI, settings must be executed for monitoring OS from ISM-VA and to enable CredSSP authentication for all nodes that configure the storage pools. Use the following procedures for the settings.

Setting Windows OS monitoring from ISM

Execute the settings for monitoring Windows OS from ISM.

For the setup procedures, refer to "B.2 Setting Procedure for Monitoring Targets (OS: Windows)" or "B.7 Setting Procedure for Monitoring Targets (Cloud Management Software: Microsoft Failover Cluster)."

Note

- A domain user account is used for the operation management of PRIMEFLEX for Microsoft Storage Spaces Direct/PRIMEFLEX for Microsoft Azure Stack HCI. Implement everything, including the procedure for when using the domain user account.
- Also execute Step 5 in "B.7.1 Settings When Using a Domain User Account" for clusters.

Settings to enable CredSSP authentication

Enable CredSSP authentication for all nodes that configure the storage pool.

The nodes that configure the storage pool can be checked with the server manager or the failover cluster manager.

Note

If this setting is not executed, Virtual Resource Management for PRIMEFLEX for Microsoft Storage Spaces Direct/PRIMEFLEX for Microsoft Azure Stack HCI cannot be used.

The procedure to execute the settings to enable CredSSP authentication is shown below.

1. Log in to the node as an ISM administrator (a user belonging to the Administrator group and having Administrator role), and then start PowerShell with administrator privileges.
2. Execute the following command.

```
Enable-WSManCredSSP -Role client -DelegateComputer <target node (full computer) name>
```

   The wild card (*) can be used to specify all the full computer names in the domain.

   Example of command execution:

```
Enable-WSManCredSSP -Role client -DelegateComputer *.pfdomain.local
```

   If a message confirming whether or not to enable CredSSP authentication is displayed, enter "Y," and then press the [Enter] key.
3. Next, execute the following command.

```
Enable-WSManCredSSP -Role server
```

   If a message confirming whether or not to enable CredSSP authentication is displayed, enter "Y," and then press the [Enter] key.
4. You can use the following command to check the enable setting of CredSSP authentication.

```
Get-WSManCredSSP
```

   If a command result such as the one below is displayed, the setting to enable CredSSP authentication has been executed.

   Example:

```
This computer is configured to permit the delegation of new certificate information for the next
targets.
wsman/*.pfdomain.local
This computer is configured to receive certificate information from a remote client computer.
```

3.9.3 Pre-settings for ISM

Implement the settings required for ISM. The cloud management software and the OS information are registered.

Registering cloud management software

Register the cloud management software in ISM.

For details, refer to "2.13.6 Management of Cloud Management Software."

1. From the Global Navigation Menu on the GUI of ISM, select [Settings] - [General] - [Cloud Management Software].
2. From the [Actions] button, select [Register].
3. Enter the information that is required for registration.

   For details on the information, refer to the ISM online help.

- For PRIMEFLEX for Microsoft Storage Spaces Direct/PRIMEFLEX for Microsoft Azure Stack HCI the IP address representative of the cluster is set for the IP address.
- The tab specifies the following:
  - For vSAN

    VMware vCenter Server 6.0, 6.5 or 6.7
  - For PRIMEFLEX for Microsoft Storage Spaces Direct/PRIMEFLEX for Microsoft Azure Stack HCI

    Microsoft Failover Cluster (Windows Server 2016 or Windows Server 2019)

- If you specified Microsoft Failover Cluster, make sure to enter the domain name in upper-case letters.

4. Select the [Register] button.

   The cloud management software registered with the "Cloud Management Software List" screen is displayed.

Registration of OS information

Register the OS information of the node.

The OS information includes information such as the OS type, IP addresses, and the account information that is required for connecting to the OS.

For PRIMEFLEX for Microsoft Storage Spaces Direct/PRIMEFLEX for Microsoft Azure Stack HCI, refer to "3.9.2 Pre-settings for Microsoft Storage Spaces Direct/PRIMEFLEX for Microsoft Azure Stack HCI."

1. From the Global Navigation Menu on the GUI of ISM, select [Management] - [Nodes].

   The "Node List" screen is displayed.

2. Select the name of the applicable node, and then select the [OS] tab.
3. From the [OS Actions] button, select [Edit OS Information].
4. Enter the information that is required for registration.
   - The OS type and OS version specifies the following:
     - For vSAN

       OS type: VMware ESXi

       OS version: 6.0, 6.5 or 6.7

     - For Storage Spaces Direct

       OS type: Windows Server

       OS version: 2016 or 2019
   - Enter the OS IP address.
   - In account, enter the local user account.
5. After entering the information, select the [Apply] button.

   Confirm that "Basic Info" and "Information from OS" are displayed.

Leave the domain name field blank without setting the domain name.

It is not required to set a domain name to use a local account for operations between ISM and the OS.

Chapter 4 Operation of ISM

This chapter describes how to control ISM.

4.1 Start and Stop of ISM

Sometimes, it may be required to start or stop ISM manually for maintenance or other reasons.

4.1.1 Start of ISM-VA

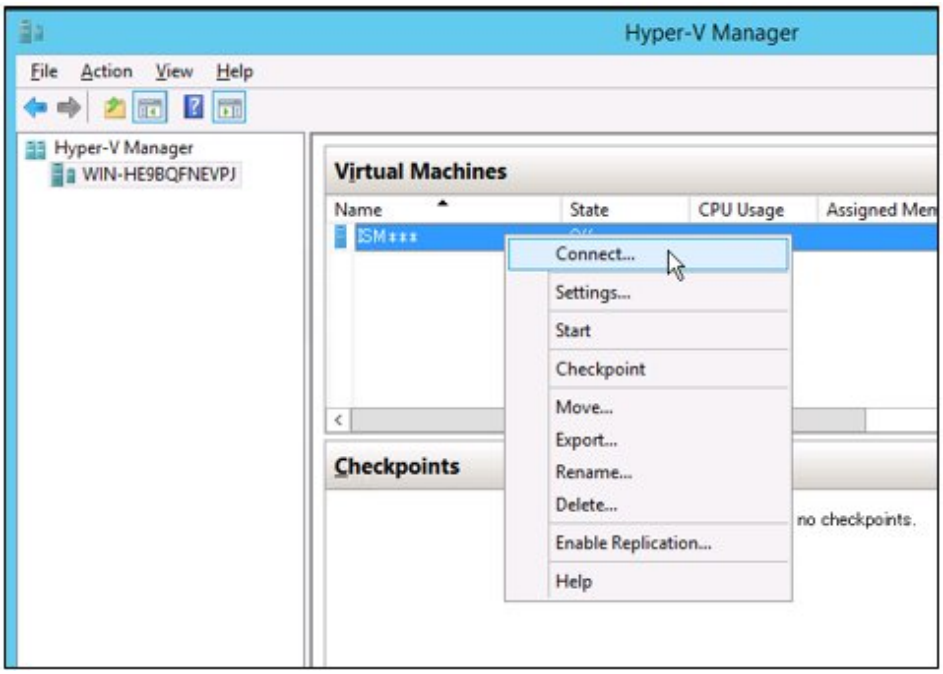
Use the respective function of the hypervisor on the installation destination to start ISM-VA. Start ISM-VA as a host OS user with administrator privileges.

The following procedures describe how to start ISM-VA from Microsoft Windows Server Hyper-V, VMware vSphere Hypervisor, and KVM.

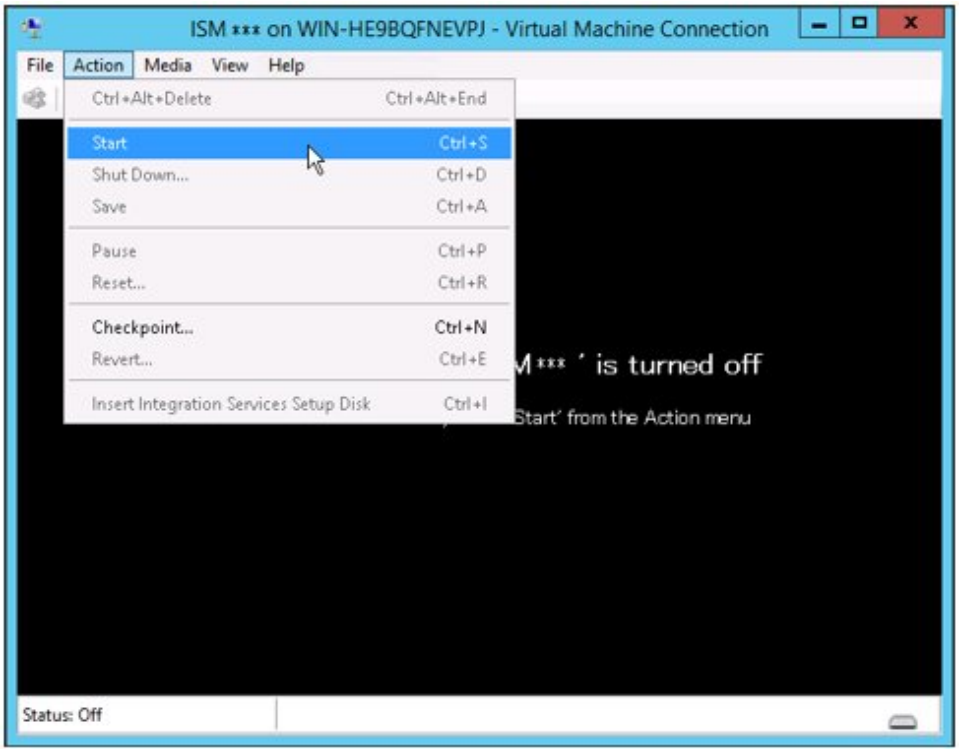
- 4.1.1.1 For ISM-VA running on Microsoft Windows Server Hyper-V (after installation)
- 4.1.1.2 For ISM-VA running on VMware vSphere Hypervisor (after installation)
- 4.1.1.3 For ISM-VA running on KVM (after installation)

4.1.1.1 For ISM-VA running on Microsoft Windows Server Hyper-V (after installation)

1. In Hyper-V Manager, right-click on the installed ISM-VA, and then select [Connect].



2. On the "Virtual Machine Connection" screen, select [Start] from the [Action] menu to start ISM-VA.



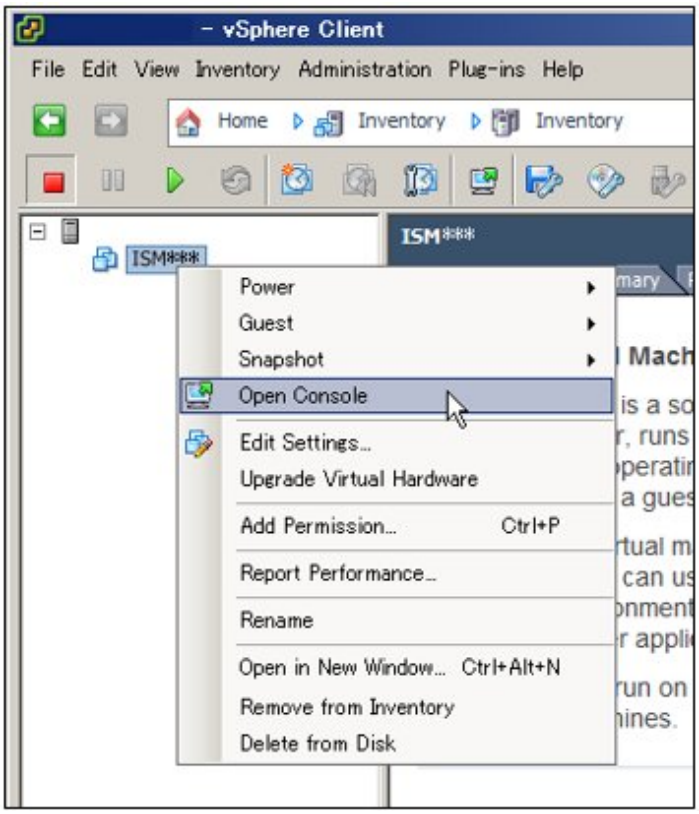
4.1.1.2 For ISM-VA running on VMware vSphere Hypervisor (after installation)

Procedures differ depending on the version of VMware ESXi. Refer to the specific reference for your version.

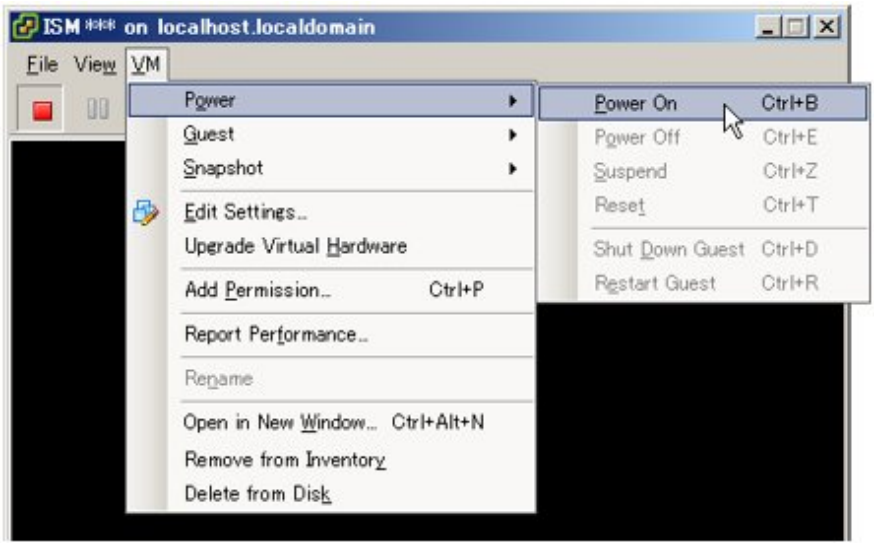
- VMware ESXi 5.5 or VMware ESXi 6.0
- VMware ESXi 6.5 or later

VMware ESXi 5.5 or VMware ESXi 6.0

1. In vSphere Client, right-click on the installed ISM-VA, and then select [Open Console].

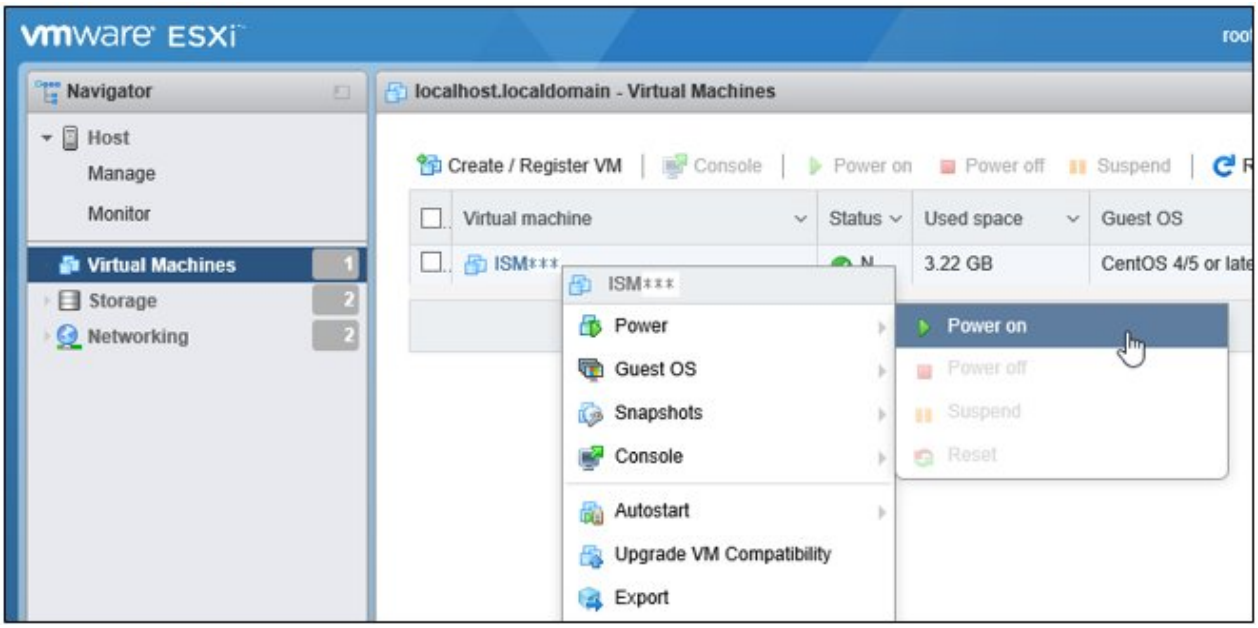


2. On the "Console" screen, select [Power] - [Power On] from the [VM] menu to start ISM-VA.

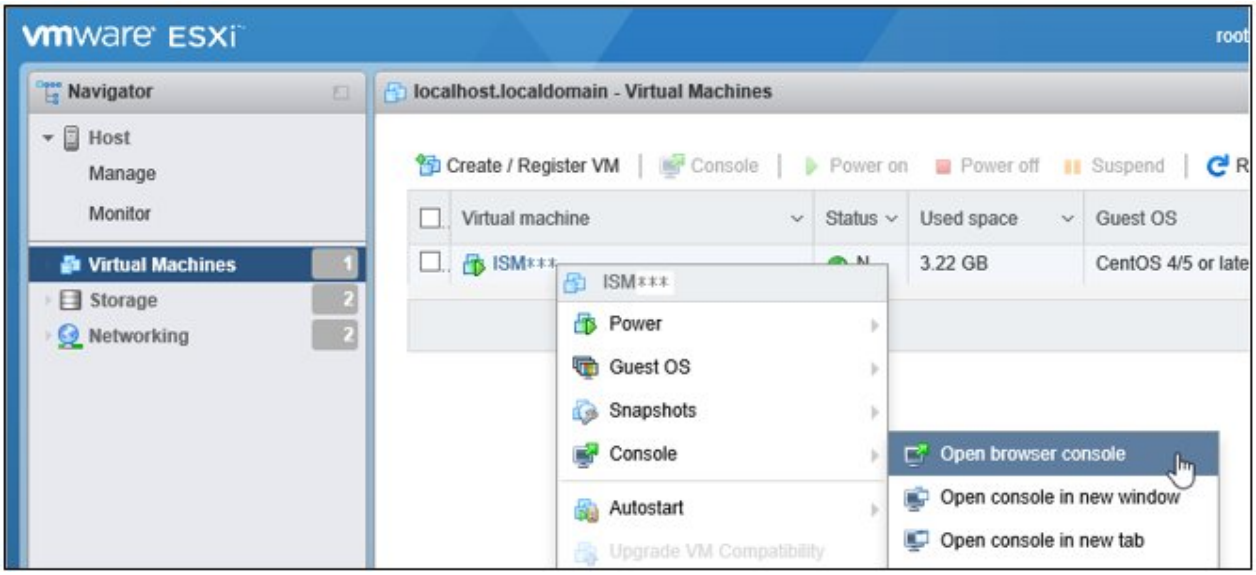


VMware ESXi 6.5 or later

1. In vSphere Client (HTML5), right-click on the installed ISM-VA, and then select [Power on].

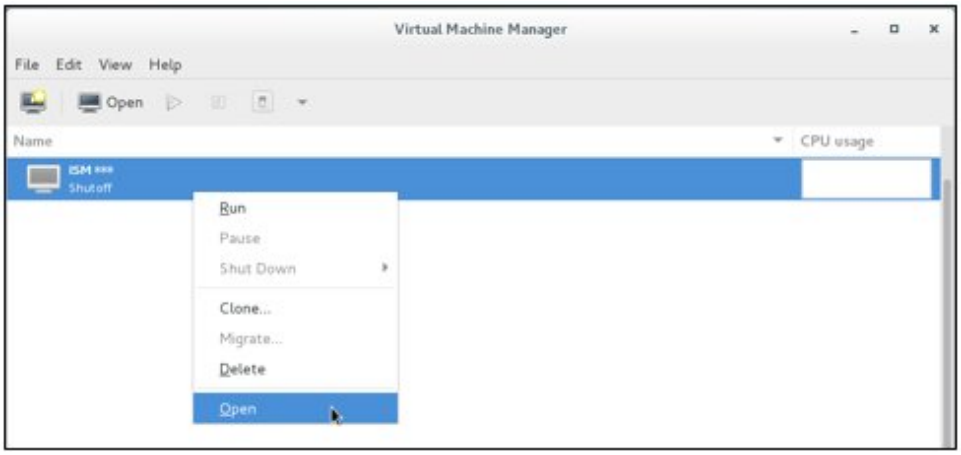


2. Right-click on the installed ISM-VA, and then select [Open browser console] or other console.

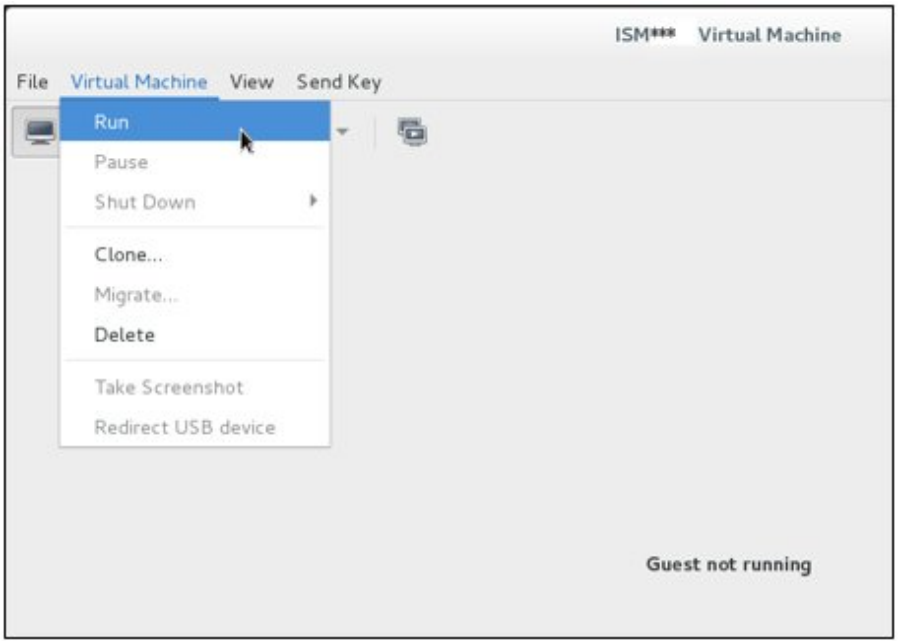


4.1.1.3 For ISM-VA running on KVM (after installation)

1. In Virtual Machine Manager, right-click on the installed ISM-VA, and then select [Open].



2. On the "ISM-VA Virtual Machine" screen, select [Run] from the [Virtual Machine] menu to start ISM-VA.



Point

Starting ISM-VA may take several minutes to complete. Wait for a while, and then confirm that you can log in to the GUI.

4.1.2 Stop of ISM-VA

Use the ISM-VA command to terminate ISM-VA.

1. Start the GUI.

   Log in to the GUI as an ISM administrator.

2. Terminate all operations.

   View the "Tasks" screen to confirm that all tasks are terminated.

   a. From the top of the Global Navigation Menu on the ISM GUI, select [Tasks].

b. In the "Tasks" screen, check that the status has become "Completed" or "Cancellation completed."

c. If there are tasks that are not either "Completed" or "Cancellation completed," then either wait for them to finish or cancel these tasks.

   If you cancel the tasks, select the tasks running and then select [Cancel] from the [Actions] button. Cancel all tasks that are currently being executed.

   Tasks of the "Updating firmware" (firmware update process) type may sometimes not be aborted by canceling. In this case, you must wait until processing finishes.

Terminating ISM-VA with any tasks still running may cause task processing to be interrupted with an error and result in incorrect operating behavior in later operations.

Therefore, be sure to either wait until all tasks finish, or cancel them manually and then, only when processing for canceling has finished, terminate ISM-VA.

3. Log out from the GUI of ISM, and then close the GUI.
4. Start the console and log in as an ISM administrator.
5. To terminate ISM-VA, execute the termination command of ISM-VA.

```
# ismadm power stop
```

4.1.3 Restart of ISM-VA

Restarts of ISM-VA are mainly executed when applying patches in ISM-VA.

1. Terminate all ISM tasks, close the GUI, and then log in to the console.

   For details on how to stop tasks and the GUI, refer to "4.1.2 Stop of ISM-VA."

2. Execute the following command to restart ISM-VA.

```
# ismadm power restart
```

4.1.4 Start and Stop of ISM Service

As soon as you start ISM-VA, the ISM service starts automatically.

To start and stop the ISM service, log in to ISM-VA from the console as an administrator and execute the applicable ISM-VA commands.

Start of ISM service

1. Execute the following command to start the ISM service.

```
# ismadm service start ism
```

Stop of ISM service

1. Terminate all ISM tasks and close the GUI.

   For details on how to stop tasks and the GUI, refer to "4.1.2 Stop of ISM-VA."

2. Execute the following command to stop the ISM service.

```
# ismadm service stop ism
```

4.2 ISM-VA Basic Settings Menu

The basic settings for ISM-VA can easily be executed either through a selection menu or an item selection format.

Displayed below are the items that can be set in the ISM-VA basic settings menu.

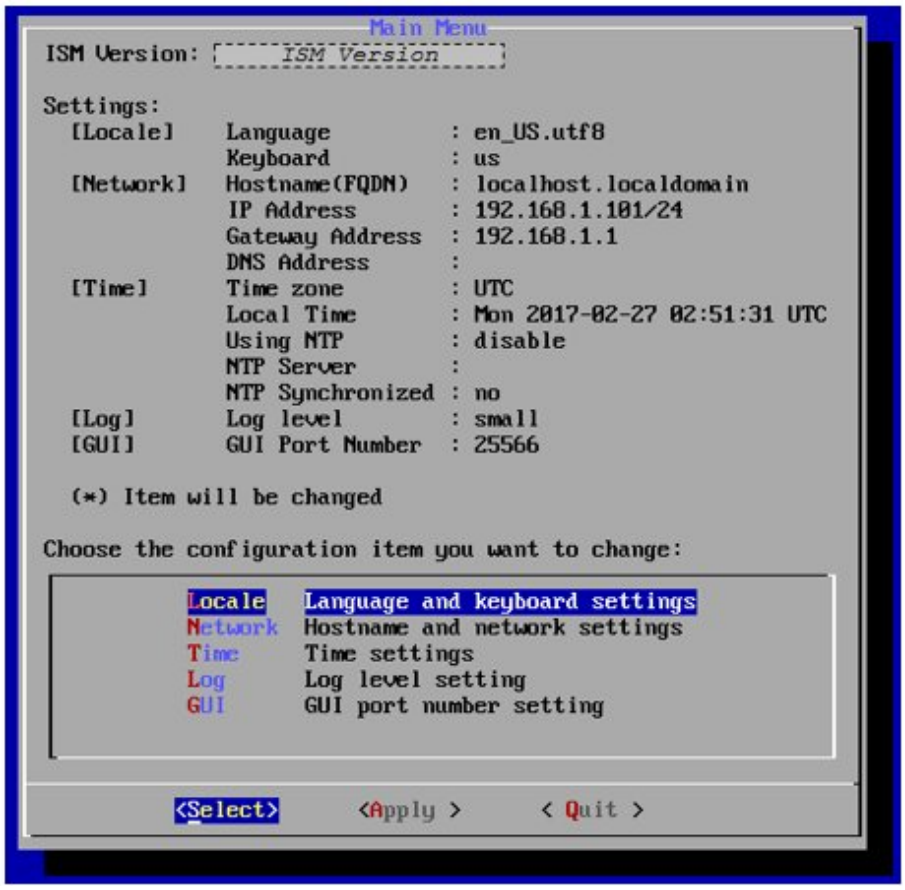
Item		Settings/Display	Corresponding ismadm command
Locale	Language	Internal language setting	ismadm locale set-locale
	Keyboard	Keyboard map setting	ismadm locale set-keymap
Network	Hostname(FQDN)	Host name setting	ismadm network modify
	IP Address	IP address setting	
	Gateway Address	Gateway setting	
	DNS Address	DNS server setting	
Time	Time zone	Time zone setting	ismadm time set-timezone
	Local Time	Local time display	ismadm time show
	Using NTP	NTP Enabling/Disabling	ismadm set-ntp
	NTP Server	NTP server setting	ismadm add-ntpserver ismadm del-ntpserver
	NTP Synchronized	NTP synchronization display	ismadm time show
Log	Log level	ISM RAS Log level setting	ismadm system change-log-level
GUI	GUI port number	Web GUI connection port setting	ismadm service modify -port

The following is the procedure for using the ISM-VA basic settings menu.

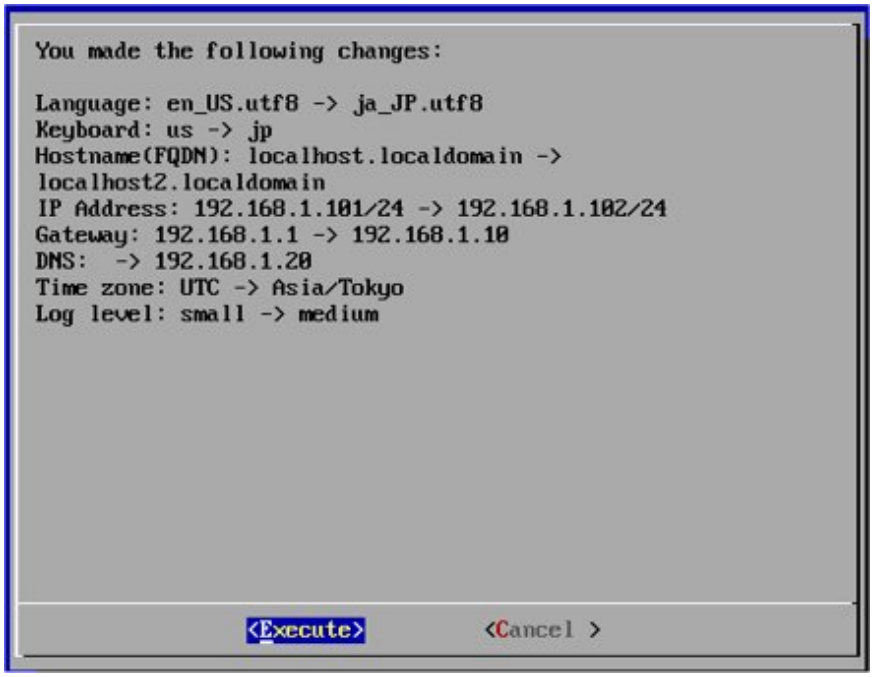
1. From the console, log in to ISM-VA as an administrator.
2. Start using the ISM-VA basic settings menu command.

```
# ismsetup
```

The screen below is displayed.



3. Select the item you want to set and enter or select a setting value.
4. After entering a setting value, select [Apply].
5. Confirm the changes, and then select [Execute].



After the change processing has finished the change results are displayed.

6. To apply the changes, select [Reboot ISM-VA] and restart ISM-VA.

4.3 Modification of Destination Port Number

You can modify the destination port number (25566) that is used for connecting to the GUI from a web browser.

1. Log in to the console as an administrator.
2. Execute the following command to stop the ISM service.

```
# ismadm service stop ism
```

3. Execute the following command to modify the destination port of ISM.

```
# ismadm service modify -port <destination port number>
```

Example of command execution:

```
# ismadm service modify -port 35566
You need to reboot the system to enable the new settings.
Immediately reboots the system.[y/n]:
```

When command execution is complete, a confirmation message is displayed, prompting whether you want to restart; enter "y" to restart ISM-VA.

When the restart is complete, the GUI can be connected from the new destination port number.

4.4 Backup and Restoration of ISM-VA

The following methods can be used to back up/restore.

- Backup/restoration of ISM-VA with the Hypervisor
- Backup/restoration of ISM with the ISM-VA Management Command

Note

When operating backup/restoration of ISM-VA, be careful of the following points.

- Operate back up with ISM-VA stopped.
- Any changes that were done after ISM has been backed up must be reflected after restoring.
- If the following links are used in ISM, determine if you must execute backup/restoration for each management server (Management VM) at the same time.
  - If the domain users and the ISM users are linked

  - If the information of the cloud management software is registered in ISM
- If you are using a backup software, back up/restore using the following functions provided by the backup software is not supported.
  - Functions that require an agent for the virtual machine (ISM-VA)
  - Restoration on file basis

4.4.1 Backup/restoration of ISM-VA with the Hypervisor

Note

Before backup/restoration of ISM-VA, stop ISM-VA. For details on how to stop it, refer to "4.1.2 Stop of ISM-VA."

Backup of ISM-VA with the Export Function

The export function of the hypervisor can be used to back up the whole of ISM-VA.

For detailed procedures to export the hypervisor, refer to "Operating Procedures."

Restoration of ISM-VA with the Import Function

Restore ISM-VA by using the procedure in "3.3 Installation of ISM-VA" to import the exported file.

4.4.2 Backup/restoration of ISM with the ISM-VA Management Command

Use the ISM-VA Management command to create a backup file that only has a part of the information.

It is different from the function of backup with the hypervisor, in that you can back up without turning off the ISM-VA. By limiting the backup targets it can be completed in less time, and the required external disk capacity is reduced. However, you must execute some environment settings, DVD imports and others again after it is restored.

Point

Estimate the required disk space before the ISM backup/restoration. For an estimate of the required disk space, refer to "3.2.1.6 Estimation of required disk space for ISM Backup/Restore."

For the ISM backup targets, refer to the following table.

Note: Y = Backup possible, N = Backup not possible

Target	Backup possible/not possible
ISM-VA setting information (setting items in the ISM-VA basic settings menu)	Y
Management data of nodes	Y
Management data of node groups	Y
Management data of accounts	Y
Management data of user groups	Y
Operation logs, audit logs, SNMP traps	Y
Profiles	Y
Power Capping settings [Note 1]	Y
Virtual disk allocation information [Note 2]	N
Repository [Note 3]	N

Target	Backup possible/not possible
Archived Logs, Node Logs [Note 3]	N
Files transferred to the "/<User group name>/ftp" directory [Note 4]	N
Firmware Baseline definitions [Note 3]	N

[Note 1]: The Power Capping settings are backed up, but Power Capping is disabled. If using Power Capping after restoration of ISM, enable Power Capping Policy. For the procedure to enable Power Capping Policy, refer to "6.4.3 Enable the Power Capping Policy of the Racks" in "Operating Procedures."

[Note 2]: After restoring ISM, the virtual disk allocation status is as follows. After restoring ISM, allocate virtual disks as required.

- The status of the allocated virtual disk to the entire ISM-VA will be back to the status of the ISM-VA that was backed up.
- The allocation of virtual disks is canceled for all user groups.

[Note 3]: The repository, Archived Logs, Node Logs, and Firmware Baseline definitions are deleted when executing restoration. After restoration, import the repository, collect logs, and create Firmware Baseline definitions again.

[Note 4]: The transferred files are deleted when executing restoration. However, the script file specified in the "Execute Script after Installation" item in Profile Management is backed up.

Restoration of the ISM backup file can only be executed for certain restoration destinations (ISM-VA backup).

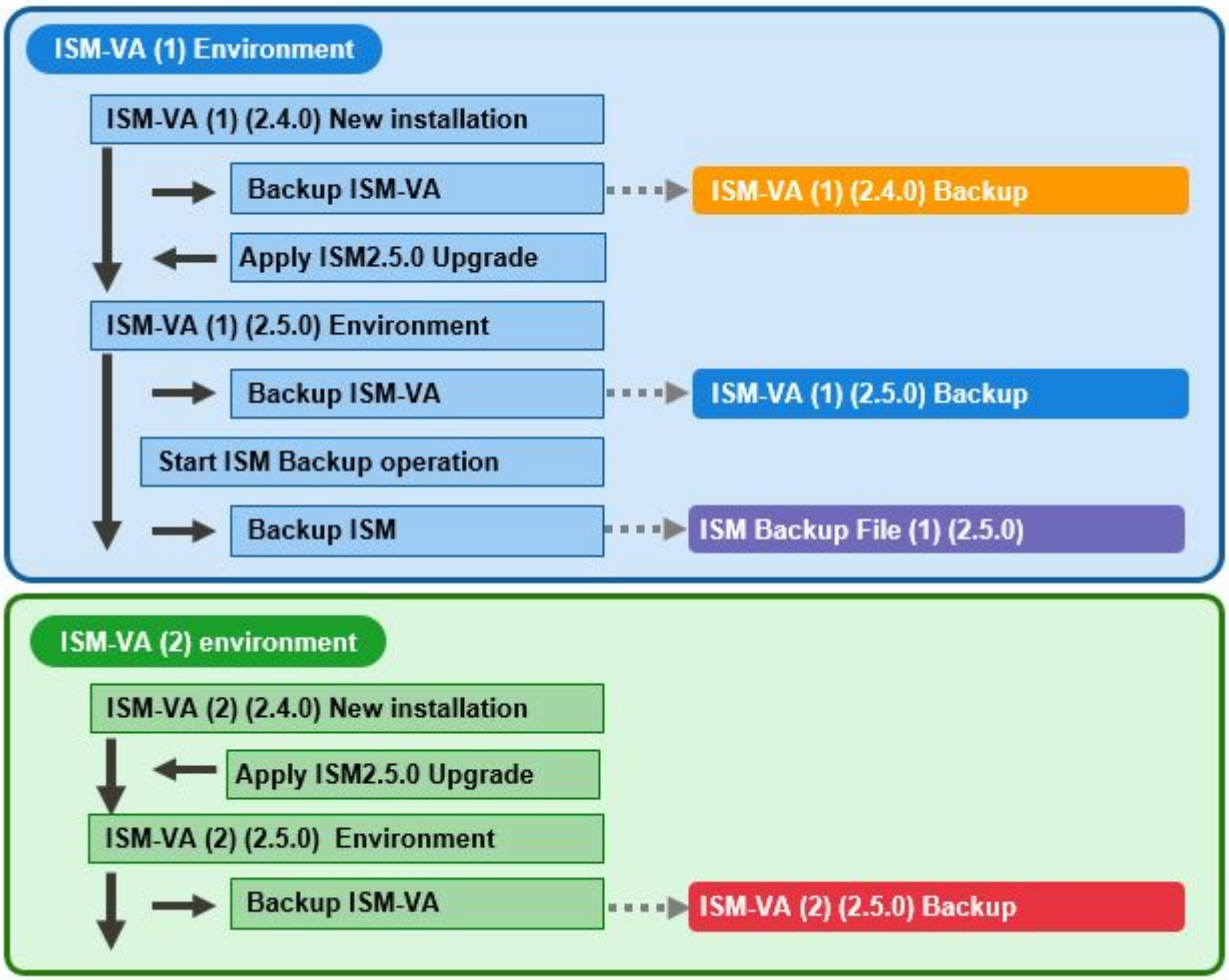
The requirements for ISM-VA that can be used as restoration destinations are as follows. Restoration for ISM-VA other than the ones below is not supported.

