NEC

DeploymentManager Ver6.1

First Step Guide

-Third Edition-

Contents

Introduction

Target Audience and Purpose

The "First Step Guide" is targeted to first time users of DeploymentManager (hereinafter, DPM) and explains the DPM product overview, each function, the system operation methods and the configuration.

Document Structure

1   About DeploymentManager: Explains the product outline and each function of the DPM.
2   System Design: Explains the information necessary for DPM system design.
3   Operating Environment: Explains the operating environment that needs to be confirmed before installing.
4   Latest Version Information: Explains the information in this version.

Appendices
Appendix A Function Tables
Appendix B For Customers Who Cannot Easily Install a DHCP Server
Appendix C For Customers Who Configure RAID on the Managed Machine
Appendix D Supplementary Information
Appendix E Revision History

DeploymentManager Manual Organization

DPM manuals are structured as described below.
The name of each manual is described in this manual according to the "Name in this Manual".

Name of Manual	Name in this Manual	Role of Manual
DeploymentManager Ver6.1 First Step Guide	First Step Guide	Intended for DPM users. Provides a product overview, and describes the various functions, system design methods, operating environment, etc.
DeploymentManager Ver6.1 Installation Guide	Installation Guide	Intended for system administrators who install DPM. Describes tasks such as how to install, upgrade, and uninstall DPM.
DeploymentManager Ver6.1 Operation Guide	Operation Guide	Intended for system administrators who operate DPM. Describes the operation environment setup procedure as well as the various operations performed when operating the program based on an actual operation flow.
DeploymentManager Ver6.1 Reference Guide	Reference Guide	Intended for system administrators who operate DPM. Describes DPM screen operations, tools, maintenance-related information, and troubleshooting. This guide is a supplement to the Installation Guide and the Operation Guide.

The latest information of DPM can be obtained from the following product site:
http://www.nec.com/masterscope/deploymentmanager/index.html

The Reference Guide is not included in the install media, and is only available on the product site.

Documentation Guidelines

The following describes important points regarding the notation used in this manual.

・ The notation used for DPM products is as follows:

Notation in this Manual	Product Name
DPM unbundled product	DeploymentManager Ver6.1
SSC product	DeploymentManager Ver6.1 for SSC(*1)

  *1
    This is a product that is bundled with SigmaSystemCenter and VirtualPCCenter.

・ The screen images in this manual are based on the DPM unbundled product. The license related displays are only for the DPM unbundled product. They are not displayed for SSC products.

・ Product versions are expressed as follows.
  Common description for DPM Ver6.1: DPM Ver6.1
  Specific description for DPM Ver6.1x: DPM Ver6.1**x**
  * **x** means revision number.

・ The install media included with the DPM product is called "Install media" in this manual.

・ IPv4 address is described as "IP address" and IPv6 address is described as "IPv6 address".

・ 32bit OS is described as "x86" and 64bit OS is described as "x64".

・ In Windows OS, the folder path in which DPM is installed or the registry key is described by those of x86. When you use x64, replace as the followings if there is no notice in particular.

  DPM install folder
   ・(x86):C:\Program Files\NEC\DeploymentManager
   ・(x64):C:\Program Files (x86)\NEC\DeploymentManager

   ・(x86):C:\Windows\system32
   ・(x64):C:\Windows\SysWOW64

  Registry key
   ・(x86):HKEY_LOCAL_MACHINE\SOFTWARE\NEC\DeploymentManager
   ・(x64):HKEY_LOCAL_MACHINE\SOFTWARE\Wow6432Node\NEC\DeploymentManager

・ The description of SQL Server in this manual is based on SQL Server 2012 Express that is included in the install media. Replace it when you use the product except SQL Server 2012 Express.
  Example)
  DPM database path
   ・For SQL Server 2012 Express x86:
      C:\Program Files\Microsoft SQL Server\MSSQL11.DPMDBI\MSSQL\Binn
   ・For SQL Server 2008 R2 SP1 Express x86:
      C:\Program Files\Microsoft SQL Server\MSSQL10_50.DPMDBI\MSSQL\Binn
   ・For SQL Server 2005 Express Edition x86:
      C:\Program Files\Microsoft SQL Server\MSSQL.x\MSSQL\Binn

- The meaning of each icon used in this manual is as follows:

Icon	Explanation
Important	Important items. These are items you need to be careful when you operate DPM not depending on the using environment.
Note	Cautionary items. These are items you need to be careful in the specific environment or operations.
Tips	Supplementary items. These are informations to use DPM more conveniently.

- The displays and procedures of DPM may differ according to the operating system used. In the case of Windows OS, this document is based on Windows Server 2008 and Windows 7, in principle. Replace when you use DPM on the OS except Windows Server 2008 and Windows 7. (There are some descriptions based on the OS except Windows Server 2008 and Windows 7.)
   Example)
      The procedure for checking the DPM version differs by operating system as follows:
       ·For Windows Server 2012/Windows 8:
        1) In Windows desktop, set the mouse pointer in the upper right (or the lower right) and select **Settings** from the charm.
        2) **Settings** screen appears. Select **Control Panel** -> **Program** -> **Programs and Features**.
       ·For Windows Server 2008/Windows 7/Windows Vista:
        From the **Start** menu, click **Control Panel** -> **Programs and Features**.
        * When "Version" is not displayed, perform the following procedure 1) and 2).
        1) Right-click **Name** in the center of the screen, and select **More**.
        2) In the **Choose Details** screen, select the **Version** check box and click the **OK** button.
       ·For an OS other than the above
        1) From the **Start** menu, click **Control Panel** -> **Add or Remove Programs**.(or **Add or Remove Applications**)
        2) Select the applicable component, and click **Click here for support information**.

- Windows Server 2003 R2/Windows Server 2008 R2 will not be explained, so please replace Windows Server 2003/Windows Server 2008 when you read it.

- In descriptions of screen operation procedures, arbitrary names to be specified by the user appear in bold and italics as follows: ***Scenario Group***.
     Example)
        In the tree view, click the **Resource** icon -> **Scenarios** icon -> ***Scenario Group*** icon.

- The version of JRE shown on the screen may not be the latest that DPM can use. Replace them properly.

- Please execute following procedures when **Finish DPM related tasks** appears in this document.
    ·If a scenario is running, wait until the scenario ends.
    ·If an automatic update is in progress, wait until the automatic update ends.
    ·If you are operating the Web Console or the various DPM tools, please end them.

- 1MByte is calculated as 1024KByte.
  1GByte is calculated as 1024MByte.

1. About DeploymentManager

1.1. DeploymentManager

DPM is system management software which provides backup/restore, creating clone and patch or application installation functions for the system regions of those machines it manages. It allows for a reduction in system management costs by allowing control of managed machines to be performed all at once and remotely over the network.

1.1.1. Advantages of Adopting DeploymentManager

Installing DPM has the following benefits.

■ System recovery can be performed using a simple procedure.
In backup by DPM, the disk image is copied without any change. Because the copied disk image is written on the disk when restoring, you can execute system recovery easily.

■ The clone of the machine can be created promptly.
The OS installation by disk duplication function, which supports backup/restore functions, allows a disk image (master image) taken from one machine (master machine) to be deployed onto other machines with the same composition. By preparing in advance parameters for individual information for each machine (IP address, computer name etc.) these settings will also be made automatically when deploying the master image.

■ Allows for flexible installation of patches and applications suited to operational needs.
For the managed machines, patches and applications selected by the administrator can be forcefully installed (scenario type) or automatically installed (automatic update type) in accordance with pre-defined conditions. Scenario type allows the administrator to operate and install the patches/applications to the desired machine at the desired timing. (For automatic update type, pre-registering the desired patches/applications to the Management Server, and giving them installation settings such as priority and schedule, will allow the patches/applications to be automatically installed when these conditions are met). When there are multiple Management Servers, you can set up a server (Package Web Server) to share the packages. Simply registering a patch or application to the server will then make the patch or application to be downloaded to each Management Server automatically.

■ Supports virtual environments.
The same controls can be used to manage a virtual machine as a physical one, allowing for simple usage even for an environment with mixed virtual and physical machines.

1.2. DeploymentManager Basic Functions

The following is an explanation of the basic functions of DPM.

See Appendix A, "Function Tables" about the details of the support status for each function.

1.2.1. Backup/Restore

The disk on which the managed machine's system (OS) is installed can be backed up or restored as the entire disk, or a partition on the disk can be backed up or restored as the entire partition.
The backup/restore functions have the following characteristics.

When backing up, with the OS on the managed machine shut down, a dedicated Linux OS (hereinafter referred to as "Deploy-OS") will be activated in the memory of the managed machine and the data are read from the disk. This read data will be sent sequentially to the Management Server and a backup image file created. When restoring, send the backup image file data from the Management Server to the managed machine, and restore the written disk contents to the disk. Performing a backup when the managed machine's OS is shut down (offline backup) allows for the creation of a backup image at a point of complete inactivity, from which the OS can be safely restarted after performing a restore.

Backup Types(*1)	
Effective Sector Backup	Effective sector backup is a type of backup that only backups regions (sectors) actually being used by partition. Using effective sector backup can makes the backup response time and backup image size as small as possible. (For further details on the support status for effective sector backup for each file system, see "Support for File System and Disk Type" in Appendix A, "Function Tables.")
Full Sector Backup	Full sector backup is a type of backup that backups all of the sectors on the partition including unused area. This takes more time than effective sector backup and the backup image file size will be bigger. About partitions on a file system that does not support effective sector backup, the backup will be executed by full sector backup automatically. (For further details on the support status for full sector backup for each file system, see "Support for File System and Disk Type" in Appendix A, "Function Tables.")

*1
- ■The backup image data can be compressed when using either, effective sector backup or full sector backup.
- ■When a backup is performed for an entire disk it can restored to an empty disk.
- ■To perform a backup by partition, it is necessary that the disk for restore be the same format (number of partitions, organization, size and file system) as the backup destination. Also, restore to the same partition as when backing up.

<For Effective Sector Backup>

Analyze header (bitmap area), and only back up effective areas (sectors)

<For Full Sector Backup>
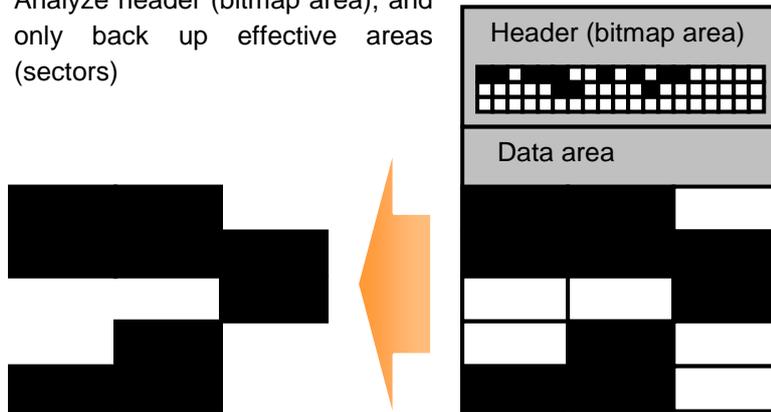
Backup all sectors
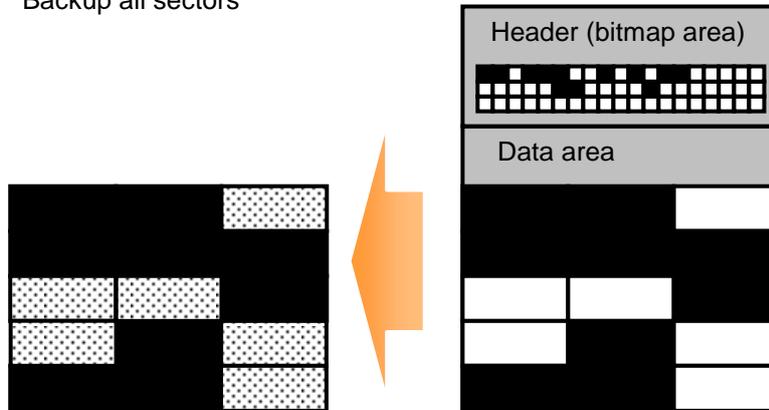
*The bitmap area is the area where the disk sector information is managed.

Backup of a RAID Configuration		
Backup of Hardware RAID	Backup/restoring of a hard disk connected to a RAID controller which is supported by DPM is possible. For RAID, backup will be performed for the entire logical disk.	
Backup of Software RAID	The backup/restoring of software RAID volume (RAID0, RAID1, RAID1 Span, RAID5, and others) created via an OS function or a disk management application is not possible. For FT servers, depending on the machine model, backup after release of RAID or a full sector scenario option specified backup with RAID still in place is possible. Contact your sales or support representative about information on the backup procedure for each machine model.	
Other Functions		
Disk Configuration Check	The disk configuration check function allows the hard disk configuration of the managed machines to be checked prior to performing backup/restore functions.	
CD Boot	Concerning the boot type of the managed machines, there are network boot (uses DHCP server) and a CD boot (does not use DHCP server) types. For CD boot, creating bootable CD and setting it in the target machine will allow backup/restoring to be performed without using DHCP server. Concerning application without using DHCP server, see Appendix B, "For Customers Who Cannot Easily Install a DHCP Server", and Appendix A, "Operating DPM without Using the DHCP Server" in *Operation Guide*.	

1.2.2.   OS Installation by Disk Duplication

The OS installation by disk duplication function, which uses the backup/restore functions, allow the disk image of a single machine (master machine) to be cloned (duplicated).

The OS installation by disk duplication function uses the tool to delete individual configuration of a single machine, and then creates a backup image (master image) from that state. This machine can then be cloned by restoring this master image into the duplication destination machines and performing parameter settings.

Master image

Duplicate source
master machine

Management
Server

Master image data

Various parameters

Duplicate destination
machines
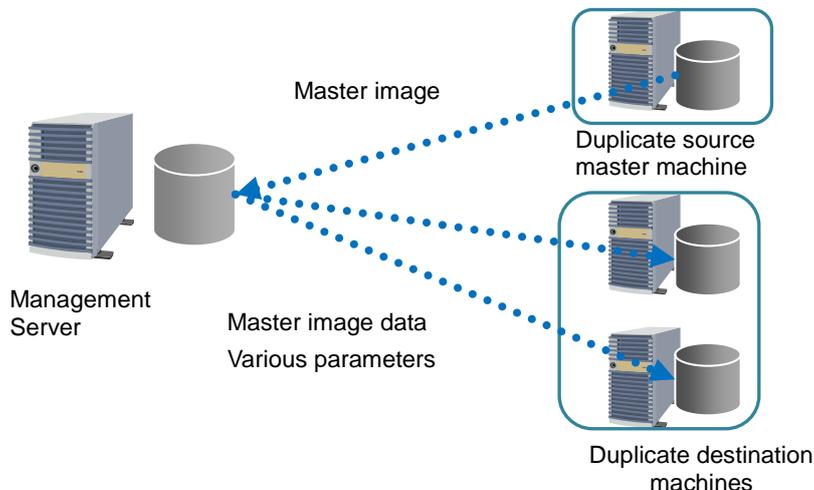
By preparing individual information for each machine (IP address, computer name etc.) as parameters in advance, the setting of this individual information will also be made automatically when deploying

the master image, meaning no control on the managed machine side is required. In addition, including patches and applications etc. in the master image allows them to be deployed with an identical configuration.

1.2.3.　OS Clear Installation

You can do a clear (new) installation of the Linux OS at the same time as doing the detailed settings on the managed machine.

The OS clear installation function creates an OS image on the Management Server from the OS media. The OS is then installed in the target machines using this OS image from the Management Server, and various parameters such as computer name and IP address are configured.

Machine at installation destination

OS image

Management Server

Various parameters
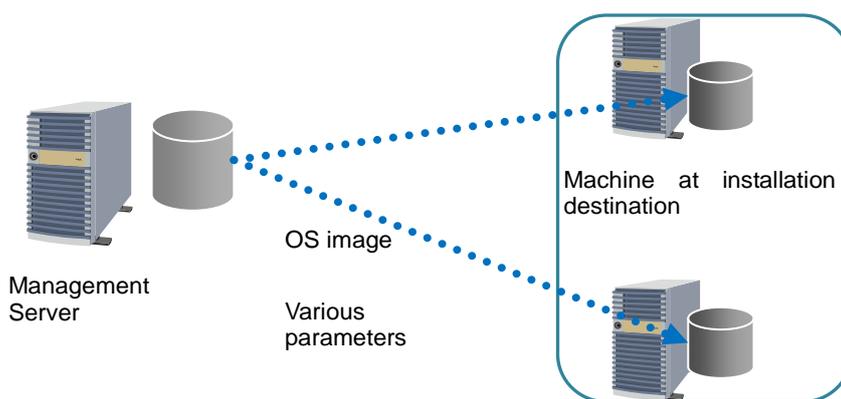
An OS clear installation can be controlled entirely remotely, with no control on the managed machine side required. By initially creating all required settings as parameters, those operations that would normally be performed by a local set up, such as the creation of partitions, formatting and setting of individual information (IP address, computer name etc.) will all be automatically performed. This is all completed automatically in a single action from the Management Server.

1.2.4.　Service Packs/HotFixes/Linux Patch Files/Application Installation

Service packs, hotfixes, Linux patch files, and applications for the managed machines can be installed either forcefully by control from the side of the Management Server(scenario type), or when automatically determined to be required by the managed machine that is the installation target's side (automatic update type). (The installation of service packs/hotfixes/Linux patch files/applications may be called remote updates in this manual.)

The image registration tools provided by DPM (Image Builder or PackageDescriber) register the service packs, hotfixes, Linux patch files, and applications to the Management Server or Package Web Server in units called packages. (For detail of a configuration using the Package Web Server, see Section 2.1.5, "System Configuration.") This package is distributed and applied to the managed machines.
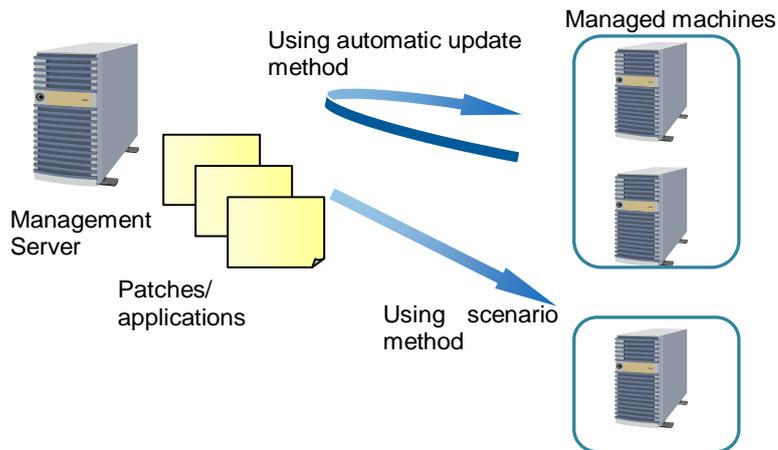
The function to install service packs, hotfixes, Linux patch files, and applications enables the following operations depending on the operation scene and the status of the managed machine.

- The patch application status of each managed machine can be checked from the Web Console. This allows users to find which machine installation has failed and to determine if need another installation, and to perform the procedure.
- When new machines are added the required patches can all be applied in a single batch.
- You can apply a patch/application that requires administrator authority.
  (DPM performs installations on the local system account).
- Patches and applications can also be installed even when not logged into the managed machines.
- The timing of the installation on the managed machines can be selected. For example, if the machine is in use, application can be performed the next time the managed machine is booted up.
- Even if the managed machine is turned off the remote power on function can be used to boot up the machine to allow installation of patches and applications.
- For a configuration featuring multiple Management Servers, the Package Web Server allows the package to be made common to all of them, and managed from a single source.
- Using multicast allows installation on a larger number of machines in a single batch.

2. System Design

2.1. Examining the System Configuration of DeploymentManager

This section explains the methods to determine the system configuration when introducing DPM.

2.1.1. System Configuration

Explains the configuration of DPM. The role of each machine when you use DPM is as following.

Role	Description	Installed components
Management Server (Required)	The machine which manages managed machines.	- DPM Server(Required) - IIS(Required) - DHCP Server(Option) - NFS Server(Option)
Package Web Server (Option)	The machine which shares packages between multiple Management Servers. The packages saved in Package Web Server are downloaded to the Management Server by HTTP protocol. You can also configure Package Web Server on the Management Server.	- IIS(Required) - PackageDescriber(Required)
Console terminal (Option)	The machine which operates the Management Server.	- Web Console (It is not required to install) - Image Builder(Remote Console)(Option) - DPM Command Line(Option)
Managed machine (Required)	The machine on which DPM functions are executed.	- DPM Client(Option)

When the Management Server is single, the example of the configuration is as following.
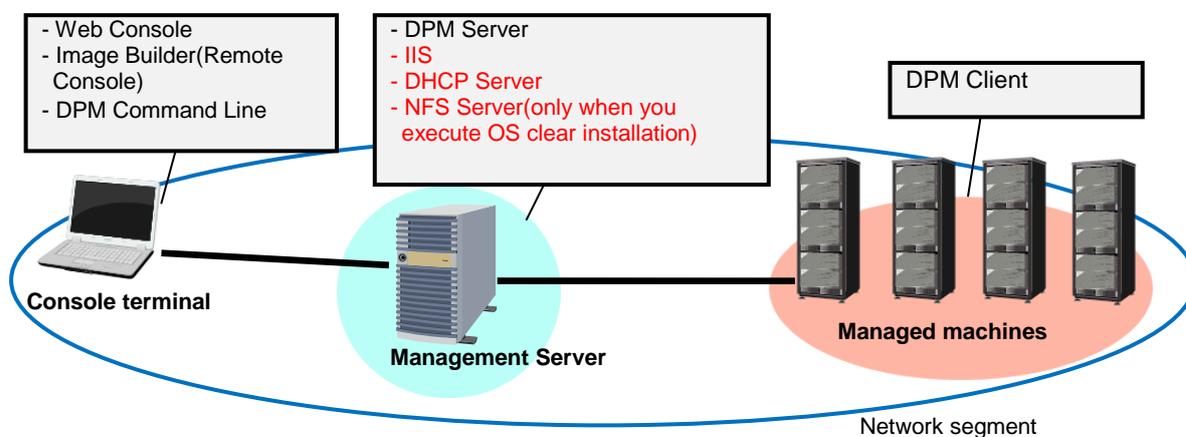
* The components with black characters are included in the install media of DeploymentManager. You need to prepare the components with red character separately.