- The environment that backed up and restored ISM-VA before starting ISM backup
- The version of the backup of ISM-VA used as restoration destination and the version of the ISM backup file are the same

The following shows an example.

This section describes whether or not it is possible to restore the ISM backup file (1)(2.5.0) backed up in ISM-VA(1)(2.5.0).

The ISM backup file (1)(2.5.0) and each ISM-VA backup are the ones that has been retrieved using the following flow.



The following shows when it is possible and not possible to restore ISM backup file (1)(2.5.0).

Note: Y = Restoration possible, N = Restoration not possible

ISM-VA environment	ISM-VA restoration destination	Restoration possible/not possible
ISM-VA (1)	The environment where the ISM-VA(1)(2.5.0) backup was restored	Y [Note 1]
	The environment where the ISM-VA(1)(2.4.0) backup was restored	N [Note 2]
	The environment upgraded to ISM 2.5.0 where the ISM-VA(1)(2.4.0) backup was restored	N [Note 2]
ISM-VA (2)	The environment where the ISM-VA(2)(2.5.0) backup was restored	N [Note 3]

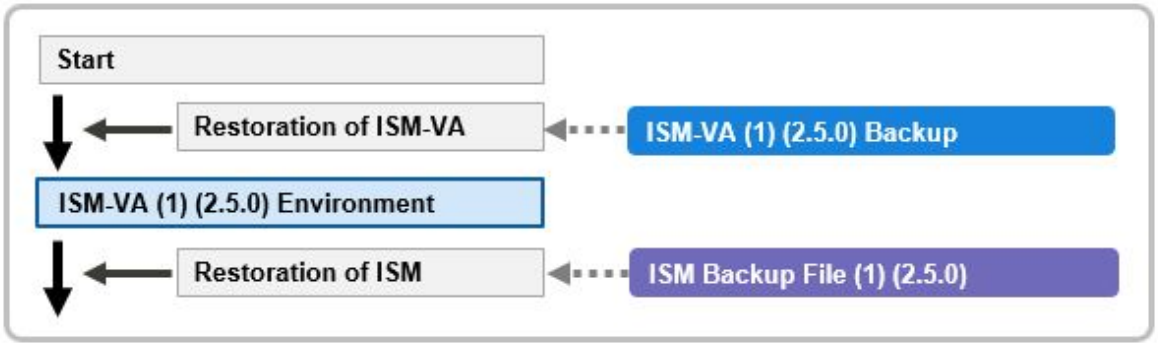
[Note 1]: For details, refer to "ISM restoration for environments where the ISM-VA(1)(2.5.0) backup was restored."

[Note 2]: For details, refer to "ISM restoration for environments where the ISM-VA(1)(2.4.0) backup was restored."

[Note 3]: For details, refer to "ISM restoration for environments where the ISM-VA(2)(2.5.0) backup was restored."

ISM restoration for environments where the ISM-VA(1)(2.5.0) backup was restored

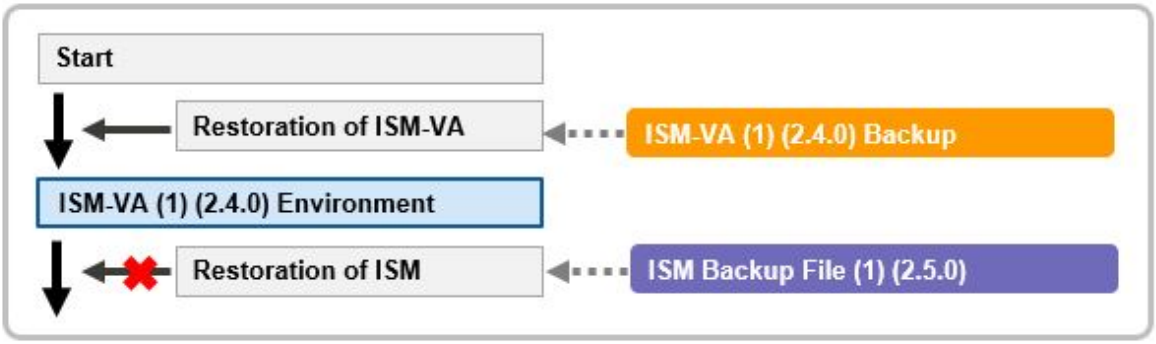
Restoration can be executed for the ISM backup file (1)(2.5.0) in an environment where the ISM-VA(1)(2.5.0) backup was restored.



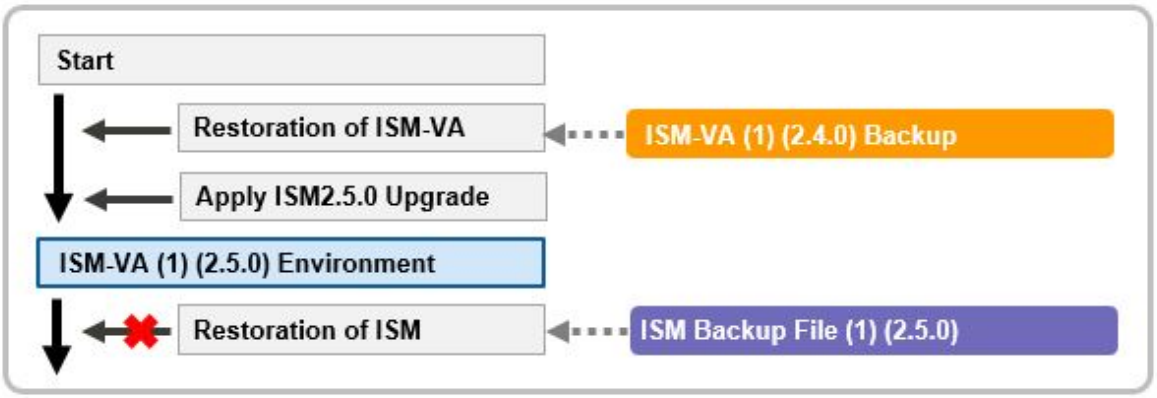
ISM restoration for environments where the ISM-VA(1)(2.4.0) backup was restored

Restoration of ISM backup file (1)(2.5.0) is not supported in an environment where the ISM-VA(1)(2.4.0) backup was restored.

ISM restoration is not supported for environments that were restored with an ISM-VA backup with of a different version than the ISM backup file.



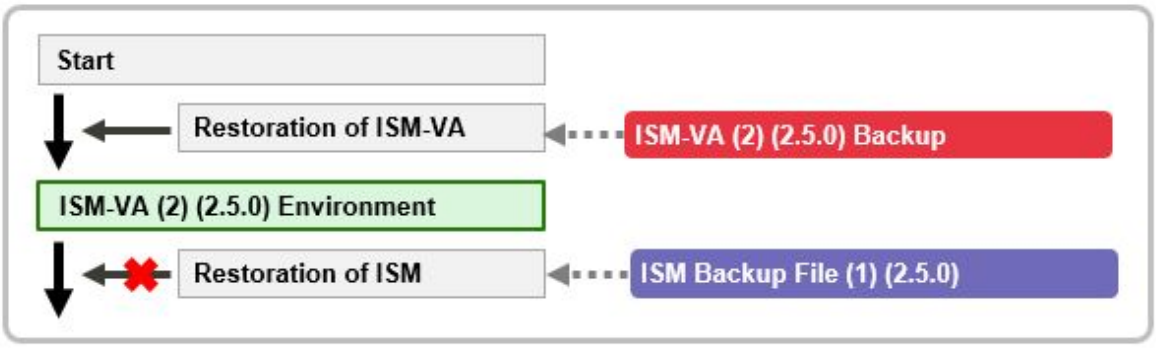
Also, after restoring an ISM-VA(1)(2.4.0) backup, restoration for an environment upgraded to ISM 2.5.0 is not supported either.



ISM restoration for environments where the ISM-VA(2)(2.5.0) backup was restored

Restoration of ISM backup file (1)(2.5.0) is not supported in an environment where the ISM-VA(2)(2.5.0) backup was restored.

ISM restoration is not supported for environments restored with an ISM-VA backup that is different from the ISM-VA created with the ISM backup file.



For details on the procedure, refer to "Operating Procedures."

4.4.2.1 Backup of ISM

The following is the backup command of ISM.

```
# ismadm system backup
```

An example of ISM backup command execution is displayed below.

When you execute the command, the available disk space and the disk space required for ISM backup are displayed.

Confirm that there is enough available disk space, then in "Start backup process? [y/n]:" enter "y" and press the [Enter] key. When aborting the ISM backup, enter "n" and press the [Enter] key.

Note

If you execute backup with insufficient available disk space, this will result in an error.

Example of ISM backup command execution: (The sentences after the * are not actually displayed on the screen.)

```
# ismadm system backup
[System Information]
Version : 2.5.0 (S2019xxxx-xx) *Version of the operating ISM-VA

[Disk Space Available]
System         : 27000MB        *Available disk space in the system (whole of ISM-VA [Note 1])
/Administrator : 17000MB        *Available disk space in the /Administrator repository

[Disk Space Required]
System         :1200MB         *Disk space required in the system (whole of ISM-VA [Note 1])to
                                    execute backup
/Administrator : 1200MB        *Disk space required in /Administrator repository to execute backup

Start backup process? [y/n]:  *Select to execute/stop the backup


        (Backup process execution display)


Output file: /Administrator/ftp/ism<ISM version>-backup-<Backup date and time>.tar.gz
*Backup file name
```

[Note 1]: Including user group repositories not allocated to the virtual disks.

Since the backup file is output under "/Administrator/ftp" it can be read via FTP.

Note

When you transfer backup files via FTP, transfer them in binary mode.

Point

If the available disk capacity is not sufficient, take the following actions:

- If System is not sufficient, follow "4.6.2 Allocation of Additional Virtual Disks to Entire ISM-VA" and add virtual disks.
- If "/Administrator" is not sufficient, delete files that are not required, or follow "4.6.3 Allocation of Additional Virtual Disks to User Groups" and add virtual disks.

4.4.2.2 Restoration of ISM

Prepare the backup files to restore ISM in "/Administrator/ftp" in advance.

The backup files that can be specified in ISM restoration can be checked in "4.4.2.3 Display of backup file list."

The following is the ISM restore command. In <Backup file name>, specify the backup file saved in "/Administrator/ftp."

```
# ismadm system restore -file <Backup file name>
```

An example of ISM restore command execution is displayed below.

When you execute the command, the versions of ISV-VA and of the backup file, as well as the available disk capacity and the required disk capacity for ISM restoration are displayed.

Confirm that the versions of ISM-VA and the backup file are the same and that there is enough available capacity, then in "Start restore process? [y/n]:" enter "y" and press the [Enter] key. When aborting the ISM restoration, enter "n" and press the [Enter] key.

Example of ISM restore command execution: (The sentences after the * are not actually displayed on the screen.)

```
# ismadm system restore -file ism2.5.0-backup-20190802102723.tar.gz
[System Information]
  Version : 2.5.0 (S2019xxxx-xx)     *Version of the operating ISM-VA

[Backup File Information]
  Version : 2.5.0 (S2019xxxx-xx)     *Version of the specified backup file

[Disk Space Available]
  System         : 45000MB             *Available disk space in the system (whole of ISM-VA)

[Disk Space Required]
  System        : 2400MB        *Disk space required in the system (whole of ISM-VA)to execute restore

Start restore process? [y/n]: *Select to execute/stop the restoration
```

Note

- When you transfer backup files via FTP, transfer them in binary mode.
- After executing the ismadm system restore command, you must restart ISM-VA. For details on the procedure, refer to "Operating Procedures."

4.4.2.3 Display of backup file list

Displays a list of the backup files saved under "/Administrator/ftp."

```
# ismadm system backup -list
```

or

```
# ismadm system restore -list
```

Example of the display of backup files list command execution: (The sentences after the * are not actually displayed on the screen.)

```
# ismadm system backup -list
[System Information]
  Version : 2.5.0 (S2019xxxx-xx)        *Version of the operating ISM-VA

[Disk Space Available]
  System         : 45000MB              *Available disk space in the system (whole of ISM-VA)

[Backup Files]
------------------------------------------------------
  DIRECTORY   : /Administrator/ftp                      *Directory where the backup file is saved
  FILE NAME   : ism2.5.0-backup-20190802102723.tar.gz   *Backup file name
  FILE SIZE   : 200MB                                   *Backup file size
  BACKUP SIZE : 1200MB                                  *Size of the backed up ISM-VA information
  BACKUP DATE : 2019-08-02 10:27:23                     *Backup date/time
  VERSION     : 2.5.0 (S2019xxxx-xx)                    *Version of the backed up ISM-VA
------------------------------------------------------
  DIRECTORY   : /Administrator/ftp
  FILE NAME   : ism2.5.0-backup-20190801151041.tar.gz
  FILE SIZE   : 150MB
  BACKUP SIZE : 1000MB
  BACKUP DATE : 2019-08-01 15:10:41
  VERSION     : 2.5.0 (S2019xxxx-xx)
```

4.5 Collection of Maintenance Data

You can collect the maintenance data that will be required for the investigation if a failure occurred.

4.5.1 ISM/ISM-VA Maintenance Data

The procedure to collect the maintenance data if the failure occurred in ISM is as follows.

Collect the required maintenance data depending on the purpose of investigation for the system operated by ISM.

Target of investigation	Person in charge	Maintenance data
Investigation of malfunctions in ISM and/or ISM-VA	Local Fujitsu customer service partner	ISM RAS Logs ISM-VA Operating System logs Database information

You can collect the maintenance data either separately according to the target of your investigation or collectively all together.

Maintenance data can only be collected by ISM administrators. ISM administrators provide the person in charge with the collected maintenance data.

Note

- Retrieving database information may take several hours to complete. In addition, this requires large amounts of free disk space in ISM-VA. If you need to collect these kinds of data, or if you are going to collect multiply maintenance data together, follow the instructions of your local Fujitsu customer service partner.
- When you execute a command, the following message may sometimes be displayed on the hypervisor console, but this does not mean any problem.

```
blk_update_request:I/O error, dev fd0, sector 0
```

Output of logs used for failure investigation can be set as follows.

- 4.5.1.1 Switching the ISM RAS Log mode
- 4.5.1.2 Switching the ISM RAS Log level
- 4.5.1.3 Specification of core file collection directory
- 4.5.1.4 How to collect ISM maintenance data

4.5.1.1 Switching the ISM RAS Log mode

You can switch whether to output the details of ISM RAS Log for the failure investigation. Log output is disabled during initial installation.

1. From the console, log in to ISM-VA as an administrator.
2. Execute the command for switching the log for failure investigation on and off.
   - Enable log output

     ```
     # ismadm system set-debug-flag 1
     ```

   - Disable log output

     ```
     # ismadm system set-debug-flag 0
     ```

4.5.1.2 Switching the ISM RAS Log level

You can switch export levels for logs to be used during failure investigation.

Switching the export level allows you to limit the sizes of logs to be exported. It is set to "small" during initial installation.

Log level	Approximate size of log to be exported	Number of managed nodes
small (default)	10 GB	100 nodes
medium	40 GB	400 nodes
large	100 GB	1000 nodes

Note

- Switching is only enabled from lower levels (settings with few managed nodes) to higher levels (settings with many managed nodes).
- After switching the log level, ISM-VA must be restarted.

1. From the console, log in to ISM-VA as an administrator.
2. Stop the ISM service.

   Stop the ISM service according to the procedure described in "4.1.4 Start and Stop of ISM Service."
3. Execute the command for switching the level of the log for failure investigation.
   - Switching to "medium"

     ```
     # ismadm system change-log-level medium
     ```

   - Switching to "large"

     ```
     # ismadm system change-log-level large
     ```
4. Confirm the setting of the level of the log for failure investigation.

   To confirm the setting, you can use the command for displaying the system information.

```
# ismadm system show
ISM Version     : <Version>
GUI Port Number : 25566
Hostname        : localhost
Log Level       : medium
```

The <Version> part shows the version of ISM-VA.

5. Execute the following command to restart ISM-VA.

```
# ismadm power restart
```

After starting ISM-VA, the new level of the log for failure investigation is effective.

Point

You can also switch export levels for ISM RAS logs with "4.2 ISM-VA Basic Settings Menu."

4.5.1.3 Specification of core file collection directory

You can set a directory for collecting and as an archiving destination when exporting core file as maintenance data. If it is not set, an internal directory of system area in ISM-VA is used.

The exported core file is collected as a target of "4.5 Collection of Maintenance Data."

1. From the console, log in to ISM-VA as an administrator.
2. Execute a command for controlling the ISM-VA service.

- Display of collection directory

```
# ismadm system core-dir-show
  Core Directory: Default Internal Directory
  Store Size: 713596
```

The location of the core file collection directory currently set and the directory size of currently using are displayed.

If the collection directory location is not yet set, "Default Internal Directory" is displayed.

- Collection directory settings

```
# ismadm system core-dir-set -dir <directory>
```

Use ftp client to create a directory such as under /Administrator/ftp/ in advance, and then specify the directory.

Example:

```
# ismadm system core-dir-set -dir /Administrator/ftp/coredump/
```

Note

Use the created collection directory as dedicated to core file export, and do not locate other files.

- Clear collection directory

```
# ismadm system core-dir-reset
```

Reverse the collection directory to unset status.

4.5.1.4 How to collect ISM maintenance data

The procedures for retrieving maintenance data for ISM is either the procedure to retrieve from the GUI, or the procedure to execute a command to retrieve.
For details, refer to "8.2 Collect Maintenance Data" in "Operating Procedures."

4.5.2 ISM for PRIMEFLEX Maintenance Data

The following is the procedure for collecting the required maintenance data in case a failure occurs in the Virtual Platform Expansion function.

4.5.2.1 Logs for Cluster Creation

The Cluster Creation log is as follows.

Maintenance data	Retrieving method
Cluster Creation log	Use the ISM-VA commands to collect it. For details, refer to "4.5.1.4 How to collect ISM maintenance data."
Execution log of the OS setting script executed after OS installation	- PRIMEFLEX for VMware vSAN Retrieve it from the following location on the ESXi host. /vmfs/volumes/datastore1_error/post_script.log (Estimated capacity: About 30 KB) - PRIMEFLEX for Microsoft Storage Spaces Direct/PRIMEFLEX for Microsoft Azure Stack HCI Retrieve it from the following location on the Hyper-V host. C:\FISCRB\Log\post_script.log (Estimated capacity: About 30 KB)
Execution log of the PowerShell script executed on the Windows Server	Retrieve it from the following location on the Windows Server. - Servers configuring a new cluster of PRIMEFLEX for Microsoft Storage Spaces Direct/PRIMEFLEX for Microsoft Azure Stack HCI - DNS server of PRIMEFLEX for VMware vSAN Retrieve all of the following files. C:\FISCRB\Log\<File name of PowerShell script>_yyyymmdd-hhmmssmmm.log .log under C:\FISCRB\Log\

4.5.2.2 Logs for Cluster Expansion

The Cluster Expansion log is as follows.

Maintenance data	Retrieving method
Cluster Expansion log	Use the ISM-VA commands to collect it. For details, refer to "4.5.1.4 How to collect ISM maintenance data."
Execution log of the OS setting script executed after OS installation	- PRIMEFLEX HS/PRIMEFLEX for VMware vSAN Retrieve it from the following location on the ESXi host. /vmfs/volumes/datastore1_error/post_script.log (Estimated capacity: About 30 KB)

Maintenance data	Retrieving method
	- PRIMEFLEX for Microsoft Storage Spaces Direct/PRIMEFLEX for Microsoft Azure Stack HCI Retrieve it from the following location on the Hyper-V host. C:\FISCRB\Log\post_script.log (Estimated capacity: About 30 KB)
Execution log of the PowerShell script executed on the Windows Server	Retrieve it from the following location on the Windows Server. - Servers added when executing Cluster Expansion for the PRIMEFLEX for Microsoft Storage Spaces Direct/PRIMEFLEX for Microsoft Azure Stack HCI - DNS server of PRIMEFLEX HS/PRIMEFLEX for VMware vSAN Retrieve all of the following files. C:\FISCRB\Log\<File name of PowerShell script>_yyyymmdd-hhmmssmmm.log .log under C:\FISCRB\Log\

4.5.2.3 Logs for Cluster Management

The Cluster Management log is as follows.

Maintenance data	Retrieving method
Cluster Management log	Use the ISM-VA commands to collect it. For details, refer to "4.5.1.4 How to collect ISM maintenance data."
vSAN log	Retrieve the vc-support log from vCenter. For details, refer to "4.5.1.4 How to collect ISM maintenance data."

4.5.2.4 Logs for Rolling Update

The Rolling Update log is as follows.

Maintenance data	Retrieving method
Rolling Update log	Use the ISM-VA commands to collect it. For details, refer to "4.5.1.4 How to collect ISM maintenance data."

4.5.2.5 Logs for Node Disconnection/Reintegration (ISM 2.5.0.010 or later)

The Node Disconnection/Reintegration log is as follows.

Maintenance data	Retrieving method
Node Disconnection/Reintegration log	Use the ISM-VA commands to collect it. For details, refer to "4.5.1.4 How to collect ISM maintenance data."

4.6 Management of Virtual Disks

You can cancel or newly add allocations of virtual disks.

4.6.1 Cancellation of Virtual Disk Allocations

The allocation of virtual disks allocated in "3.7.2 Allocation of Virtual Disks to User Groups" can be canceled.

Note

- On canceling an allocation, all data that were stored in the user group will be lost.
- Allocations of virtual disks to Administrator groups cannot be canceled.
- Allocations of virtual disks to the entire ISM-VA as executed according to "3.7.1 Allocation of Virtual Disks to Entire ISM-VA" cannot be canceled.

The following operating example shows how to cancel the allocation of a virtual disk to a user group named usrgrp1.

1. After starting ISM-VA, from the console, log in to ISM-VA as an administrator.
2. In order to cancel allocation of the virtual disks, stop the ISM service temporarily.

```
# ismadm service stop ism
```

3. Confirm that the virtual disk is allocated to usrgrp1.

```
# ismadm volume show -disk
Filesystem                Size  Used Avail  Use% Mounted on
/dev/mapper/centos-root    16G  2.5G   13G   17% /
devtmpfs                  1.9G     0  1.9G    0% /dev
tmpfs                     1.9G  4.0K  1.9G    1% /dev/shm
tmpfs                     1.9G  8.6M  1.9G    1% /run
tmpfs                     1.9G     0  1.9G    0% /sys/fs/cgroup
/dev/sda1                 497M  170M  328M   35% /boot
tmpfs                     380M     0  380M    0% /run/user/0
tmpfs                     380M     0  380M    0% /run/user/1001
/dev/mapper/usrgrp1vol-lv  10G   33M   10G    1% 'RepositoryRoot'/usrgrp1

  PV         VG          Fmt  Attr PSize  PFree
  /dev/sda2  centos      lvm2 a--  19.51g    0
  /dev/sdb1  usrgrp1vol  lvm2 a--  10.00g    0
```

   In this example, the VG named usrgrp1vol is allocated to usrgrp1.

4. Specify the User Group Name and unmount the virtual disk.

```
# ismadm volume umount -gdir usrgrp1
```

5. Specify the Volume Name (usrgrp1vol) for usrgrp1 and delete the virtual disk.

```
# ismadm volume delete -vol usrgrp1vol
  Logical volume "usrgrp1vol" successfully removed.
```

6. Confirm the virtual disk settings.

   Confirm that no virtual disk is set for usrgrp1 and that the previously used directory "/dev/sdb" is now free.

```
# ismadm volume show -disk
Filesystem                Size  Used Avail  Use% Mounted on
/dev/mapper/centos-root    16G  2.5G   13G   17% /
devtmpfs                  1.9G     0  1.9G    0% /dev
tmpfs                     1.9G  4.0K  1.9G    1% /dev/shm
tmpfs                     1.9G  8.6M  1.9G    1% /run
tmpfs                     1.9G     0  1.9G    0% /sys/fs/cgroup
/dev/sda1                 497M  170M  328M   35% /boot
tmpfs                     380M     0  380M    0% /run/user/0
tmpfs                     380M     0  380M    0% /run/user/1001
/dev/sdb1                                       (Free)

  PV         VG     Fmt  Attr PSize  PFree
```

```
  /dev/sda2  centos lvm2 a--  19.51g     0
  /dev/sdb1         lvm2 ---  10.00g 10.00g
```

7. Restart ISM-VA.

```
# ismadm power restart
```

4.6.2 Allocation of Additional Virtual Disks to Entire ISM-VA

Using the same procedure as in "3.7.1 Allocation of Virtual Disks to Entire ISM-VA," you can additionally allocate multiple virtual disks to the entire ISM-VA.

4.6.3 Allocation of Additional Virtual Disks to User Groups

You can allocate virtual disks in addition to the ones you allocated according to "3.7.2 Allocation of Virtual Disks to User Groups."

The following operating example shows how to allocate an additional virtual disk to a user group named usrgrp1.

1. Connect to the virtual disk.

   Execute the operations in Step 1 of "3.7.2 Allocation of Virtual Disks to User Groups."

2. After starting up ISM-VA, from the console, log in to ISM-VA as an administrator.

3. In order to allocate the additional virtual disks, stop the ISM service temporarily.

```
# ismadm service stop ism
```

4. Confirm that the virtual disks you added in Step 1 are correctly recognized.

```
# ismadm volume show -disk
Filesystem                Size  Used Avail  Use% Mounted on
/dev/mapper/centos-root    16G  2.6G   13G   17% /
devtmpfs                  1.9G     0  1.9G    0% /dev
tmpfs                     1.9G  4.0K  1.9G    1% /dev/shm
tmpfs                     1.9G  8.5M  1.9G    1% /run
tmpfs                     1.9G     0  1.9G    0% /sys/fs/cgroup
/dev/sda1                 497M  169M  329M   34% /boot
/dev/mapper/usrgrp1vol-lv  10G  33M   10G    1% 'RepositoryRoot'/usrgrp1
tmpfs                     380M     0  380M    0% /run/user/0
/dev/sdc                                     (Free)

  PV         VG      Fmt  Attr PSize  PFree
  /dev/sda2  centos  lvm2 a--  19.51g    0
  /dev/sdb1  usrgrp1vol  lvm2 a--  10.00g    0
```

   In this example, /dev/sdc is recognized as an area that was added but is not yet in use.

5. Execute the command for allocating additional virtual disks in order to allocate the added virtual disk to usrgrp1vol.

```
# ismadm volume extend -vol usrgrp1vol -disk /dev/sdc
  Logical volume "/dev/mapper/usrgrp1vol-lv" resized.
```

6. Confirm the virtual disk settings.

   Confirm that the newly added volume (/dev/sdc) is set for use by usrgrp1 (usrgrp1vol).

```
# ismadm volume show -disk
Filesystem                Size  Used Avail  Use% Mounted on
/dev/mapper/centos-root    16G  2.6G   13G   17% /
devtmpfs                  1.9G     0  1.9G    0% /dev
tmpfs                     1.9G  4.0K  1.9G    1% /dev/shm
tmpfs                     1.9G  8.6M  1.9G    1% /run
tmpfs                     1.9G     0  1.9G    0% /sys/fs/cgroup
/dev/sda1                 497M  170M  328M   35% /boot
```

```
/dev/mapper/usrgrp1vol-lv  15G   33M   15G    1% 'RepositoryRoot'/usrgrp1
tmpfs                     380M     0  380M    0% /run/user/0
tmpfs                     380M     0  380M    0% /run/user/1001

  PV         VG      Fmt  Attr PSize  PFree
  /dev/sda2  centos  lvm2 a--  19.51g    0
  /dev/sdb1  usrgrp1vol lvm2 a--  10.00g    0
  /dev/sdc1  usrgrp1vol lvm2 a--   5.00g    0
```

7. Restart ISM-VA.

```
# ismadm power restart
```

4.7 Certificate Activation

You can manage an SSL certificate that is set in the web browser when you use the ISM GUI.

4.7.1 Deployment of SSL Server Certificates

When using a SSL server certificate issued by an authentication authority concerning security, follow the procedure below to set it.

1. Transfer the SSL server certificate to ISM-VA.

   Transfer destination: /Administrator/ftp

   For information on how to transfer files using the GUI, refer to "4.22 File Upload Using the GUI."

   For information on how to transfer files via FTP, refer to "2.1.2 FTP Access."

2. From the console, log in to ISM-VA as an administrator.

3. Deploy the SSL server certificate.

   Execute the following command, specifying the "key" and "crt" files you transferred.

   ```
   # ismadm sslcert set -key /Administrator/ftp/server.key -crt /Administrator/ftp/server.crt
   ```

4. Restart ISM-VA.

   ```
   # ismadm power restart
   ```

Point

You can create the unique SSL server certificate corresponding to the unique host name used in a local network on the Linux server with the openssl command installed, with use of the following commands.

```
# openssl genrsa -rand /proc/uptime 2048 > server.key
# openssl req -new -key server.key -x509 -sha256 -days 365 -set_serial $RANDOM -extensions v3_req -out
server.crt
```

- Specify an arbitrary file name for the file name of the certificate (server.key/server.crt)
- Specify the effective days of the certificate for days option
- Specify the host name upon entering "Common Name" after executing openssl req command

4.7.2 Display of SSL Server Certificates

You can have the SSL certificates displayed that are enabled in ISM-VA.

1. From the console, log in to ISM-VA as an administrator.

2. Execute the command for displaying the SSL server certificates.

```
# ismadm sslcert show
```

4.7.3 Export of SSL Server Certificates

You can export the SSL certificates that are enabled in ISM-VA.

1. From the console, log in to ISM-VA as an administrator.
2. Execute the command for exporting the SSL server certificates.

```
# ismadm sslcert export -dir /Administrator/ftp
```

You can download the exported files via FTP.

4.7.4 Creation of Self-signed SSL Server Certificates

Create a self-signed SSL server certificate based on the IP address specified in ISM-VA or FQDN.

1. From the console, log in to ISM-VA as an administrator.
2. Execute the command for creating the self-signed SSL server certificates.
   - For SSL accessing with IP address

```
# ismadm sslcert self-create -cnset ip
```

   - For SSL accessing with FQDN

```
# ismadm sslcert self-create -cnset fqdn
```

3. Restart ISM-VA.

```
# ismadm power restart
```

4.7.5 Download of CA Certificates

You can download CA certificates from the following URL when self-signed SSL server certificates are created.

`https://<IP address of ISM-VA>:25566/ca.crt`

If you are using Internet Explorer or Google Chrome, execute [Save as] and change the file name to "ca.crt" for the displayed contents. When saving, select one of the following file types depending on the browser:

- Internet Explorer: [Text file (*.txt)]
- Google Chrome: [All files]

Example of command execution: when downloading to a Linux server where the curl command has been installed

```
# curl -Ok https://192.168.10.20:25566/ca.crt
```

4.8 License Settings

You can register, display, and delete server licenses and node licenses in ISM-VA.

1. From the console, log in to ISM-VA as an administrator.
2. Execute a command for the license settings.
   - Registration of licenses

```
# ismadm license set -key <License key>
```

- Display of licenses

```
# ismadm license show
```

Example of command execution:

```
# ismadm license show
Operation Mode : Advanced
#  [Type]  [Edition]  [#Node]  [Exp.Date]  [Reg.Date]  [Licensekey]
1  Server  Adv.             -           -  2019-08-01  **********************==
2  Node    Adv.            10           -  2019-08-01  **********************==
```

Table 4.1 Description on the command output

Item	Description
[Operation Mode]	Displays one of the following ISM Operation Modes: - Essential - Advanced - Advanced for PRIMEFLEX
[Type]	Displays "Server" for a server license and "Node" for a node license.
[Edition]	Displays one of the following types of the license: - Adv.: ISM license - I4P: ISM for PRIMEFLEX license
[#Node]	Displays the number of nodes that can be managed on that license. Always displays a "-" if the license type is "Server."
[Exp.Date]	Displays the expiration date of the license. Always displays a "-" if it is unlimited.
[Reg.Date]	Displays the date when the license was registered.
[Licensekey]	Displays the character string of the registered license key.

- Deletion of licenses

```
# ismadm license delete -key <License key>
```

Note

After registering or deleting licenses, ISM-VA must be restarted.

Point

You can register licenses, check the displayed contents including license types, and delete licenses by selecting [Settings] - [General] - [License] from the Global Navigation Menu on the GUI of ISM.

4.9 Network Settings

You can execute and display the network settings.

1. From the console, log in to ISM-VA as an administrator.
2. Execute a command for the network settings.

   - Display of network devices

```
# ismadm network device
```

- Modification of network settings

```
# ismadm network modify <LAN device name> ipv4.method manual ipv4.addresses <IP address>/
<Maskbit> ipv4.gateway <Gateway IP address>
```

Note

After modifying any network settings, ISM-VA must be restarted.

Example of command execution:

```
# ismadm network modify eth0 ipv4.method manual ipv4.addresses 192.168.1.101/24 ipv4.gateway
192.168.1.1
```

- Add DNS server

```
# ismadm network modify <LAN device name> +ipv4.dns <DNS server>
```

Example of command execution:

```
# ismadm network modify eth0 +ipv4.dns 192.168.1.2
```

- Delete DNS server

```
# ismadm network modify <LAN device name> -ipv4.dns <DNS server>
```

Example of command execution:

```
# ismadm network modify eth0 -ipv4.dns 192.168.1.2
```

- Display of network settings

```
# ismadm network show <LAN device name>
```

Example of command execution:

```
# ismadm network show eth0
```

Point

You can also execute the network setting with "4.2 ISM-VA Basic Settings Menu."

4.10 Alarm Notification Settings

You can register certificates to be used when sending alarm notifications from Monitoring.

Registration of certificates for alarm notification mails

1. Transfer the certificates.

   Transfer destination: <User group name>/ftp/cert

   For information on how to transfer files using the GUI, refer to "4.22 File Upload Using the GUI."

   For information on how to transfer files via FTP, refer to "2.1.2 FTP Access."

2. From the console, log in to ISM-VA as an administrator.
3. Execute the command for registering certificates for alarm notification mails.

```
# ismadm event import -type cert
```

Point

To display and delete the certificates for alarm notification mails that are registered in ISM-VA, use the following command.

- Display of certificates for alarm notification mails

```
# ismadm event show -type cert
```

- Deletion of certificates for alarm notification mails

```
# ismadm event delete -type cert  -file <Certificate file> -gid <User Group Name>
```

4.11 ISM-VA Service Control

This function can stop and restart ISM-VA as well as control the services that run internally.

1. From the console, log in to ISM-VA as an administrator.
2. Execute a command for controlling the ISM-VA service.

   - Restart of ISM-VA

   ```
   ismadm power restart
   ```

   - Stop of ISM-VA

   ```
   ismadm power stop
   ```

   - Display of list of internal services

   ```
   ismadm service show
   ```

   - Start of internal services individually

   ```
   ismadm service start <Service name>
   ```

   Example of command execution: Start FTP server individually

   ```
   # ismadm service start vsftpd
   ```

   - Stop of internal services individually

   ```
   ismadm service stop <Service name>
   ```

   Example of command execution: Stop FTP server individually

   ```
   # ismadm service stop vsftpd
   ```

   - Restart of internal services individually

   ```
   ismadm service restart <Service name>
   ```

   Example of command execution: Restart FTP server individually

   ```
   # ismadm service restart vsftpd
   ```

   - Display of status of internal services individually

   ```
   ismadm service status <Service name>
   ```

   Example of command execution: Display FTP server status individually

   ```
   # ismadm service status vsftpd
   ```

- Enabling internal services individually

```
ismadm service enable <Service name>
```

Example of command execution: Enable FTP server individually

```
# ismadm service enable vsftpd
```

- Disabling internal services individually

```
ismadm service disable <Service name>
```

Example of command execution: Disable FTP server individually

```
# ismadm service disable vsftpd
```

4.12 Display of System Information

You can have the internal system information of ISM-VA displayed from the console.