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When multiple Management Servers are configured, the example of the configuration is as following.
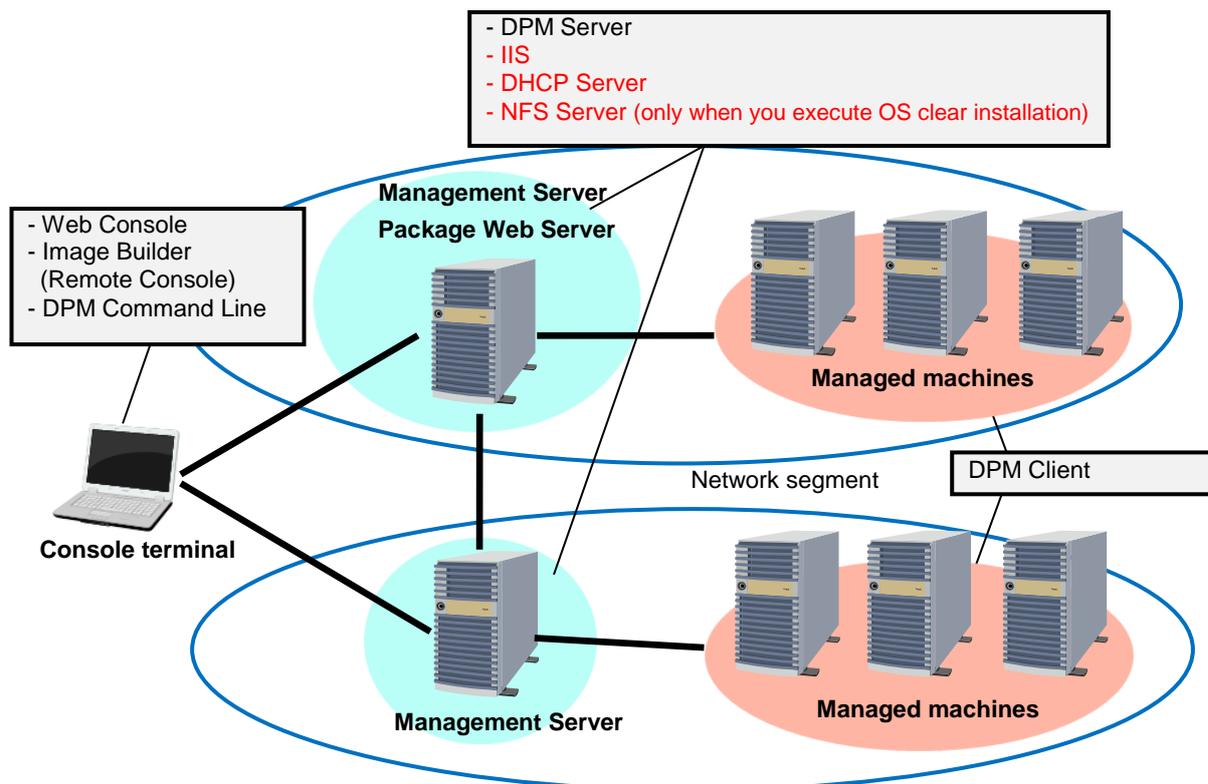
Boxes in diagram:
- DPM Server
- IIS
- DHCP Server
- NFS Server (only when you execute OS clear installation)

- Web Console
- Image Builder
  (Remote Console)
- DPM Command Line

Management Server
Package Web Server

Managed machines

Console terminal

Network segment

DPM Client

Management Server

Managed machines

* The components with black characters are included in the install media of DeploymentManager.
  You need to prepare the components with red character separately.

2.1.2. Component Configuration of the DeploymentManager

The DPM is comprised of the following components.

(1) Management Server Side Components

Component Name	Description	Circumstances Under Which Installation is Required
DPM Server	Performs management of managed machines, and executes processes affecting the managed machines from commands received from the Web Console or the DPM Command Line. Also includes the database that saves the configuration information of the managed machines.	Must be installed.
Web Console	The user interface from which the status of the managed machines can be checked, and processes affecting the managed machines can be executed.	No installation operation is required. (Required components will be downloaded from the Management Server via web browser).

IIS	Used to provide web based functions with the DPM.	Must be installed. (As this is not included in the DPM installation media, you need to prepare this separately yourself).
DHCP Server	Assigns IP addresses in the operation by network boot. You can choose to use network boot or CD boot. If it is difficult to introduce DHCP server, you can operate DPM without DHCP server(by CD boot). In that case, some functions are restricted. See Appendix B, "For Customers Who Cannot Easily Install a DHCP Server" for details. Because DHCP server is used to assign IP address used by network boot temporarily, it is possible to use fixed IP in the installed OS on each managed machine.	This is required for the following functions. ▪ Backup/restore/disk configuration check by network boot ▪ OS installation by disk duplication ▪ OS clear installation ▪ BIOS/firmware update (As this is not included in the DPM install media, you need to prepare this separately.)
NFS Server	This is used to distribute OS image when you execute OS clear installation.	This is required for OS clear installation. (As this is not included in the DPM install media, you need to prepare this separately.)
Image Builder	This is a tool for creating packages and disk duplication data file, etc. And registering the created files in the Management Server.	Installed at the same time as the DPM Server. Various separate installation is required if you wish to use the Image Builder/DPM command line from a different machine than the Management Server. (Under these circumstances it will be referred to as Image Builder (Remote Console) for the Image Builder).
DPM Command Line	The command line interface that executes command on the managed machines and checks the result of their execution.	
PackageDescriber	This is a tool to create packages and registers them to the Package Web Server. Also, you can use this on the Package Web Server.	This is required to share packages between multiple Management Servers. (Even if the Management Server is single, it is required to specify detailed conditions when applying a patch by the automatic update type.

(2) Managed Machine Side Components

Component Name	Description	Circumstances Under Which Installation is Required
DPM Client	Transfers data with the DPM Server and controls the managed machines. When it is difficult to install DPM Client, it is possible to operate without DPM Client. In that case, some functions are restricted.	This is required for the following functions. ・ OS installation by disk duplication ・ Installing service packs/hotfixes/Linux patch files/applications ・ Shutdown Also, this is required to enable the following settings. ・ **Check the completion of a scenario by the communication with DPM Client** in the setting of DPM Server ・ **Forced Execution Of A Reboot Is Performed Before Execution** in **Scenario Execution Option Setting**

2.1.3. Technologies Used in DeploymentManager

The following is an explanation of the technologies used in the DPM. See the technologies explained in this section and design your system.

2.1.3.1. Wake On LAN (WOL)

The DPM uses **Wake On LAN** (abbreviation "**WOL**") in order to turn on the power remotely to a managed machine that has the power turned off. Turning power on using WOL is a function that broadcasts a packet called a magic packet, which includes the MAC address of the managed machine. By configuring direct broadcast routing settings on the network device, the power of managed machines in other segments can be turned on remotely.

Used Function	Power On
Conditions required to perform WOL	·Have a LAN board that supports WOL. ·Configure WOL settings in BIOS menu or the LAN driver settings of OS, etc. For more details of the conditions required to perform WOL see the description on managed machines in Section 3.8.2, "Precautions." If you manage the machine with a LAN board that does not support WOL, then please turn the power on manually.
Precautions	For precautions concerning WOL, see the description on managed machines in Section 3.8.2, "Precautions."

2.1.3.2. Network Boot

A network boot is one way to boot a machine, using a standard called PXE (Preboot eXecution Environment). Normally, when a machine has an OS installed it is booted from a boot file contained inside the hard disk drive (HHD), but during a network boot the boot file is downloaded from a server on the network and then used to perform the boot. The DPM uses network boots to locate new machines, perform activation checks and for tasks such as backup/restoring.

Communication Sequence in a Network Boot (When Management Server and DHCP server are on the same Server)

Management Server and DHCP server   Managed Machine

DHCP service		Startup

DHCP Discover

Response(DHCP Offer)

DHCP Request

IP address release

Requesting the Boot file name

Sending the Boot file name

Downloading the Boot file

DPM Server service
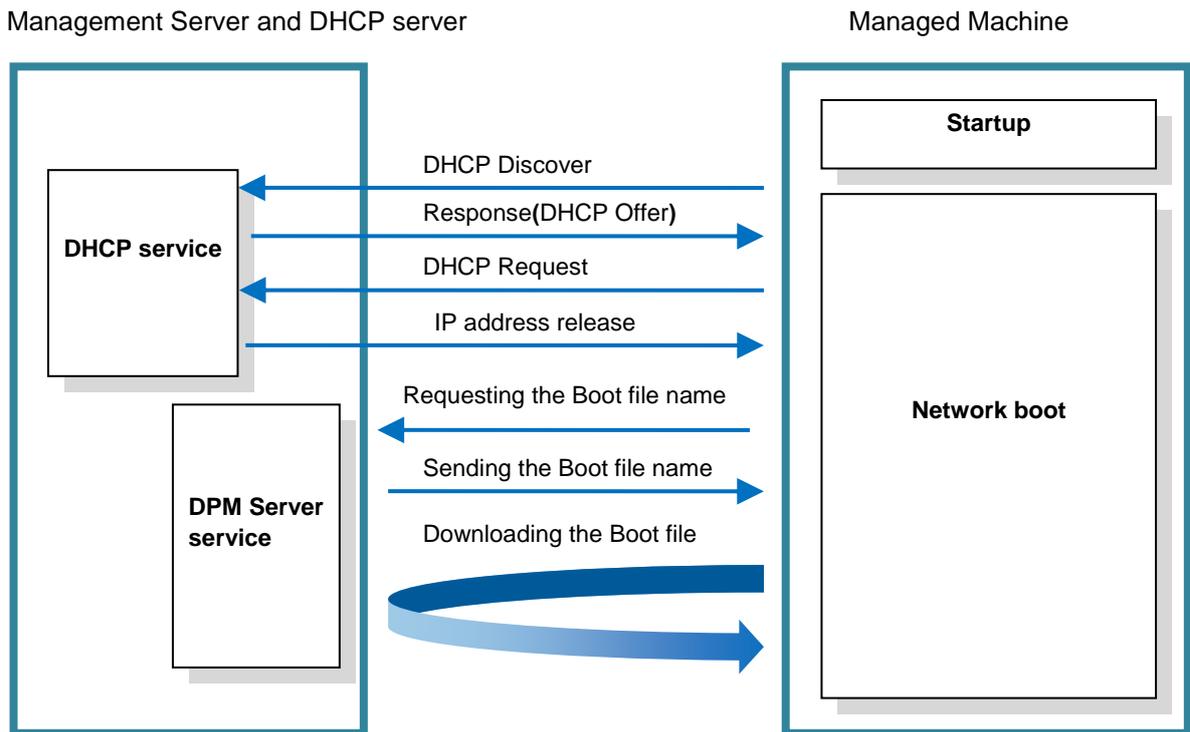
Network boot

Communication Sequence in a Network Boot (When Management Server and DHCP server are different servers)

Management Server	DHCP server		Managed machine

DPM Server service

DHCP service

Startup

Network boot

DHCP Discover

DHCP Discover

Response(DHCP Offer)

DHCP Request

IP address release

Response(DHCP Offer)

Requesting the Boot file name

Sending the Boot file name

Downloading the Boot file

Used Functions	·Backup/Restore/Disk Configuration Check (when operating using DHCP server) ·OS Installation by Disk Duplication ·OS clear installation ·BIOS/firmware update ·Register a New Managed Machine
Conditions required to perform a network boot	·A DHCP server is active on the network. ·The managed machine's LAN board can boot by PXE. ·In the BIOS or EFI boot menu of the managed machine, the boot order of the LAN board is set higher than that of the HDD.
Precautions	·You should use the managed machine's onboard LAN card to perform a network boot. ·When the DHCP server and managed machine are in different segments, you should set a DHCP relay agent on the network device. ·When the DPM Management Server and DHCP server are configured on the same machine, you should perform the assignment of the IP address to the managed machine from the DHCP server on the DPM Management Server. ·Please do not install an application that has a TFTP server function on the Management Server other than DPM. As the DPM Server also uses a TFTP service, sometimes a port number conflict may occur and the DPM Server may not work properly. ·Do not set up a network boot server (PXE server) on the same network with the DPM Management Server. When setting up one, prepare a DHCP server for each PXE server, and perform IP address assignment reservation settings. ·In an environment in which you cannot set up a DHCP server, or if the managed machine cannot execute a network boot, a CD boot can be used in place of a network boot to perform a backup/restore/disk configuration check. Unlike when performing a network boot, operation involving insertion of a boot CD into the managed machine will be required. This will also mean the functions required for network boot will not be able to be used. For details of functions that can be used in an environment in which a DHCP server cannot be set up, see Appendix B, "For Customers Who Cannot Easily Install a DHCP Server." ·When registering a machine with multiple LAN boards to the DPM, set the BIOS boot order so that only the LAN board on which the DPM managed is performed is set higher than the HDD, with all other LAN boards set lower than the HDD. Setting LAN boards on which the DPM management is not performed set higher than the HDD can be the cause of such errors as scenario execution errors.

2.1.3.3. UUID

UUID stands for Universal Unique IDentifier. It is a 16Byte numerical value housed in a SMBIOS configuration, and is used to uniquely identity hardware.

In order to manage the managed machines, the DPM stores their MAC address and UUID information. The MAC address is used as the key for processes such as turning the power on using WOL, but for machine that have multiple LAN boards (multiple MAC addresses), UUID is used to uniquely identify them. Even if the LAN boards are exchanged, causing the MAC address to change, the machine will be still recognized as the same machine it was before.