1. From the console, log in to ISM-VA as an administrator.
2. Execute the command for displaying the system information.

```
# ismadm system show
ISM Version     : <Version>
GUI Port Number : 25566
Hostname        : localhost
Log Level       : small
```

The <Version> part shows the version of ISM-VA.

4.13 Modification of Host Names

You can modify the host name of ISM-VA.

1. From the console, log in to ISM-VA as an administrator.
2. Execute the command for modification of host names.

```
# ismadm system modify -hostname <Host name (FQDN)>
```

Example of command execution:

```
# ismadm system modify -hostname ismva2.domainname
You need to reboot the system to enable the new settings.
Immediately reboots the system. [y/n]:
```

Note

- Enter the host name in lowercase letters.
- After executing the command, a reboot is required.
- To modify the default host name "localhost," you need to follow the procedure described in "4.7 Certificate Activation" and deploy a certificate in ISM-VA that corresponds to the modified host name.

Point

You can also modify the host name with "4.2 ISM-VA Basic Settings Menu."

4.14 Operation of Plug-in

You can apply and delete plug-in to/from ISM-VA, and display the plug-in applied to ISM-VA.

4.14.1 Application of Plug-in

1. Transfer the plug-in files to ISM-VA.

   Transfer destination: /Administrator/ftp

   For information on how to transfer files using the GUI, refer to "4.22 File Upload Using the GUI."

   For information on how to transfer files via FTP, refer to "2.1.2 FTP Access."

   Transfer the plug-in file in binary mode.

2. From the console, log in to ISM-VA as an administrator.

3. In order to apply plug-in, stop the ISM service temporarily.

   Stop the ISM service according to the procedure described in "4.1.4 Start and Stop of ISM Service."

4. Execute the command for applying plug-in.

   Execute the following command, specifying the plug-in file.

   ```
   # ismadm system plugin-add -file <Plug-in file>
   ```

   Example of command execution:

   ```
   # ismadm system plugin-add -file /Administrator/ftp/FJSVsvism-ext-1.0.0-10.tar.gz
   ```

5. After applying the plug-in, restart ISM-VA.

   ```
   # ismadm power restart
   ```

4.14.2 Display of Plug-in

Display of the applied plug-in version.

```
# ismadm system plugin-show
  FJSVsvism-ext 1.0.0
```

It is displayed in "Plug-in name and version" format.

Point

You can also display the information about plug-in with use of the command "ismadm system show" from "4.12 Display of System Information."

```
# ismadm system show
ISM Version     : <Version>
GUI Port Number : 25566
Hostname        : localhost
Log Level       : small
Plugin          : FJSVsvism-ext 1.0.0
```

The <Version> part shows the version of ISM-VA.

Plugin displays the applied plug-in name and its version.

4.14.3 Deletion of Plug-in

Uninstall the applied plug-in.

1. Execute the command for deleting plug-in.

```
# ismadm system plugin-del -name <Plug-in Name>
```

   The plug-in name is displayed with the command output in "4.14.2 Display of Plug-in."

   Example of command execution:

```
# ismadm system plugin-del -name FJSVsvism-ext
Uninstall plugin <FJSVsvism-ext 1.0.0> ? [y/n]:
```

   After executing the command, the confirmation screen to uninstall the plug-in is displayed.

2. Enter [y] to finalize the uninstallation.

3. After plug-in deletion, restart ISM-VA.

```
# ismadm power restart
```

4.15 ISM-VA Internal DHCP Server

You can use ISM-VA as a DHCP server by starting the ISM-VA internal DHCP services.

A DHCP server is required when using Profile Management for OS installation. It is possible to either use an external DHCP server or to use the procedure below to set up ISM as a DHCP server (In this case, you can select which DHCP server is used according to the operating procedure described in "4.15.4 Switch of DHCP Servers").

If you use only the external DHCP server, the following settings are not required.

4.15.1 Settings for ISM-VA Internal DHCP Server

Set up the ISM-VA internal DHCP server. After the setup, the settings are made effective by stopping the DHCP services and starting them again.

Note

Stop DHCP services and start them after changing the settings for the DHCP server.

For the methods to stop and start the service, refer to "4.15.2 Operation of ISM-VA Internal DHCP Service."

To set up a DHCP server, you have two procedures. Set up the DHCP server with the either procedure according to your operation.

- Setup by specifying the parameter of ismadm dhcpsrv command

  This sets up for the DHCP server required for profile assignment of ISM-VA.

- Setup with conf file

  This sets up for general DHCP servers, regardless of the settings used in profile assignment of ISM-VA.

Setup by specifying the parameter of ismadm dhcpsrv command

```
# ismadm dhcpsrv set-simple -subnet <subnet>
                            -netmask <subnet mask>
                            -start <allocate start address>
                            -end <allocate end address>
                            -broadcast <broadcast address>
                            [-dns <DNS server IP address>]
                            [-gw <gateway IP address>]
```

You must enter the command in a single line.

You must specify the following parameters:

-subnet

-netmask

-start

-end

-broadcast

Example of command execution:

```
# ismadm dhcpsrv set-simple -subnet 192.168.1.0 -netmask 255.255.255.0 -start 192.168.1.150 -end
192.168.1.160 -broadcast 192.168.1.255 -dns 192.168.1.200 -gw 192.168.1.250

---------------- New Configuration ----------------
ddns-update-style none;
default-lease-time 86400;
max-lease-time 259200;

shared-network LOCAL-NET {
  subnet 192.168.1.0 netmask 255.255.255.0 {
     range 192.168.1.150 192.168.1.160;
     option subnet-mask 255.255.255.0;
     option broadcast-address 192.168.1.255;
     option vendor-class-identifier "PXEClient";
     option domain-name-servers 192.168.1.200;
     option routers 192.168.1.250;
          }
       }
-------------------------------------------------
Update DHCP configureation ? (Current settings are discarded)
[y/n]:
```

When you execute the command, a message to confirm the value that you have set is displayed; enter "y" to confirm the setting.

Setup with conf file

Upload the conf file with description and feed the file with the command.

For information on how to transfer files using the GUI, refer to "4.22 File Upload Using the GUI."

For information on how to transfer files via FTP, refer to "2.1.2 FTP Access."

```
# ismadm dhcpsrv set -file <conf file>
```

Example of command execution:

```
# ismadm dhcpsrv set -file /Administrator/ftp/dhcpd.conf.new
```

4.15.2 Operation of ISM-VA Internal DHCP Service

You can start and stop the ISM-VA internal DHCP services and display their statuses.

- Confirmation of DHCP service status

```
# ismadm service status dhcpd
```

Command output

```
Active: active(running) :DHCP service active status
Active: inactive(dead)  :DHCP service inactive status
/usr/lib/systemd/system/dhcpd.service; enable;   :Settings to enable when booting ISM-VA
/usr/lib/systemd/system/dhcpd.service; disabled; :Settings not to enable when booting ISM-VA
```

- Manual start of DHCP services

```
# ismadm service start dhcpd
```

Note

- Set up for the DHCP server before you start the ISM-VA internal DHCP services.

  For the method to set up the DHCP server, refer to "4.15.1 Settings for ISM-VA Internal DHCP Server."

- When the DHCP server is in "dead" state even in active settings, confirm if an error is shown with "4.15.3 Confirmation of ISM-VA Internal DHCP Server Information" - "Display of the DHCP server message."

- Manual stop of DHCP services

```
# ismadm service stop dhcpd
```

- Setup to enable DHCP services upon start of ISM-VA

```
# ismadm service enable dhcpd
```

- Setup not to enable DHCP services upon start of ISM-VA

```
# ismadm service disable dhcpd
```

4.15.3 Confirmation of ISM-VA Internal DHCP Server Information

You can display the ISM-VA internal DHCP server information.

You can execute the following: Display the contents of the currently-set DHCP server, Display messages of the DHCP server, Export the current set contents (conf file) to the location where ftp access is possible, and Export a sample conf file to the location where ftp access is possible.

- Display of the contents of the currently set DHCP server

```
# ismadm dhcpsrv show-conf
```

- Display of the DHCP server message

```
# ismadm dhcpsrv show-msg [-line]
```

  20 lines are displayed when you execute it without option.

  You can specify the number of displayed lines by specifying the option [-line].

  Example of command execution:

```
# ismadm dhcpsrv show-msg -line 50
```

- Export of the current setting contents (conf file) to the location where ftp access is possible

```
# ismadm dhcpsrv export-conf -dir /Administrator/ftp
```

- Export a sample setting content (conf file) to the location where ftp access is possible

```
# ismadm dhcpsrv export-sample -dir /Administrator/ftp
```

4.15.4 Switch of DHCP Servers

When you use a DHCP server with Profile Management, you can switch use of the server between the ISM-VA internal DHCP server and the external DHCP server.

- Display of the current setting

```
# ismadm dhcpsrv show-mode
```

  Command output

```
DHCP mode: local   :ISM-VA internal DHCP server is used in Profile function.
DHCP mode: remote  :The external DHCP server is used in Profile function.
```

- Switching of the settings
  - Setting up so that a profile is assigned with use of the ISM-VA internal DHCP server

```
# ismadm dhcpsrv set-mode local
```

  - Setting up so that a profile is assigned with use of the external DHCP server

```
# ismadm dhcpsrv set-mode remote
```

4.16 MIB File Settings

You can import MIB files that allow you to execute arbitrary trap reception in ISM-VA.

Registration of MIB files

1. Transfer an MIB file.

   Transfer destination: /Administrator/ftp/mibs

   For information on how to transfer files using the GUI, refer to "4.22 File Upload Using the GUI."

   For information on how to transfer files via FTP, refer to "2.1.2 FTP Access."

2. From the console, log in to ISM-VA as an administrator.
3. Execute MIB file registration command.

```
# ismadm mib import
```

Point

You can display and delete the MIB files registered on ISM-VA by using the following commands.

- Display of MIB files

```
# ismadm mib show
```

- Deletion of MIB files

```
# ismadm mib delete -file <MIB file name>
```

4.17 Application of Patches

You can apply patches to ISM-VA.

Note

Back up ISM-VA before applying patches.

For the backup procedure, refer to "2.1.2 Export ISM-VA" in "Operating Procedures."

1. Transfer the patch files to ISM-VA.

   Transfer destination: /Administrator/ftp

   Patch files (tar.gz format) are included in the released files (zip format).
   Decompress the released files to obtain the patch files.

For information on how to transfer files using the GUI, refer to "4.22 File Upload Using the GUI."

For information on how to transfer files via FTP, refer to "2.1.2 FTP Access."

Transfer the correction file in binary mode.

2. From the console, log in to ISM-VA as an administrator.
3. In order to apply patches, stop the ISM service temporarily.

   Stop the ISM service according to the procedure described in "4.1.4 Start and Stop of ISM Service."
4. Execute the command for applying patches.

   Execute the following command, specifying the patch file.

```
# ismadm system patch-add -file <Patch file path>
```

   Example of command execution:

```
# ismadm system patch-add -file /Administrator/ftp/ISM240x_S20190901-01.tar.gz
```

5. After applying patches, restart ISM-VA.

```
# ismadm power restart
```

4.18 Upgrade of ISM-VA

If you need to upgrade ISM, contact your local Fujitsu customer service partner.

Note

If you want to upgrade from V1.0 - V1.5 to V2.5, contact your local Fujitsu customer service partner.

After acquiring the upgrade file, use the following procedure to upgrade.

Note

Back up ISM-VA before upgrading.

For the backup procedure, refer to "2.1.2 Export ISM-VA" in "Operating Procedures."

1. Transfer the upgrade files to ISM-VA.

   Transfer destination: /Administrator/ftp

   Check the names of the upgrade files in the readme.txt or readme_en.txt file saved in the upgrade program.

   For information on how to transfer files using the GUI, refer to "4.22 File Upload Using the GUI."

   For information on how to transfer files via FTP, refer to "2.1.2 FTP Access."
2. From the console, log in to ISM-VA as an administrator.
3. In order to execute upgrade, stop the ISM service temporarily.

   Stop the ISM service according to the procedure described in "4.1.4 Start and Stop of ISM Service."
4. Execute the upgrade command.

   Execute the following command, specifying the upgrade file.

```
# ismadm system upgrade -file <Upgrade file path>
```

   Example of command execution:

```
# ismadm system upgrade -file /Administrator/ftp/ISM240x_S20190901-01.tar.gz
```

5. After executing the upgrade, restart ISM-VA.

```
# ismadm power restart
```

4.19 ISM-VA Statistics Information Display

You can display statistics information of the CPU utilization rate, memory utilization rate, and swap utilization number for ISM-VA.

4.19.1 Overview of Statistics Information Display

You can summarize and display all data (about one month's data) collected by the hour.

```
# ismadm system stat
```

Table 4.2 Output contents

Display Item	Description
DATE	Date
CPU-avg	Average CPU utilization rate
CPU-max	Maximum CPU utilization rate
MEM-total	Physical memory capacity (MB) allocated to ISM-VA
MEM-avg	Average memory utilization rate (except the cache used by the OS)
MEM-max	Maximum memory utilization rate (except the cache used by the OS)
SWAP-avg	Average swap utilization number per second
SWAP-max	Maximum swap utilization number per second

Example of command execution:

```
# ismadm system stat
    DATE     CPU-avg   CPU-max   MEM-total MEM-avg   MEM-max   SWAP-avg   SWAP-max
2018/04/01    32.43     35.18      7823     57.96     58.71      0.00       0.00
2018/04/02    32.85     36.99      7823     57.52     58.66      0.00       0.00
2018/04/03    33.00     38.33      7823     56.14     58.17      0.00       0.00
2018/04/04    32.64     38.65      7823     54.22     55.22      0.00       0.00
2018/04/05    32.64     37.76      7823     53.84     54.97      0.00       0.00
2018/04/06    29.90     37.72      7823     54.62     56.28      0.00       0.00
2018/04/07    18.75     44.33      7823     55.01     56.13      0.00       0.00
```

4.19.2 Network Statistics Information Display

You can display the data of the specified date by the hour. The date can be specified individually or in a range. The detailed data for all dates collected with the "all" specification is displayed.

```
# ismadm system stat -date {DATE or all}
```

Table 4.3 Output contents

Display Item	Description
DATE	Date
HOUR	Hour (hour)
CPU-avg	Average CPU utilization rate
CPU-max	Maximum CPU utilization rate

Display Item	Description
MEM-total	Physical memory capacity (MB) allocated to ISM-VA
MEM-avg	Average memory utilization rate (except the cache used by the OS)
MEM-max	Maximum memory utilization rate (except the cache used by the OS)
SWAP-avg	Average swap utilization number per second
SWAP-max	Maximum swap utilization number per second

- Example of execution (for individual specification):

```
# ismadm system stat -date 2018/04/01,2018/04/02,2018/04/03
    DATE    HOUR   CPU-avg   CPU-max   MEM-total MEM-avg   MEM-max   SWAP-avg   SWAP-max
2018/04/01 00:00    31.57     33.87      7823     54.31     54.76      0.00       0.00
2018/04/01 01:00    31.97     34.25      7823     54.26     54.80      0.00       0.00
2018/04/01 02:00    32.13     34.13      7823     54.25     54.88      0.00       0.00
```

- Example of execution (for range specification):

```
# ismadm system stat -date 2018/04/01-2018/04/05
    DATE    HOUR   CPU-avg   CPU-max   MEM-total MEM-avg   MEM-max   SWAP-avg   SWAP-max
2018/04/01 00:00    31.57     33.87      7823     54.31     54.76      0.00       0.00
2018/04/01 01:00    31.97     34.25      7823     54.26     54.80      0.00       0.00
2018/04/01 02:00    32.13     34.13      7823     54.25     54.88      0.00       0.00
```

- Example of execution (when specifying all):

```
# ismadm system stat -date all
    DATE    HOUR   CPU-avg   CPU-max   MEM-total MEM-avg   MEM-max   SWAP-avg   SWAP-max
2018/04/01 00:00    31.57     33.87      7823     54.31     54.76      0.00       0.00
2018/04/01 01:00    31.97     34.25      7823     54.26     54.80      0.00       0.00
2018/04/01 02:00    32.13     34.13      7823     54.25     54.88      0.00       0.00
```

4.19.3 Real Time Information Display

You can summarize the currently operating information at intervals of one second and displays them for the specified number of times. The number of times that can be specified is in the range between 1 and 600.

```
# ismadm system stat -real {COUNT}
```

Table 4.4 Output contents

Display Item	Description
DATE	Date
TIME	Time
CPU-avg	Average CPU utilization rate
MEM-total	Physical memory capacity (MB) allocated to ISM-VA
MEM-avg	Average memory utilization rate (except the cache used by the OS)
SWAP-avg	Average swap utilization number per second

Example of command execution:

```
# ismadm system stat -real 10
    DATE     TIME     CPU-avg   MEM-total  MEM-avg    SWAP-avg
2018/04/10 08:00:25     0.51      7823       63.28      0.00
2018/04/10 08:00:26     1.02      7823       63.28      0.00
2018/04/10 08:00:27     1.52      7823       63.28      0.00
2018/04/10 08:00:28     0.51      7823       63.28      0.00
2018/04/10 08:00:29     1.52      7823       63.28      0.00
```

```
2018/04/10 08:00:30     2.02      7823       63.29      0.00
2018/04/10 08:00:31     1.02      7823       63.29      0.00
2018/04/10 08:00:32     1.51      7823       63.29      0.00
2018/04/10 08:00:33     1.02      7823       63.29      0.00
2018/04/10 08:00:34     1.52      7823       63.29      0.00
```

4.19.4 Output Statistics Information File

You can output the same contents that is displayed on the screen to a file.

Use Overview of Statistics Information Display, Detailed Statistics Information Display and the Real Time Information Display combined together.

Output location: /Administrator/ftp/ismva_stat.txt

```
# ismadm system stat -file
```

```
# ismadm system stat -date {DATE or all} -file
```

```
# ismadm system stat -real {COUNT} -file
```

4.20 Change of the SSL/TLS Protocol Version

You can set the available SSL/TLS protocol versions.

1. From the console, log in to ISM-VA as an administrator.
2. Execute the command to set SSL/TLS to be enabled.

   ```
   # ismadm security enable-tls TLSv1.1,TLSv1.2
   You need to reboot the system to enable the new settings. Immediately reboots the system. [y/n]:
   ```

   When command execution is complete, a confirmation message prompting whether you want to restart is displayed.
3. Enter "y" to restart ISM-VA.

   After the restart the specified SSL/TLS protocol version can be used.

- When executing the command, specify the versions that are permitted to be used separated with a comma (not a space).

  The following versions can be specified:

  SSLv3, TLSv1, TLSv1.1, and TLSv1.2
- After executing the command, a reboot is required.
- The following is set by default.

ISM environment	SSL/TLS versions that can be used
Update/upgrade from a version earlier than ISM 2.3.0	SSLv3, TLSv1, TLSv1.1, TLSv1.2
Starts from ISM 2.3.0 or later	TLSv1.2

4.21 Settings for Links with Other Software

You can register certificates used when linking to other software.

1. Transfer the certificates.

   Transfer destination: /Administrator/ftp/software/cert

For information on how to transfer files using the GUI, refer to "4.22 File Upload Using the GUI."

For information on how to transfer files via FTP, refer to "2.1.2 FTP Access."

2. From the console, log in to ISM-VA as an administrator.
3. Execute a command to register certificates used when linking to other software.

```
# ismadm security import-software-cert -software <Software name> -type <ipv4, ipv6 or fqdn> -
server <IP address or FQDN of the server where you installed the software> -file <Certificate
file name>
```

The following are the software names that can be specified.

Types of software	Software name specified in software
Trend Micro Deep Security	TrendMicroDeepSecurity

Note

- For the certificate used in linking with Trend Micro Deep Security, select "Base 64 encoded X.509(.CER)" from the certificate export wizard in your web browser. Selected and retrieved certificates other than "Base 64 encoded X.509(.CER)" cannot be used.
- To register the certificate used for Link with Trend Micro Deep Security, you must set the information of Trend Micro Deep Security in the widget.

Point

To display and delete the certificates for linking to other software that are registered in ISM-VA, use the following command.

- Display of certificate for link with other software

```
# ismadm security show-software-cert -software <Software name>
```

- Deletion of certificate for link with other software

```
# ismadm security delete-software-cert -software <Software name> -type <ipv4, ipv6 or fqdn> -
server <IP address or FQDN of the server where you installed the software>
```

4.22 File Upload Using the GUI

Using the GUI, the files used by the various functions in ISM can be uploaded to and deleted from the storage location in ISM-VA.

- The file storage location is the same as the storage location of the upload by FTP. For details, refer to "2.1.2 FTP Access."
- For the method to upload files, refer to "2.8 Upload Files to ISM-VA" in "Operating Procedures."

Point

The following operations are not available when you use the GUI. To perform them, use FTP.

- Downloading of the files in the file storages
- New creation, renaming, and deletion of the file storage directory

Chapter 5 Maintenance of Nodes

This chapter describes the maintenance of nodes.

5.1 Maintenance Mode

If you need to execute maintenance of a node after detecting a failure, it is recommended to enable Maintenance Mode on the target node in the ISM.

As alarm detection and background processing in ISM is restricted for nodes that Maintenance Mode is enabled, this prevents alarms from being issued repeatedly for the failed node.

The operating behavior of ISM while a node is in Maintenance Mode is as follows.

Affected function	Operating behavior in Maintenance Mode
Sensor Threshold Monitoring	Retrieval of current sensor statuses is stopped.
SNMP Trap Monitoring	Traps are received and recorded in the trap logs, but alarms are not issued.
Get Node Information	Retrieval of node information, which is periodically executed by ISM, is stopped. If required, retrieve the node information manually.
Node Log Collection	Scheduled log collections are skipped. If required, collect the Node Logs manually.

Point

During Maintenance Mode, all functions other than those stated above remain available. For example, while a node is in Maintenance Mode, you can still execute the following operations:

- Assignment, reassignment, and release of profiles
- Firmware updates
- Manual collection of node information
- Manual collection of Node Logs

Procedure for enabling Maintenance Mode

1. Open the Details of Node screen.
2. From the [Actions] button, select [Enable Maintenance Mode].

   When the screen for confirmation is displayed, confirm the node name and select [Yes].

Procedure for disabling Maintenance Mode

1. Open the Details of Node screen.
2. From the [Actions] button, select [Disable Maintenance Mode].

Note

- Enable/Disable Maintenance Mode for PRIMEQUEST also enables/disables Maintenance Mode for the partitions and extension partitions under it. You can not specify a partition or extension partition and enable/disable Maintenance Mode.
- Enable/Disable Maintenance Mode for VCS Fabric (Brocade VCS Fabric) also enables/disables Maintenance Mode for the VDX fabric switch under it. You can not specify a VDX Fabric Switch to enable/disable Maintenance Mode for.

5.2 Investigation of Errors

In ISM, malfunctions are detected separately on each node.

For information that is more detailed than what is stated in the [Events] - [Events] - [Operation Log], you must access and investigate the respective devices directly.

Appendix A Instructions for Manage and Operate Nodes

This chapter describes information on pre-settings and environmental settings, as well as settings of nodes to be managed or operated and their reference information required to use ISM.

A.1 ISM Environmental Settings

This section describes information on environmental settings and notes required to use functions of ISM.

A.1.1 DHCP/PXE Settings in Using Profile Management/Firmware Management

When using the following functions, use the PXE boot function:

- Using Profile Management to install an OS on a server
- Using Firmware Management to execute Offline Update of a server or an installed PCI card

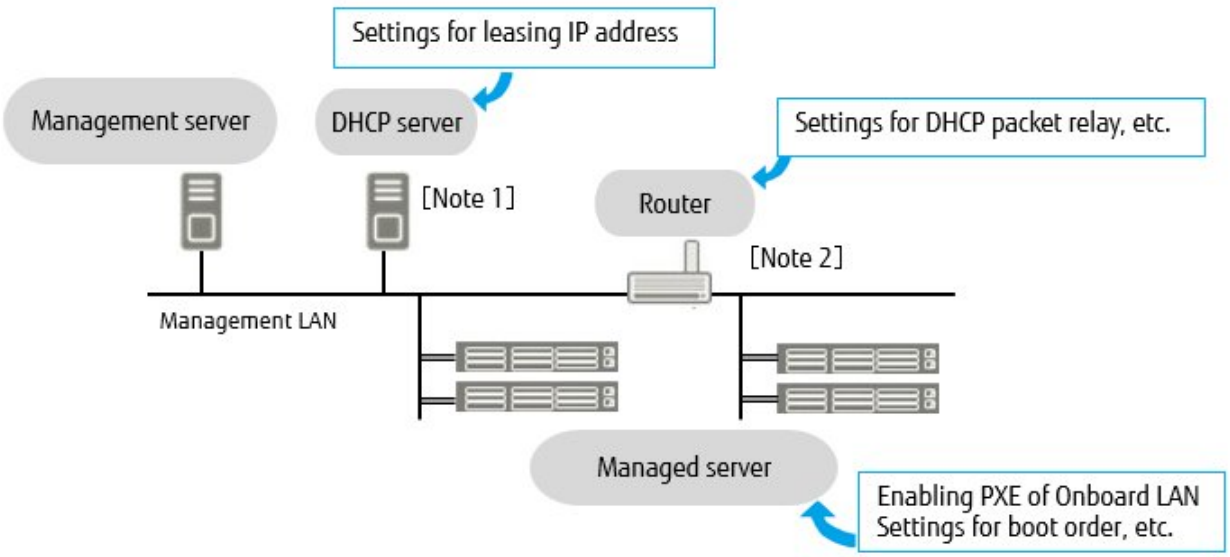
To operate PXE correctly, adequate prior preparation for managed server (node) and network configurations are required. This section provides information on the required operations for PXE boot.

Please note that for profile assignment other than OS installation and execution of firmware online update, the operations described in this section are not required.

Network configuration example

An example of network configuration in using PXE boot function and major preparatory operations are described below.

Figure A.1 Network configuration example



[Note 1]: Instead of preparing an external DHCP server, you can use the DHCP server function in the ISM-VA (management server).

You can choose to use either the external DHCP server or the DHCP server in the managed server.

[Note 2]: If the network segment is not split, a router is not required.

Required preparatory operations

Managed Server

You can use the onboard LAN port [Note 1] or LAN card for the PXE boot function.

Change BIOS settings as required and enable PXE boot from the LAN port. [Note 2]

[Note 1]: Depending on the model of managed server, it may be described as "Dynamic LoM."

[Note 2]: You can specify the LAN port in the "PXE Boot Port" settings of each node.

Note

Pre-settings:

- Configure so that the LAN port and PXE function are enabled.

  For onboard, these settings items are set as Enabled in factory shipment. Reset the settings items to Enabled if they have been changed to Disabled. For LAN cards, refer to the manuals, etc., of the respective cards.

- If PXE boot is set to Enabled for multiple network ports, check the settings of BIOS boot order and set the boot order so that the highest priority of ISM is given to the LAN port used for PXE boot in the network ports.

- If specifying the LAN port to be used with "PXE Boot Port" of ISM and the LAN port is not unique in "Select Port" (by specifying a slot number or a port number), specify the LAN port in "Select MAC Address."

DHCP Server/Router

Enable the DHCP function in the ISM-VA or run the DHCP server in the same network segment as the target node to be able to lease the appropriate IPv4 address to the LAN port for PXE boot. Set the lease period to 60 minutes or longer.

Example: Scope settings when the ISM-VA connects to 192.168.1.100/24

- Lease range: 192.168.1.128 to 192.168.1.159
- Lease period: eight days

If the managed server is connected with the network of a different segment, set up a router so that the DHCP packets, etc., required for PXE boot can be transferred to each other between the segments.

Likewise, set up the variety of ports used by ISM so that their communication is available.

ISM (Management Server)

There is no specific setting for PXE boot. Follow this manual to execute the procedures below.

- Allocating virtual disk(s) to overall ISM-VA/allocating virtual disk(s) to user groups
- Importing the OS installation DVD (For OS installation)
- Importing the ServerView Suite Update DVD (For Office update)
- Importing the ServerView Suite DVD
- Registering managed servers in ISM

  When registering in ISM, register the iRMC user with "OEM" or "Administrator" authorization.

A.1.2 Pre-settings for Virtual Resource Management

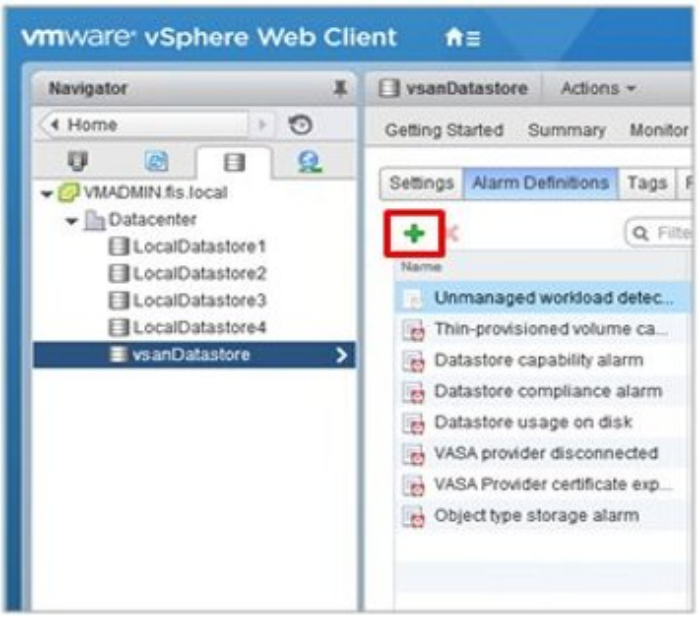
Operations of virtualization platform can be monitored by using Virtual Resource Management. This section provides information about pre-settings required for Virtual Resource Management.

Pre-settings for VMware vSAN

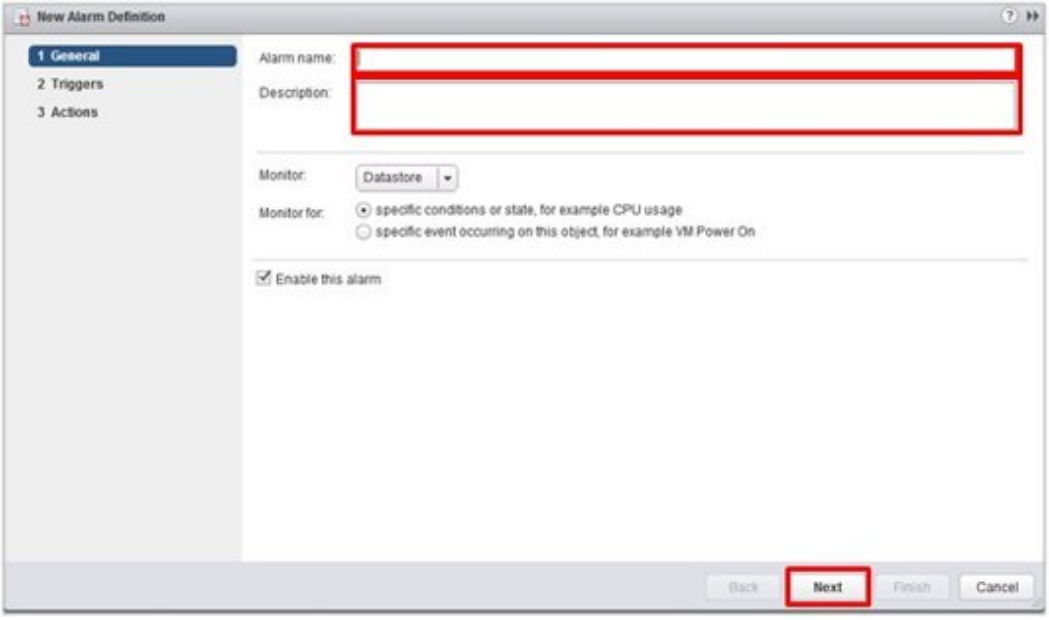
VMware vSAN alarm definition is required to enable the detection of vSAN datastore errors caused by a network disconnection between the vSAN hosts. The procedure below describes how to add vSAN alarm definitions.

1. Open the vSphere Web Client screen. From [Home], select the storage view tab, and then select the created vSAN datastore (The following is an example when the vSAN datastore name is "vsan_ds.").

   From the [Management] tab (or from the [Monitor] tab, select [Issues] for vCenter Server Appliance 6.5) on the right side of the displayed screen, select [Alarm Definitions], and then select [+].

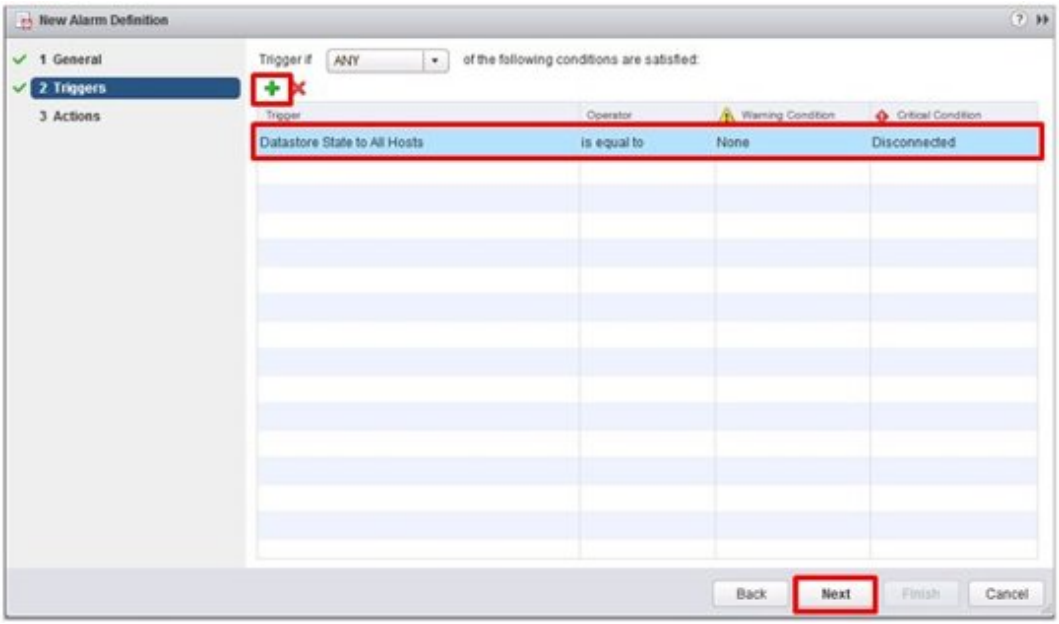


2. When the wizard screen is displayed, enter "Alarm name" and "Description" according to the following table, and then select the [Next] button.



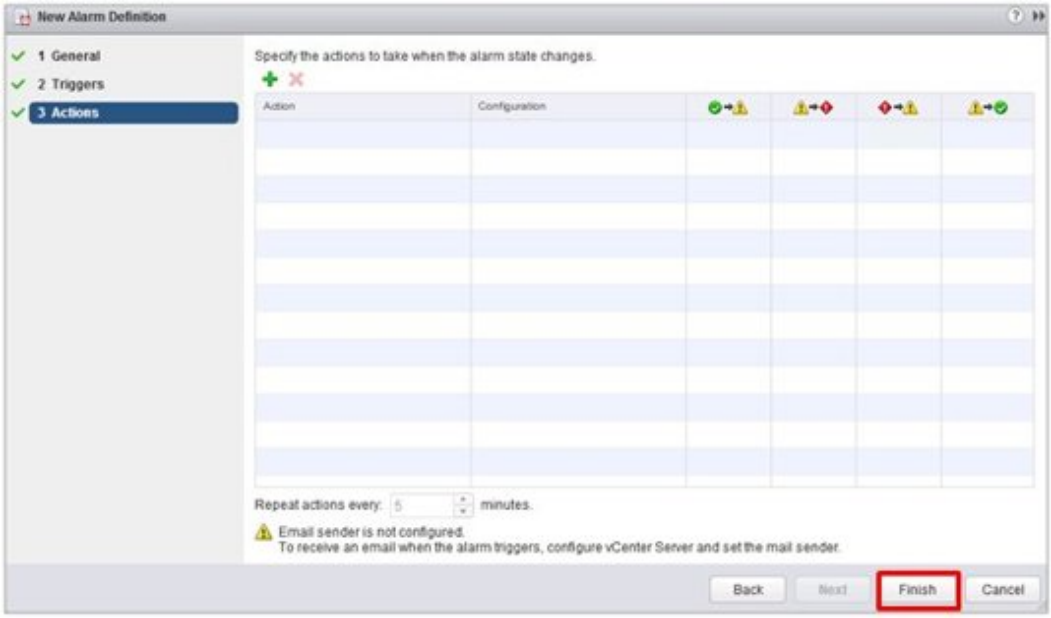
Item	Content
Alarm name	Network disconnection between hosts
Description	Alarm for when the network between the hosts has been disconnected.