Used Function	Management of managed machines
Precautions	If the mother board is exchanged, the UUID will change, meaning the machine will need to be newly registered as a DPM managed machine.

2.1.3.4. Deploy-OS

Deploy-OS is Linux OS customized for DPM. When performing backup/restoring, Deploy-OS is sent as boot image from the Management Server to the managed machine. On the managed machine, Deploy-OS is booted and reads the managed machine's disk and sends disk data via the network to the Management Server. In order to read the disk data and send the data via the network, the Deploy-OS is required to contain a disk controller and LAN board device driver.

By specifying the Deploy-OS corresponding to each managed machine by the Web Console or DPM Command Line, the disk controller and LAN board device driver corresponding to each machine model can be built. Contact your sales or support representative about the information on Deploy-OS corresponding to the machine model. Also, contact your sales or support representative about the way to obtain the Deploy-OS, which is not included in the installation media.

1) Start the managed machine with Deploy-OS

Deploy-OS

Managed machine

Backup image file

2) Deploy-OS creates an image of the disk contents and sends it to the Management Server

Backup Target OS

Management Server
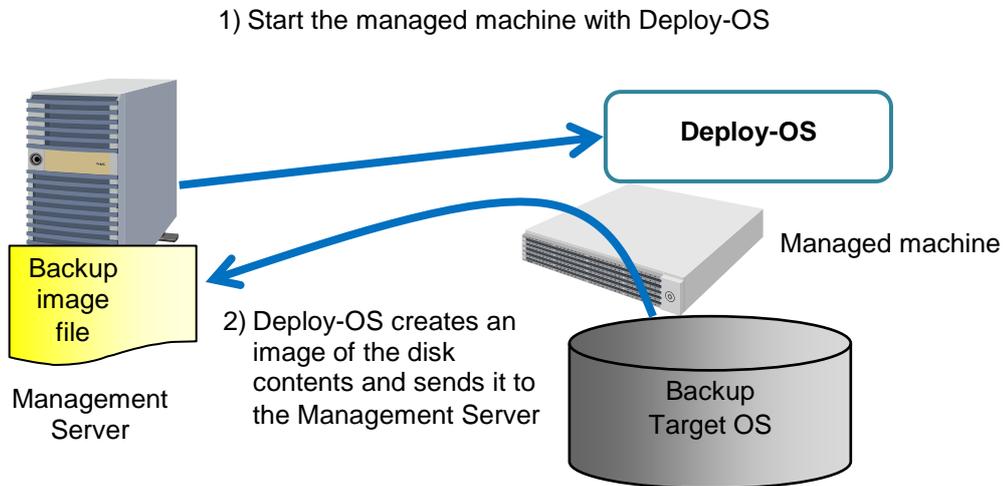
Used Function	·Backup/restore/disk configuration check ·OS Installation by Disk Duplication
Precautions	When using backup/restore/disk configuration check or OS installation by disk duplication, the Deploy-OS corresponding to the machine model of the managed machine needs to be used.

2.1.3.5. Multicast Distribution

You can choose from two types of image distribution using the DPM, unicast (default) and multicast. The multicast type allows the same image (same packet) to be sent to multiple managed machines, so it reduces network load in comparison to the unicast when distributing the same image to multiple managed machines.

Function Used	·Install patch/application
	·OS Installation by Disk Duplication (used when restoring)
Precautions	If even one of the distribution destinations does not receive the data, it will be resent to all managed machines. Depending upon network environment, sometimes this function can be effective and sometimes it can be ineffective in reducing network load.

2.1.4. How DeploymentManager Works

The following is an explanation of how the DPM operates. See the explanation in this section and design your system.

2.1.4.1. OS Installation by Disk Duplication

The OS installation by disk duplication function uses the tool to delete individual configuration of a single machine, and then creates a backup image (master image) from that state. This machine can then be cloned by restoring this master image into the duplication destination machines and performing parameter settings.

For Windows OS, the Sysprep (System Preparation Utility) tool provided by Microsoft is used to delete individual configuration. When running a Linux OS the tool included with the DPM (LinuxRepSetUp) is used.

<OS installation by disk duplication flow (for Windows OS)>

(1)Setup master machine for duplication

(2)Master machine backup

(3)OS initialization(Sysprep execution)(*)

**(4)Master machine backup
(Items where the OS has an initialized status can be collected as a master image)**

Create the master image

(5)Return to the state before running sysrep on the master machine

(6)Create distinguishing information for the duplication destination machine

(7)Restore the master image to the duplication destination machine

Distribute the master image

*In the case of Linux, an individual deletion tool (LinuxRepSetUp) will be executed.

(1)Prepare the master machine used for duplication. Manually set each setting and install applications etc. on the master machine.

(2)Perform a backup of the master machine using the Web Console or the DPM Command Line. This is performed so that the master machine can be returned to the state prior to the execution of Sysprep after the master image has been created.

(3)Execute the Sysprep tool on the master machine. The execution of Sysprep will be performed via a patch file provided by the DPM.

(4)Backup the master machine using the Web Console or the DPM Command Line. This backup image file, after Sysprep has been executed, will be the master image used to perform the duplication.

(5)In order to return the master machine to the state prior to execution of Sysprep, now restore the backup image created in step (2) to the master machine.

(6)Prepare information (a disk duplication data file) specific to each of the duplicate destination machines, with Image Builder.

(7)Use the Web Console or the DPM Command Line to restore the master image(created in (4)) to the duplicate destination machines. After the restore has been performed, apply the settings contained in the disk duplication data file automatically to the duplicate destination machines.

* You can also create a disk duplication data file for the master machine in order to return it to the state prior to execution of Sysprep. In this case, the original settings of the master machine should be set to a disk duplication data file before the execution of Sysprep in step (3). After performing the backup of step (4), the content of the disk duplication data file will be applied when the machine starts.
* See Section 3.3, "OS Installation by Disk Duplication (Windows)" in *Operation Guide* and Section 3.4, "OS Installation by Disk Duplication (Linux)" in *Operation Guide* for the steps for OS installation by disk duplication.

Precautions	See Section 2.2.3, "Regarding OS Installation by Disk Duplication" for precautions.

2.1.4.2. OS Clear Installation

By using an OS image and Linux installation parameter file, DPM sets up the OS on the managed machine automatically.
OS clear installation can be done only for Red Hat Enterprise Linux.

```
┌─────────────────────────────────────────┐
│ (1)NFS Server setup                      │
└─────────────────────────────────────────┘
                    │
                    ▼
┌─────────────────────────────────────────┐
│ (2)Red Hat Linux install kernel preparation │  ⎤
└─────────────────────────────────────────┘    │
                    │                            │  Create the OS
                    ▼                            ⎬  image
┌─────────────────────────────────────────┐    │
│ (3)Copy the Red Hat Linux installation CD │   ⎦
└─────────────────────────────────────────┘
                    │
                    ▼
┌─────────────────────────────────────────┐
│ (4)Create the Linux installation parameter file │
└─────────────────────────────────────────┘
                    │
                    ▼
┌─────────────────────────────────────────┐
│ (5)OS image distribution/setup           │  ⎤  Deliver the OS
└─────────────────────────────────────────┘  ⎦  image
```
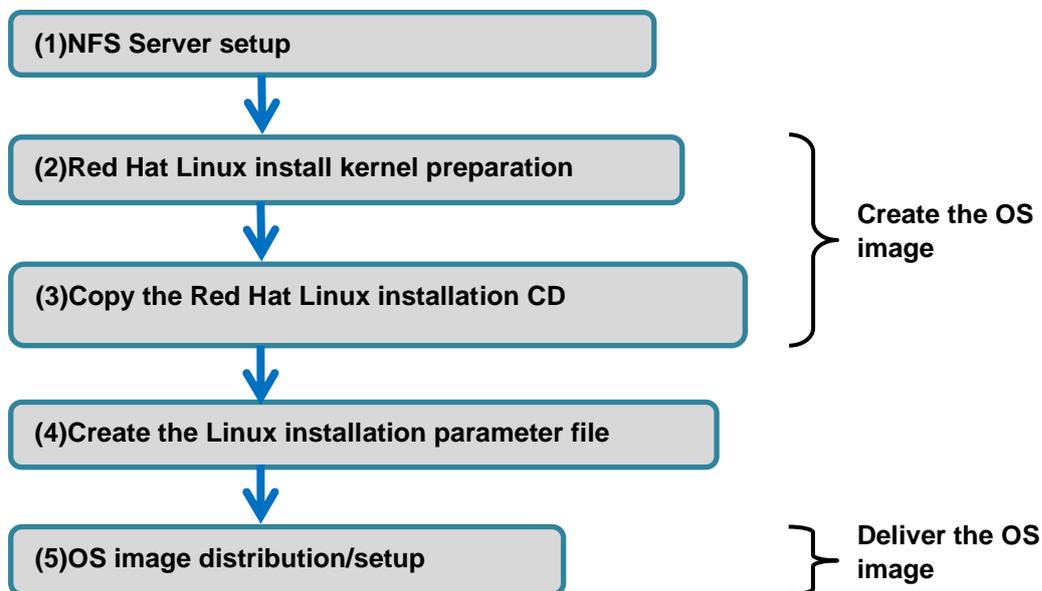
(1) Set up an NFS Server in order to distribute the OS image.

(2) For a network boot, prepare the mini-kernels (file name vmlinuz and initrd.img) that will be loaded first and used for network installation. Copy them into the applicable folder on the Management Server from the OS media, etc.

(3) Use the Image Builder to register an image of the Red Hat Enterprise Linux install CD to the Management Server.

(4) Create a Linux installation parameter file that will perform settings on the managed machine.

(5) Execute the OS distribution scenario. Execution of the scenario will distribute the OS image to the managed machines. The Linux installation parameter file will also be distributed, and the settings on the managed machines will be executed automatically.

Precautions	See Section 2.2.4, "Regarding OS Clear Installation" for precautions.

2.1.4.3. Service Packs/HotFixes/Linux Patch Files/Application Installation

DPM's patch/application installation is that DPM Server communicates with the service installed on the managed machines (DPM client), sends execute files (.exe/.msu/.rpm, etc) and script files (.bat/.vbs/.sh, etc) and then executes them.

There are two distribution types: scenario type and automatic update type.

<Scenario system structure>
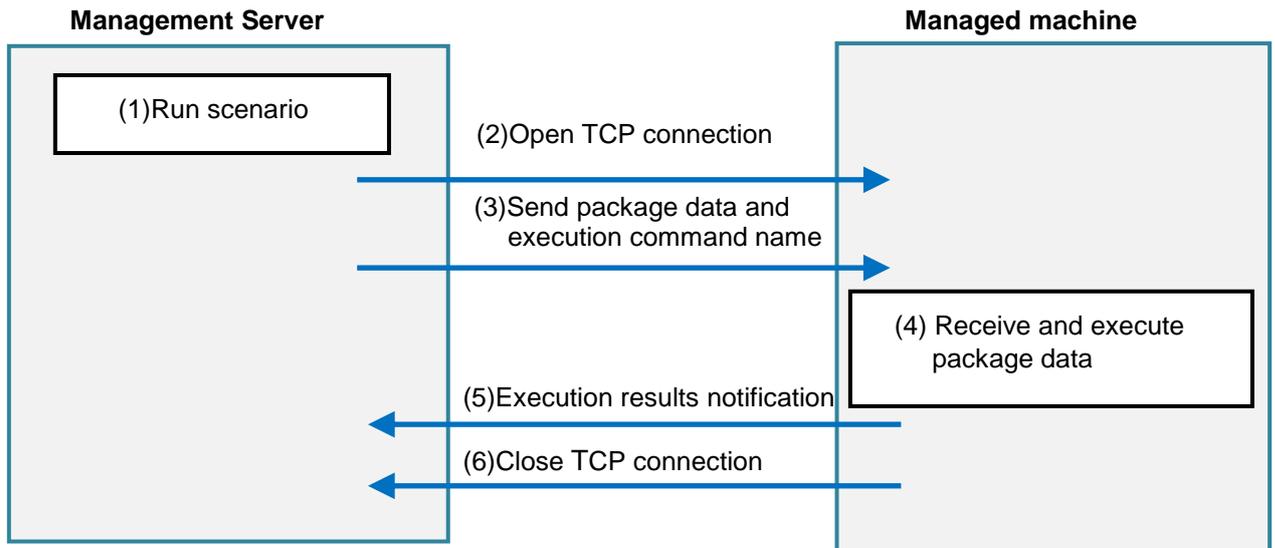
(1) Execute the scenario using the Web Console or the DPM Command Line.