3. Select [+] on the following screen, set each item according to the following table, then select the [Next] button.

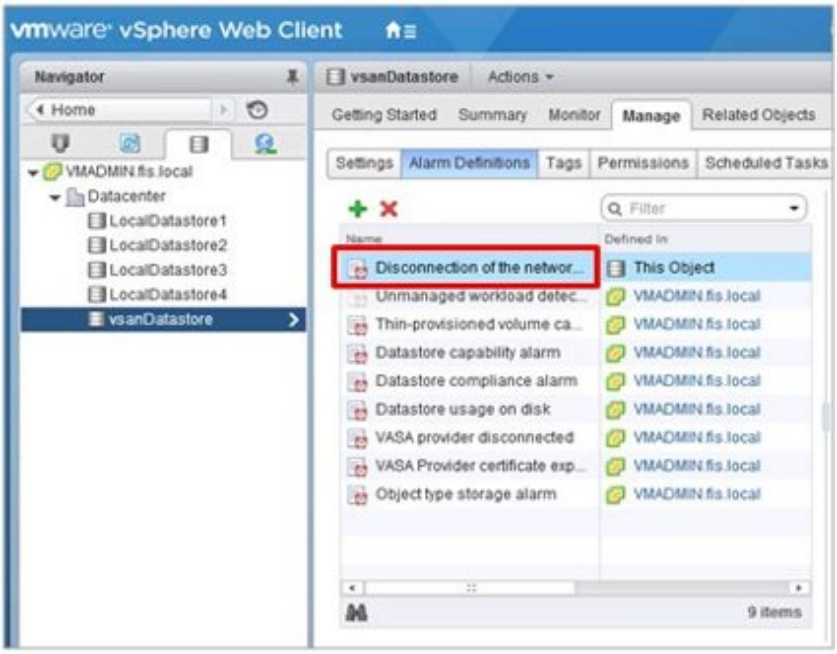


Item	Parameter
Trigger	Datastore State to All Hosts
Operator	is equal to
Warning Condition	None
Critical Condition	Disconnected

4. Action is not required to be set. Select the [Finish] button (or the [Close] button).



The new definition is added to the alarm definitions when completed.



Pre-settings for Storage Spaces Direct

For operation management of Microsoft Storage Spaces Direct, you must set ISM-VA to enable OS monitoring and CredSSP authentication for all the nodes configuring the storage pools. Use the following procedures for setting.

Settings for ISM-VA

Execute the settings for OS monitoring from ISM. For the setting procedure, refer to "B.2 Setting Procedure for Monitoring Targets (OS: Windows)."

Settings for nodes

Enable CredSSP authentication for all nodes configuring the storage pool.

Note

If you do not execute these settings, Virtual Resource Management cannot be used for Storage Spaces Direct.

The nodes configure the storage pools can be checked from the Server Manager and the Failover Cluster Manager.

1. Log in to the node as a user with domain administrator privileges and start PowerShell.
2. Execute the following command.

```
Enable-WSManCredSSP -Role client -DelegateComputer <Target node (Computer) name>
```

   Wild card (*) can be used to specify all of the computer names in a domain.

   Example:

```
Enable-WSManCredSSP -Role client -DelegateComputer *.pfdomain.local
```

3. Next, execute the following command.

```
Enable-WSManCredSSP -Role server
```

A.1.3 ETERNUS DX/AF Drive Enclosure Display

ISM manages drive enclosures that are connected to the ETERNUS DX/AF control enclosure as nodes.

This section provides the required setting information to manage drive enclosures.

Registration of drive enclosure

A drive enclosure is automatically registered in ISM as a node by the following procedure.

1. Register the controller enclosure of ETERNUS DX/AF that the drive enclosure is connected to in ISM as its node.
2. The drive enclosure is displayed on a node list after node information has been retrieved for the controller enclosure in ISM.

Details of node information of drive enclosure

Detailed node information for a drive enclosure is displayed in the detailed node information for the controller enclosure.

Status of drive enclosure

The drive enclosure status is always displayed as "Unknown." This is because the drive enclosures are collectively managed by a controller enclosure. Refer to the controller enclosure node information.

Deletion of drive enclosure

A drive enclosure is deleted from a node list in the following cases:

- When controller enclosure node information has been retrieved after a drive enclosure has been cut off from the controller enclosure.
- When the node of the controller enclosure is deleted from ISM.

A.1.4 Notes on MIB File Import

This section describes the notes on MIB file import in ISM.

About the format of MIB

By describing the specific format for the annotation in the trap definition, it is possible to indicate the severity of MIB etc., but it may not be processed as defined depending on the contents. This section describes the format of MIB to be imported.

The annotation format of the Trap definition (TRAP-TYPE/NOTIFICATION-TYPE) of MIB conforms to the format proposed by Novell NMS.

Examples:

```
sniScVoltageTooHigh TRAP-TYPE
ENTERPRISE sniServerMgmt
VARIABLES {
trapServerName,
trapTime,
trapCabinetNumber,
trapObjectNumber,
trapString
}
DESCRIPTION
    "Power supply voltage is too high."
--#TYPE     "Voltage too high"
--#SUMMARY "Power supply voltage %d (%s) in cabinet %d at server %s is too high."
--#SEVERITY     CRITICAL
::= 652
```

Description of comment field

Comment	Description
--#TYPE	Short name for the Trap. This name can be up to 40 characters long. It is used as a part of the trap message in ISM.
--#SUMMARY	Description of the trap with placeholders and format information for the actual parameters for trap transmission. It is used as a part of the trap message in ISM.

Comment	Description
--#ARGUMENTS	List of parameters to substitute in the SUMMARY string. Parameters are substituted in the order in which they appear in the list. Each element of the list is the index (zero-based) of the parameter in the VARIABLES clause.
--#SEVERITY	Default severity assigned to the trap. This can be one of the following: - INFORMATIONAL - MINOR - MAJOR - CRITICAL

Note

- If --#TYPE is not defined, the object name is substituted.
- If --#SUMMARY is not defined, the contents of DESCRIPTION is substituted.
- If --#SEVERITY is not defined or if the severity type other than INFORMATIONAL/MINOR/MAJOR/CRITICAL is defined, the severity of the trap is handled as INFORMATIONAL.

Countermeasure for when Unknown trap was received

At the time of the trap reception, if the corresponding MIB is not registered, the severity is displayed as Unknown and the incorrect message will be displayed. If you receive the Unknown trap, import the latest MIB and update the data. If you still receive the Unknown trap even after the update, confirm that there are no abnormalities in the target devices. However, if you receive traps from nodes that are not managed in ISM, the message will not be correctly displayed.

A.2 Details of Managed Nodes Settings

This section describes port numbers that are used in ISM and connection information that must be set on the managed nodes.

A.2.1 List of Available Port Numbers

ISM needs to communicate with devices. This section provides the information required on the available port numbers for communications. Set these according to your device type or environment.

Table A.1 Available port numbers for ISM for each target device

Target Device	Function	Protocol	Available Port
PRIMERGY (RX/BX/CX/TX) PRIMEQUEST 3000B IPCOM VX2 (except PRIMERGY CX1430 M1)	Retrieval of node information	IPMI/HTTPS	623/443
	Auto Discovery	SSDP	1900
	Monitoring	IPMI	623
	Trap reception	SNMP (Trap)	162
	Firmware update	IPMI/TFTP	623/69
	Log collection	IPMI/SSH/HTTPS	623/22/443
	Profile assignment (general)	IPMI	623
		HTTP	80
		HTTPS	443
	Profile assignment (only upon OS installation)	FTP	21
		DHCP	67

Target Device	Function	Protocol	Available Port
		TFTP	69
		SMB	445
		PXE	4011
		ISM-original	9213
PRIMERGY CX1430 M1	Retrieval of node information	IPMI/HTTPS	623/443
	Monitoring Firmware update	IPMI	623
	Log collection	IPMI	623
PRIMERGY BX Chassis (MMB)	Retrieval of node information	SNMP/SSH	161/22
	Monitoring	SNMP/SSH	161/22
	Trap reception	SNMP (Trap)	162
	Firmware update	SNMP/SSH/TFTP	161/22/69
	Log collection	SSH	22
PRIMEQUEST 2000Type3 PRIMEQUEST 3000E	Retrieval of node information	SNMP/IPMI	161/623
	Monitoring	SNMP/IPMI	161/623
	Trap reception	SNMP (Trap)	162
	Firmware update	FTP/SSH	21/22
	Log collection	IPMI	623
ETERNUS DX/AF	Retrieval of node information	SNMP/SSH	161/22
	Monitoring	SNMP	161
	Trap reception	SNMP (Trap)	162
	Firmware update	FTP/SSH	21/22
	Log collection	FTP/SSH	21/22
	Profile assignment	SSH	22
ETERNUS NR (NetApp)	Retrieval of node information	SNMP/SSH	161/22
	Monitoring	SNMP/HTTPS	161/443
	Trap reception	SNMP (Trap)	162
	Firmware update	-	-
	Log collection	SSH/HTTPS	22/443
	Profile assignment	-	-
ETERNUS CS800 S7	Retrieval of node information	SNMP	161
	Monitoring	SNMP	161
SR-X	Retrieval of node information	SNMP/SSH	161/22
	Monitoring	SNMP	161
	Trap reception	SNMP (Trap)	162
	Firmware update	FTP/SSH	21/22
	Log collection	SSH	22
	Profile assignment	SSH	22
PSWITCH 2048P/T	Retrieval of node information	SNMP/SSH	161/22

Target Device	Function	Protocol	Available Port
PSWITCH 4032P	Auto Discovery	SSDP	1900
	Monitoring	SNMP	161
	Trap reception	SNMP (Trap)	162
	Firmware update	FTP/SSH	21/22
	Log collection	SSH	22
	Profile assignment	SSH	22
VDX	Retrieval of node information	SSH	22
	Monitoring	SNMP	161
	Trap reception	SNMP (Trap)	162
	Firmware update	FTP/SSH	21/22
	Log collection	SSH	22
	Profile assignment	SSH	22
Catalyst 3750-X Nexus 5000 Series Arista 7000 Family	Retrieval of node information	SSH	22
	Monitoring	SNMP	161
	Trap reception	SNMP (Trap)	162
CFX2000F/R PRIMERGY Switch Blade/Converged Fabric Switch Blade (10Gbps 18/8+2)	Retrieval of node information	SSH	22
	Monitoring	SNMP	161
	Trap reception	SNMP (Trap)	162
	Firmware update	FTP/SSH	21/22
	Log collection	SSH	22
	Profile assignment	SSH	22
PRIMERGY BX Switch Blade (1Gbps/ 10Gbps)	Retrieval of node information	SSH	22
	Monitoring	SNMP	161
	Trap reception	SNMP (Trap)	162
	Firmware update	FTP/TFTP/SSH	21/69/22
	Log collection	SSH	22
PRIMERGY BX LAN Pass-Thru Blade	Retrieval of node information Monitoring	SNMP	161 (communicate with MMB)
	Trap reception	SNMP (Trap)	162
Brocade FC Switch	Retrieval of node information	SSH	22
	Monitoring	SNMP	161
	Trap reception	SNMP (Trap)	162
PRIMERGY BX FC Switch Blade	Retrieval of node information	SSH	22
	Monitoring	SNMP	161
	Trap reception	SNMP (Trap)	162
	Firmware update	SSH	22
	Log collection	SSH	22
Asetek Rack CDU	Retrieval of node information	SNMP	161
	Monitoring	SNMP	161

Target Device	Function	Protocol	Available Port
Schneider Electric Metered Rack Mount PDU Schneider Electric Smart-UPS	Trap reception	SNMP (Trap)	162

Table A.2 Available port numbers for ISM for each target OS

Target OS	Function	Protocol	Available Port
Windows	Retrieval of OS information	WSMAN	5986
	Monitoring	WSMAN	5986
	Firmware update (ISM 2.5.0.010 or later)	WSMAN/FTPS	5986/21
	Log collection (For FTPS, ISM 2.5.0.010 or later)	WSMAN/FTPS	5986/21
Linux	Retrieval of OS information	SSH	22
	Monitoring	SSH	22
	Firmware update	SSH	22
	Log collection	SSH	22
VMware ESXi	Retrieval of OS information	vSphere API/CIM	443/5989
	Monitoring	vSphere API	443
	Firmware update	-	-
	Log collection	REST	443

A.2.2 Details of Node Settings

To manage nodes with the use of ISM, you must set the connection information on the node side. This section provides the required connection information for settings.

Connection information

To establish a connection with the nodes, and before performing node registration, the following settings are required on the node side. For more information, refer to the manuals of the respective devices.

Table A.3 Available devices and connection information

Node	Connection Information			
	IPMI Account [Note 1]/ Password	SSH Account/ Password	Information Required to Enter for SNMP [Note 2]	HTTPS Account/ Password
PRIMERGY(RX/CX/TX) (Except for CX1430 M1)	Y	-	-	- [Note 4]
PRIMERGY CX1430 M1	Y	-	-	Y
PRIMEQUEST 2000Type3	Y	Y	Y	-
PRIMEQUEST 3000E	Y	Y	Y	-
PRIMEQUEST 3000B	Y	-	-	- [Note 4]
ETERNUS DX/AF	-	Y	Y	-
ETERNUS NR	-	Y	Y	-
ETERNUS CS800 S7	-	-	Y	-

Node	Connection Information			
	IPMI Account [Note 1]/ Password	SSH Account/ Password	Information Required to Enter for SNMP [Note 2]	HTTPS Account/ Password
SR-X	-	Y	Y	-
PSWITCH 2048P/T PSWITCH 4032P	-	Y	Y	-
VDX	-	Y	Y	-
Brocade FC Switch	-	Y	Y	-
Cisco Catalyst	-	Y	Y	-
Cisco Nexus	-	Y	Y	-
Arista 7000 Family	-	Y	Y	-
PRIMERGY BX Chassis (MMB)	-	Y	Y	-
PRIMERGY BX Server Blade	Y	-	-	-
PRIMERGY BX Switch Blade (1Gbps/10Gbps)	-	Y	Y	-
PRIMERGY BX LAN Pass-Thru Blade	-	-	- [Note 3]	-
PRIMERGY BX FC Switch Blade	-	Y	Y	-
PRIMERGY Switch Blade/ Converged Fabric Switch Blade (10Gbps 18/8+2)	-	Y	Y	-
CFX2000F/R	-	Y	Y	-
AsetekRackCDU	-	-	Y	-
SchneiderElectric Metered RackMountPDU	-	-	Y	-
SchneiderElectric Smart-UPS	-	-	Y	-

Note: Y = Required, - = Not required

For the models which are confirmed for operation, contact your local Fujitsu customer service partner.

[Note 1]: Use the account with administrator access privilege or OEM.

[Note 2]: For SNMP v1 or v2, you must enter the community name.
For SNMP v3, you must enter the user name, security level, authentication protocol (when authentication is used), authentication password (when authentication is used), encrypted protocol (when encryption is used), encrypted password (when encryption is used).

[Note 3]: PRIMERGY BX LAN Pass-Thru Blade requires connection information settings of the chassis (MMB).

[Note 4]: You can only specify HTTPS port number. The account/password will be the same as its IPMI.

Required settings for management

Confirm the following settings in addition to the connection information settings:

[PRIMERGY]

When you are using the iRMC S4 firmware version 9.00 or later for the PRIMERGY S8/M1/M2/M3 generation server, you must change the IPMI privileges and permissions of web UI of iRMC to retrieve the SAS card information of the ISM node details. Execute the following procedure to change the IPMI privileges and permissions.

1. [User Management] - [iRMC S4 User Management] - [IPMI Privileges/Permissions] - check the [Redfish Enabled] checkbox.
2. [User Management] - [iRMC S4 User Management] - [IPMI Privileges/Permissions] - change the box of [Redfish Role] to Administrator.

[SR-X]

Enable LLDP settings.

[VDX]

- Enable LLDP settings.
- Set the IP address of the management LAN port for each switch.

[Brocade FC switch]

- Disable AG mode.
- Enable SW-MIB settings.

  Example of command execution:

```
snmpconfig --enable mibCapability -mib_name SW-MIB
```

[Arista 7000 Family]

Enable LLDP settings.

[ETERNUS DX/AF]

As the port connecting to ISM, use the maintenance port of Control Module.

(If connecting to a remote port, the firmware update function, the log collection function and profile assignment function may not work.)

[PRIMEQUEST 2000 Type3, PRIMEQUEST 3000E]

- For the MMB account settings (account settings for IPMI connection) for ISM, use the account that registered in the web UI [Network Configuration] - [Remote Server Management] of PRIMEQUEST.
- For the SSH account settings for ISM, use the account that registered in the web UI [User Administration] - [User List] of PRIMEQUEST. The access privileges must be administrator or CE.

[PRIMERGY BX]

- Switch Blade: Enable LLDP settings.
- Fibre Channel Switch Blade.
- Disable AG mode.
- Enable SW-MIB settings.

  Example of command execution:

```
snmpconfig --enable mibCapability -mib_name SW-MIB
```

- When the power of the Chassis is OFF, information cannot be retrieved from MMB. Therefore, the relation between the server blade and connection blade look temporarily cancelled. When the status of the power is ON, select the chassis, go to the [Action] button - [Get Node information] and execute the operation.

Required settings for notification

Execute the settings for SNMP traps in addition to the settings for connection information and for required information for management.

For details, refer to the manuals of the respective devices.

Supported devices whose Engine ID is automatically input when you select them as a target node in Trap Reception settings are as follows.

Table A.4 Available devices

Node	Availability of Automatic input of Engine ID
PRIMERGY(RX/CX/TX)	Y
PRIMEQUEST 2000Type3	-
PRIMEQUEST 3000E	Y
PRIMEQUEST 3000B	Y
ETERNUS DX/AF	Y
ETERNUS NR	-
SR-X	Y [Note 1]
PSWITCH 2048P/T PSWITCH 4032P	Y
VDX	Y
Brocade FC Switch	Y
Cisco Catalyst	Y
Cisco Nexus	Y
PRIMERGY BX Chassis (MMB)	-
PRIMERGY BX Server Blade	Y
PRIMERGY BX Switch Blade (1Gbps/10Gbps)	Y [Note 1]
PRIMERGY BX LAN Pass-Thru Blade	-
PRIMERGY BX FC Switch Blade	Y
PRIMERGY Switch Blade/Converged Fabric Switch Blade (10Gbps 18/8+2)	Y [Note 1] [Note 2]
CFX2000F/R	Y [Note 1] [Note 2]
AsetekRackCDU	-
SchneiderElectricMetered RackMountPDU	-
SchneiderElectricSmart-UPS	-

Note: Y = Supported, - = Not supported

[Note 1]: When SNMP v3 Engine ID is not set for the following devices and selecting the target node in the ISM Trap Reception settings, the Engine ID is not automatically input. To automatically input the Engine ID, set the SNMP v3 Engine ID for the devices in advance.

- PRIMERGY BX Switch Blade (10Gbps)
- PRIMERGY Switch Blade/Converged Fabric Switch Blade (10Gbps 18/8+2)
- CFX2000F/R
- SR-X

[Note 2]: When fabric is configured and SNMP v3 Engine ID has been set for the devices, set each Engine ID with the same values in the whole fabric.

A.3 Details of Other Settings for Node Operation

This section describes the details of other settings for managed nodes.

A.3.1 General Standards for Firmware Update Time

It may take time to update firmware with the use of the Firmware Manager of ISM. This section provides guideline standards for the time required to update firmware.

When making plans to update firmware, refer the times described below. In addition, interrupting the firmware update before completion should be avoided.

Note

The times described below indicate the time taken for updating the current firmware with standard configurations. Since the time may vary depending on the firmware version, network configurations and/or network load conditions, it is recommended to plan with enough margin, including time to address unexpected troubles.

Table A.5 General standards for firmware update time

Target of Firmware Update	Standard Time/Unit	Note
Firmware update of iRMC in PRIMERGY	Online update 10 to 20 min.	
	Offline update 15 to 30 min.	If the server is set to be turned ON after the firmware is assigned, it takes an additional 15 minutes.
Firmware update of BIOS in PRIMERGY	Online update 1 to 2 min.	To assign firmware, you must take into account the extra time for powering the server ON/OFF.
	Offline update 15 to 30 min.	If the server is set to be turned ON after the firmware is assigned, it takes an additional 15 minutes.
Firmware update of iRMC in PRIMEQUEST 3800B	Online update 10 to 20 min.	
Firmware update of BIOS in PRIMEQUEST 3800B	Online update 5 to 15 min.	To assign firmware, you must take into account the extra time for powering the server ON/OFF.
Firmware update of PRIMEQUEST 2000 series, 3000 series	70 to 130 min.	
PRIMERGY BX900S2 MMB	10 to 20 min.	The time noted in the left is the time taken per MMB.
Firmware update of network switch SR-X	2 to 10 min.	
Firmware update of fabric switch CFX2000R/F, converged fabric switch blade	10 to 20 min.	
Firmware update of converged switch VDX	15 to 30 min.	
Firmware update of PSWITCH 2048P/T, PSWITCH 4032P	20 to 30 min.	
Firmware update of LAN switch blade	10 to 20 min.	
Firmware update of Cisco Systems Nexus series	30 to 50 min.	
Firmware update of Cisco Systems Catalyst series	10 to 20 min.	
Firmware update of FC switch blade	10 to 20 min.	
Firmware update of PCI card	Online update 5 to 15 min.	To assign firmware, you must take into account the extra time for powering the server ON/OFF. The time noted in the left is the time taken per card.
	Offline update	The time noted in the left is the time taken per card.

Target of Firmware Update	Standard Time/Unit	Note
	15 to 20 min.	
Firmware update of ETERNUS DX/AF series	10 to 60 min.	When a unified environment exists and multiple controller enclosures are installed, the update time will be longer.

A.3.2 General Standards for Disk Usage in Using Log Management

ISM is capable of periodically collecting logs from nodes and accumulating them on ISM-VA by using the Log Management. This section provides the information on the area for accumulating the collected logs and general standards for accumulated data amount.

The collected logs are accumulated on the log storage area on a virtual disk(s) allocated to user groups. See allocation of virtual disk to each user group of ISM-VA.

Note

- The following are the default settings for log retention period and the number of generations.

  Change the log retention period and the number of generations as required.

Archived Logs	Node Logs (data for download/data for log search)
7 Generations	30 days

- The capacity described on this document is reference value for specific configurations and operations. The capacity can vary greatly depending on the actual use conditions.

Type of managed logs and their accumulation area

Log Management creates archived logs, node logs (data for download) and node logs (data for log search) after the collection of logs.

Each of the above logs is accumulated in the following log storage areas.

Log Type	Storage Area
Archived Logs	Log storage area for the user group related to the node group to which a node belongs [Note 1]
Node Logs (data for download)	
Node Logs (data for log search)	Log storage area for Administrator group [Note 2]

[Note 1]: If a node group is not related to a user group, these logs are accumulated in the log storage area of Administrator group.

[Note 2]: The node logs (data for log search) of all nodes are accumulated in the log storage area of the Administrator group. Even if a node group is related to a user group(s) other than the Administrator group, these logs are accumulated in the log storage area of the Administrator group.

General standards for log capacity

[Capacity for Archived Logs]

Table A.6 General standard for one generation per node

Log Collection Target			Standard Capacity
Hardware	Server	PRIMERGY	1 KB
		PRIMEQUEST 3000B	1 KB
		IPCOM VX2	1 KB
	Chassis	PRIMERGY BX	100 KB
		PRIMEQUEST 3000E	50 KB

Log Collection Target			Standard Capacity
	Connection Blade	Ethernet Switch	100 KB
		Fibre Channel Switch	10 MB
	Switch	SR-X	50 KB
		CFX	100 KB
		PSWITCH 2048P/T PSWITCH 4032P	350 KB
		VDX	50 MB
		Cisco Catalyst	1 MB
		Cisco Nexus	1 MB
	Storage	ETERNUS DX/AF	10 MB
		ETERNUS NR (NetApp) Cluster	100 KB
		ETERNUS NR (NetApp) Chassis	500 MB
Operating system	Windows		5 MB
	Linux		5 MB
	VMware ESXi		3 MB
	IPCOM OS		50 MB
ServerView Suite	ServerView Agents		Windows: 10 MB Linux: 80 MB
	ServerView Agentless Service		
	ServerView RAID Manager		

[Capacity for Node Logs (data for download)]

Table A.7 General standard for 30 days' worth per node

Log Collection Target			Standard Capacity
Hardware	Server	PRIMERGY (except CX1430 M1)	50 KB
		PRIMEQUEST 3000B	50 KB
		IPCOM VX2	50 KB
	Chassis	PRIMERGY BX	50 KB
		PRIMEQUEST 3000E	500 KB
	Connection Blade	Ethernet Switch	100 KB
		Fibre Channel Switch	50 KB
	Switch	SR-X	100 KB
		CFX	100 KB
		PSWITCH 2048P/T PSWITCH 4032P	150 KB
		VDX	100 KB
		Cisco Catalyst	50 KB
		Cisco Nexus	50 KB
	Storage	ETERNUS DX/AF	100 KB
		ETERNUS NR (NetApp) Cluster	200 KB

Log Collection Target		Standard Capacity
Operating system	Windows	1 MB
	Linux	1 MB
	VMware ESXi	4 MB
	IPCOM OS	1 MB

[Capacity for Node Logs (data for log search)]

Table A.8 General standard for 30 days' worth per node

Log Collection Target			Standard Capacity
Hardware	Server	PRIMERGY (except CX1430 M1)	500 KB
		PRIMEQUEST 3000B	500 KB
		IPCOM VX2	500 KB
	Chassis	PRIMERGY BX	500 KB
		PRIMEQUEST 3000E	500 KB
	Connection Blade	Ethernet Switch	1 MB
		Fibre Channel Switch	500 KB
	Switch	SR-X	1 MB
		CFX	1 MB
		PSWITCH 2048P/T PSWITCH 4032P	1 MB
		VDX	1 MB
		Cisco Catalyst	500 KB
		Cisco Nexus	500 KB
	Storage	ETERNUS DX/AF	1 MB
		ETERNUS NR (NetApp) Cluster	2 MB
Operating system	Windows		15 MB
	Linux		15 MB
	VMware ESXi		50 MB
	IPCOM OS		15 MB

Appendix B Settings for Monitoring Target OS and Cloud Management Software

To manage OS/Cloud Management Software by using ISM, you must execute settings on the OS/Cloud Management Software side. This chapter provides the required information for the settings.

B.1 List of Settings Required per Monitoring Target OS/Could Management Software

To use the display of the virtual machine information, device information (OS information and disk volume), Log Management (OS log collection), and firmware update (Online PCI card) from ISM, you must execute settings for each OS/cloud management software. Change the settings according to the tables shown below.

B.1.1 Required Settings per Monitoring OSes

Note: Y = Settings required, N = Settings not required, - = Not applicable

OS		Service		Security		Domain	
		sshd	WinRM	Firewall	PowerShell	SPN	ISM-VA Settings
Red Hat Enterprise Linux	6.x	Y	-	N	-	-	Y
	7.x	Y	-	N	-	-	Y
	8.x	Y	-	N	-	-	Y
SUSE Linux Enterprise Server	11	Y	-	Y	-	-	Y
	12	Y	-	Y	-	-	Y
	15	Y	-	Y	-	-	Y
Windows Server	2008 R2	-	Y	Y	Y	Y	Y
	2012	-	Y	Y	Y	Y	Y
	2012 R2	-	Y	Y	Y	Y	Y
	2016	-	Y	Y	Y	Y	Y
	2019	-	Y	Y	Y	Y	Y
VMware ESXi	5.x	-	-	-	-	-	Y
	6.x	-	-	-	-	-	Y

For details on required settings for each OS, refer to the following sections.

- B.2 Setting Procedure for Monitoring Targets (OS: Windows)
- B.3 Setting Procedure for Monitoring Targets (OS: Red Hat Enterprise Linux)
- B.4 Setting Procedure for Monitoring Targets (OS: SUSE Linux Enterprise Server)
- B.5 Setting Procedure for Monitoring Targets (OS: VMware ESXi)

B.1.2 Required Settings per Monitoring Cloud Management Software

Note: Y = Settings required, N = Settings not required, - = Not applicable

Cloud Management Software		Settings for each host/ virtual machine		Domain		
		sshd	WinRM	SPN	ISM-VA Settings	Kerberos delegation configuration
vCenter Server	5.5 or later	-	-	-	Y	-
	6.x or later	-	-	-	Y	-
Microsoft Failover Cluster	Windows Server 2012 or later	-	Y	Y	Y	Y
Microsoft System Center	2012 or later	-	Y	Y	Y	Y
KVM Red Hat		Y	-	-	Y	Y
KVM SUSE Linux Enterprise		Y	-	-	Y	Y
OpenStack		Refer to "B.11 Setting Procedure for Monitoring Targets (Cloud Management Software: OpenStack)."				

For details on required settings for the cloud management software, refer to the following.

- B.6 Setting Procedure for Monitoring Targets (Cloud Management Software: vCenter Server)
- B.7 Setting Procedure for Monitoring Targets (Cloud Management Software: Microsoft Failover Cluster)
- B.8 Setting Procedure for Monitoring Targets (Cloud Management Software: Microsoft System Center)
- B.9 Setting Procedure for Monitoring Targets (Cloud Management Software: KVM)
- B.10 Setting Procedure for Monitoring Targets (Cloud Management Software: IPCOM)
- B.11 Setting Procedure for Monitoring Targets (Cloud Management Software: OpenStack)

B.1.3 Precautions When Setting a Monitoring Target OS and Cloud Management Software

- To monitor a target server, it is required to register OS information, with the user account having administrator privilege.
- To manage Emulex LAN/FC/CNA cards mounted on Windows/Linux, Emulex OneCommand Manager CLI must be already installed on the OS of the target server.
- To manage the QLogic FC card mounted on Windows/Linux, QLogic QConvergeConsole CLI must be already installed on the OS of a target server.
- Use the latest Emulex OneCommand Manager CLI or QLogic QConvergeConsole CLI. Apply the latest drivers for LAN/FC/CNA cards.
- To manage LAN/FC/CNA card mounted on Linux, the pciutils and ethtool package must be already installed on the OS of the target server.
- To monitor the performance of the disk speed, network speed, and CPU utilization rate per CPU core of Linux, the sysstat package must be already installed on the OS of the target server.
- To collect Linux operating system logs or ServerView Suite logs, a zip package must be already installed on the OS of the target server.

  Also, to collect the operating system logs, a syslog demon such as rsyslog package must be already installed on the OS of the target server.
- To manage OS with a general user account of Linux, a sudo package must be already installed on the OS of the target server.
- After having changed the domain user password from Active Directory, change the password in ISM.

B.2 Setting Procedure for Monitoring Targets (OS: Windows)

ISM uses WS-Management protocol for the monitoring target devices on which Windows Server is installed. For the communication method, Https Protocol + Basic authentication is used. The following are the required settings.

- B.2.1 Confirmation on Staring WinRM Service
- B.2.2 Settings for WinRM Service
- B.2.3 Opening the Firewall Port
- B.2.4 Execution Policy Change for Windows PowerShell
- B.2.5 Settings When Using a Domain User Account

B.2.1 Confirmation on Staring WinRM Service

1. Open the command prompt as an administrator and execute the following command to check that WinRM service has started.

```
>sc query winrm
```

2. Check the following results and confirm that the "STATE" is "RUNNING."

```
    TYPE               : 20 WIN32_SHARE_PROCESS
    STATE              : 4 RUNNING
                         (STOPPABLE, NOT_PAUSABLE, ACCEPTS_SHUTDOWN)
    WIN32_EXIT_CODE    : 0 (0x0)
    SERVICE_EXIT_CODE  : 0 (0x0)
    CHECKPOINT         : 0x0
    WAIT_HINT          : 0x0
```

3. If the WinRM service has not started, execute the following command to start WinRM service.

```
>sc start winrm
```

4. Set the WinRM service to be delayed-auto-started (delayed-auto).

```
>sc config winrm start=delayed-auto
```

B.2.2 Settings for WinRM Service

Settings for WinRM Service

Point

Since Basic authentication is not allowed in the initial settings, you must set the service to allow Basic authentication.

Execute the following command.

```
>winrm set winrm/config/service/Auth@{Basic="true"}
```

To use https communication, communication with Basic authentication is encrypted.

1. Open the command prompt as an administrator and execute the following command.

```
>winrm quickconfig
```

The settings are already complete if the message "WinRM service is already running on this machine." is displayed. In this case, proceed to "Settings for Https Communication."

2. Enter "y," and then press the [Enter] key.

```
WinRM service is already running on this machine.
WinRM is not set up to allow remote access to this machine for management.
The following changes must be made:

Configure LocalAccountTokenFilterPolicy to grant administrative rights remotely to local users.
Make these changes [y/n]? y
```

The following message is displayed.

```
WinRM has been updated for remote management.

Configured LocalAccountTokenFilterPolicy to grant administrative rights remotely to local users.
```

3. If the OS of a target server is Windows Server 2008 R2, execute the following command to increase the numerical value of MaxConcurrentOperationsPerUser depending on the type and the number of cards.

```
>winrm set winrm/config/Service @{MaxConcurrentOperationsPerUser="numerical value"}
```

Example: In the case where the above value is set as 1500 (1500 is recommended because 1500 is set by default in Windows Server 2012/2012R2.)

```
>winrm set winrm/config/Service @{MaxConcurrentOperationsPerUser="1500"}
```

Settings for Https Communication

To establish https communication, you must set a certificate.

1. Preparation of required tools

Two tools are required for creating a certificate. You can create the certificate without depending on the execution environment.

- .NET Framework 4.5 (Download site)

  https://www.microsoft.com/en-us/download/details.aspx?id=30653

- Windows Software Development Kit (Download site)

  https://developer.microsoft.com/en-us/windows/downloads/windows-10-sdk

- The Windows Software Development Kit of the above URL is supported in Windows 7 SP1 or Windows 8.1, and Windows Server 2012 R2 or Windows Server 2016. When installing OS of other than mentioned, install the appropriate Windows Software Development Kit.
- Windows Software Development Kit includes two tools required for creating the certificate.
  - Certificate creation tool (makecert.exe)

    https://msdn.microsoft.com/en-us/library/bfsktky3(v=vs.80).aspx

  - Personal information exchange file creation tool (pvk2pfx.exe)

    https://msdn.microsoft.com/en-us/library/windows/hardware/ff550672(v=vs.85).aspx

2. Creating certificates

Use the certificate creation tool and personal information exchange file creation tool to create the following three files:

- CER file (Certificate)
- PVK file (Private key file)
- PFX file (Service certificate)

For more detailed procedure for creating certificates, refer to the following URL.

https://msdn.microsoft.com/en-us/library/ff699202.aspx

a. Creating a certificate and private Key files

When create the certificate and private key files, you must execute commands depending on the environment of a target server.

The following is a command example when the server name of a target server is set as "192.168.10.10" and the effective period of the certificate is set to March 30th, 2017.

```
>makecert.exe -r -pe -n "CN=192.168.10.10" -e 03/30/2017 -eku 1.3.6.1.5.5.7.3.1 -ss My
-sr localMachine -sky exchange <certificate file name.cer> -sv <private key file name.pvk>
```

For detailed settings on the certificate configuration, refer to the following URL.

https://technet.microsoft.com/en-us/library/ms186362(v=sql.105).aspx

b. Creating a service certificate

Execute the following command.

```
>pvk2pfx.exe -pvk <private key file name.pvk> -spc <certificate file name.cer> -pfx <service
certificate file name.pfx>
```

3. Registering a certificate and a service certificate

Open the Certificate Snap-In and register the certificate created above in Step 2.

a. Execute mmc. exe on a target server.

b. From [File], select [Add and Remove Snap-In].

c. From [Available Snap-in], select “Certificate” to [Add].

d. Select "Computer Account," and then select [Next] - [Finish].

e. Select [OK].

4. Registering an SSL certificate

Register <certificate file name.cer> with the Trusted Root Certificate Authority.

a. From [Console Root] - [Certificates (Local Computer)], right-click on [Trusted Root Certificate Authority].

b. From [ALL Tasks] - [Import], select <certificate file name.cer> file, and finish the "Certificate Import" wizard.

c. Select [Console Root] - [Certificate (Local Computer)] - [Trusted Root Certificate Authority] - [Certificate] in sequence, and confirm if "Issued to" and "Issued by" are the server names specified as CN, and “Authentication Purpose” is specified as “Server Authentication.”

5. Registering SSL certificate

Register <service certificate file name.pfx> in "personal."

a. From [Console Root] - [Certificate (Local Computer)], right-click on [Personal].

b. From [All Tasks] - [Import], select<service certificate file name.pfx, and finish the "Certificate Import" wizard.

c. From [Console Root] - [Certificate (Local Computer)], select [Personal] in sequence, and confirm if "Issued to" and "Issued by" are the server name specified as CN, and "Authentication Purpose" is specified as "Server Authentication."