(2) Connect the Management Server to the managed machine.

(3) Management Server sends the package data and command name for executing that is set in the scenario to the managed machine.

(4) By running the execution file or the script file that is included in the package data, you can install the patch/application.

(5) The managed machine sends a report of the results of the execution to the Management Server.

(6) The connection between the Management Server and managed machine is cut.

<Automatic update system structure>

Management Server   **Managed machine**
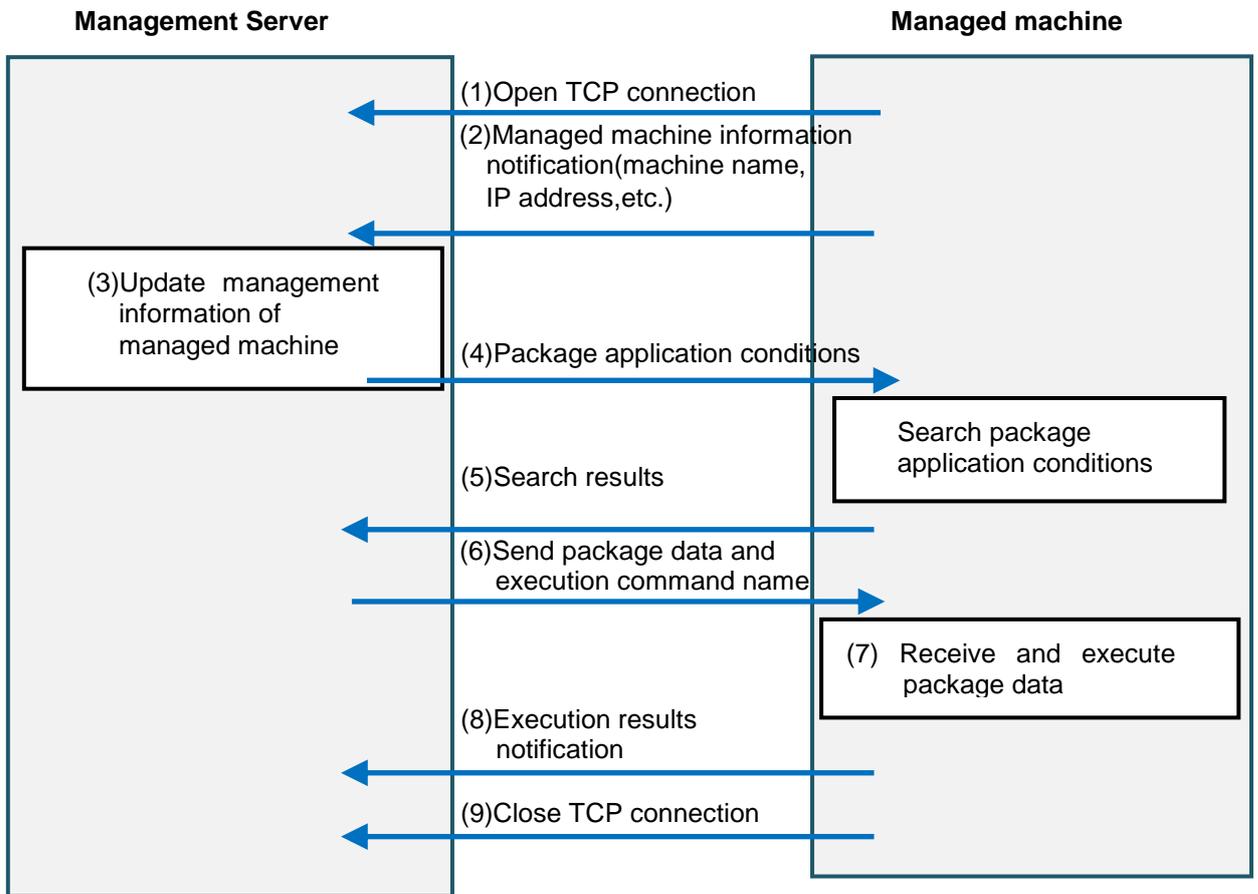
(1) Connect the managed machine to the Management Server.

(2) Managed machine notifies the managed machine information to the Management Server.

(3) An update of the management data of the managed machine on the Management Server is performed.

(4) The information about the application conditions (OS/dependency information/application information) for the package is sent from the Management Server to the managed machine.

(5) Based on the conditions for application of packages, the managed machine returns information on the packages that need to be applied.

(6) The Management Server sends the package data and execution command name to the managed machine.

(7) The managed machine receives the package data. By running the execution file or the script file that is included in the package data, you can install the patch/application.
(The actual time at which this will be executed depends on the automatic update settings).

(8) The managed machine sends a report of the results of the execution to the Management Server.

(9) The connection between the Management Server and managed machine is cut.

Prior to application, the service pack, hotfix, Linux patch file, or application will be registered to the Management Server or Package Web Server using the Image Builder or PackageDescriber. Distribution will be automatically performed from the Management Server to any of the machines that meet the conditions below.

- The package is intended for the targeted OS of automatic update.
- The package urgency is **high** or **highest**.
- In the case of a service pack, the major version and minor version, or ID information are/is entered.
- In the case of a hotfix, the MS number or ID information is entered.
- In the case of an application, the display name or ID information is entered.

Precautions	The following conditions must be met about the service pack, hotfix, Linux patch file or application that can be distributed by DPM.
	·The silent install can be executed. (Response such as entering key during the install does not need to be required, or it is possible to execute the silent install with script file (.bat/.vbs for Windows, shell script for Linux)).
	·A reboot of the OS must not occur during the install.
	·In the case of Windows, the operation is performed using the user authority of the local system account, so the registry under HKEY_CURRENT_USER and files on the network should not be accessed.
	·The size of the patch/application etc. does not exceed 2GByte.
	·If the process to install the patch/application etc. (setup.exe/update.exe, etc) creates a child process during the installation of the patch/application, the parent process must not end without waiting for the created child process to end. In the case of a patch/application that the parent process ends first, even if the child process is running, the completion is recognized.

2.1.5.　System Configuration

This is the example of DPM system configuration. There are various configurations that depend on the system.

The following is the basic DPM configuration.
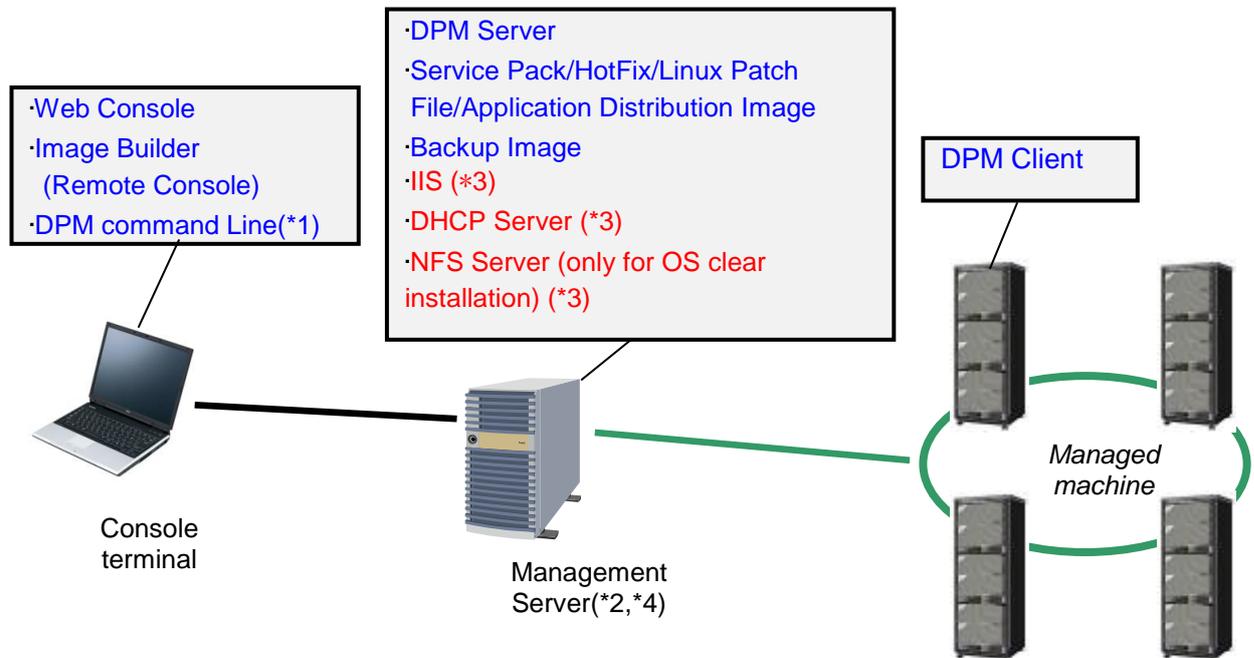
*1

　　The Web Console, Image Builder and DPM Command Line can also be operated from the same machine as the Management Server.

*2

　　The Image Builder and DPM Command Line will be installed when the DPM Server is installed.

*3

　　This is not included in the installation media.

*4

・ A DHCP server configured on the Management Server, or the one configured on a different server can be used, but when using the one configured on the Management Server, that DHCP server must be the only DHCP server on that network. When using a DHCP server configured on a different server, multiple DHCP servers can work on the same network.

・ You can configure either operation using a DHCP server or operation not using it on a single Management Server. When you want to perform both kinds of operation simultaneously, such as the case that certain machines are managed with a DHCP server and other machines are managed without a DHCP server, you will need to set up two Management Servers. (One operating with a DHCP server, and the other operating without a DHCP server).

・ If the DPM server settings are set to **Use A DHCP Server** then you will not be able to operate multiple Management Servers on the same network. If you want to have multiple DPM servers with the **Use A DHCP Server** setting on the same network, you must stop the DPM services and DHCP server's service except the server that you want to operate. Or prepare a DHCP server for each PXE server, and perform IP address assignment reservation settings.
You can place multiple Management Servers if all of the Management Servers are set to **Do Not Use A DHCP Server**, or if one of the Management Servers is set to **Use A DHCP Server** and all of the other Management Servers are set to **Do Not Use A DHCP Server**. See Section 1.2.2, "Setting Up the DHCP Server" in *Installation Guide* for the setting method of DHCP server.

・ The Management Server can have a cluster configuration.