Register the Thumbprint Described on the Certificate to WinRM Service

1. Checking Thumbprint

The following shows how to check if the certificate is saved in LocalMachine\my.

a. Start PowerShell from a command prompt.

b. Check the Thumbprint. Execute the following command.

```
>ls cert:LocalMachine\my
```

The following is displayed.

```
PS C:\Windows\system32> ls cert:LocalMachine\my

Directory: Microsoft.PowerShell.Security\Certificate::LocalMachine\my
Thumbprint                                Subject
----------                                -------
1C3E462623BAF91A5459171BD187163D23F10DD9      CN=192.168.10.10
```

2. Registering the Thumbprint described on the certificate with WinRM Listener.

   Finish Powershell and execute the following command. A space must be entered between "HTTPS" and "@."

```
>winrm create winrm/config/listener?Address=*+Transport=HTTPS @{Hostname="<CN Name that was
specified above in step (4)Creating a Certificate and Private Key
Files>";CertificateThumbprint="<created certificate thumbprint>"}
```

3. Checking the registration of WinRM Listener

   Execute the following command.

```
>winrm get winrm/config/listener?Address=*+Transport=HTTPS
```

   If the command result as shown below is returned, WinRM Listener is successfully registered.

```
Listener
    Address = *
    Transport = HTTPS
    Port = 5986
    Hostname = 192.168.10.10
    Enabled = true
    URLPrefix = wsman
    CertificateThumbprint = 1C3E462623BAF91A5459171BD187163D23F10DD9
    ListeningOn = 192.168.10.10, 127.0.0.1, ::1, 2001:258:8402:200:bd8a:1c1:c50d
:8704, fe80::5efe:192.168.10.10%13, fe80::bd8a:1c1:c50d:8704%12
```

B.2.3 Opening the Firewall Port

You must open the port that you have set up in the above WinRM Listener, so that WinRM services can accept requests. The default port number of https communication is 5986.

For Windows Server 2008 R2

Execute the command as shown below.

```
>netsh advfirewall firewall add rule name= <firewall rule name> enable=yes localip=any remoteip=any
protocol=tcp localport=<port number> remoteport=any edge=no dir=in profile=domain,private,public
action=allow
```

Example: Set the name "WinRM" as the rule to open port number 5986

```
>netsh advfirewall firewall add rule name=WinRM enable=yes localip=any remoteip=any protocol=tcp
localport=5986 remoteport=any edge=no dir=in profile=domain,private,public action=allow
```

For Windows Server 2012/2012R2/2016 or Windows Server 2019

Open the PowerShell from the command prompt. And then execute the command as shown below.

```
>New-NetFirewallRule -DisplayName <firewall rule name> -Action Allow -Direction Inbound -Enabled True
-Protocol TCP -LocalPort <port number>
```

Example: Set the name "WinRM" as the rule to open the port number 5986

```
>New-NetFirewallRule -DisplayName WinRM -Action Allow -Direction Inbound -Enabled True  -Protocol TCP
-LocalPort 5986
```

Note

The firewall settings differ depending on the environment of the target servers.

B.2.4 Execution Policy Change for Windows PowerShell

1. Open Windows PowerShell as an administrator and execute the following command.

```
>set-executionpolicy remotesigned
```

2. If the following message is displayed, enter [Y] and press the [Enter] key.

```
Execution Policy Change
The execution policy helps protect you from scripts that you do not trust. Changing the execution
policy might expose you to the security risks described in the about_Execution_Policies help
topic at
https://msdn.microsoft.com/powershell/reference/5.1/Microsoft.PowerShell.Core/about/
about_Execution_Policies. Do you want to change the execution policy?
```

B.2.5 Settings When Using a Domain User Account

Monitoring by using a domain user account cannot monitor multiple different domain environments concurrently.

1. Adding an SPN of WinRM service to Active Directory

   Execute the following command and check that the SPN of the WinRM service is registered in Active Directory.

```
>setspn -L <monitoring target host name>
```

   If WSMAN/<monitoring target host name> and WSMAN/<FQDN name of the monitoring target host> are output, the SPN of the WinRM service is registered.

```
>setspn -L <monitoring target host name>
    WSMAN/<monitoring target host name>
    WSMAN/<FQDN name of the monitoring target host>
```

   If WSMAN/<monitoring target host name> and WSMAN/<FQDN name of the monitoring target> are not output, execute the following command on the monitoring target server and start WinRM service again.

```
>net stop winrm
```

```
>net start winrm
```

   You must register the correct Service Principal Name (SPN) in Active Directory, even if WSMAN/<monitoring target host name> and WSMAN/<FQDN name of the monitoring target host> are not output after restarting the WinRM service. Execute the following command to register an SPN of the WinRM service.

```
>setspn -A WSMAN/<monitoring target host name> <monitoring target host name>
```

```
>setspn -A WSMAN/<FQDN name of the monitoring target host> <monitoring target host name>
```

2. Adding an SPN of the monitoring target server to Active Directory

   To perform monitoring with a domain user account, you must correctly register a Service Principal Name (SPN) of a monitoring target server on Active Directory. Execute the following command to register the Service Principal Name of the monitoring target server.

```
>setspn -A HOST/<monitoring target IP address> <monitoring target host name>
```

Point

- Command for checking

```
>setspn -L <monitoring target host name>
```

- Command for deleting

```
>setspn -D HOST/<monitoring target IP address> <monitoring target host name>
```

3. Adding domain information to ISM-VA

   To perform monitoring with the domain user account, follow the procedures in "3.4.2 Initial Setup of ISM-VA."

4. Adding DNS information to ISM-VA

   To perform monitoring with the domain user account, execute "Add DNS server" in "4.9 Network Settings" to register the DNS server on ISM-VA.

B.3 Setting Procedure for Monitoring Targets (OS: Red Hat Enterprise Linux)

ISM communicates with the target servers with Red Hat Enterprise Linux installed, by using ssh (Secure Shell service). The following are the required settings.

- B.3.1 Confirmation on Starting of ssh Service
- B.3.2 Settings When Using a Domain User Account
- B.3.3 Settings When Using a General User Account
- B.3.4 Common Settings for User Accounts

B.3.1 Confirmation on Starting of ssh Service

Configure so that sshd can be started. The command differs depending on the OS versions.

For Red Hat Enterprise Linux 6

1. Execute the following command, and confirm if sshd is auto-started.

```
# chkconfig -list sshd
```

   The auto-start of sshd is disabled if the result is as shown below.

```
sshd            0:off  1:off  2:off  3:off  4:off  5:off  6:off
```

2. Execute the following command so that sshd can be started automatically if the item of the number (corresponding to the run level of the target server) is "off."

```
# chkconfig sshd on
```

   From the next starting of the target server, sshd will be auto-started.

3. Start sshd.

```
# /etc/init.d/sshd start
```

For Red Hat Enterprise Linux 7/8

1. Execute the following command, and confirm if sshd is auto-started.

```
# systemctl is-enabled sshd
```

   The auto-start of sshd is disabled if the result is as shown below.

```
disabled
```

2. Execute the following command if the auto-start of sshd is disabled.

```
# systemctl enable sshd
```

   From the next starting of the target server, sshd will be auto-started.

3. Start sshd.

```
# systemctl start sshd
```

B.3.2 Settings When Using a Domain User Account

Pay attention to the following points when monitoring by using a domain user account.

Adding domain information to ISM-VA

To perform monitoring using the domain user account, follow the procedures in "3.4.2 Initial Setup of ISM-VA."

Adding DNS information to ISM-VA

To perform monitoring using the domain user account, follow the procedures in "Add DNS server" in "4.9 Network Settings" to register the DNS server on ISM-VA.

Restriction on a domain user account name

Pay attention to the restriction on the user names of Linux when you use the domain user name that has been registered on Active Directory for Linux.

- Representative examples unavailable for Linux user names

  Uppercase letters, numeric characters at the beginning, and symbols, such as dot (.)

Restriction when collecting Emulex card information

Use "hbacmd" to collect the card information for the devices on which the card provided by Avago/Emulex is mounted.

When collecting the card information with the domain user account, provide "hbacmdan" with administrator privileges.

For details, refer to "OneCommandManager Command Line Interface User Manual."

Restriction when collecting QLogic card information

You cannot retrieve the information about the devices on which the card provided by QLogic is mounted, by using the domain user account. Register a root user from the "Edit OS Information" screen to retrieve the information.

Restriction when collecting ServerView logs

You cannot collect ServerView logs by using the domain user account. Register a root user from the "Edit OS Information" screen to collect the information.

Restriction when updating firmware

You cannot execute online firmware update by using the domain user account. Register a root user from the "Edit OS Information" screen to execute firmware update.

B.3.3 Settings When Using a General User Account

Pay attention to the following points when monitoring using a general user account other than the root user account.

Settings for sudo command

You must change the monitoring target server settings to enable the applicable user account to execute the sudo command with their login password (a general user account password).

The following is an example of a setting to enable the sudo command with the login password of user 1.

1. Edit /etc/sudoers file.

```
# visudo
:
#Defaults targetpw              ・・・Comment out
root    ALL=(ALL)       ALL
user1   ALL=(ALL)       ALL   ・・・Add user1
:
```

2. Log in to a monitoring target server with ssh using user 1.

   If the password for user 1 is asked for when executing the sudo command, the setting is completed.

Settings for environment variables

After logging in to the monitoring target server with ssh using the applicable account, confirm that the prompt strings meet the following conditions. If the following conditions are met, do not change the settings for prompt strings. Prompt strings can be changed by changing the value of environment variable PS1.

- Directed to home directory upon login
- "~" is included in the prompt strings upon login
- "$" or "#" is included after "~" in the prompt strings upon login

Example: [user1@localhost ~]$

Example parameter for environment variable PS1:

```
[user1@localhost ~]$  echo $PS1
[\u@\h \W]\$
```

B.3.4 Common Settings for User Accounts

Settings for a login shell

Set "/bin/bash" for the login shell for the user account. If you cannot change the login shell, create a new user account on Linux, and update the OS information registered in ISM.

Log in to the target server for monitoring with an appropriate user account via ssh, and execute the following command to confirm the login shell.

```
# echo $SHELL
```

When the command result is not "/bin/bash," execute the following command.

```
# chsh -s /bin/bash
```

Settings for ".bashrc"

1. Open ".bashrc" file in the home directory of an applicable account.

   Create a file if there is no ".bashrc" file.

```
# vi ~/.bashrc
```

2. Add the paths of "/sbin," "/usr/sbin," and "/usr/local/sbin" to ".bashrc" file.

```
PATH=$PATH:/sbin
PATH=$PATH:/usr/sbin
PATH=$PATH:/usr/local/sbin
```

Settings for the environment variable

To execute the Log Collection function of ServerView, you must set the environment variable PS1 of the applicable account. To set the environment variable PS1, refer to "Settings for environment variables" in "B.3.3 Settings When Using a General User Account."

B.4 Setting Procedure for Monitoring Targets (OS: SUSE Linux Enterprise Server)

ISM communicates with the target servers with SUSE Linux Enterprise Server installed, by using ssh (Secure Shell service). The following are the required settings.

- B.4.1 Confirmation on Starting of ssh Service
- B.4.2 Opening the Firewall Port
- B.4.3 Settings When Using a Domain User Account
- B.4.4 Settings When Using a General User Account
- B.4.5 Common Settings for User Accounts

B.4.1 Confirmation on Starting of ssh Service

The start of sshd is disabled by default in SUSE Linux Enterprise Server.

Set sshd to be started. The command differs depending on OS versions.

SUSE Linux Enterprise Server 11

1. Execute the following command, and confirm if sshd is auto-started.

```
# chkconfig -list sshd
```

The auto-start of sshd is disabled if the result is as shown below.

```
sshd            0:off  1:off  2:off  3:off  4:off  5:off  6:off
```

2. Execute the following command so that sshd can be started automatically if the item of the number (corresponding to the run level of the target server) is "off."

```
# chkconfig sshd on
```

From the next starting of the target server, sshd will be auto-started.

3. Start sshd.

```
# /etc/init.d/sshd start
```

SUSE Linux Enterprise Server 12/15

1. Execute the following command, and confirm if sshd is auto-started.

```
# systemctl is-enabled sshd
```

The auto-start of sshd is disabled if the result is as shown below.

```
disabled
```

2. Execute the following command if the auto-start of sshd is disabled.

```
# systemctl enable sshd
```

   From the next starting of the target server, sshd will be auto-started.

3. Start sshd.

```
# systemctl start sshd
```

B.4.2 Opening the Firewall Port

If you set the firewall enabled, allow the ssh communication with the settings of the firewall. The firewall of SUSE Linux Enterprise Server closes the ssh port by default.

The firewall settings differ depending on the environment of the target servers.

SUSE Linux Enterprise Server 11/12

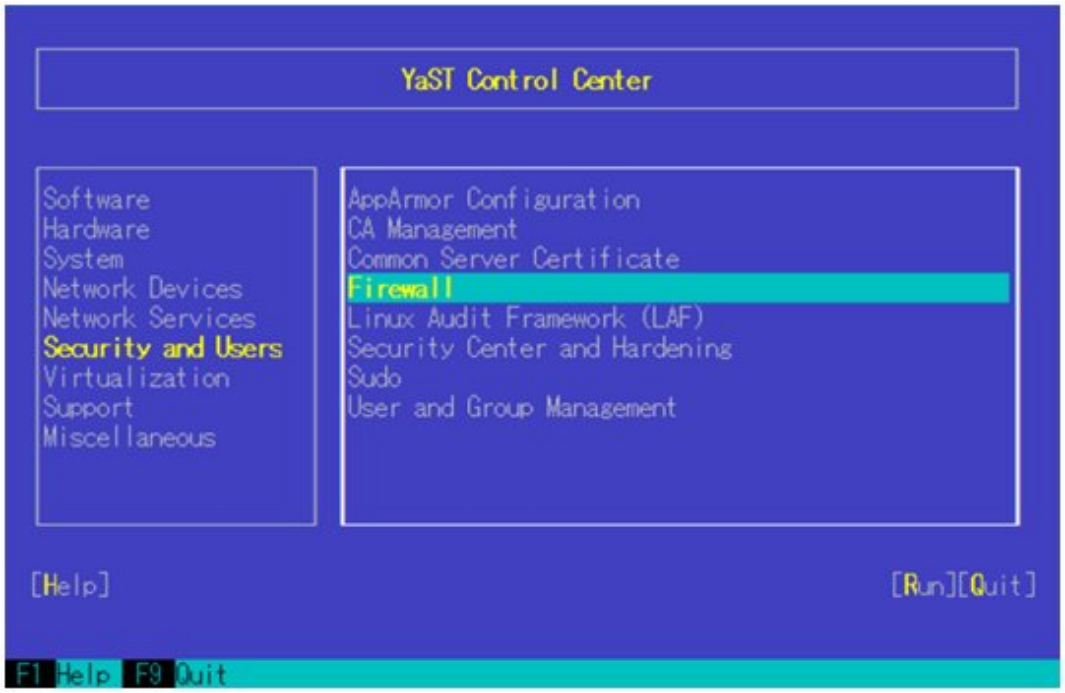
The example as shown below is the firewall settings in which YaST is used.

1. Execute the following command to display YaST Control Center.

```
# yast
```

   In "yast," select items by using the arrow key combined with the [Tab] key.

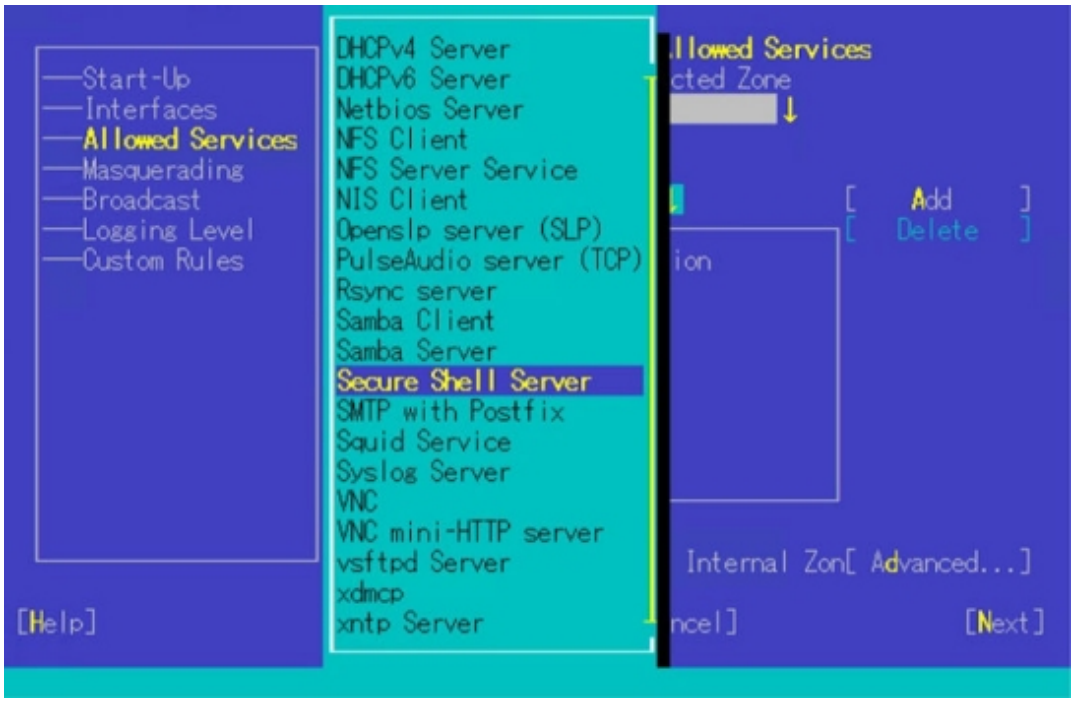
2. Select [Security and Users] - [Firewall], and press the [Enter] key.



3. From the "Start-Up" screen, change the status of [Service Start] to "Enable Firewall Automatic Starting."

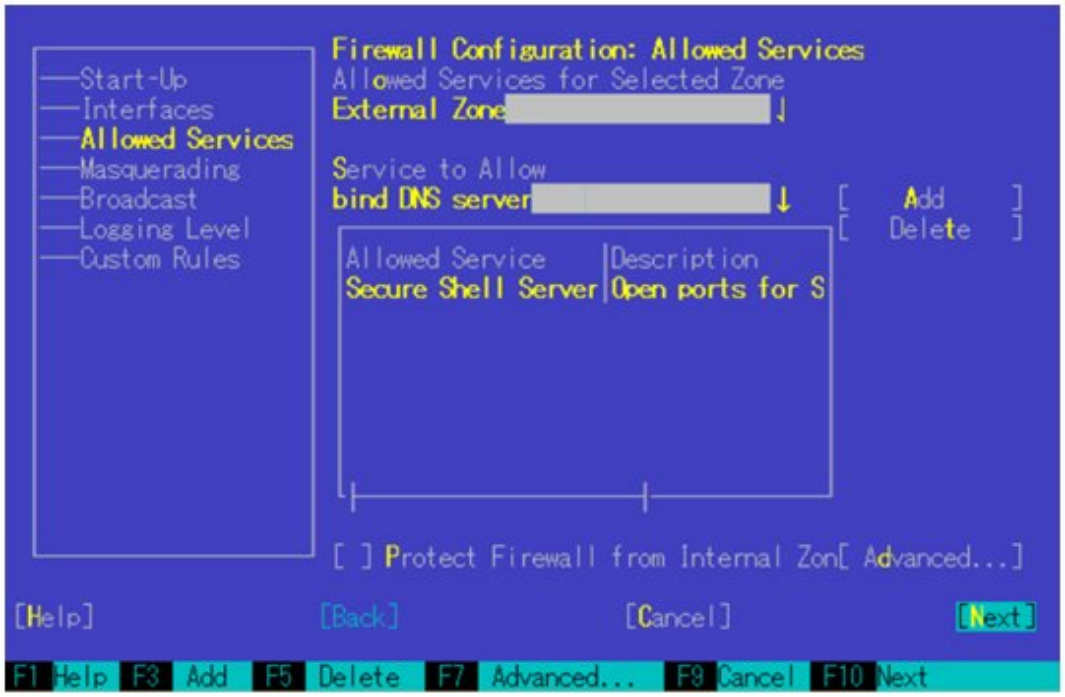
4. From [Allowed Services] - [Service to Allow], press the down-arrow key.

5. Select "Secure Shell Server," and press the [Enter] key.



6. Select [Add] and press the [Enter] key.

7. Confirm if "Secure Shell Server" is added to [Allowed Service], move to [Next], and then, press the [Enter] key.



8. After the "Firewall Configuration: Summary" screen is displayed, select [Finish] and press the [Enter] key to finish the firewall settings.

9. Move to "Quit," press the [Enter] key to finish YaST Control Center.

SUSE Linux Enterprise Server 15

For SUSE Linux Enterprise Server 15, Firewall setting with YaST is not supported. Use "firewall-cmd" to set Firewall.

1. Start firewalld.

```
# systemctl start firewalld
```

2. Execute the following command, and allow the ssh communication.

```
# firewall-cmd --permanent --add-service=ssh
# firewall-cmd --reload
```

B.4.3 Settings When Using a Domain User Account

Pay attention to the following points when monitoring using a domain user account.

Adding domain information to ISM-VA

To perform monitoring with the domain user account, follow the procedures in "3.4.2 Initial Setup of ISM-VA."

Adding DNS information to ISM-VA

To perform monitoring with the domain user account, follow the procedures in "Add DNS server" in "4.9 Network Settings" to register the DNS server on ISM-VA.

Restriction when collecting Emulex card information

Use "hbacmd" to collect the card information for the devices on which the card provided by Avago/Emulex is mounted.

When collecting the card information with the domain user account, provide the "hbacmdan" administrator privilege.

For details, refer to "One Command Manager Command Line Interface User Manual."

Restriction when collecting QLogic card information

You cannot retrieve the information about the devices on which the card provided by QLogic is mounted, by using the domain user account. Register a root user from the "Edit OS Information" screen to retrieve the information.

Restriction when collecting ServerView logs

You cannot collect ServerView logs by using the domain user account. Register a root user from the "Edit OS Information" screen to collect the information.

Restriction when updating firmware

You cannot execute Online firmware update by using the domain user account. Register a root user from the "Edit OS Information" screen to execute firmware updates.

B.4.4 Settings When Using a General User Account

Pay attention to the following points when monitoring using a general user account other than the root user account.

Settings for sudo command

You must change the monitoring target server settings to enable the applicable user account to execute the sudo command with their login password (a general user account password).

The following is an example of a setting to enable the sudo command with the login password of user 1.

1. Edit /etc/sudoers file.

```
# visudo
:
#Defaults targetpw            <- Comment out
root    ALL=(ALL)       ALL
user1   ALL=(ALL)       ALL   <- Add user1
:
```

2. Log in to a monitoring target server with ssh using user 1.

   If the password for user 1 is asked for when executing the sudo command, the setting is completed.

Settings for environment variables

After logging in to the monitoring target server with ssh using the applicable account, confirm that the prompt strings meet the following conditions. If the following conditions are met, do not change the settings for prompt strings. Prompt strings can be changed by changing the value of environment variable PS1.

- Directed to home directory upon login
- "~" is included in the prompt strings upon login
- "$" or "#" is included after "~" in the prompt strings upon login

Example: [user1@localhost ~]$

Example parameter of environment variable PS1:

```
[user1@localhost ~]$ echo $PS1
[\u@\h \W]\$
```

B.4.5 Common Settings for User Accounts

Settings for a login shell

Set "/bin/bash" for the login shell for the user account. If you cannot change the login shell, create a new user account on Linux, and update the OS information registered in ISM.

Log in to the target server for monitoring with an appropriate user account via ssh, and execute the following command to confirm the login shell.

```
# echo $SHELL
```

When the command result is not "/bin/bash," execute the following command.

```
# chsh -s /bin/bash
```

Settings for ".bashrc"

1. Open the ".bashrc" file in the home directory of an applicable account.

   Create a file if there is no ".bashrc" file.

   ```
   # vi ~/.bashrc
   ```

2. Add the paths of "/sbin," "/usr/sbin" and "/usr/local/sbin" to ".bashrc" file.

   ```
   PATH=$PATH:/sbin
   PATH=$PATH:/usr/sbin
   PATH=$PATH:/usr/local/sbin
   ```

Settings for environment variables

To execute the Log Collection function of ServerView, you must set the environment variable PS1 of applicable account. To set the environment variable PS1, refer to "Settings for environment variables" in "B.4.4 Settings When Using a General User Account."

B.5 Setting Procedure for Monitoring Targets (OS: VMware ESXi)

ISM communicates with target servers with VMware ESXi installed, by using vSphere API/CIM protocol. The following are the required settings.

B.5.1 Settings When Using Domain User Account

Pay attention to the following points when monitoring by using a domain user account.

Adding domain information to ISM-VA

To perform monitoring with the domain user account, follow the procedures in "3.4.2 Initial Setup of ISM-VA."

Adding DNS information to ISM-VA

To perform monitoring with the domain user account, follow the procedures in "Add DNS server" in "4.9 Network Settings" to register the DNS server on ISM-VA.

B.6 Setting Procedure for Monitoring Targets (Cloud Management Software: vCenter Server)

ISM communicates with vCenter Server. The following settings are required for communication.

B.6.1 Adding DNS Information to ISM-VA

When executing Monitoring under the condition where an ESXi host with FQDN is registered on vCenter, execute "Add DNS server" in "4.9 Network Settings" to register the DNS server on ISM-VA.

B.6.2 Settings When Using Domain User Account

To retrieve the information from vCenter Server, settings for respective hosts must have already been registered on vCenter Server. Refer to "B.5 Setting Procedure for Monitoring Targets (OS: VMware ESXi)" to execute the settings for respective hosts.

B.7 Setting Procedure for Monitoring Targets (Cloud Management Software: Microsoft Failover Cluster)

ISM communicates with Microsoft Failover Cluster. The following settings are required for communication.

B.7.1 Settings When Using a Domain User Account

1. Setting WinRM for respective hosts configuring a cluster

   To retrieve the information from Microsoft Failover Cluster, settings for respective hosts that configure a cluster must have already been completed. Refer to "B.2 Setting Procedure for Monitoring Targets (OS: Windows)" to execute the settings for respective hosts.

2. Adding an SPN to Active Directory

   You must correctly register a Service Principal Name (SPN) of a monitoring target cluster on Active Directory when monitoring a Windows Server using the domain user account. Execute the following procedure to register the Service Principal Name of the monitoring target cluster.

   ```
   > setspn -A HOST/<monitoring target cluster IP> <monitoring target cluster name>
   ```

   Point

   Command for checking

   ```
   >setspn -L <monitoring target cluster name>
   ```

   If the command result as shown below is output, the registration has succeeded.

   ```
   HOST/<monitoring target cluster IP>
   ```

3. Adding domain information to ISM-VA

   When executing Monitoring using the domain user account, follow the procedures in "3.4.2 Initial Setup of ISM-VA."

4. Adding DNS information to ISM-VA

   When executing Monitoring with the domain user account, follow the procedures in "Add DNS server" in "4.9 Network Settings" to register the DNS server on ISM-VA.

5. Kerberos delegation configuration for Active Directory

   a. Log on to the Active Directory server.

   b. Open Server Manager.

   c. From the [Tool] button, select [Active Directory Users and Computers].

   d. Expand the domain, and then expand the [Computers] folder.

   e. Right-click the cluster node name or cluster name on the right-side window, and then select [Properties].

   f. From the [General] tab, check the [Trust computer for delegation to any service (Kerberos only)] checkbox.

   g. Select [OK] and repeatedly perform the above Step e to f for all the cluster nodes or cluster.

B.8 Setting Procedure for Monitoring Targets (Cloud Management Software: Microsoft System Center)

Refer to "B.2 Setting Procedure for Monitoring Targets (OS: Windows)" to execute the settings for the respective hosts and virtual machines with Microsoft System Center installed.

B.9 Setting Procedure for Monitoring Targets (Cloud Management Software: KVM)

Point

If you use domain users, setting procedures differ depending on the cloud management software that you use. Refer to the applicable procedure below.

- B.9.1 Setting Procedure for KVM Red Hat Enterprise Linux (Using Domain User)
- B.9.2 Setting Procedure for KVM SUSE Linux Enterprise Server (Using Domain User)

B.9.1 Setting Procedure for KVM Red Hat Enterprise Linux (Using Domain User)

To retrieve the KVM information, set the SSSD service for the monitoring target node.

The required packages are shown below:

- krb5-workstation
- samba
- samba-client
- samba-common
- sssd

Set the following items from the terminal as a root user.

1. Editing "/etc/hosts"

   a. Open the "/etc/hosts" file.

```
# vi /etc/hosts
```

b. Add the following.

- An IP address and a host name of the KVM server to be the monitoring target
- An IP address of ISM-VA

Example:

```
192.168.30.222 rhel73.win2016.local rhel73
192.168.30.228
```

Note

This setting is not reflected in the local host name (on the local host). However, without this setting, executing the command to join Active Directory as described further below will result in an error.

2. Editing "/etc/krb5.conf"

a. Open the "/etc/krb5.conf" file.

```
# vi /etc/krb5.conf
```

b. Set a domain name in uppercase letters in "default_realm" in the [libdefaults] section.

Example:

```
[libdefaults]
 dns_lookup_realm = true
 dns_lookup_kdc = true
 ticket_lifetime = 24h
 renew_lifetime = 7d
 forwardable = true
 default_realm = WIN2016.LOCAL
```

c. Execute the settings in the [realms] section.

Example:

```
[realms]
 WIN2016.LOCAL = {
  kdc = 192.168.30.69
  admin_server = WIN2016-ADVM.WIN2016.LOCAL
 }
```

For kdc, set an IP address of the server that issues Kerberos tickets.

For admin_server, set the FQDN of the Kerberos management server.

Generally, kdc and admin_server are the same servers as the DNS and Active Directory servers.

d. Execute the settings in the [domain_realm] section.

Example:

```
[domain_realm]
 win2016.local = WIN2016.LOCAL
 .win2016.local = WIN2016.LOCAL
```

Note

Use uppercase and lowercase letters as in the above example to set the domain name you are actually using.

3. Editing "/etc/samba/smb.conf"

   a. Open the "/etc/samba/smb.conf" file.

   ```
   # vi /etc/samba/smb.conf
   ```

   b. Delete all sections other than the [global] section, and execute the settings in the [global] section as follows.

   Example:

   ```
   [global]
      workgroup = WIN2016
      client signing = yes
      client use spnego = yes
      kerberos method = secrets and keytab
      log file = /var/log/samba/%m.log
      realm = WIN2016.LOCAL
      security = ads
   ```

   Note

   For workgroup and realm, set the domain name you are actually using.

4. Creation of "/etc/sssd/sssd.conf"

   a. Open the "/etc/sssd/sssd.conf" file. Since it does not exist in the default setting, you must create it newly.

   ```
   # vi /etc/sssd/sssd.conf
   ```

   Example:

   ```
   [sssd]
   config_file_version = 2
   services = pam,nss
   domains = WIN2016.LOCAL

   [pam]

   [nss]
   filter_groups = root
   filter_users = root

   [domain/WIN2016.LOCAL]
   id_provider = ad
   auth_provider = ad
   enumerate = false
   cache_credentials = false
   case_sensitive = false
   ```

   Note

   For domains in the [sssd] section and for the [domain/WIN2016.LOCAL] section name, set the domain names you are actually using.

   b. To create a home directory automatically when a domain user logs in, add the following to the [domain/Domain name] section in "/etc/sssd/sssd.conf."

   ```
   fallback_homedir = /home/%u
   ```

5. Modification of permission in "/etc/sssd/sssd.conf"

   Modify the permission in "/etc/sssd/sssd.conf" to "600."

```
# chmod 600 /etc/sssd/sssd.conf
```

Note

Any value other than “600” will cause an error at startup of the sssd service.

6. Setting of a local host name (on the local host)

   Set the local host name (on the local host) with the following command.

```
# hostnamectl set-hostname <FQDN of host>
```

   Example:

```
# hostnamectl set-hostname rhel73.win2016.local
```

Note

This is the host name setting on the local host. It is not reflected to the host name on the network. Make sure that the FQDN of the host matches the one you set in Step 1.

7. IP address setting of DNS server

   a. Use the following command to set the IP address of the DNS server and restart the interface.

```
# nmcli connection modify <Interface name> ipv4.dns <IP address of DNS server>
# systemctl restart NetworkManager
```

   b. Execute the following command to look up the interface name.

   - For Red Hat Enterprise Linux 6 or earlier

```
# ifconfig
```

   - For Red Hat Enterprise Linux 7 or later

```
# ip addr
```

   c. Execute the following command to check the settings.

```
# host <Kerberos management server name>
```

   Example:

```
# host WIN2016-ADVM.WIN2016.LOCAL
```

   If the output includes the IP address, the settings are correct.

8. Getting permission to retrieve a Kerberos ticket

   a. Execute the following command to get permission to retrieve a Kerberos ticket.

```
# kinit Administrator
```

   b. When you are requested to enter the password, enter the password for the domain administrator user "Administrator."

   c. Execute the following command to check the settings.

```
# klist
```

   If the domain information is output, the settings are correct.

   If there is any failure, check "/etc/krb5.conf."

9. Joining Active Directory

   a. Use the following command to join Active Directory.

   ```
   # net ads join -U Administrator
   ```

   b. When you are requested to enter the password, enter the password for the domain administrator user "Administrator."

   c. Execute the following command to check the settings.

   ```
   # net ads info
   ```

   If the server information (shown as "LDAP server") and domain information is output, the settings are correct.

   If there is any failure, check the host name setting and the settings in "/etc/samba/smb.conf." Alternatively, refer to Point in Step 13.

10. System authentication settings

    Execute the following command to set the system authentication (authorization for a target monitoring server).

    This command automatically updates all related setup files.

    - To not automatically create a home directory for the domain user

    ```
    # authconfig --enablesssd --enablesssdauth --enablelocauthorize --update
    ```

    - To create a home directory automatically for the domain user

      Execute Step b in Step 4 in advance, and then execute the following command.

    ```
    # authconfig --enablesssd --enablesssdauth --enablelocauthorize --enablemkhomedir --update
    ```

    Note

    For Red Hat Enterprise Linux 8.0 or later, it is recommended to use "authselect" instead of "authconfig."

    To use "authselect," execute the following command.

    ```
    # authselect select sssd with-mkhomedir
    ```

    If the home directory is not created automatically when you log in as a domain user, create the directory manually.

11. Starting SSSD (System Security Services Daemon) service

    a. Execute the following commands to start the SSSD service.

    ```
    # systemctl enable sssd
    # systemctl start sssd
    ```

    b. Execute the following command to check that the service has started.

    ```
    # systemctl status sssd
    ```

    If it is running normally, the settings are correct.

    If there is any failure, check the contents of "/etc/sssd/sssd.conf" and the file permissions.

12. Checking login as a domain user

    You can use any of the following commands to check logins with the SSH protocol. For formats of the domain user name, refer to the following Point.

    ```
    # ssh <domain user name>@<IP address of monitored server>
    ```

    ```
    # ssh -l <domain user name> <IP address of monitored server>
    ```

    Examples:

```
# ssh administrator@192.168.30.222
```

```
# ssh 'administrator@win2016'@192.168.30.222
```

```
# ssh -l 'win2016.local\administrator' 192.168.30.222
```

If you can log in normally with any of these procedures, the settings are correct.

Point

- Name formats for domain users

  There are several different formats to write domain user names as follows.

  Since "case sensitive" is set to "false" in the [domain/WIN2016.Domain name] section in "/etc/sssd/sssd.conf," there is no distinction between uppercase and lowercase letters.

Name formats for domain users	Examples
User name	administrator
'Domain prefix\User name'	'win2016\administrator'
'Domain prefix.Domain name suffix\User name'	'win2016.local\administrator'
'User name@Domain prefix'	'administrator@win2016'
'User name@Domain prefix.Domain name suffix'	'administrator@win2016.local'

- Check of domain user existence

  You can use any of the following commands to check whether a domain user exists. For the domain user name, you can use any of the name formats for domain users described above.

```
# id <domain user name>
```

```
# getent passwd <domain user name>
```

  If the user information is displayed, the settings are correct.

13. Settings for the Domain User

    Follow the procedures in "B.9.3 Settings When Using a General User Account," and set the domain user appropriately.

Point

When login is no longer available after changing a host name

If you changed a host name both on the local host and on the network, execute the following two commands.

```
# net ads join -U Administrator
# systemctl restart sssd
```

If the login still fails, the previous settings may exist in "/etc/krb5.keytab," so you must delete "/etc/krb5.keytab" with the following command first, and then execute the above commands.

```
# rm /etc/krb5.keytab
```

14. Adding domain information to ISM-VA

    Execute the settings in "3.4.2 Initial Setup of ISM-VA."

15. Adding DNS information to ISM-VA

    Register DNS servers in ISM-VA by executing "Add DNS server" in "4.9 Network Settings."

B.9.2 Setting Procedure for KVM SUSE Linux Enterprise Server (Using Domain User)

To retrieve the KVM information, set the SSSD service on the monitoring target node.

Execute the following settings by either using the yast command on the terminal or by using YaST on the GUI menu. The following procedure uses the yast command.

1. Startup of yast command

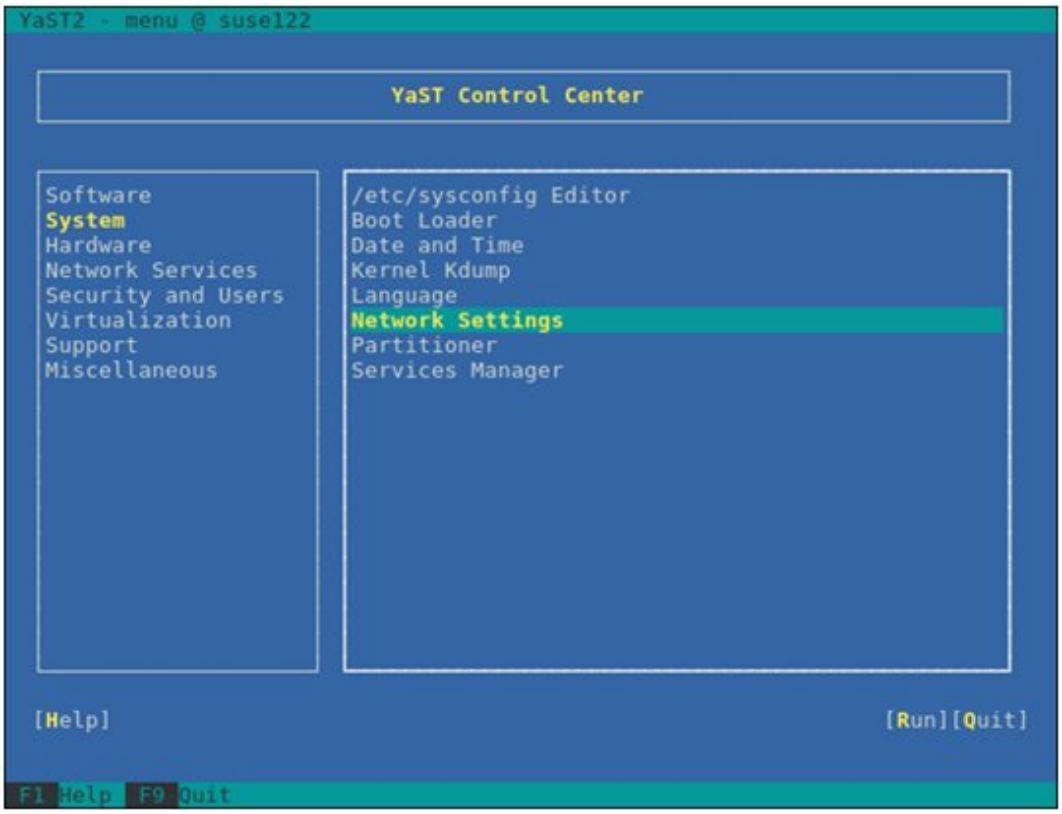
   Execute the following command as a root user from your terminal.

   ```
   # yast
   ```

   To select items in yast, use combinations of the arrow keys and the [Tab] key.

2. Host name and DNS settings

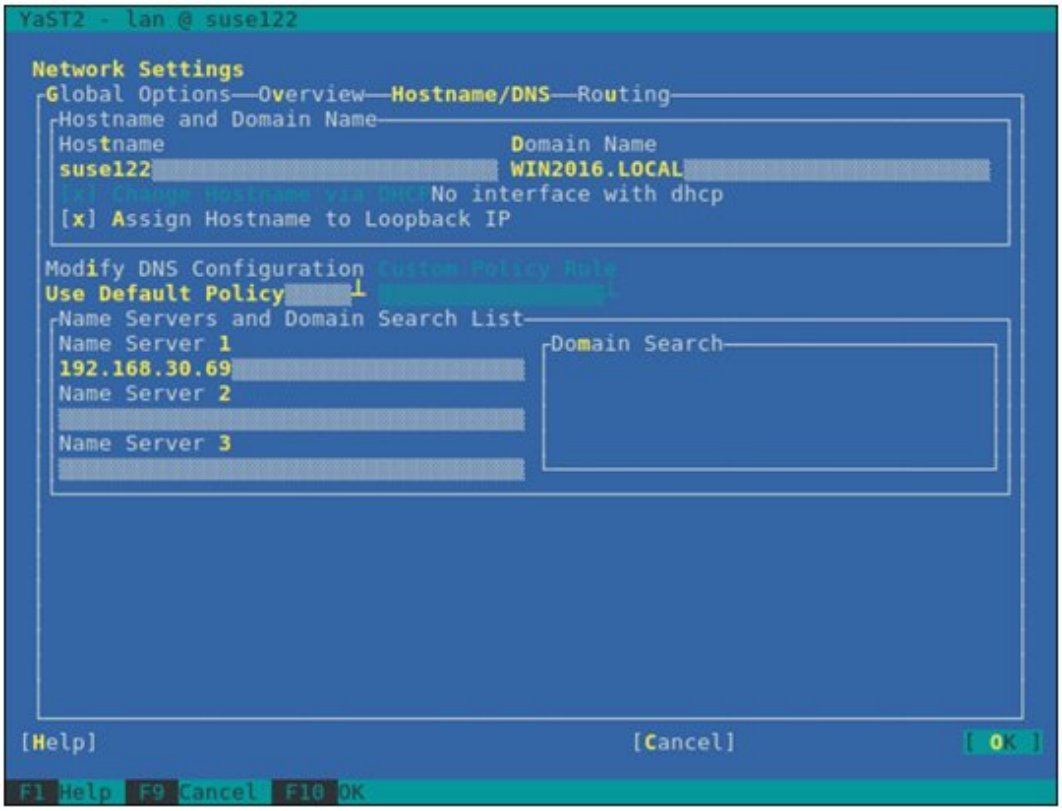
   a. Select [System] - [Network Settings], and then press the [Enter] key.



   b. Select [Hostname/DNS], execute the settings for the following items, then select [OK] and press the [Enter] key.

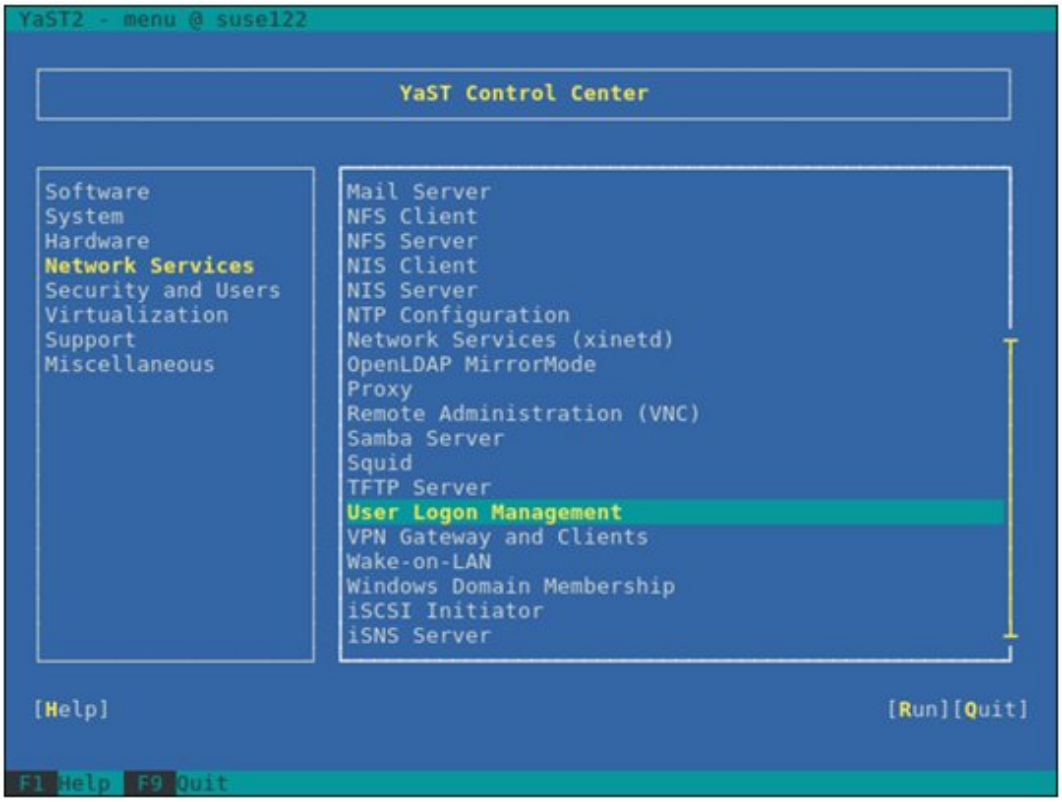
   - Hostname
   - Domain Name
   - Assign Hostname to Loopback IP

- Name Server 1

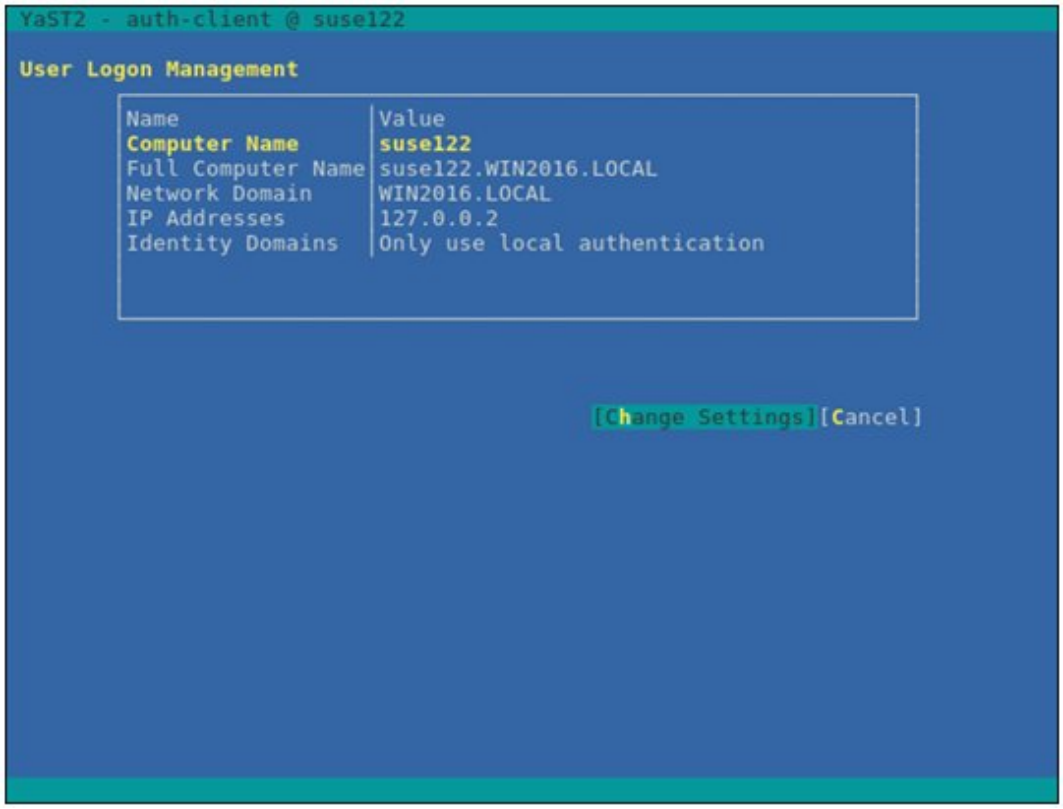


3. SSSD service settings

a. Select [Network Services] - [User Logon Management], and then press the [Enter] key.



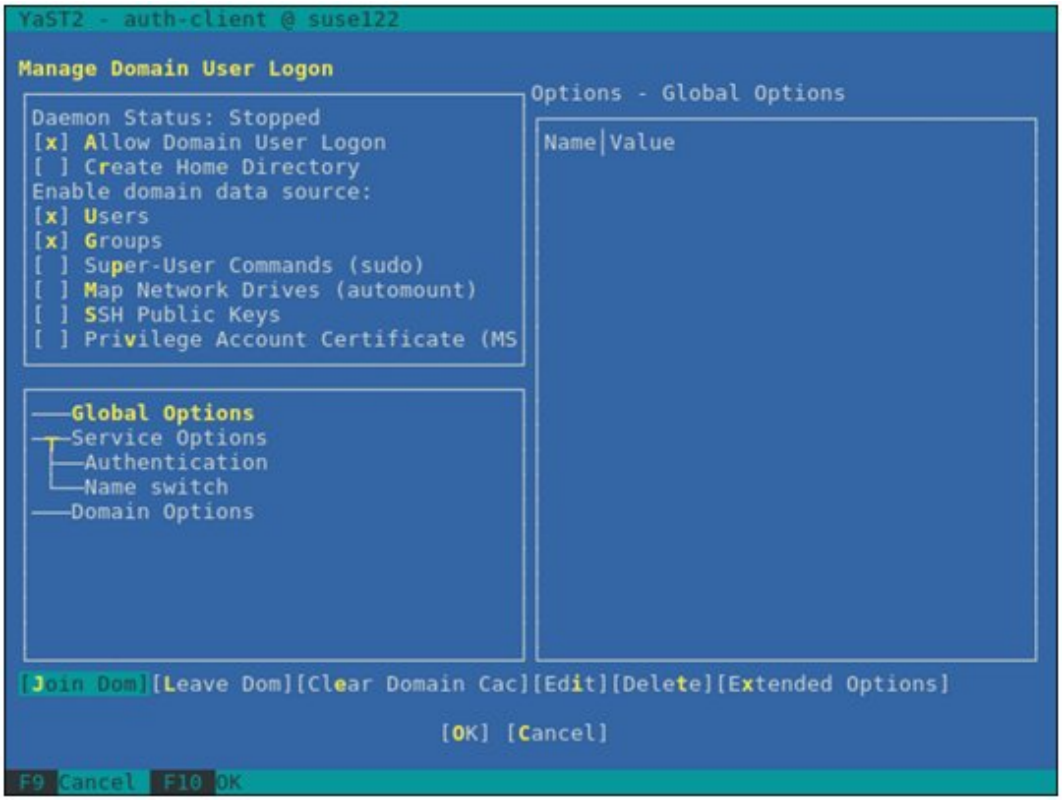
b. Select [Change Settings], and then press the [Enter] key.



c. Check the checkboxes for the following items, select [Join Dom], and then press the [Enter] key.

- Allow Domain User Logon
- Users

- Groups



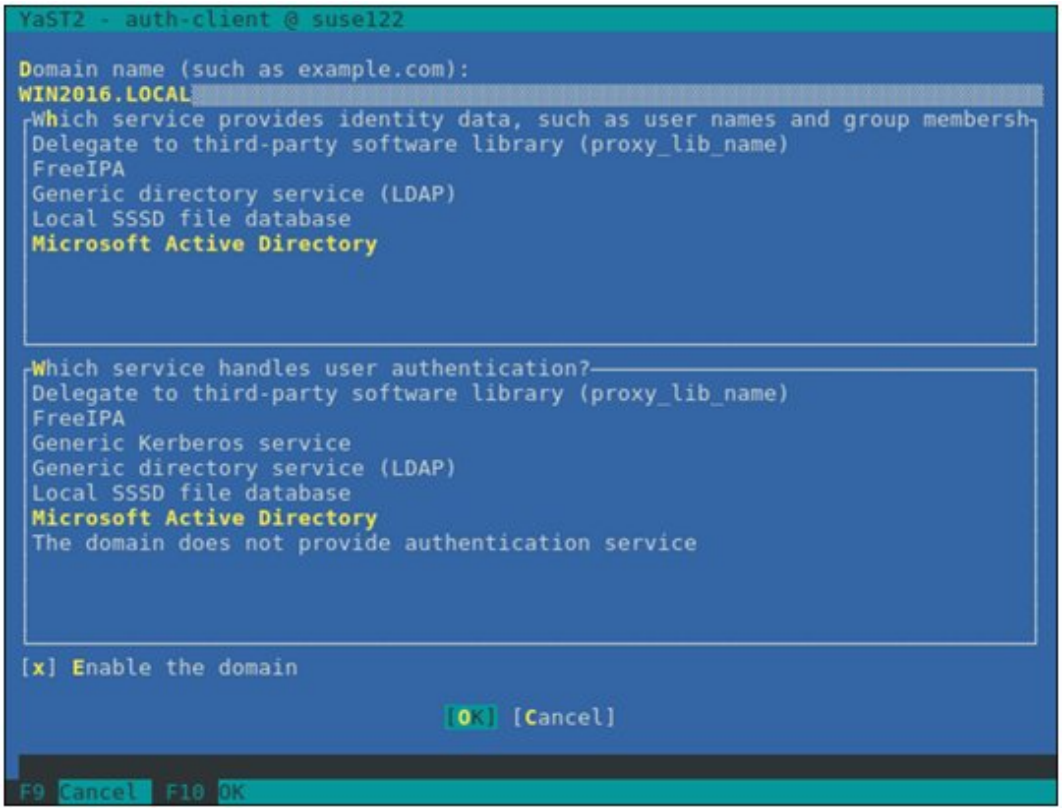
d. Set the following items, then select [OK] and press the [Enter] key.

- Domain name
- Which service provides identity data, such as user names and group members

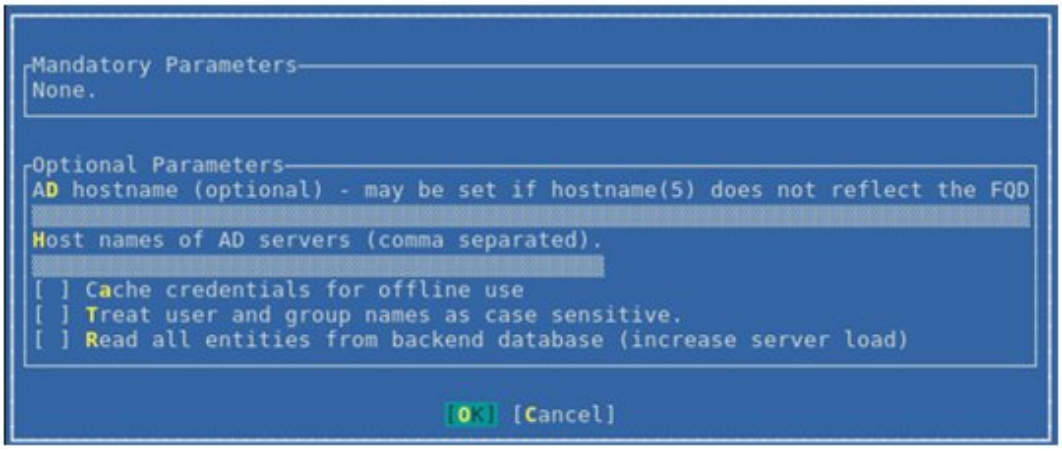
  Microsoft Active Directory
- Which service handles user authentication?

  Microsoft Active Directory

- Enable the domain



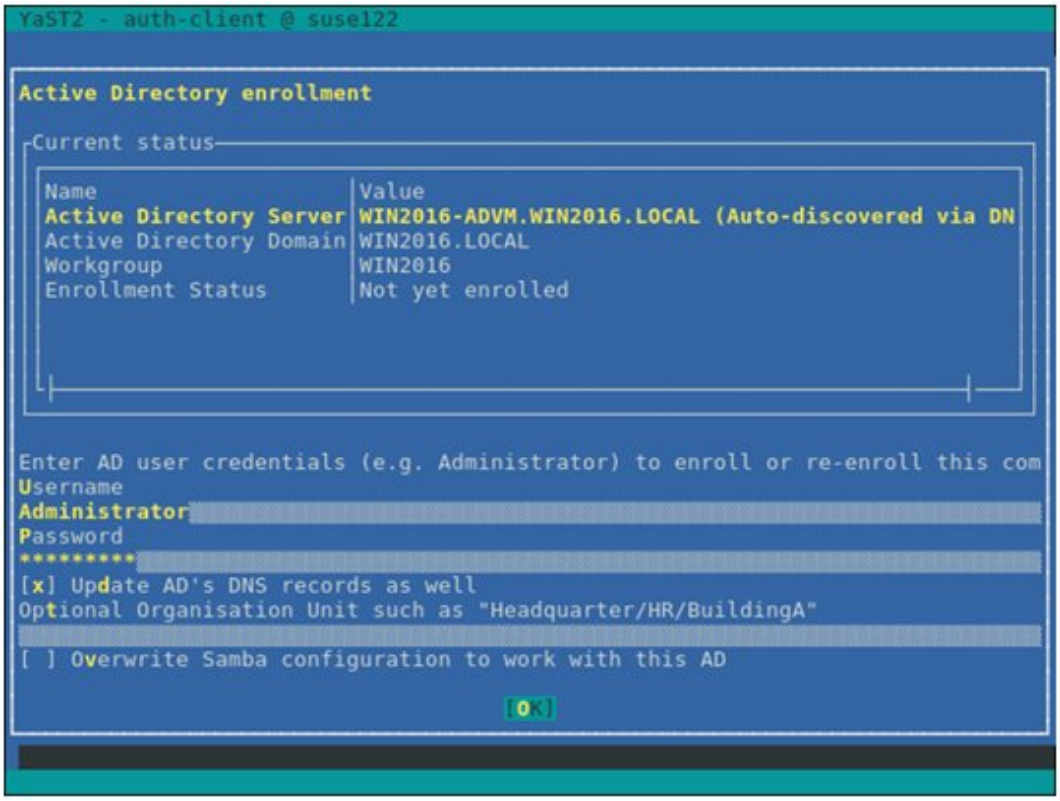
e. Leave all items blank and uncheck the checkboxes, select [OK], and then press the [Enter] key.



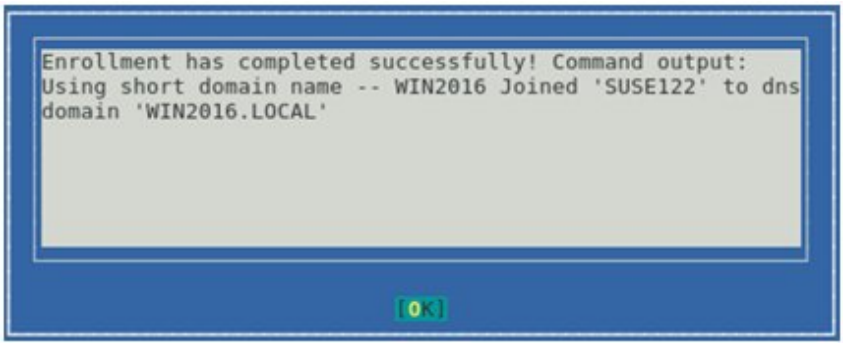
f. Set the following items, then select [OK] and press the [Enter] key.

- Username
- Password

- Update AD's DNS records as well



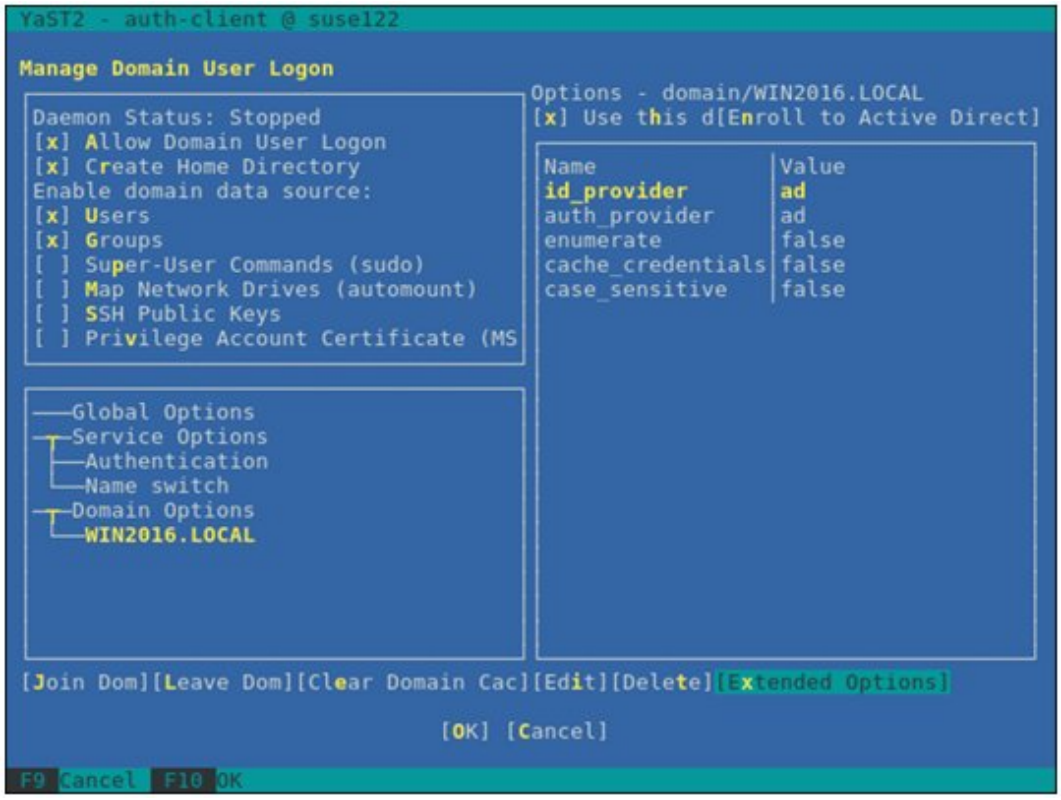
g. Select [OK], and then press the [Enter] key.



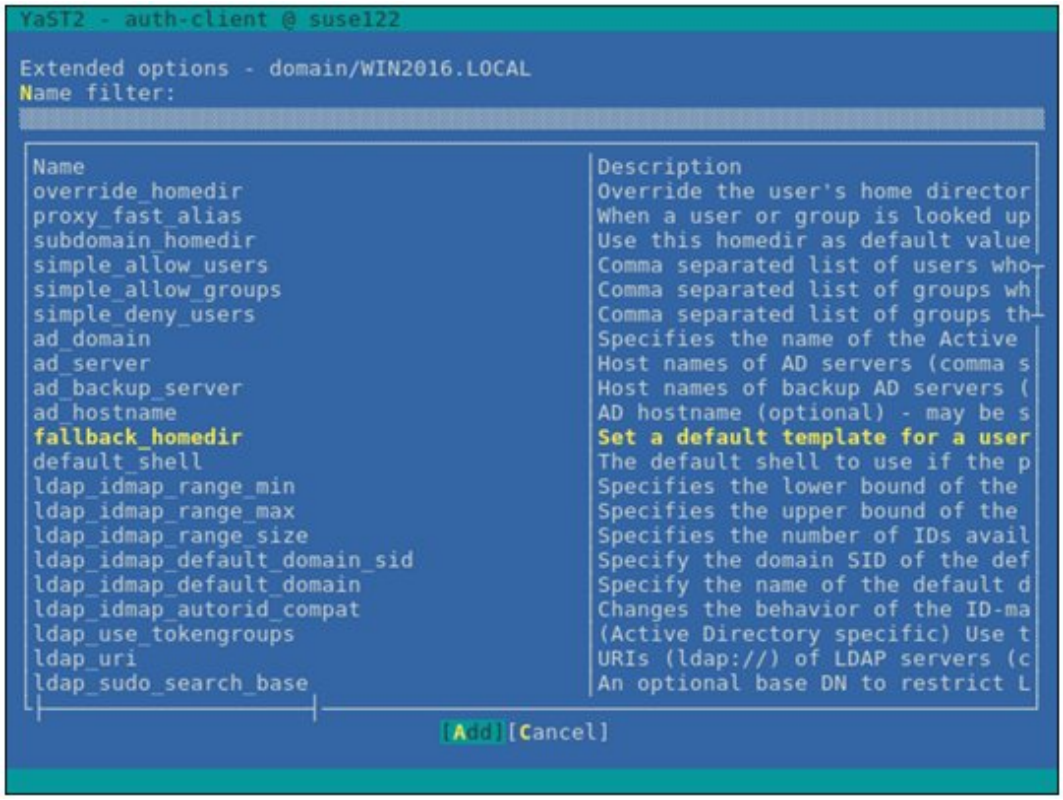
To create a home directory for the domain user, proceed to Step h.

If you do not create a home directory for the domain user, proceed to Step k.

h. Set [Create Home Directory], then select [Extended Options] and press the [Enter] key.

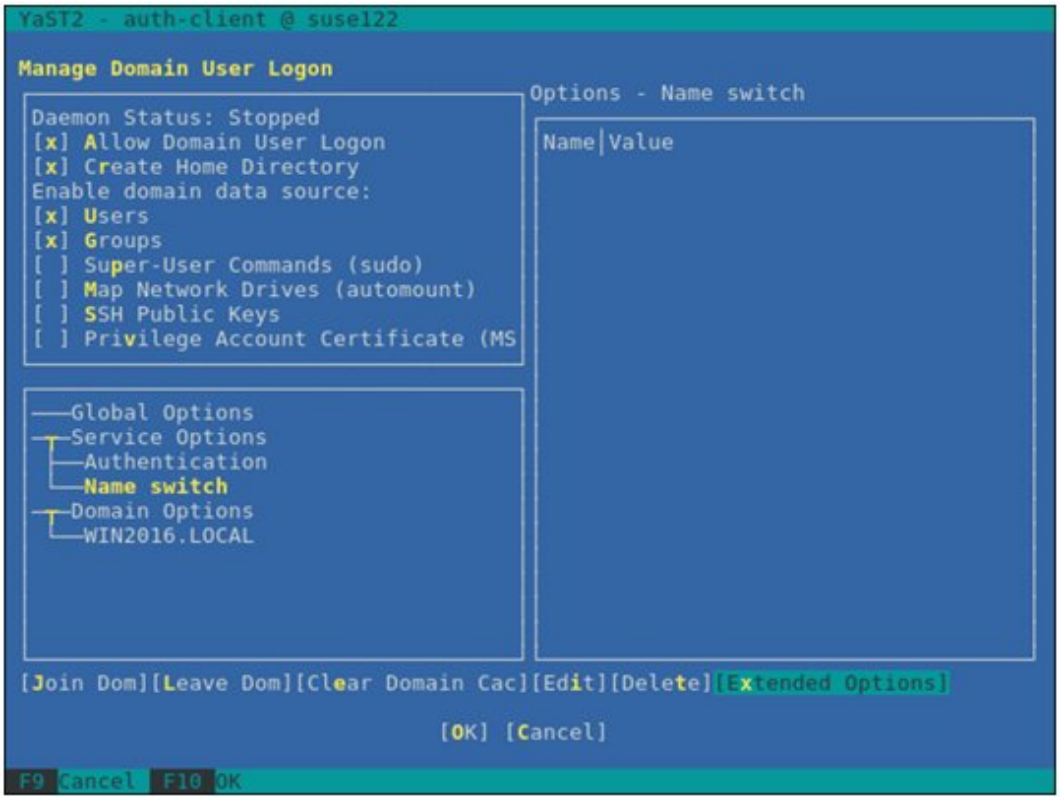


i. Select [fallback_homedir], then select [Add] and press the [Enter] key.

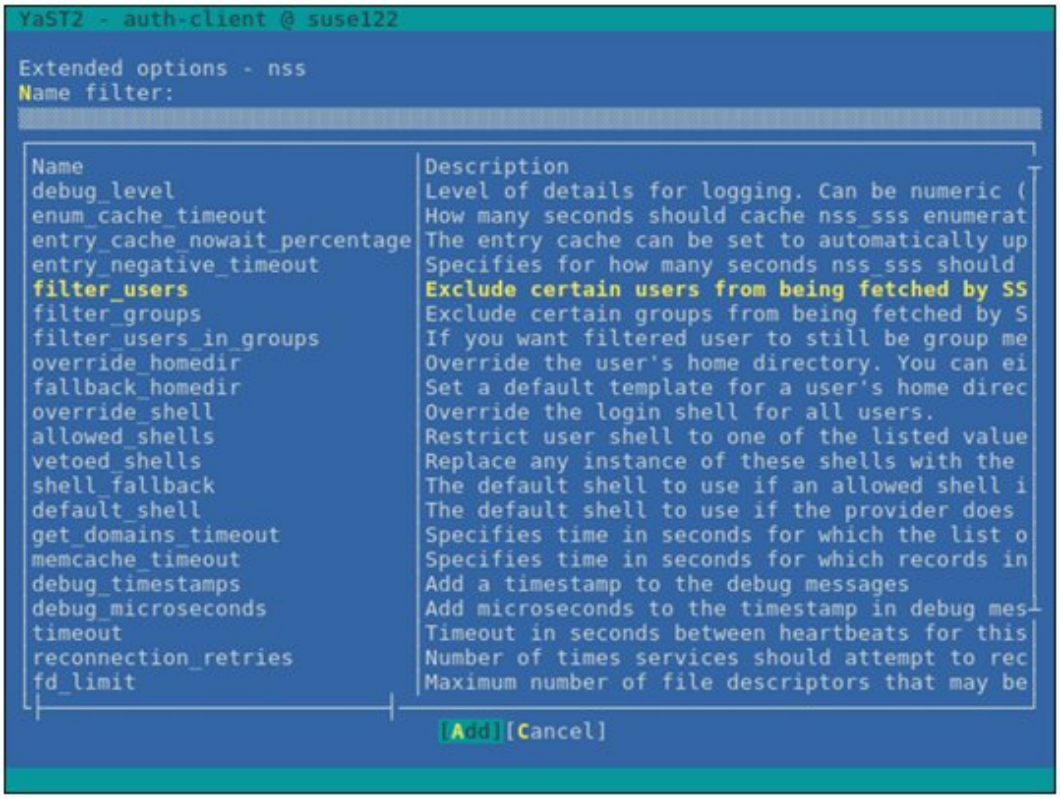


j. Enter "/home/%u," then select [OK] and press the [Enter] key.

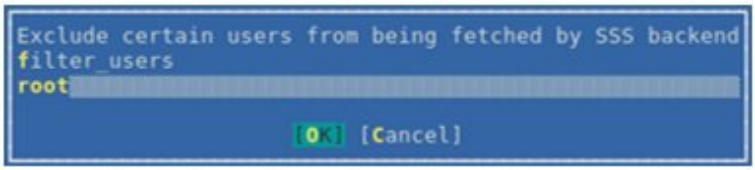
k. Select [Name switch] - [Extended Options], and then press the [Enter] key.



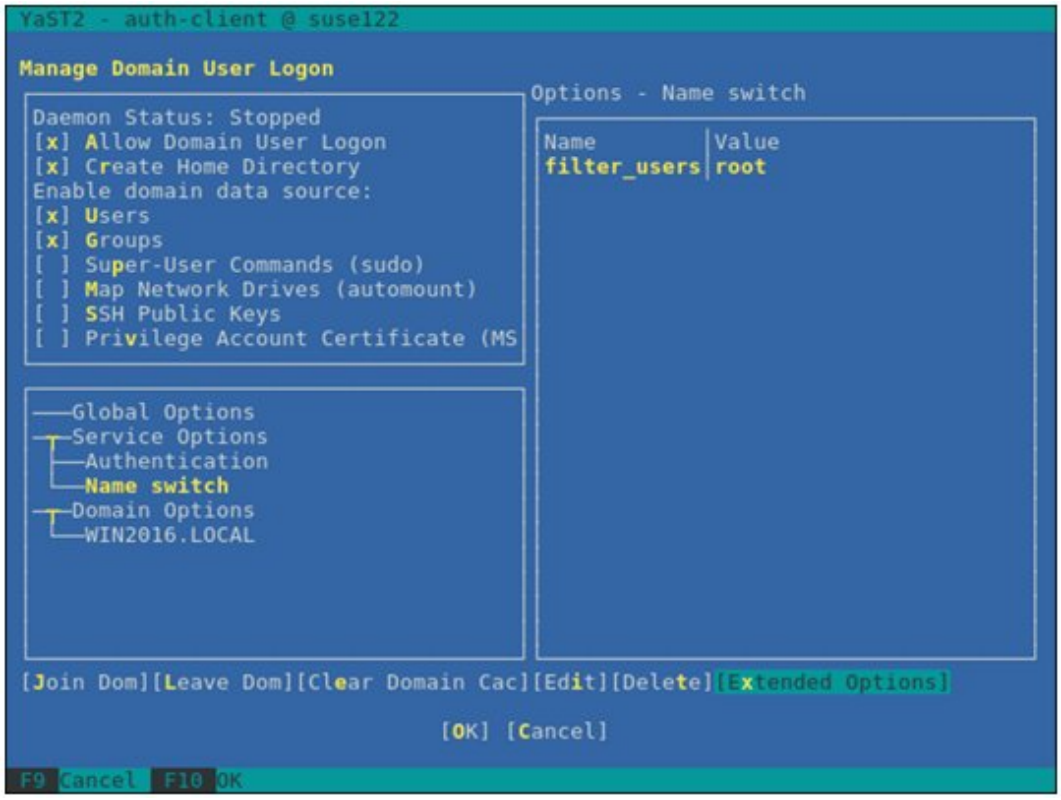
l. Select [filter_users], then select [Add] and press the [Enter] key.