Below is a configuration that includes multiple Management Servers. Registering packages such as patches and applications to the Package Web Server means they do not have to be registered individually to each Management Server.
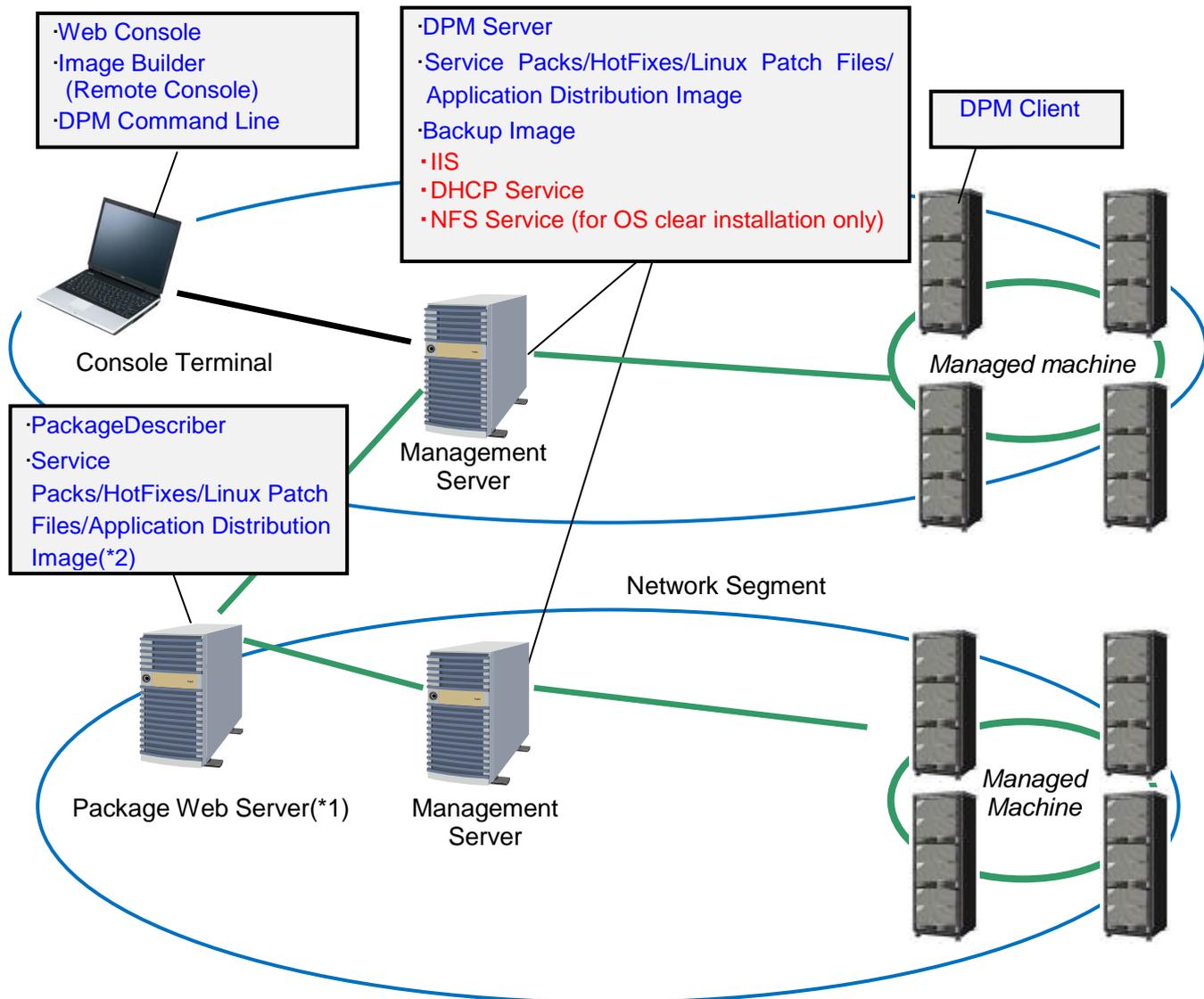
*1
    Also, you can configure Package Web Server on the Management Server.
*2
    The distribution image is downloaded from the package Web server by the Management Servers.
    The other cautions and notes will be similar to those in the Basic Configuration Example.

2.2. Precautions Regarding System Configuration

2.2.1. Regarding the Network Environment

Please confirm that the network managed by DPM meets the following hardware/software environment. Change the settings if it does not meet this.

Hardware environment

LAN Configuration	The Management Server and managed machine are connected using a LAN of 100Mbps or higher. (1Gbps or higher is recommended)
Other	·When using a switching hub or a router with spanning tree protocol (STP) that has self-diagnosis function, turn off the STP of the port to which a managed machine is to be connected. Generally, the STP check requires about 30~60 seconds and you can't communicate on the network during this time. If the device is a type that only has a short interval from the time it is turned on until network boot, it won't network boot properly. Even if the STP is set for ports connecting to devices other than managed machines, when an operating LAN is disconnected because of network failure, etc, it takes some time as well to find a new route. Therefore, the communication cannot be available at this time. ·With DPM, "Speed" and "Duplex" is negotiated as "Auto" setting. Also with switch setting, "Speed" and "Duplex" must be set as "Auto." If it is not set to Auto, the DPM won't be able to do WOL. Also, the backup/restore capability will be reduced if you are operating at a fixed value (100Mbps FULL), etc.

Software environment

DHCP Server	This is required to use all of the DPM functions. If there is no DHCP server existing on the network, please set DPM to "Do Not Use A DHCP Server". See Appendix B, "For Customers Who Cannot Easily Install a DHCP Server" for details. You cannot install or use DHCP server software manufactured by a third party on the same machine as the DPM server. Please use the Windows standard DHCP server if setting up the DHCP server on the same machine.
NFS Server	An NFS Server is required to perform OS clear installation by DPM.

- You cannot start services of the DPM Server correctly if the network is not connected correctly.
- When a managed machine with multiple LAN boards is used and IP addresses in the same segment are assigned to the multiple LAN boards, communication may fail if there are any LAN boards which are not connected to LAN cables.
  It is recommended that you should not assign fixed IP but you should assign by DHCP or should not set IP address on LAN boards that are not connected with a LAN cable.
- DPM may not operate correctly if other applications, etc. are using a TFTP (Trivial File Transfer Protocol) port or communication port described in Appendix D, "Network Port and Protocol List" in *Reference Guide*.
  Please confirm the usage status of ports by other applications.
- You cannot change the limit (MTU. Normally 1500Byte) for TFTP communication packets when using DPM.

- It is recommended that the DHCP server be set before the DPM server is installed. See Section 1.2.2, "Setting Up the DHCP Server" in *Installation Guide* if you set the DHCP server after the DPM Server is installed.
- If there are problems with the DHCP server or the network configuration, the following message will appear for a few seconds during network boot and application obstacles can occur such as errors with DPM scenario execution.
  PXE-E51:No DHCP or proxyDHCP offers were received.

  If this message is displayed, please confirm if the DHCP server was able to assign an IP address to the managed machine. Please be especially careful of the following points.
  ·DHCP server is recognized by the domain controller
  ·The DHCP server is active
  ·The DHCP server scope is set correctly
  ·The DHCP server has not run out of managed IP addresses
  ·STP is not set on the router or switch
  (See "Hardware environment" above.)

Regarding managing managed machines when the Management Server exceeds the network segment

On multiple network segments that exceed the router, please set the following on the switch or router in advance to use DPM to manage machines.
 - Direct broadcast routing for doing WOL.
 - Set multicast routing protocol to use multicast transmission.
 - Set the DHCP relay agent on the router/switch for the DHCP packets to relay to the DHCP server.
   (If the DHCP server and the Management Server are different devices, set the router/switch to also relay to the Management Server)
 - Routing and forwarding for the port that DPM uses for communication. See Appendix D, "Network Port and Protocol List" in *Reference Guide* for the ports used by DPM.

Router settings can be configured after installing DPM.
To manage machines in other segments, create scopes which can lease IP addresses for those segments.

Regarding DPM operation on a Tag VLAN environment

Functions that perform network boot or CD boot (backup/restore/OS installation by disk duplication, etc.) are not supported in an environment that uses a TagID between the managed machine and the switch (*)/router.
In this case, you will be able to use functions performed with network boot or CD boot by structuring

it not to use the TagID only on the network between the managed machine and the switch (*)/router as below.
 -Set the network to be able to communicate using Default VLAN.
 -Configure the settings so that packets including a TagID do not flow on a VLAN that includes managed machines, for example by using the port group configuration function.

There will be no affect on the DPM operations even if using TagID for the network between the Management Server and the switch (*)/router. You can install service packs/hotfixes/Linux patch files/applications even in an environment using TagID where you can't perform a network boot or a CD boot.
* This includes a virtual switch in a virtual environment.

Regarding ports used by DPM

The DPM service may not be able to start when there is a conflict between the port that DPM is using and the port used by other service or application due to the effect of ephemeral port, depending on the type of OS.
The method for confirming and handling an ephemeral port is as below.
See Appendix D, "Network Port and Protocol List" in *Reference Guide* for the port numbers used by DPM.

[For Windows OS]
The setting methods and confirmation methods differ for Windows XP/2003 and prior and for Vista/2008 and later.

·For Windows XP/2003 and prior
[Confirmation method]
  Confirm the following registry values.
  See the [Method to handle] when the setting value is larger than the maximum of the port used by DPM.
  This phenomenon does not apply because of using the Windows default value of 5000 as the maximum value when the following registry doesn't exist.

Key	HKEY_LOCAL_MACHINE¥SYSTEM¥CurrentControlSet¥Services¥Tcpip¥Parameters
Name	MaxUserPort

  If port competition occurs even though the registry does not exist, the following problem might be occurring.
  Microsoft support online (http://support.microsoft.com/kb/953230)

[Method to handle]
  Please add the following registry to reserve the ports to be used by DPM. Please add the following value if it already exists.

Key	HKEY_LOCAL_MACHINE¥SYSTEM¥CurrentControlSet¥Services¥Tcpip¥Parameters
Name	ReservedPorts
Value	26509,26510,26511,26529
Type	REG_MULTI_SZ

·For Windows Vista/2008 and later
See the method of the following Microsoft Knowledgebase for performing confirmation and handling using netsh command.
 Microsoft support online(http://support.microsoft.com/kb/929851)

[Confirmation method]
  Please confirm if the port used by DPM is an ephemeral port from the following command output results.

netsh int ipv4 show dynamicport tcp
netsh int ipv4 show dynamicport udp

Example)
   Start Port:26000
   Number of Ports:4000
   In this case, 26000 through 29999 are being used as ephemeral ports so DPM may not be able to start.

[Method to handle]
   Change the range of the ephemeral ports so that the ports used by DPM are not in the ephemeral port range.
   Run the following command and adjust so the ports that DPM is using are not included.

```
netsh int ipv4 set dynamicport tcp start=XXXXX num=YYYYY
netsh int ipv4 set dynamicport udp start=XXXXX num=YYYYY
```

Set it with XXXXX being the starting port for the ephemeral ports and YYYYY being the number of ports used as ephemeral ports. You need to consider port number used by other applications when deciding the range of port.

[For Linux OS (including ESX/XenServer)]
   [Confirmation method]
      Confirm the content of the following files.
      See the [Method to handle] if the ports used by DPM are included in the file.

      /proc/sys/net/ipv4/ip_local_port_range
      Example)
         # cat /proc/sys/net/ipv4/ip_local_port_range
         26000 61000
         In the case of the above output results, 26000 through 61000 are being used as ephemeral ports so DPM may not be able to start.

   [Method to handle]
      You can change the ephemeral port range, or change the DPM start order.

   ·Ephemeral port change method
    Change the setting so the ephemeral ports are automatically changed at start up.
    See the OS documentation regarding the method for using sysctl.

   <Procedure>
      (1) Add the following line to the /etc/sysctl.conf file.
            Create it if it doesn't exist.

            net.ipv4.ip_local_port_range = XXXXX ZZZZZ

            Set it with XXXXX being the starting port for the ephemeral ports and ZZZZZ being the end port number.
            You need to consider port number used by other daemons when deciding the range of port.
      (2) Make boot.sysctl active for SUSE Linux Enterprise.
            This is automatically set at startup with Red Hat Enterprise Linux.

   ·Method for changing the DPM start order
    Change the DPM client start order according to the following policy.
    -After the network (start order 10) and syslog daemon (start order 12)
    -Before other daemons that use ephemeral ports

<Procedure>
(1) Edit the following file.

/etc/init.d/depagt

Before editing : # chkconfig:35 40 89
After editing : # chkconfig:35 xx 89
xx is the startup position. Enter the new startup position here.
It starts from the lowest number.

(2) Run the following command.
chkconfig depagt reset

2.2.2. Regarding Backup/Restore

Regarding the backup/restore target machine

Confirm that the LAN board and hard disk controller of machines, that backup/restoring are performed, are supported by the DPM.

For supporting devices, it could be necessary to install the module for the machine model. For details, contact your sales or support representative.

Regarding the target disk/partition

■ Maximum number of disks

If the number of disks connected exceeds the maximum number for each disk type as below, those disks that are above the maximum number of disks will not be able to be backed up.