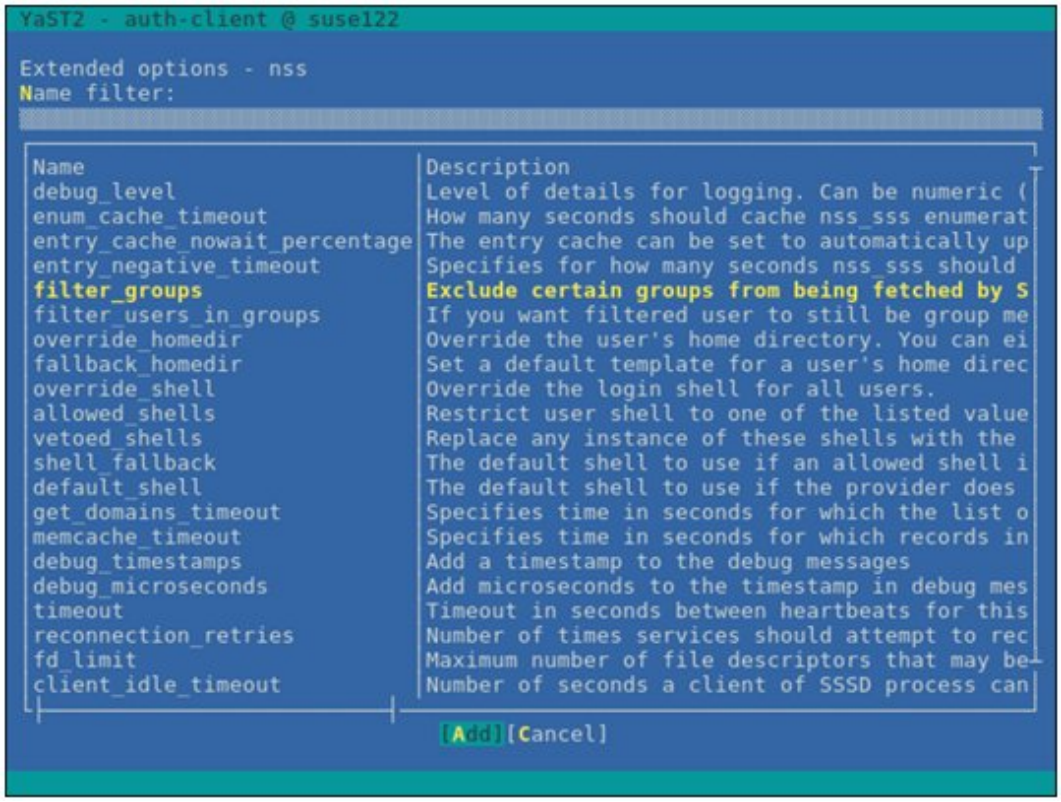
m. Enter "root," then select [OK] and press the [Enter] key.



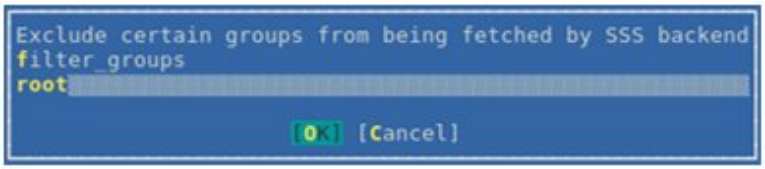
n. Select [Name switch] - [Extended Options], and then press the [Enter] key.



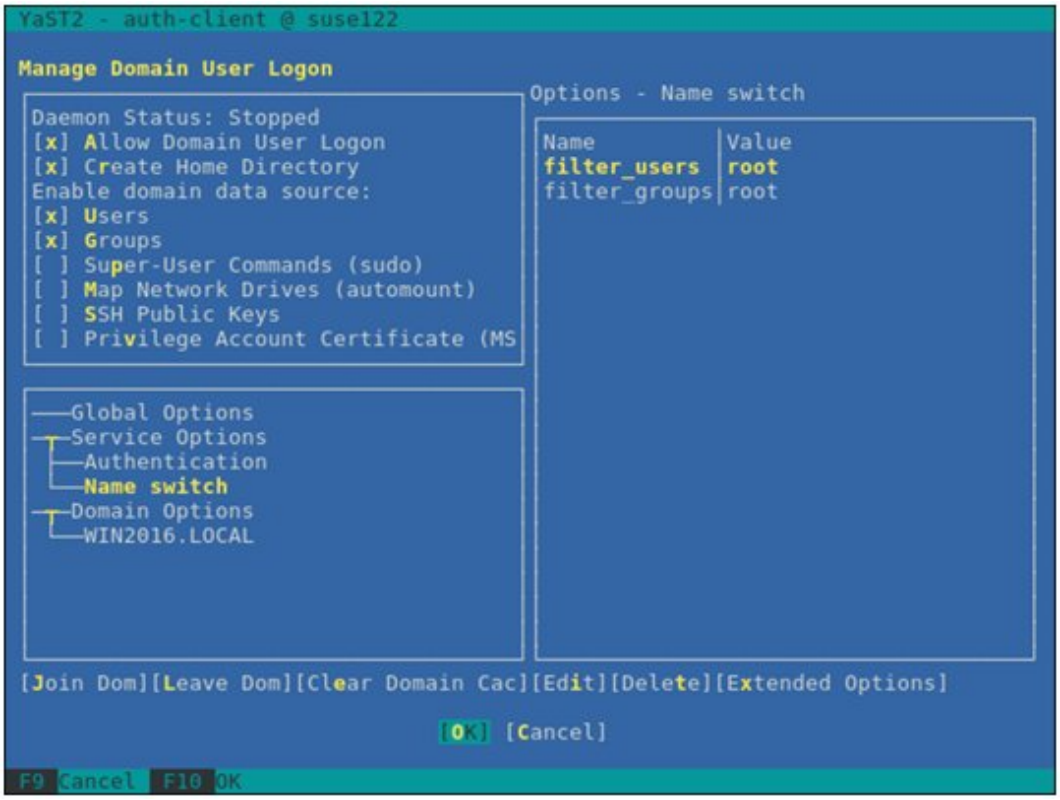
o. Select [filter_groups], then select [Add] and press the [Enter] key.



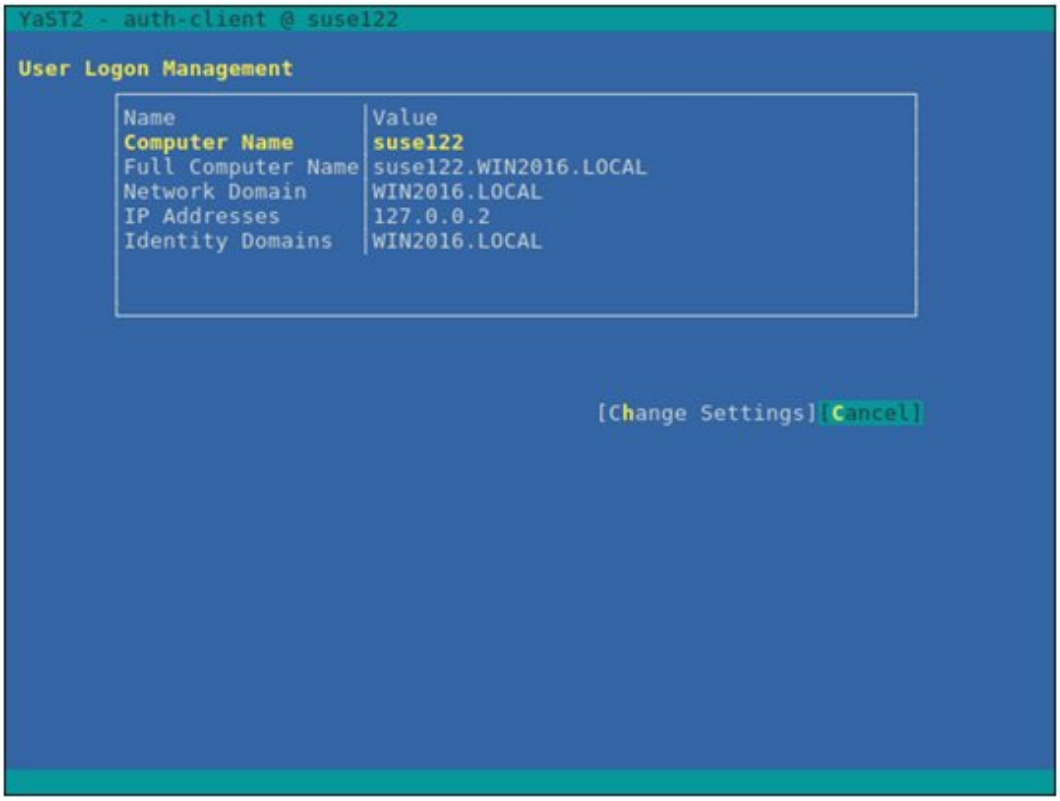
p. Enter "root," then select [OK] and press the [Enter] key.



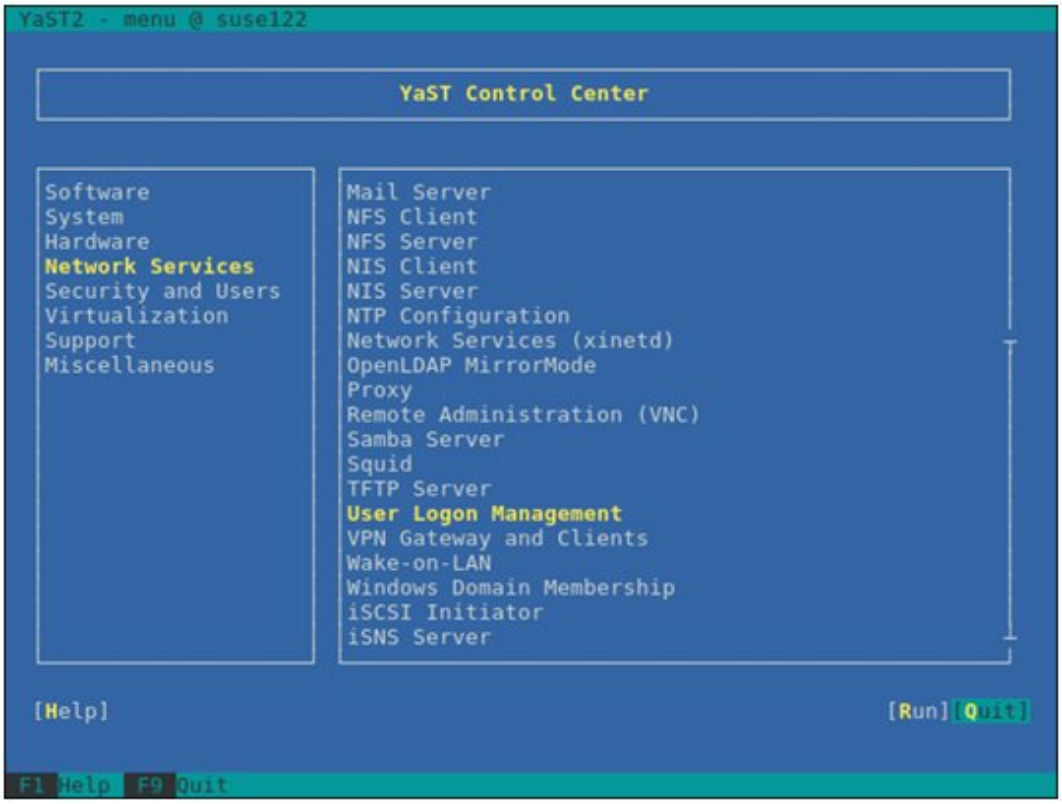
q. Select [OK], and then press the [Enter] key.



r. Select [Cancel], and then press the [Enter] key.



s. Select [Quit], and then press the [Enter] key.



This completes your settings for the SSSD service.

4. Check of login as a domain user

   You can use any of the following commands to check logins with the SSH protocol. For formats of the domain user name, refer to the following Point.

```
# ssh <domain user name>@<IP address of monitored server>
```

```
# ssh -l <domain user name> <IP address of monitored server>
```

   Examples:

```
# ssh administrator@192.168.30.222
```

```
# ssh 'administrator@win2016'@192.168.30.222
```

```
# ssh -l 'win2016.local\administrator' 192.168.30.222
```

   If you can log in normally with any of these procedures, the settings are correct.

Point

Name formats for domain users

There are several different formats to write domain user names as follows. Since "case sensitive" is set to "false" in the optional domain settings, there is no distinction between uppercase and lowercase letters.

Name formats for domain users	Examples
User name	administrator
'Domain prefix\User name'	'win2016\administrator'
'Domain prefix.Domain name suffix\User name'	'win2016.local\administrator'
'User name@Domain prefix'	'administrator@win2016'
'User name@Domain prefix.Domain name suffix'	'administrator@win2016.local'

5. Settings for the Domain User

   Follow the procedures in "B.9.3 Settings When Using a General User Account" and execute the settings for the domain user.

6. Adding domain information to ISM-VA

   Execute the settings in "3.4.2 Initial Setup of ISM-VA."

7. Adding DNS information to ISM-VA

   Register DNS servers in ISM-VA by executing "Add DNS server" in "4.9 Network Settings."

B.9.3 Settings When Using a General User Account

In principle, KVM information can only be retrieved by root users.

When letting users other than the root users (including domain users) retrieve KVM information, you must add those users to the “libvirt” group on the monitoring Linux server.

Execute the following command as a root user.

```
# gpasswd -a <user name> libvirt
```

Point

To remove a user from the "libvirt" group, execute the following command as a root user.

```
# gpasswd -d <user name> libvirt
```

Note

- Set the user name using only lowercase letters.
- You can also use the above commands to add and remove domain users.

B.10 Setting Procedure for Monitoring Targets (Cloud Management Software: IPCOM)

ISM communicates with IPCOM. The following settings are required for communication.

B.10.1 Setting Procedure to Assign Privilege to Execute the Command to Retrieve the Virtual Machine Information

When you retrieve the virtual information of IPCOM with an admin user, you must add the admin user to the "libvirt" group on the monitoring IPCOM server and assign the privilege to execute the command to retrieve the virtual machine information.

Execute the following command as an admin user.

```
# sudo gpasswd -a admin libvirt
```

Point

To remove an admin user from the "libvirt" group, execute the following command as an admin user.

```
# sudo gpasswd -d admin libvirt
```

B.11 Setting Procedure for Monitoring Targets (Cloud Management Software: OpenStack)

ISM communicates with OpenStack. The following settings are required for communication.

B.11.1 Setting Procedure for a Controller Node

1. Installing an SSL module

   If an SSL module is already installed on the controller node, the installation is not required.

   The following is an example of an installation using the "yum" command.

   ```
   # yum install mod_ssl
   ```

2. Preparing SSL certificates

   a. You must prepare SSL certificates and SSL certificate key files for HTTPS communication.

      SSL certificates can be prepared in the following three ways:

      - Reusing the existing SSL certificates and SSL certificate key files that are already installed
      - Issuing by the Certificate Authority
      - Creating self-certificates

Point

Example of creating a self-certificate

```
# openssl genrsa -rand /proc/uptime 2048 > server.key
# openssl req -new -key server.key -x509 -sha256 -days 365 -set_serial $RANDOM -extensions
v3_req -out server.crt
```

For "Common Name," enter an IP address, FQDN, or a host name.

Note

- Only SSL certificates whose version is X.509 v3 can be used. You can check the version information with the following command.

  ```
  # openssl x509 -text -noout -in certificate_file_path
  ```

  For "certificate_file_path," enter a full pathname of the certificate file.

- A certificate file may be created automatically when installing OpenStack, but it may be created with a version other than X.509 v3. Be sure to use the certificates created in X.509 v3.

b. Store the obtained SSL certificate in the controller node.

- SSL certificate file: /etc/pki/CA/certs/
- SSL certificate key file: /etc/pki/CA/private/

3. Determining port assignment

   Determine the port to assign to the Proxy server.

   Select a port that is not used by other services on the controller node.

   1-1023 cannot be used.

4. Preparing a setting file for OpenStack environment variables

   Download the information according to the following procedure. (The procedure may vary depending on the used version/platform.)

   a. Log in to "OpenStack Dashboard" as an admin user.

   b. Select the admin icon on the top right.

   c. Select "OpenStack RC File v3" to download.

   You can also use the file created when installing OpenStack.

5. Retrieving the OpenStack endpoint information

   Execute the following command on the controller node to retrieve the following four types of URL information and two types of version information. Retrieve the last "vx" part of the URL for the version information.

   - URL and version of the item where "Service Type" is "identity" and "Interface" is "public"
   - URL of the item where "Service Type" is "network" and "Interface" is "public"
   - URL of the item where "Service Type" is "image" and "Interface" is "public"
   - URL and version of the item where "Service Type" is "compute" and "Interface" is "public"

   Execute the following command on the controller node.

   ```
   source <OpenStack environment variable settings file>; unset OS_SERVICE_TOKEN; export
   OS_PASSWORD=<OpenStack_PASSWORD>; openstack endpoint list
   ```

   Example:

```
source keystonerc_admin; unset OS_SERVICE_TOKEN; export OS_PASSWORD=password; openstack endpoint
list
```

Example of output:

```
+----------------------------------+-----------+--------------+--------------+---------
+-----------+-----------------------------------------------+
| ID | Region | Service Name | Service Type | Enabled | Interface | URL |
+----------------------------------+-----------+--------------+--------------+---------
+-----------+-----------------------------------------------+
| 01d7dd66d19947d5870acec413876ba2 | RegionOne | keystone | identity | True | public | http://
192.168.30.86:5000/v3                          |
| 04005c8d71a544e596b9e40083fa7206 | RegionOne | placement | placement | True | internal | http://
192.168.30.86:8778/placement                 |
| 0797675ff3c64da58a57a4988ec44a2b | RegionOne | cinderv2 | volumev2 | True | admin
| http://192.168.30.86:8776/v2/%(tenant_id)s       |
| 09ae73e20c004030ae04a7f5d8bf048a | RegionOne | placement | placement | True | admin | http://
192.168.30.86:8778/placement                 |
| 12d9cbc0b1de4bf5a63d6819ec274685 | RegionOne | swift | object-store | True | internal | http://
192.168.30.86:8080/v1/AUTH_%(tenant_id)s  |
| 201c7c5ecef54c0691c043eafe6087ae | RegionOne | neutron | network | True | admin
| http://192.168.30.86:9696                            |
| 32920d76f674494d9a9dd98e06c9e229 | RegionOne | gnocchi | metric | True | internal
| http://192.168.30.86:8041                            |
| 3ff445febbee434aafc70c964dc3dbdc | RegionOne | ceilometer | metering | True | internal | http://
192.168.30.86:8777                           |
| 42f8a5c483ef43f18e736b622c2d5cf8 | RegionOne | cinderv2 | volumev2 | True | internal | http://
192.168.30.86:8776/v2/%(tenant_id)s          |
| 4aba919df7f947bbaf7a19918fadd01e | RegionOne | swift | object-store | True | admin | http://
192.168.30.86:8080/v1/AUTH_%(tenant_id)s  |
| 4b8c976fe4e742018b0fd4177dcae429 | RegionOne | cinderv3 | volumev3 | True | admin
| http://192.168.30.86:8776/v3/%(tenant_id)s          |
| 5b61335921c247689906b1bf390a45e7 | RegionOne | cinderv2 | volumev2 | True | public | http://
192.168.30.86:8776/v2/%(tenant_id)s          |
| 676ec9c2044947fea66b15f6168465de | RegionOne | gnocchi | metric | True | admin
| http://192.168.30.86:8041                            |
| 6855184db088496baabb85f5a70021f4 | RegionOne | aodh | alarming | True | internal
| http://192.168.30.86:8042                            |
| 8944c76fb0784089b1f7f56c94388530 | RegionOne | nova | compute | True | public
| http://192.168.30.86:8774/v2.1/%(tenant_id)s        |
| 930030ede13049439e2933665e91a3b4 | RegionOne | cinderv3 | volumev3 | True | public | http://
192.168.30.86:8776/v3/%(tenant_id)s          |
| 9503ad1f5e754993838fa53fd5d58690 | RegionOne | nova | compute | True | admin
| http://192.168.30.86:8774/v2.1/%(tenant_id)s        |
| 9541b01381404c4cb200dcbeea0168c4 | RegionOne | keystone | identity | True | admin
| http://192.168.30.86:35357/v3                        |
| 98f00b9d75564ba29e92ccd5fdccb376 | RegionOne | keystone | identity | True | internal | http://
192.168.30.86:5000/v3                         |
| 9ae897c5ae704d9aa142b7b61c728468 | RegionOne | aodh | alarming | True | admin
| http://192.168.30.86:8042                            |
| 9bdc57b0a32e40148e2a049ba9211e8b | RegionOne | placement | placement | True | public | http://
192.168.30.86:8778/placement                 |
| b0ea3c01f909451bafb57ccc2e5a6e32 | RegionOne | glance | image | True | admin
| http://192.168.30.86:9292                            |
| b75f5ae0fc8644fc9859ef37d4a4afc5 | RegionOne | ceilometer | metering | True | public | http://
192.168.30.86:8777                           |
| b7de11ad749b4d0f9b593446794c355c | RegionOne | swift | object-store | True | public | http://
192.168.30.86:8080/v1/AUTH_%(tenant_id)s  |
| b82ce3bd754a46289838cdc4ec17fd0f | RegionOne | cinder | volume | True | public
| http://192.168.30.86:8776/v1/%(tenant_id)s          |
| be3d757e64a945f8b0cdf784f0167ff8 | RegionOne | neutron | network | True | internal | http://
192.168.30.86:9696                           |
| c70161c0b104474f8f1d15fee74b222f | RegionOne | gnocchi | metric | True | public
```

```
| http://192.168.30.86:8041                                |
| c89faf6e8b9d4b3f9823d1a7e490e45b | RegionOne | cinder | volume | True | internal
| http://192.168.30.86:8776/v1/%(tenant_id)s        |
| cbd56dff0a5d4fe4b1a705e820115fd6 | RegionOne | ceilometer | metering | True | admin | http://
192.168.30.86:8777                          |
| dab0b8fa23c943a787803e0fd5e00450 | RegionOne | nova | compute | True | internal
| http://192.168.30.86:8774/v2.1/%(tenant_id)s      |
| dbaf3b9d826d49ec8955623bf57cd7ec | RegionOne | neutron | network | True | public
| http://192.168.30.86:9696                                |
| e2fff591156f4176a13aad68c7e0e000 | RegionOne | glance | image | True | internal
| http://192.168.30.86:9292                                |
| ecda799534b144e7a48dbe8c4e99836a | RegionOne | cinderv3 | volumev3 | True | internal | http://
192.168.30.86:8776/v3/%(tenant_id)s        |
| f9052dd300904e8c80fca87fdb8bc2a1 | RegionOne | glance | image | True | public
| http://192.168.30.86:9292                                |
| fa9b861b2e14423baba72aa08bf2953d | RegionOne | aodh | alarming | True | public
| http://192.168.30.86:8042                                |
| fd768ee6e3844bd982e27b6cd3501c5b | RegionOne | cinder | volume | True | admin
| http://192.168.30.86:8776/v1/%(tenant_id)s        |
+----------------------------------+-----------+--------------+--------------+---------
+-----------+-----------------------------------------------+
```

Example of retrieval:

Service Type	URL	Version
identity	http://192.168.30.86:5000/v3	v3
network	http://192.168.30.86:9696	-
image	http://192.168.30.86:9292	-
compute	http://192.168.30.86:8774/v2.1	v2.1

6. Retrieving the OpenStack endpoint information with version information

   Retrieve the URL with the version information and the version of the URL for network and image with the curl command.

   Retrieve the last "vx" part of the URL for the version information.

   If there are multiple results, use the href key where "status" is "CURRENT."

   - For network

     Execute the following command.

     ```
     # curl -k <url of network>
     ```

     Example:

     ```
     # curl -k "http://192.168.30.86:9696"
     ```

     Example of output:

     ```
     {"versions": [{"status": "CURRENT", "id": "v2.0", "links": [{"href": "http://
     192.168.30.86:9696/v2.0/", "rel": "self"}]}]}
     ```

     Example of retrieval:

Service Type	URL	Version
network	http://192.168.30.86:9696/v2.0	v2.0

   - For image

     Execute the following command.

     ```
     # curl -k <url of image>
     ```

Example:

```
# curl -k "http://192.168.30.86:9292"
```

Example of output:

```
{"versions": [{"status": "CURRENT", "id": "v2.5", "links": [{"href": "http://
192.168.30.86:9292/v2/", "rel": "self"}]}, {"status": "SUPPORTED", "id": "v2.4", "links":
[{"href": "http://192.168.30.86:9292/v2/", "rel":
"self"}]}, {"status": "SUPPORTED", "id": "v2.4", "links": [{"href": "http://
192.168.30.86:9292/v2/", "rel": "self"}]}, {"status": "SUPPORTED", "id": "v2.2", "links":
[{"href": "http://192.168.30.86:9292/v2/", "rel": "self"}]}, {"status": "SUPPORTED", "id":
"v2.1", "links": [{"href": "http://192.168.30.86:9292/v2/", "rel": "self"}]}, {"status":
"SUPPORTED", "id": "v2.0", "links": [{"href": "http://192.168.30.86:9292/v2/", "rel":
"self"}]}, {"status": "DEPRECATED", "id": "v1.1", "links": [{"href": "http://
192.168.30.86:9292/v1/", "rel": "self"}]}, {"status": "DEPRECATED", "id": "v1.0", "links":
[{"href": "http://192.168.30.86:9292/v1/", "rel": "self"}]}]}
```

Example of retrieval:

Service Type	URL	Version
image	http://192.168.30.86: 9292/v2	v2

7. Changing Apache SSL settings

   a. Create a setting file with an arbitrary name by referring to the following example. The file extension must be ".conf."

```
Listen <Port number determined in Step 3>
<VirtualHost *: <Port number determined in Step 3>>
    ServerName <IP address of the controller node, FQDN or host name>
    SSLEngine on
    SSLProtocol all -SSLv2 -SSLv3 -TLSv1 -TLSv1.1
    SSLCipherSuite HIGH:MEDIUM:!aNULL:!MD5:!SEED:!IDEA:!3DES:!RC4:!DH
    SSLHonorCipherOrder on
    SSLCertificateFile <Full pathname of SSL certificate>
    SSLCertificateKeyFile <Full pathname of SSL certificate key file>
    LogLevel notice
    ErrorLog /var/log/httpd/ssl_openstack_api_error.log
    ServerSignature Off
    CustomLog /var/log/httpd/ssl_openstack_api_access.log combined
    <Location /identity>
        ProxyPass <URL of "identity" retrieved in Step 4>
        Header set x-openstack-api-version <version of "identity" retrieved in Step
        4>
    </Location>
    <Location /network>
        ProxyPass <URL of network retrieved in Step 4>
        Header set x-openstack-api-version <version of "network" retrieved in Step
        4>
    </Location>
    <Location /compute>
        ProxyPass <URL of "compute" retrieved in Step 4>
        Header set x-openstack-api-version <version of "compute" retrieved in Step
        4>
    </Location>
    <Location /image>
        ProxyPass <URL of "image" retrieved in Step 4>
        Header set x-openstack-api-version <version of "image" retrieved in Step 4>
    </Location>
</Virtualhost>
```

   Example:

```
Listen 5001
<VirtualHost *:5001>
    ServerName 192.168.30.86
    SSLEngine on
    SSLProtocol all -SSLv2 -SSLv3 -TLSv1 -TLSv1.1
    SSLCipherSuite HIGH:MEDIUM:!aNULL:!MD5:!SEED:!IDEA:!3DES:!RC4:!DH
    SSLHonorCipherOrder on
    SSLCertificateFile /etc/pki/CA/certs/server.crt
    SSLCertificateKeyFile /etc/pki/CA/private/server.key
    LogLevel notice
    ErrorLog /var/log/httpd/ssl_openstack_api_error.log
    ServerSignature Off
    CustomLog /var/log/httpd/ssl_openstack_api_access.log combined
    <Location /identity>
        ProxyPass http://localhost:5000/v3
        Header set x-openstack-api-version v3
    </Location>
    <Location /network>
        ProxyPass http://localhost:9696/v2.0
        Header set x-openstack-api-version v2.0
    </Location>
    <Location /compute>
        ProxyPass http://localhost:8774/v2.1
        Header set x-openstack-api-version v2.1
    </Location>
    <Location /image>
        ProxyPass http://localhost:9292/v2
        Header set x-openstack-api-version v2
    </Location>
</Virtualhost>
```

b. Store an Apache SSL settings file.

Store in the following path.

```
/etc/httpd/conf.d/
```

c. Reload the Apache settings.

Execute the following command from the terminal as a root user.

```
systemctl reload httpd
```

8. Setting a Firewall

Use the following command to allow the specified port.

- Command to confirm the port allowance status

```
iptables -nL --line-numbers
```

- Command to open a port

```
iptables -I INPUT 1 -p tcp --dport <port> -s <IP address of ISM> -j ACCEPT
```

Example of a command to open a port.

```
iptables -I INPUT 1 -p tcp --dport 5001 -s 192.168.0.101 -j ACCEPT
```

- Command to save settings

```
/sbin/service iptables save
```

- Command to close a port

```
iptables -D INPUT <No>
```

Example of a command to close a port

```
iptables -D INPUT 1
```

B.11.2 Settings when using Virtualized Network Analysis

1. Editing "/etc/nova/nova.conf"

   a. Open the "/etc/nova/nova.conf" file.

   ```
   # vi /etc/nova/nova.conf
   ```

   b. Add the following two items in a separate line for each.

Key	Value
scheduler_available_filters	arbitrary
scheduler_default_filters	SameHostFilter

   Example:

```
scheduler_available_filters = nova.scheduler.filters.all_filters
scheduler_default_filters =
SameHostFilter,RetryFilter,AvailabilityZoneFilter,RamFilter,DiskFilter,ComputeFilter,Comput
eCapabilitiesFilter,ImagePropertiesFilter,ServerGroupAntiAffinityFilter,ServerGroupAffinity
Filter
```

2. Restarting the nova service

   Execute the following command on the controller node.

   Enter the command in a line.

```
for service in api consoleauth conductor scheduler novncproxy; do systemctl restart openstack-
nova-$service; done
```

Appendix C Uninstallation of ISM-VA

Uninstall ISM-VA according to the installation destination.

The following procedures describe how to uninstall ISM-VA from Microsoft Windows Server Hyper-V, VMware vSphere Hypervisor, and KVM.

- Uninstalling from Microsoft Windows Server Hyper-V
- Uninstalling from VMware vSphere Hypervisor 5.5 or VMware vSphere Hypervisor 6.0
- Uninstalling from VMware vSphere Hypervisor 6.5 or later
- Uninstalling from KVM

Uninstalling from Microsoft Windows Server Hyper-V

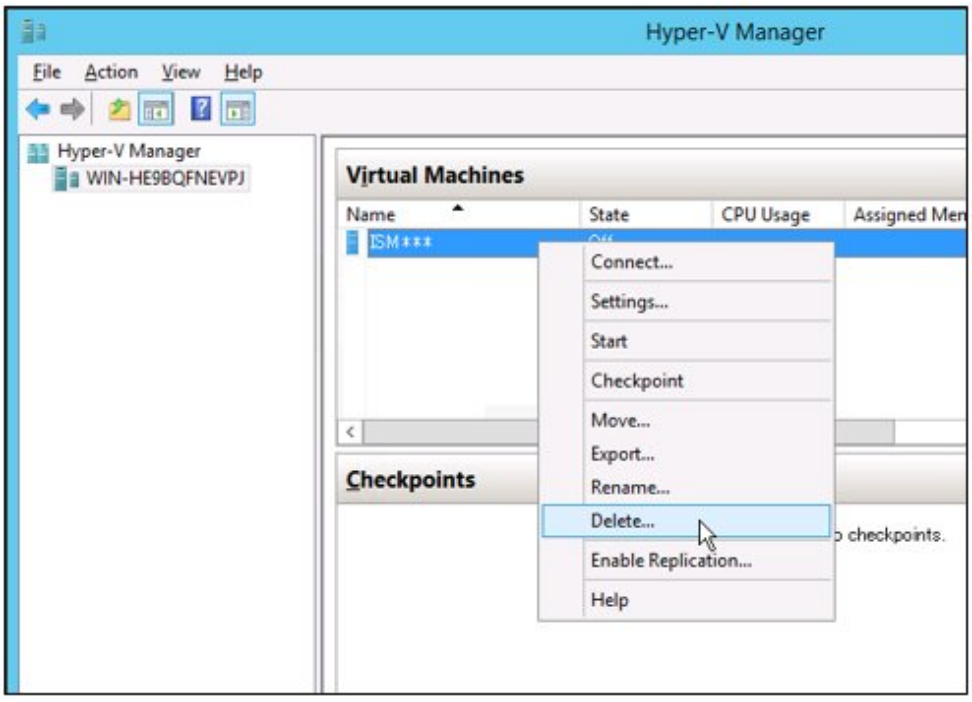
1. Stop ISM-VA.

   For details, refer to "4.1.2 Stop of ISM-VA."

2. Start Hyper-V Manager, right-click on the installed ISM-VA, and then select [Settings].

   Take a memo of the displayed storage location of the virtual hard disk that is allocated to the ISM-VA and of the corresponding file name.

3. In Hyper-V Manager, right-click on the installed ISM-VA, and then select [Delete].



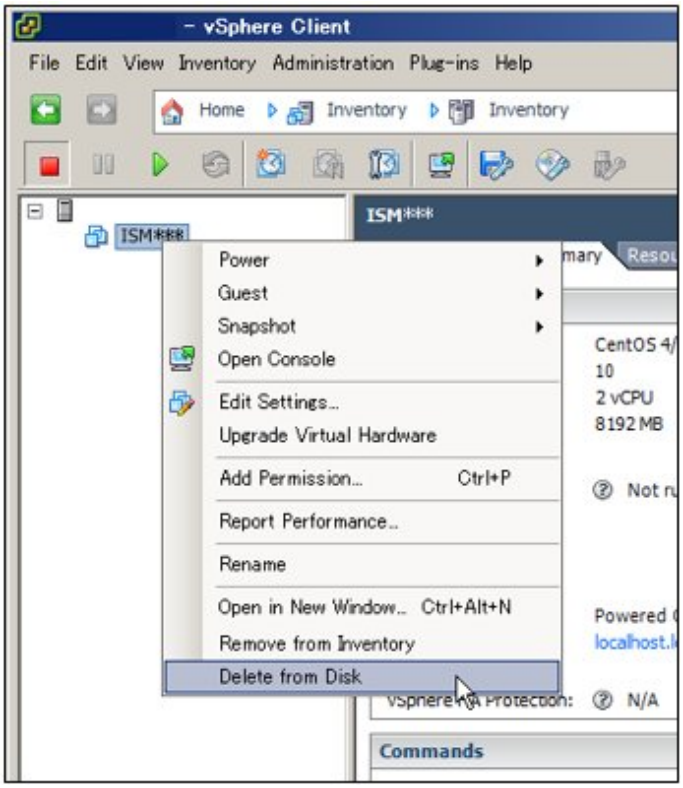
4. Use Explorer to remove the virtual hard disk for which you took the memo in Step 2.

Uninstalling from VMware vSphere Hypervisor 5.5 or VMware vSphere Hypervisor 6.0

1. Stop ISM-VA.

   For details, refer to "4.1.2 Stop of ISM-VA."

2. Start vSphere Client, right-click on the installed ISM-VA, and then select [Delete from Disk].

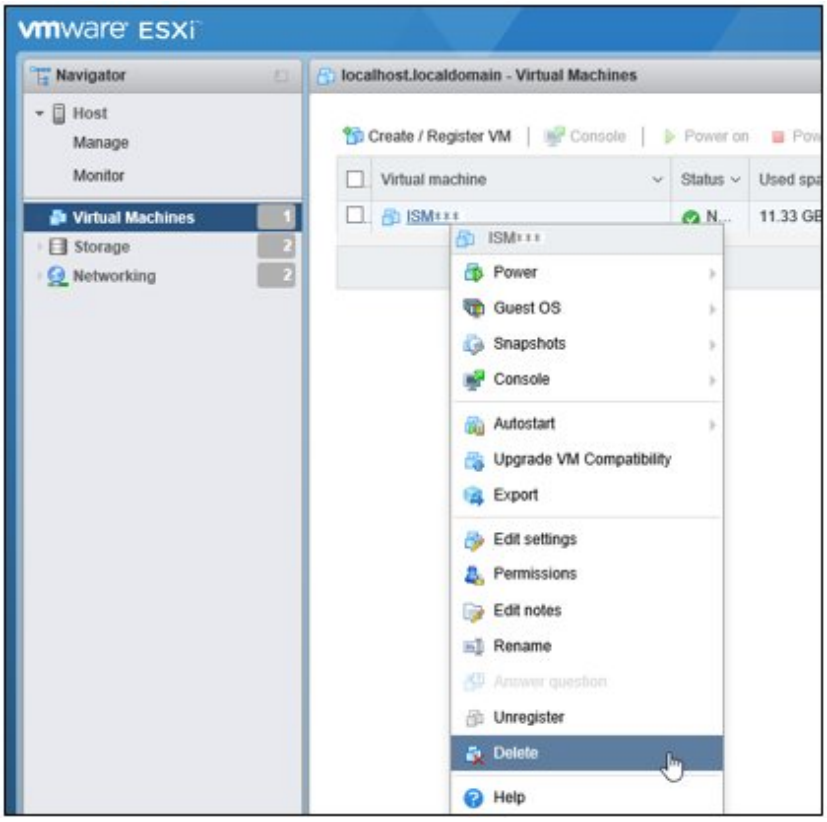


Uninstalling from VMware vSphere Hypervisor 6.5 or later

1. Stop ISM-VA.

   For details, refer to "4.1.2 Stop of ISM-VA."

2. Start vSphere Client (HTML5), right-click on the installed ISM-VA, and then select [Delete].

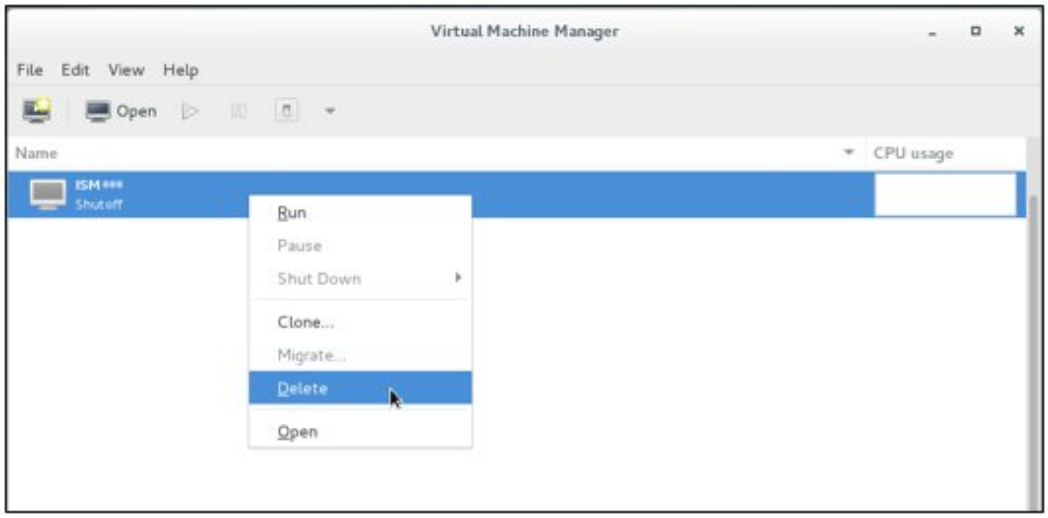


Uninstalling from KVM

1. Stop ISM-VA.

   For details, refer to "4.1.2 Stop of ISM-VA."

2. Start Virtual Machine Manager, right-click on the installed ISM-VA, and then select [Delete].



Appendix D Requirements for Cluster Creation and Cluster Expansion

PRIMEFLEX, which is a Hyper-converged infrastructure (HCI) product, can add successor servers in addition to the same generation servers of the ones at the time of purchase.

D.1 Addable Servers

For a model of addable servers for each type of servers at the time of purchase, contact your local Fujitsu customer service partner.

D.2 Cluster Creation and Cluster Expansion for ADVM Configurations

For configurations running the ADVM of PRIMEFLEX HS or PRIMEFLEX for VMware vSAN, if you want to manage the added server with ADVM, you must use the KB below to apply a version of ESXi/vCSA that supports the functional level of ADVM.

The functional level of PRIMEFLEX HS 1.0 is "Windows Server 2012R." The functional level of PRIMEFLEX HS 1.1 and PRIMEFLEX for VMware vSAN is "Windows Server 2016."

- vCenter Server

  https://kb.vmware.com/s/article/2071592

- ESXi

  https://kb.vmware.com/s/article/2113023

User management with ESXi/vCSA Active Directory may not be supported in the future.

If you execute Cluster Expansion using an ESXi/vCSA version that does not support user management with Active Directory, you must change your user management with Active Directory to local account management.

D.3 Network Configuration

When adding a server, match the physical/logical network configuration for the Management LAN/vMotion LAN/vSAN LAN to the configuration for the server at the time of purchase.

For the network interface of the existing servers and servers for expanding a cluster (10GBase-T, or 10GBase), select the same port.

The physical network configuration for the existing servers and servers for expanding a cluster is as follows. The additionally installed LAN cards that are not used by Management LAN, vMotion LAN, and vSAN LAN are not included.

Table D.1 Network configuration for PRIMEFLEX HS

Item	Existing server and Network configuration		Servers for expanding a cluster and Network configuration [Note 1]	
Server	PRIMERGY RX2530 M2 PRIMERGY RX2540 M2	PRIMERGY CX2550 M2	PRIMERGY RX2530 M4 PRIMERGY RX2540 M4 PRIMERGY RX2530 M5 PRIMERGY RX2540 M5	PRIMERGY CX2560 M4 PRIMERGY CX2560 M5
Network Configuration	- Port expansion option: 10G x2 ports - PCI: 10G x2 ports	- Port expansion option: 1G x2 ports - PCI: 10G x2 ports	- Onboard 1G x2 ports - Port expansion option: 10G x2 ports - PCI: 10G x2 ports	- Onboard 1G x1 port - Port expansion option: 1G x2 ports - PCI: 10G x2 ports

[Note 1]: The network configuration to add PRIMERGY M2 series models to PRIMEFLEX HS is the same as the configuration for adding existing servers.

Table D.2 Network configuration for PRIMEFLEX for VMware vSAN

Item	Existing server and Network configuration		Servers for expanding a cluster and Network configuration [Note 1]	
Server	PRIMERGY RX2530 M4 PRIMERGY RX2540 M4	PRIMERGY CX2560 M4	PRIMERGY RX2530 M5 PRIMERGY RX2540 M5	PRIMERGY CX2560 M5
Network Configuration	- Onboard 1G x 2 ports - Port expansion option: 10G x 2 ports - PCI: 10G x 2 ports	- Onboard 1G x 1 port - Port expansion option: 1G x 2 ports - PCI: 10G x 2 ports	- Onboard 1G x 2 ports - Port expansion option: 10G x 2 ports - PCI: 10G x 2 ports	- Onboard 1G x 1 port - Port expansion option: 1G x 2 ports - PCI: 10G x 2 ports

[Note 1]: The network configuration to add PRIMERGY M4 series models to PRIMEFLEX for VMware vSAN is the same as the configuration for adding existing servers.

Figure D.1 Network configuration when adding PRIMERGY RX2530 M4/PRIMERGY RX2530 M5 in a PRIMERGY RX2530 M2 environment of PRIMEFLEX HS

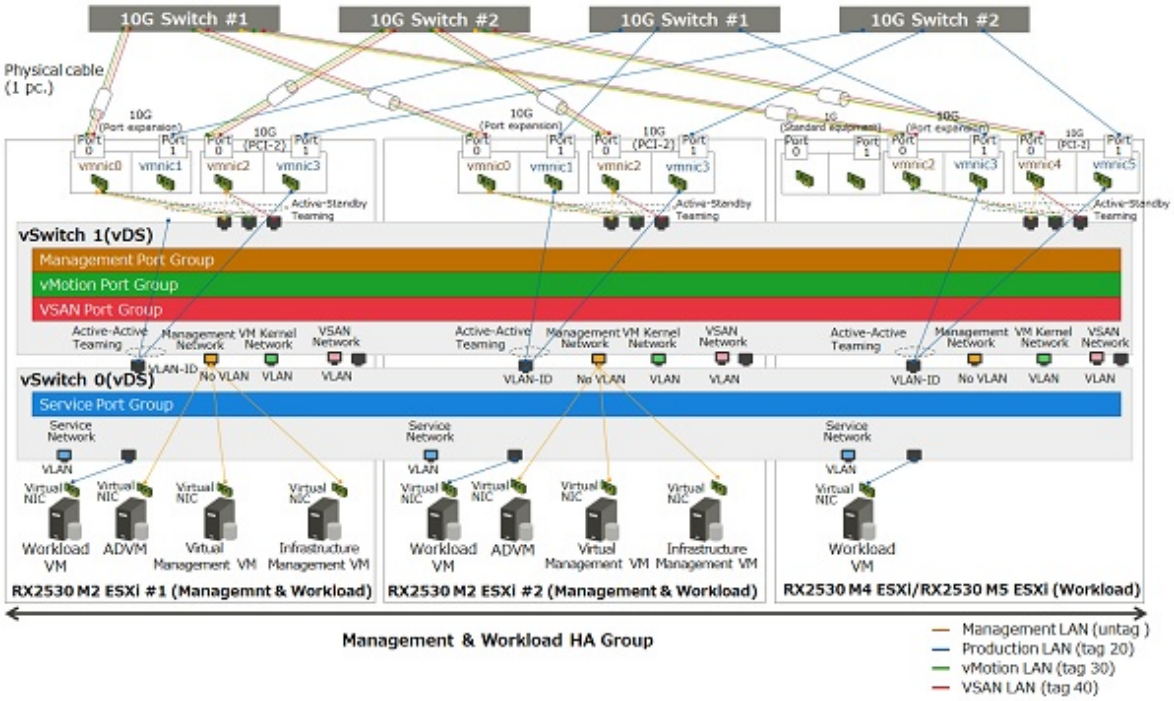
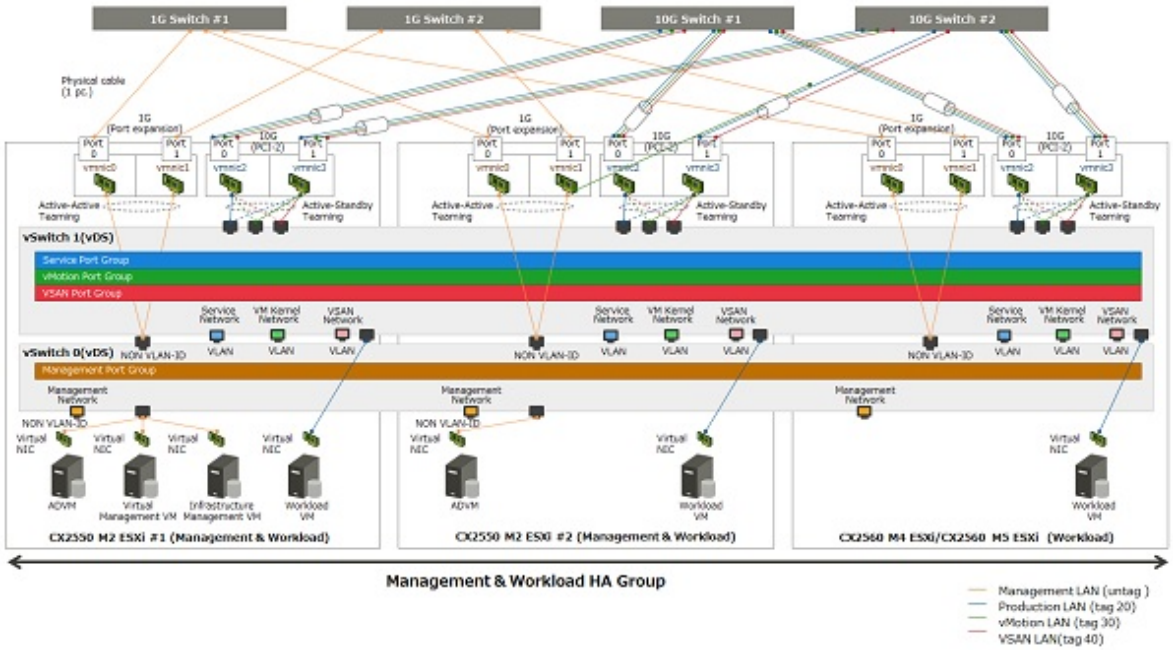


Figure D.2 Network configuration when adding PRIMERGY CX2560 M4/PRIMERGY CX2560 M5 in a PRIMERGY CX2550 M2 environment of PRIMEFLEX HS



D.4 Hardware Requirements

With SDS, it is recommended to add servers with hardware with the same configuration as the existing server. However, if the generation of the existing server differs from that of the servers for expanding a cluster, it may not be possible to execute the same configuration.

This part describes the policy for selecting the hardware configuration of the server for expanding a cluster for the existing server.

The following are the options that are relevant for the existing servers and the servers for expanding a cluster. The following options are also for the servers for creating a new cluster:

- Base unit
- CPU
- Memory
- HDD
- SSD
- On board LAN (Flexible LOM)
- SAS controller card
- Option card (LAN card that is required to be mounted)

Note

- For the relevant options, it is recommended to select them according to the policy of this document. If you select an option that does not match the policy of this document, performance may be affected. The recommended configuration of the servers for expanding a cluster can be confirmed by the configurator.
- For the irrelevant options, select them according to the installation conditions of each server and your environment.

The following is the details of each option.

D.4.1 Base unit

The server types listed in "D.1 Addable Servers" can be added.

D.4.2 CPU

Since the CPU generations that can be installed on existing servers and servers for expanding a cluster are different, it is recommend that CPUs installed in the servers for expanding a cluster have CPUs equal to or higher than those installed in existing servers.

"CPUs equal to or higher than the CPU" means that the both number of cores and clocks are equal to or higher than the CPU installed in the existing server.

The number of CPUs is to be the same as that of existing servers.

Depending on the CPU installed in the existing server, there may be cases in which there are no CPUs equal to or higher than the CPUs that can be installed in the servers for expanding a cluster. In that case, it is recommended to execute the operation in different clusters separately from the existing server.

If servers with non-equivalent CPUs are added to the same cluster, the throughput of the virtual machine may be affected depending on the position of the virtual machine or virtual machine component.

D.4.3 Memory

Install the memory to be installed in the servers for expanding a cluster so that it is to be greater than the total capacity of installed memory per 1 node of the existing server.

If the memory of the same model name can be arranged, it is recommended to install the same units with the same model name.

If there is no memory of the same model name, there is no problem even if the capacity per unit memory and the number of units mounted are different from the destination place to be added.

D.4.4 HDD (Capacity)

It is recommended to mount the same model name/number of units for HDD mounting to the servers for expanding a cluster if you can arrange the same HDD model name as the existing server.

If the HDD with the same model name as the existing server is not supported by the servers for expanding a cluster, use HDD with equal or higher performance, and mount it so that the disk capacity is over the existing server.

All the HDDs mounted on the servers for expanding a cluster must be the same model name. Also, use the same model name for all the HDDs mounted on the servers configuring a new cluster.

HDD with equal or higher performance is an HDD that satisfies the following requirements. If there are multiple HDDs that satisfy the requirements, select the HDD of which "rotation number" is close to the servers for expanding a cluster.

Item	Condition
HDD type (nearline SAS, SAS and others)	Same as the existing servers
Rotation number (rpm)	Same as or exceeding the existing servers
Sector size	Same as the existing servers

As for the disk capacity and the number of mounted HDD, install the disk capacity so that it will be more than the existing server per server for expanding a cluster.

There are the following configurations for the HDD installation pattern.

If there are multiple HDD mounted patterns satisfying the requirements, this order is recommended: Configuration 1 > Configuration 2 = Configuration 3 > Configuration 4.

However, the number of mounted HDDs as SDS must be satisfied.

Configuration	Item	
	Disk capacity (per one HDD)	Number installed
Configuration 1	Same as the existing servers	Same number as the existing servers
Configuration 2	HDD which has more capacity than that of existing server and the least capacity	Same number as the existing servers
Configuration 3	HDD which has less capacity than that of existing server and the greatest capacity SSD	The capacity of each server is the minimum number above the existing number of servers (More number than existing servers)
Configuration 4	HDD which has more capacity than that of existing server and the least capacity	The capacity of each server is the minimum number above the existing number of servers (Less number than existing servers)

Examples of HDD installation are shown below.

Example 1:

HDD configuration of the existing servers (vSAN): 900 GB x 4 units

- If the disk of the server for expanding a cluster is 400 GB, 900 GB, 1 TB, or 2 TB, it will be the 900 GB x 4 units of configuration 1.
- If the disk of the server for expanding a cluster is 400 GB, 1 TB, or 2 TB, it will be the 1 TB x 4 units of configuration 2.
- If the disk of the server for expanding a cluster is 400 GB or 600 GB, it will be the 600 GB x 6 units of configuration 3.
- If the disk of the server for expanding a cluster is 2 TB, it will be the 2 TB x 2 units of configuration 4.

Example 2:

HDD configuration of the existing servers (vSAN): 600 GB x 2 units

- If the disk of the server for expanding a cluster is 400 GB or 1.2 TB, the configuration will be the 400 GB x 3 units, that is configuration 3 (Since the number of mounted HDDs should be two or more, 1.2 TB x 1 unit configuration is not acceptable).

D.4.5 SSD (Cache/Capacity)

It is recommended to mount the same model name/number of units for SSD mounting to the server for expanding a cluster if you can arrange the same SSD model name as the existing server.

If the SSD with the same model name as the existing server is not supported by the server for expanding a cluster, use SSD with equal or higher performance, and mount it so that the disk capacity is over the existing server.

For the product class, the same as the existing server is recommended, but it can be changed according to your environment.

All the SSD mounted on the server for expanding a cluster must be the same model name. Also, use the same model name for all the SSDs mounted on the servers configuring a new cluster.

An SSD with equal or higher performance is an SSD that satisfies the following requirements.

Item	Condition
Data transfer rate (SAS 12 Gbps and others)	Same as the existing servers
Recording method (MLC and others)	Same as the existing servers

As for the disk capacity and the number of mounted SSD, install the disk capacity so that it will be more than the existing server per server for expanding a cluster.

There are the following configurations for the installation pattern.

If there are multiple SSD mounted patterns satisfying the requirements, this order is recommended: Configuration 1 > Configuration 2 = Configuration 3 > Configuration 4.

However, the number of mounted SSDs as each SDS must be satisfied.

Configuration	Item		
	Disk capacity (Per one SSD)	Number installed	Product class (Write assurance value)
Configuration 1	Same as the existing servers	Same number as the existing servers	The same number as the existing servers is recommended
Configuration 2	SSD which has more capacity than that of existing server and the least capacity	Same number as the existing servers	
Configuration 3	SSD which has less capacity than that of existing server and the greatest capacity SSD	Number that makes the capacity per server more than the existing servers (More number than existing servers)	
Configuration 4	SSD which has more capacity than that of existing server and the least capacity	The capacity of each server is the minimum number above the existing number of servers (Less number than existing servers)	

D.4.6 Onboard LAN (Flexible LOM)

Select the option with communication speed/number of port described in "D.3 Network Configuration."

D.4.7 SAS Controller Card

Select the SAS controller card for the vSAN connection available for each generation of servers.

SAS controller cards must have firmware that supports the ESXi/vSAN version being deployed.

Update the SAS controller card firmware if necessary.

For the relationship between the vSAN version and firmware version, contact your local Fujitsu customer service partner.

Since a combination of SAS controller card firmware and driver versions are used for vSAN Ready Node authentication, you must update the driver when you update the firmware.

The firmware/driver versions can be inconsistent between nodes. However, updating to the latest version is recommended due to performance impact, troubleshooting, etc.

D.4.8 Option Card (LAN card that is required to be mounted)

As described in "D.3 Network Configuration," this is the LAN card that is to be mounted so that the network configuration of the server for expanding a cluster can be the same as in the existing server.

Select a card that satisfies the requirements.

The network interface (10GBase/10GBase-T) must be the same as the existing server.

D.4.9 Options Other Than the Above

For options other than the above, you can select them according to the requirements for each PRIMEFLEX or your environment because they are not related to servers for expanding a cluster.

D.5 Software Requirements

D.5.1 Software Version

You must install the same version of software for both existing servers and servers for expanding a cluster.

If the software installed on the existing server is not supported by the servers for expanding a cluster, update the software of the existing servers before adding a server. Also, update the software on the existing servers when creating a new cluster.

The update policy for the software installed on each PRIMEFLEX are as follows.

Software name	Where to install	Version
ESXi	- Server for expanding a cluster - Existing servers	Install a version that is supported by both the servers for expanding a cluster and the existing servers. Select the same version for both the servers for expanding a cluster and the existing servers (including build numbers).
vSAN	- Server for expanding a cluster - Existing servers	Install a version that is supported by both the servers for expanding a cluster and the existing servers. Select the same version for both the servers for expanding a cluster and the existing servers (including build numbers).
vCenter Server (vCSA)	Virtual Management VM	Install the same version as ESXi or a later version.
Windows Server (ADVM)	ADVM	Install the version at the time of purchase.
ISM for PRIMEFLEX	Infrastructure Management VM	Install a version which supports ESXi/vSAN of both the server for expanding a cluster and the existing servers.
ServerView RAID Manager	ADVM	Install a version which supports ESXi of both the server for expanding a cluster and the existing servers.
ServerView Suite DVD	Infrastructure Management VM	Import the ServerView Suite DVD into ISM for PRIMEFLEX. Confirm that the ServerView Installation Manager on the ServerView Suite DVD to be imported meets the following requirement. - Supports the versions of custom images to be installed on the servers for expanding a cluster.

D.5.2 Software Version Check

Check the version of ESXi that is installed on the ESXi host of the vSAN cluster, which is the destination for cluster expansion.

For the supported version, contact your local Fujitsu customer service partner.

If your ESXi version is not supported, you must update the software. Check the ESXi versions that are supported on the servers for expanding a cluster and determine the ESXi version for the updates.

After determining the ESXi version for servers for expanding a cluster, check the version of the following software for which the ESXi version is supported. Also, check the software on the existing servers when creating a new cluster.

- PRIMERGY firmware version
- vCSA version
- ISM for PRIMEFLEX version
- RAID Manager version
- ServerView Installation version and the version of the ServerView Suite DVD that contains ServerView Installation

D.5.3 SAS Controller Card Firmware Version Check

Check that the SAS controller card firmware version supports the ESXi version that is determined in "D.5.2 Software Version Check."

For the supported versions, contact your local Fujitsu custoer service partner.

The relationship between the ESXi version and vSAN version can be checked on the following website.

https://kb.vmware.com/s/article/2150753

If you updated your SAS controller card firmware version, a driver for it may need to be updated.

For details, contact your local Fujitsu custoer service partner.

D.6 Sizing of Management VM

Resources of Infrastructure Management VM, Virtual Management VM and ADVM may be insufficient according to the number of servers to be added.

If resources of each VM are insufficient, add physical/virtual resources.

Although you add servers in order to increase resources, securing the resource of ISM-VA and vCSA in advance is still required.

If the physical resources of the management and workload server are insufficient, add the physical memory/disk to the management & workload server.

Refer to the manual of each software for the resource amount required for the number of registered nodes and the procedure to change the resource amount.

The resource amount of the Management VM at factory settings and the number of registerable nodes in each model are as follows.

Model name	Management VM name/Software name	Resource amount			Number of registerable nodes
		CPU	Memory	Disk	
PRIMEFLEX HS V1.0	Infrastructure Management VM (ISM for PRIMEFLEX)	4vCPU	8 GB	136 GB	400 nodes
	Virtual Management VM (vCenter Server Appliance)	2vCPU	10 GB	120 GB	Host: 10 units Virtual machine: 100 units
PRIMEFLEX HS V1.1	Infrastructure Management VM (ISM for PRIMEFLEX)	4vCPU	8 GB	136 GB	400 nodes
	Virtual Management VM(if Small is selected) (vCenter Server Appliance)	4vCPU	16 GB	290 GB	Host: 100 units Virtual machine: 1000 units
PRIMEFLEX for VMware vSAN	Infrastructure Management VM (ISM for PRIMEFLEX)	4vCPU	8 GB	100 GB	400 nodes
	Virtual Management VM (if Small is selected) (vCenter Server Appliance)	4vCPU	16 GB	290 GB	Host: 100 units Virtual machine: 1000 units

Appendix E Troubleshooting

This appendix describes the major causes and countermeasures for errors and unexpected behavior in ISM operation.

Symptom: When registering nodes after editing IP address, the error "Registration of nodes discovered manually failed. IP address cannot be changed. The specified IP address already exists." is displayed.

Causes and countermeasures

When registering nodes after editing IP address, execute ping to the changed IP address and execute it after checking that there is no response.

For iRMC S3 generation PRIMERGY, ping to IP addresses might result in success a few minutes before and after changing.

Symptom: GUI login fails with "Session Time Out" for ISM that was normally used, and the symptom occurs even after ISM-VA restart.
The following messages are output in the console screen of the hypervisor.

```
[55490.269659] XFS (dm-0): Internal error xfs_bmap_read_extents(1) at line 1321 of file fs/xfs/
libxfs/xfs_bmap.c.  Caller xfs_iread_extents+0x75/0xd0 [xfs]
[55490.272852] XFS (dm-0): Corruption detected. Unmount and run xfs_repair
[55490.275983] ffff8801ecb6e000: 42 4d 41 50 00 00 00 82 00 00 00 00 00 7a 2e fc  BMAP.........z..
[55490.277488] ffff8801ecb6e010: ff ff ff ff ff ff ff ff 00 00 00 00 03 a5 20 00  .............. .
[55490.278907] ffff8801ecb6e020: 00 00 10 a1 ae 80 00 80 00 00 00 00 03 a6 20 00  .............. .
[55490.280367] ffff8801ecb6e030: 00 00 10 a1 c5 80 00 30 00 00 00 00 03 a6 80 00  .......0........
[55490.281844] XFS (dm-0): Internal error xfs_bmap_read_extents(1) at line 1321 of file fs/xfs/
libxfs/xfs_bmap.c.  Caller xfs_iread_extents+0x75/0xd0 [xfs]
[55490.284837] XFS (dm-0): Corruption detected. Unmount and run xfs_repair
[55490.286288] ffff8801ecb6e000: 42 4d 41 50 00 00 00 82 00 00 00 00 00 7a 2e fc  BMAP.........z..
[55490.287727] ffff8801ecb6e010: ff ff ff ff ff ff ff ff 00 00 00 00 03 a5 20 00  .............. .
[55490.289073] ffff8801ecb6e020: 00 00 10 a1 ae 80 00 80 00 00 00 00 03 a6 20 00  .............. .
[55490.290441] ffff8801ecb6e030: 00 00 10 a1 c5 80 00 30 00 00 00 00 03 a6 80 00  .......0........
[55490.291716] XFS (dm-0): Internal error xfs_bmap_read_extents(1) at line 1321 of file fs/xfs/
libxfs/xfs_bmap.c.  Caller xfs_iread_extents+0x75/0xd0 [xfs]
[55490.294744] XFS (dm-0): Corruption detected. Unmount and run xfs_repair
[55490.296176] ffff8801ecb6e000: 42 4d 41 50 00 00 00 82 00 00 00 00 00 7a 2e fc  BMAP.........z..
[55490.297620] ffff8801ecb6e010: ff ff ff ff ff ff ff ff 00 00 00 00 03 a5 20 00  .............. .
[55490.299035] ffff8801ecb6e020: 00 00 10 a1 ae 80 00 80 00 00 00 00 03 a6 20 00  .............. .
[55490.300401] ffff8801ecb6e030: 00 00 10 a1 c5 80 00 30 00 00 00 00 03 a6 80 00  .......0........
[55490.301766] XFS (dm-0): Internal error xfs_bmap_read_extents(1) at line 1321 of file fs/xfs/
libxfs/xfs_bmap.c.  Caller xfs_iread_extents+0x75/0xd0 [xfs]
```

Causes and countermeasures

- ISM does not operate normally due to corruption of the virtual disk of ISM-VA.

  Corruption of virtual disk might occur if hardware is in physical error and the server operating ISM-VA or ISM-VA itself is compulsorily stopped.

- If you have the ISM-VA already backed up, restore and use it.
  If you do not execute backup, install it newly.

Symptom: For one of the following functions, the error "Communication with server failed," is displayed when executing an operation to import a file.

- [Structuring] - [Profiles] - [Actions] - [Import] - [Browse] button
- From [Structuring], select [Import] from the menu on the left side of the screen, then select the [Import Data List] tab - [Actions] - [Import DVD] - [Browse] button
- From [Structuring], select [Import] from the menu on the left side of the screen, then select the [Import Data List] tab - [Actions] - [Import Firmware] - [Browse] button

- From [Structuring], select [Import] from the menu on the left side of the screen, then select the [ServerView Suite] tab - [Actions] - [Import DVD] - [Browse] button

Causes and countermeasures

- Confirm the files in the FTP folder and subfolders for the user group to which the user belongs; the files names should not contain any character encoding other than UTF-8.
- Confirm the current status of data communication between ISM and the client.

Symptom: Failure in confirming status and control of node

Causes and countermeasures

- Confirm that the network between the target node and ISM is operating correctly.
- Confirm whether the power cable is connected to the respective device and whether power is supplied.
- Confirm whether the IP address registered in ISM matches that of the respective device (or OS). Especially after modifying any IP addresses, you should confirm that you did not forget to change the registration information in ISM.
- Check whether the user accounts registered in ISM match those in the respective device (or OS). Especially after modifying any passwords, you should confirm that you did not forget to change the registration information in ISM.
- Confirm that no other ISM function is being in use for the node to be manipulated with ISM (for example, starting a profile assignment while a firmware update is in progress).

Symptom: File downloads fail when using Internet Explorer 11.

Causes and countermeasures

File downloads may fail depending on your Internet Explorer settings. Modify your settings as follows.

On the [Internet Options] - [Security] tab, select the [Custom level] button and change the setting for [Downloads] - [File download] to [Enable].

Symptom: Fails to register Microsoft Active Directory as LDAP server settings.

Causes and countermeasures

When you register Active Directory registered a large number of user information (for example, 1,000 or more), check that environment variable called "MaxPageSize" in Active Directory has the value according to the registered user information.

Firmware Management

Symptom: When updating the firmware, the target firmware cannot be specified.

Causes and countermeasures

- Firmware data must be imported and loaded in advance. If you have not imported them yet, execute an import first.
- If you are importing firmware individually and there is an error in the specified information such as firmware type or model name, the firmware will not be displayed as firmware that supports the specified node. Confirm the information on the repository screen. If it contains any errors, delete it from the repository first, and then import the firmware with the correct information.
- As you cannot downgrade the firmware to a previous version, firmware versions older than the current one on the node are not displayed in the Latest Version column. Check the version of the current version on the node and of the firmware you imported.

Symptom: Online Update of the PCI card fails

Causes and countermeasures

For Online Update the operating behavior of firmware on PCI cards depends on the OS of the server on which each PCI card is mounted. Refer to the documentation that is supplied with the firmware data or by the source from which you obtained the firmware data to confirm whether it is compatible with the relevant server OS.

Use Offline Update if the firmware data does not support the OS of the server.

Symptom: The text in the release notes is not correctly displayed.

Causes and countermeasures

Depending on the encoding settings in your browser, the release notes may sometimes not be correctly displayed. Check your encoding settings.

Symptom: Firmware updates for ETERNUS DX/AF models fail.

Causes and countermeasures

Possibly, the conditions for enabling the Update Mode are not fulfilled.

Refer to the precautions PDF file "Matrix of Versions for Which Firmware Updates Are Executable," which is provided together with the firmware data, to confirm whether your environment fulfills the conditions for enabling the Update Mode.

Symptom: Offline Update fails.

Causes and countermeasures

- When using Offline Update, the ServerView Suite DVD and the ServerView Suite Update DVD must have been imported. Confirm that the ServerView Suite DVD or the ServerView Suite Update DVD has been imported.
- Possibly, there is any error in the environment settings for running PXE boot. Confirm the following:
  - Whether DHCP servers are able to lease appropriate IP addresses
  - Whether, by any error, the PXE function is disabled in the BIOS settings of the node
  - Whether the onboard LAN or LAN card of the node is connected to ISM

Profile Management

Symptom: An error occurs in assigning, reassigning, or release a profile on a PRIMERGY server.

Causes and countermeasures

You executed the profile assignment operation with the power of the target node being on. For profile assignment on PRIMERGY, be sure to execute the operation after turning the power off.

Symptom: An error occurs in assigning, reassigning, or releasing a profile on a switch or storage.

Causes and countermeasures

Executing these settings from ISM may sometimes result in an error when there are ongoing connections to the target node from sources other than ISM via SSH or the web. When you are going to operate a node from ISM, log out from external connections beforehand.

Symptom: An error occurs when installing an OS with Profile Management.

Causes and countermeasures

- The OS installation media to be installed were not yet imported. Import the installation media for the OS to be installed before you execute profile assignment.
- The ServerView Suite DVD that supports the installation target node and the type of OS was not yet imported. Import the ServerView Suite DVD that supports the installation target node and the type of OS before you execute profile assignment. If no version is specified for the ServerView Suite DVD to be used within the profile, the latest imported DVD is used. If you are using older device models and/or OSes, set the version of the DVD to be used within the profile.
- Possibly, there is any error in the environment settings for running PXE boot. Confirm the following:
  - Whether DHCP servers are able to lease appropriate IP addresses
  - Whether, by any error, the PXE function is disabled in the BIOS settings of the node
  - Whether the onboard LAN or LAN card of the node is connected to ISM

Symptom: An error occurs when importing an exported profile or policy.

Causes and countermeasures

If you import a profile or policy without any changes to the same ISM from which you exported it, an error occurs as a profile or policy of the same name already exists. Edit the "Profile Name" within the file to be imported, modifying the respective profile name or policy name.

Network Management

Symptom: No connection information is displayed on the Network Map.

Causes and countermeasures

In order to retrieve and display connection information with ISM, it is first required to enable the LLDP function of each node. Enable LLDP with reference to the instruction manual or other documentation for the node. For nodes that support no LLDP, set the connection information manually on the ISM screen.

Symptom: The information displayed on the Network Map is outdated or incorrect.

Causes and countermeasures

- The contents displayed on the Network Map are equivalent to the information at the time you last executed [Update network information] on the GUI screen. Execute [Update network information].
- Whenever an item such as the port status of a node has changed, execute [Get Node Information] and then [Update network information].

Symptom: The virtual connection relationships are not displayed on the Network Map or there are errors in the displayed contents.

Causes and countermeasures

To display the connection relationships between the virtual switches and the virtual machines, you must register the OS information of the cloud management software and of the managed target nodes to ISM.

Check that the cloud management software information is properly registered and the OS information of the managed node is properly registered.

Symptom: Fails to change the VLAN settings.

Causes and countermeasures

- The network switch must be accessible from ISM. Confirm that the switch is operating normally and that it can be accessed from ISM.
- Depending on the network switch device type there are reserved VLAN IDs. Check that the VLAN ID to be changed is not the registered VLAN ID of the network switch to be set up.

Symptom: Fails to change link aggregation settings.

Causes and countermeasures

- The network switch must be accessible from ISM. Confirm that the switch is operating normally and that it can be accessed from ISM.
- Depending on the network switch device type, the LAG Name and Mode that can be set differently. Check the LAG name and Mode can be set by the device specification.

Log Management

Symptom: Node logs of a node are collected incorrectly or not at all.

Causes and countermeasures

- Execute it again after some time when the log collection fails because of influence of the connection status or other.
- When you have newly registered a node, log collection is not yet set to be executed. Set a schedule for log collection under [Log Collection Settings].

- If the status on the [Log Collection Settings] tab on the Details of Node screen is "Exempt" and no action button for log collection is displayed, either the node is a device not eligible for log collection, or, at a point immediately after node registration, the device information was not yet obtained. If the target node is eligible for log collection, wait for a few minutes before you refresh the screen.
- Confirm the [Target] of the log type you specify for log collection. For schedule settings, confirm that the [Enable schedule execution] checkbox is checked.
- If you are able to collect logs by executing [Collect Logs] on the GUI screen but not with the schedule settings you made, it is possibly caused by the node power being off at the time of scheduled execution. Check the contents of the schedule.
- If the total volume of the log file exceeds the upper limit (size limit) set in the user group settings, new log files cannot be saved. From the Global Navigation Menu, check the [Operation Log] in [Events] - [Events] and if either of the items below can be found in the log collection timing, delete some of the collected logs to reduce the data volume.
  - During log collection for node (<node name>) Archived Log for the user group (User group name>) exceeded the capacity (xxMB) set for log retention.
  - During log collection for node (<node name>) Node Log (download data) for the user group (<User group name>) exceeded the capacity (xxMB) set for log retention.
  - During log collection for node (<node name>) Node Log (log discovery data) exceeded the capacity (xxMB) set for log retention.

Symptom: Settings for log collection of a node cannot be set.

Causes and countermeasures

If the node status is "Exempt," check whether the node actually supports log collection. If the status is "Exempt" although the node supports log collection, maybe ISM did not yet obtain the node information, so confirm the network connection with the node and the node property settings, and then execute [Get Node Information].

Symptom: "Operating System" and "ServerView Suite" cannot be specified in log collection of a node.

Causes and countermeasures

- When the OS information of a target node is not registered yet, or not yet obtained with ISM, it cannot be specified. Register the OS information before you execute [Get Node Information].
- Depending on the type of OS, you may not be able to specify "ServerView Suite" as it may not be eligible for information retrieval.