Disk Type	Maximum number of disks
IDE	4
RAID(*1)	8
SCSI, FC, RAID except the above	16(*2)(*3)

*1
The following RAID controllers are the target.
・Mylex AcceleRAID 160
・Mylex AcceleRAID 352

*2
The total disk number of SCSI, FC, and RAID

*3
If several connection paths are set for FC, they could be recognized as something different from the actual number of the connected disks.

■ Maximum number of partitions

You cannot backup basic disks that exceed the following maximum number of partitions.

If you create an extended partition, the number of logical drives that can be backed up is "Partitions – 3". If the structure exceeds this, neither disk backup nor partition backup can be done. Yet, the upper limit for number of partitions on a dynamic disk is 1000.

Disk Type	Maximum number of partitions
IDE	15
RAID (*4)	6
SCSI, FC, RAID except the above	14

*4
The following RAID controllers are the target.
・Mylex AcceleRAID 160
・Mylex AcceleRAID 352

·Regarding the range that can be recovered with the backup/restore function in response to a physical defect or logical defect with a hard disk

For backup/restoring of a disk unit, the disk management information will be returned to the disk along with the disk contents. On the other hand, the disk management information will not be returned with partition unit backup. Therefore, handle disk physical failures and logical failures as follows.

-In the case of a physical failure, recover it using the backup image file from the disk unit backup after replacing with a hard disk that works properly. It cannot be recovered with a partition unit backup.

-In the case of a logical failure, the hard disk can be recovered without replacement if you use a backup image file from a disk unit backup. However, you may not be able to recover it with a partition unit backup, depending on the location of the defect.

It is recommended that you use the partition unit backup together with the disk unit backup.

·Regarding the target disk data

-See Appendix A, "Function Tables" for supported file systems.

-Backup/restoring cannot be performed for a hard disk drive with a sector size larger than normal (512Byte).

-It is not recommended that you backup a partition that is not formatted. You can backup such a partition by the full sector backup.

-It is not recommended that you duplicate (restore) to the HDD whose size is different from the HDD of the backup target. However, as the exception, there is a case that you can restore to the disk whose size is larger than the disk that you backed up.

-Backup/restoring cannot be performed in the either of following cases.

The entire disk is designated	·When restoring to a disk with a different type (IDE/SCSI, etc) than the backup disk.
When partition unit is designated	·When restoring a partition that is formatted with a different file system or with a different Byte unit size than at the time of backup.
	·The following error may occur when restoring to a partition with a different size. **Could not write data of the specified size. (SIZEA/SIZEB)** **The disk may be damaged.** *When perform a backup by partition, please have the disk for restore be the same format (number of partitions/organization/size/file system) as the backup destination. Also, restore to the same partition as when backing up.

-The following phenomenon may occur if the HDD to be backed up has bad sectors.

·An error may occur during the backup even if there is no data saved in those sectors.

·Even if an error doesn't occur, using that backup image file to restore will result in the file being read incorrectly and problems, such as that the OS does not start up, may occur.

If there are bad sectors, swap in a new HDD or physically formatting the HDD and then doing a restore from a previously gathered backup image.

Please confirm if there are bad sectors by running Scan Disk/Check Disk from the OS for the target HDD.

See the Help for the OS you are using for the process for running Scan Disk/Check Disk.

It is recommended that you run Scan Disk/Check Disk before performing a backup.

·Other, regarding the backup target

-Backup/restoring cannot be performed for ActiveDirectory server (domain controller).

·Regarding backup of multiple disks/partitions
-You can't backup/restore multiple disks or partitions at the same time with one scenario.
-Please backup all disks/partitions where necessary data is stored in any of the following corresponding cases. In order to maintain consistency of the information between disks and between partitions, please be careful to not start the OS until the backup/restoring for all of the disks/partitions has completed. Please select **Turn Off Power After Scenario Execution** in the **Option** tab of the scenario so that the OS doesn't start during the scenario execution.
  -When the backup source and the restore destination are on different devices
  -When the data required for OS start is saved over multiple disks
  -When the data necessary for the OS start and the data necessary for OS installation by disk duplication (Windows: sysprep, Linux: /opt/dpmclient) is saved across multiple disks
  -If files or data required by the system are saved on a different HDD
  -Disks are linked by several disks or several partitions, such as when mounting another drive.
  -When it is necessary to have consistency in the data between disks or partitions (dynamic disk, LVM1/LVM2, etc.)

·Regarding the backup image file volume
-The approximate estimates of the compression rate for a backup file using effective sector backup is as follows for a backup of a machine immediately after OS installation.

For Windows OS	Approximately 60%
For Linux OS	Approximately 40%

-All sectors will be backed up when a full sector backup is performed. As a result, if there will be no compression or the compression rate will be low, the backup image size may be the same size as the disk size being backed up. (For further details on the support status for backup for each file system, see "Support for File System and Disk Type" in Appendix A, "Function Tables.")
-When you execute a backup, backup data is temporarily created as a temporary file. This temporary file is renamed to the file name specified in the scenario upon the backup completion. Therefore, if there is an already created backup image, you will need disk space for the temporary file in addition to the already created backup image file.
-If you are using generation management, the image file (generation management number +1) is created so please be careful that the hard disk to which the image file will be saved has enough free space.
  Example)
    If the generation management number is five, and the size of one image file is approximately 5GByte, then 5GByte x (5+1+1) = 35GByte including above temporary file, so a maximum of 35GByte of free space will be required.
-Please be careful since the backup image size cannot exceed the size limited for each file on the file system of the destination partition.

·Regarding the timeout value for communication between the Management Server and the managed machine
If you backup an NTFS/ext2/ext3 partition with a large size, the following message may be displayed on the managed machine and a scenario error may occur.

ERROR: Broken pipe.
To resolve the problem, please refer to User's Guide.
Press 'p' key to poweroff, 'r' key to reboot:

[A way to manage the problem]
  Please change the value for the timeout of the communication between the management sever and the managed machine.
  Also, the set value will be different depending on the managed machine speck and partition size.

  Registry
  Key:HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services\bkressvc\Parameters
  Name   :UnicastReceiveTimeoutMillisec

```
Value      :60000
Type       :REG_DWORD
```

Example)
In the following case, you set approximately 1800000 to the UnicastReceiveTimeoutMillisec because a scenario error occurred.
```
CPU                 : Pentium4 3.40GHz
Memory              : 512MByte
Partition size      : 1TByte
File system         : ext3
Block size          : 1024Byte
```

·Other
-Please sufficiently confirm the OS license rules so that there is no violation when performing backup/restore functions.
-A partition with the name "System Reserved" may be automatically created when you install Windows Server 2008 R2/Windows 7.
This partition may be necessary for the operation of Windows, so be careful of the following for backup/restoring of a Windows partition using partition units.
-If partition with the volume name "System Reserved" exists when confirming the partition structure from the Windows disk management, please be sure to backup/restore this with the Windows system partition.
-Please do not start up the Windows system or change any system configurations with the tools on the "System Reserved" partition until all the backup/restoring of the Windows system partition and the "System Reserved" partition has completed.
-See Section 3.5, "OS Clear Installation (Linux)" in *Operation Guide*, Section 3.6, "Installing Service Packs, HotFixes, Linux Patch Files, and Applications (Scenario Type)" in *Operation Guide*, and Section 3.7, "Distributing the BIOS/Firmware Update Floppy Disk Image" in *Operation Guide* regarding performing floppy disk image distribution, OS installation, service pack/hotfix/Linux patch file/application installation, etc. at the same time as a backup, register the image and configure it from the "HW Setting", "OS" and "Package" tabs.

2.2.3.   Regarding OS Installation by Disk Duplication

・ Be sure to use the same machine model and same hardware configuration device for the master machine that serves as the duplication source and the machine that serves as the duplication destination. For example, if you create a master without a USB keyboard/mouse connected but a USB keyboard/mouse is connected to the duplication destination, a new device may be detected after the completion of OS installation by disk duplication, and the machine may be required to reboot.
・ Duplication (restore) with a different size HDD than the master machine device with DPM is not recommended. However, as an exception, you can restore to a larger size disk than at the time of backup. When HDDs of multivendor are supported by the machine and it is necessary to restore to the HDD that was produced by different manufacturer than the machine that was backed up, or that HDD storage devices of different sizes will be procured in the future, so see Section 10.1.2, "Notes when the Machine with HDDs of Multi Vendors is Managed" in *Reference Guide* and prepare countermeasures in advance.
・ Please sufficiently confirm the OS license rules so that there is no violation when performing an OS installation by disk duplication.

[For Windows OS]
The following items exist when performing OS installation by disk duplication.
・ Items set using the Sysprep mini-setup
・ Items originally set by DPM
・ Items returned to default by Sysprep

It is necessary to confirm that the applications operating on the master machine are not affected by either of the above in advance.

-You will not be able to operate normally if there is installed software that depends on the SID (Security Identifier) or the computer name. In this case, please uninstall the software from the machine that will be the duplication source or execute the OS installation by disk duplication prior to installing.
-Please configure it so that the Windows startup drive is the C drive when performing OS installation by disk duplication in an environment with Windows OS installed. Regarding other drives, if a drive is added or changed, the drive letter can be changed after the disk duplication. See the precautions in Section 3.3, "OS Installation by Disk Duplication (Windows)" in *Operation Guide* for details.
- When you combine an OS image created by DPM Ver6.1 with a disk duplication data file created by an old version (DPM Ver4.0 - 6.0) or combine an OS image created by an old version with a disk duplication data file created by DPM Ver6.1, you can use the range of functions supported by the old version that was used. (Functions that were added by version upgrades are not supported.)
-An Active Directory server (domain controller) cannot be set up using the OS installation by disk duplication.

[For Linux OS]
The bonding driver at the time of OS installation by disk duplication is not supported. Please remove the bonding setting from the master. It may not be able to perform correctly at the time of individual setting if it is not removed.

2.2.4.   Regarding OS Clear Installation

OS clear installation is explained.

·It is recommended that files be created with the same version of DPM when combining an OS image and a Linux install parameter file.
When you combine an OS image created by DPM Ver6.1 with a Linux install parameter file created by an old version (DPM Ver4.0 - 6.0) or combine an OS image created by an old version with a Linux install parameter file created by DPM Ver6.1, you can use the range of functions supported by the old version that was used (Functions that were added by version upgrades are not supported.)
·In addition to DPM, DHCP Server and NFS Server are required to do the network installation of Red Hat Linux using DPM. A DHCP Server and an NFS Server can be built on a non-Windows system(For example, they can be configured on Linux.)
·When you configure NFS Server on Windows Server 2008, the service for NFS(Network File System) is necessary. About the installation procedure of NFS Server, see the document with the product.

2.2.5.   Other

Other is as follows.

·DPM can be operated in the cluster environment. When building a cluster configuration, contact your sales or support representative.

·All DPM functions can be used when a DHCP server is installed. DPM can be operated without a DHCP server being installed, but available functionality is limited if no DHCP server is installed. For details on restrictions, see Appendix B, "For Customers Who Cannot Easily Install a DHCP Server."

2.3. DeploymentManager Product Line and Licenses

DPM product line and licenses are described.

2.3.1. Product Line

The DPM unbundled product and products included in DPM are as follows.
When DPM is used as an unbundled product, a DPM unbundled license is required.
For SigmaSystemCenter/VirtualPCCenter, the relevant licenses are needed for using those products, and not the DPM unbundled license. See the various product sites for details on product configurations and licenses and contact your distributor.

·DeploymentManager
  The version of each component included in this product is as follows.

Component name	Version
DPM Server	6.12.000
DPM Client(Windows)	6.12.000
DPM Client(Linux)	6.12
Image Builder(Remote Console)	6.12.000
DPM Command Line	6.12.000
PackageDescriber	6.12.000

  This is a DPM unbundled product. The DPM product site is below.
  DeploymentManager(http://www.nec.com/masterscope/deploymentmanager/index.html)

·SigmaSystemCenter
  DPM is included with SigmaSystemCenter (hereinafter SSC). The SSC product site is below.
  SigmaSystemCenter(http://www.nec.com/sigmasystemcenter/index.html)

·VirtualPCCenter
  DPM is included with VirtualPCCenter (hereinafter VPCC). The VPCC product site is below.
  VirtualPCCenter(http://www.nec.com/vpcc/index.html)

2.3.2. Product Configurations and Licenses

DeploymentManager (unbundled product) includes the following products. See Section 2.3.1, "Product Line" for details on product configurations and licenses for SigmaSystemCenter and VirtualPCCenter.

Product Name	Description
DeploymentManager Ver6.1	This is the DPM main product. One is needed per Management Server. Licenses are not given for managed machines with the stand-alone product. Separate licenses are required according to the number and models of managed machines. One license is required for each Management Server in the case of a cluster configuration.
DeploymentManager Ver6.1 Server Target License(1)	This license is needed when managed machines use a server OS. Example) -Windows Server 2003/Windows Server 2003 R2/Windows Server 2008/Windows Server 2008 R2/Windows Server 2012 are server OSs.
DeploymentManager Ver6.1 Server Target License(5)	-A server license is needed if the OS is a Linux OS (Red Hat Enterprise Linux, SUSE Linux Enterprise).
DeploymentManager Ver6.1 Server Target License(20)	-For example, if 10 managed machines in which Windows Server 2008 R2 is installed are being managed, then 10 server licenses are required (five server licenses x two bundles, or five server licenses x one bundle + one server license x five bundles, or one server license x 10 bundles).
DeploymentManager Ver6.1 Client Target License (1)	This license is needed when managed machines use a client OS. Example) -Windows XP/Windows Vista /Windows 7/Windows 8 are client OSs.
DeploymentManager Ver6.1 Client Target License (10)	-For example, if there are 20 managed machines on which Windows 7 is installed, then 20 client licenses are required (10 client licenses x two bundles, or 10 client licenses x one bundle + one client license x 10 bundles, or one client license x 20 bundles).
DeploymentManager Ver6.1 Client Target License (50)	
DeploymentManager Ver6.1 Client Target License (100)	

·Licensing Philosophy

   -Please purchase one license for each machine being managed by a Management Server. For example, if you buy two products and manage 50 client OS machines on each, please purchase two bundles of fifty client licenses, and not one bundle of 100 client licenses.

   -If you use the OS installation by disk duplication function, then a number of licenses equal to the number of managed machines that are registered, including master machines and duplicate machines, is required.

   -One license is needed for each virtual machine operating in virtualization software. When a moving virtual machine between virtual machine servers such as VMware VMotion, it is considered as a same managed machine and you do not need to purchase a license additionally.

   -One license is required for each ft server.

   -A number of products equal to the number of nodes in a cluster is required when using a cluster configuration for Management Servers, but only purchase a number of licenses equal to the actual number of managed machines. In this case, register the same license to multiple servers.

·Transferring Hardware

When transferring the hardware of the Management Server, uninstall DPM from the server before transferring, and install DPM in the server after transferring. In this case, continuous use is possible. There is no need to re-purchase the main product.

When transferring managed machine hardware, a new license must be purchased.

·Regarding version upgrades
In case of the major version-up, the license for the new version is required.
Example)
  -In case of the major version-up from DPM Ver5.1 to DPM Ver6.0, a license for the new version is required.
  -In case of the minor version-up from DPM Ver6.0 to DPM Ver6.1, the existing license can continue to be used.

2.4. DeploymentManager Process up to DeploymentManager Operation

Explains the work flow necessary for operating DPM. Build the system while reading each manual.

(1) Verify the operating environment.
After selecting a system configuration, make sure that the DPM operating environment matches your environment.
See Section 3, "Operating Environment" for details.

(2) Configure the needed settings before installation of DPM.
Install and configure modules needed to run DPM before installing DPM.
See Section 1, "Before Installing DPM" in *Installation Guide* for details.

(3) Install DPM.
Install DPM to the Management Server(s) and managed machine(s) according to the configuration selected during system design.
See Section 2, "Installing DPM" in *Installation Guide* for details.

(4) Preparations before running DPM.
Start the Web Console and register the license key.
See Section 5, "Preparing for DeploymentManager Operation" in *Installation Guide* for details.

(5) Register resources to DPM.
Register managed machines. See Section 2, "Registering Resources on DeploymentManager" in *Operation Guide* for details on registration.

(6) Perform preparations before executing a scenario. What is done at this point depends on the functions to be used. See the procedures for each function in *Operation Guide*.
When using backup/restore/disk configuration check or OS installation by disk duplication, you must specify Deploy-OS corresponding to the machine model. For the information of Deploy-OS, contact your sales or support representative. Confirm the support status, and if it is necessary to install the module for the machine model, install it.

See Section 1.1, "Operation Flow: From Startup to Scenario Execution" in *Operation Guide* for details on the procedure after creation of a scenario.

3. Operating Environment

Before installing DPM, you need to design the system, considering the system requirement, the hardware environment, etc.

3.1. Information on Included Software

This section provides information on software included with the DPM unbundled product.
See the relevant product sites listed in Section 2.3.1, "Product Line" for details on products included in SSC products.

The installation media includes the following components aside from the DPM components listed in Section 2.1, "Examining the System Configuration of DeploymentManager".

　　·Microsoft SQL Server 2012 Express x86/x64
　　·JRE7 Update9
　　·Windows Installer 4.5
　　·.Net Framework 4

3.2. Management Server

This section describes system requirements for the Management Server. Install the DPM Server in the Management Server.

3.2.1. System Requirements

The system requirements for the Management Server are as follows.

Hardware environment

CPU	2GHz or higher, Multiple core	
Memory Size	Approximately 156MByte Note: Memory used for each service listed in "Software environment" – "other" as below is not included. Additional memory is required for the following operations.	
	For each one managed machine that is registered	Approximately 0.3MByte
	For creating one scenario	Approximately 0.07MByte
	For every added machine on which a scenario is run simultaneously	Approximately 8.5MByte
	For each one device increase in the number of devices running automatic updates	Approximately 0.2MByte
	If using Image Builder	Approximately 40MByte

Disk Size	Refer to the following total space for disk.
	▪ DPM Server module: Approximately 360MByte
	▪ SQL Server 2012 Express: Approximately 900MByte
	▪ .NET Framework: Approximately 900MByte
	▪ Data base(DPMDBI Instance)
	 - DPM Server install: Approximately 256MByte
	 - Space for data by the following calculation process.
	   Number of registered machines x 10KByte + number of registered packages x 3KByte + number of registered machines x 0.15KByte x number of registered packages
	   Example) This will be approximately 1.0GByte for 40,000 registered machines, and 100 registered packages.
	▪ Space for backup images, OS images, setup parameter files, service packs/hotfixes/Linux patch files/application images and BIOS/firmware update images.
	(DPM creates compressed files of service packs/hotfixes/Linux patch files/application images to distribute in addition to original files. Therefore the double volume is necessary.)
	▪ Additionally, approximately 6GByte is temporarily necessary when installing DPM Server.	

Other	100Mbps or faster LAN board (1Gbps or faster recommended) CD/DVD drive	

Software environment

OS	x86	Windows Server 2008 Standard/Enterprise(No SP/SP2)(*1) (*2)
	x64	Windows Server 2008 Standard x64/Enterprise x64 (No SP/SP2)(*1)(*2) Windows Storage Server 2008 Standard x64/Enterprise x64 (No SP/SP2)(*1) (*2) Windows Server 2008 R2 Standard/Enterprise/Datacenter (No SP/SP1)(*1) (*2) Windows Storage Server 2008 R2(SP1)(*1) Windows Server 2012 Standard/Datacenter(No SP)(*1)
Database Engine		Microsoft SQL Server 2012 Express x86/x64(*3) Microsoft SQL Server 2012 Standard/Enterprise x86 Microsoft SQL Server 2012 Standard/Enterprise x64 Microsoft SQL Server 2008 R2 Express x86/x64 Microsoft SQL Server 2008 R2 Standard/Enterprise/Datacenter x86 Microsoft SQL Server 2008 R2 Standard/Enterprise/Datacenter x64 Microsoft SQL Server 2008 Express/Standard Edition/Enterprise x86/x64 Microsoft SQL Server 2005 Express Edition/Standard Edition/Enterprise Edition x86/x64
Java Execution Environment		JRE7 Update9(*3)
Other		Internet Information Service (IIS) 7.0/7.5/8.0 .NET Framework(*3)(*4) ASP .NET(*4) DHCP server Windows Installer 4.5 or later (*5)

*1
   Full installation is supported. Always perform installations and other operations by an Administrator user.
*2
   When SQL Server 2012 is used as the database engine, "No SP" is not supported.
*3
   This is included in the install media.
   About .NET Framework, .NET Framework 4 is included.
*4
   The followings are necessary according to OS version.
      ▪ For Windows Server 2008
         -.NET Framework 2.0 or 3.0 or 3.5 SP1, and .NET Framework 4
          (When OS is installed, .NET Framework 2.0 is already installed.)
         -ASP.NET 2.0 and ASP.NET 4.0
      ▪ For Windows Server 2012
         -.NET Framework 3.5 SP1 and .NET Framework 4.5
         -ASP.NET 3.5 and ASP.NET 4.5
*5
   If Windows Installer 4.5 is not installed, it is included in the install media, so install it. Windows Installer 4.5 is already installed with Windows Server 2008 R2/Windows Server 2012.

> **Tips** See the following for JRE.
> http://www.oracle.com/technetwork/java/javase/downloads/index.html

3.2.2.　Precautions

The precautions are as follows.

·Please use TCP/IP for the Management Server and set a fixed IP address.

Note	Set no more than 128 IP addresses for the Management Server, including all LAN boards.

Tips	If you are managing an NEC US110, see Section 10.2, "Notes when the Managed Machine is NEC US110" in Reference Guide.

It is not recommended that you install Microsoft SQL Server 2012 Express in the install media on the domain controller. Therefore you cannot install DPM Server on the domain controller.

3.3.　Web Console

This section describes system requirements for the web console.

3.3.1.　System Requirements

The system requirements for the Web Console are as follows.

Hardware environment

Display	A display with a resolution of at least 1024 x 768 Graphics card able to display at least 256 colors are required.

Software environment

OS	Any OS can be used.
Web Browser	Internet Explorer 7(not recommended)/8/9(compatible mode) /10(compatible mode)

Tips	■Both browsers of x86/x64 can be used. ■For Internet Explorer 9/ Internet Explorer 10, the compatible mode can be used. To set the compatible mode, click the Compatibility View button () on the Address bar of Internet Explorer.

3.3.2.　Precautions

Change the security settings in Internet Explorer's **Internet Options**.

JavaScript	Set **Security** - **Custom Level** - **Security Settings** - **Scripting** - **Active Scripting** to **Enable**. For details, see Section 5.1.1, "Starting the Web Console" in *Installation Guide*.
Cookie	-In **Privacy**, move the slider under **Settings** to any setting other than "Blocks all cookies from all websites." -Under **Privacy** - **Sites**, enter the URL of the Management Server you wish to connect to, and click **Allow**.

3.4. Image Builder(Remote Console)

This section describes system requirements for Image Builder (Remote Console).

3.4.1. System Requirements

The system requirements for the Image Builder are as follows.

Hardware environment

CPU	Depend on the OS
Memory Size	Approximately 40MByte
Disk Size	Approximately 6MByte When creating an image file, a separate space is needed temporarily for storage.
Other	A display with a resolution of at least 800 x 600 is required.

Software environment

OS	x86	Windows Server 2008 Standard/Enterprise(No SP/SP2)(*1) Windows Vista Business/Enterprise/Ultimate(No SP) Windows 7 Professional/Ultimate/Enterprise(No SP/SP1) Windows 8 Pro/Enterprise(No SP)
	x64	Windows Server 2008 Standard x64/Enterprise x64(No SP/SP2)(*1) Windows Storage Server 2008 Standard x64/Enterprise x64(No SP/SP2)(*1) Windows Server 2008 R2 Standard/Enterprise/Datacenter (No SP/SP1)(*1) Windows Storage Server 2008 R2(SP1)(*1) Windows 7 Professional x64/Ultimate x64/ Enterprise x64 (No SP/SP1) Windows 8 Pro x64/Enterprise x64(No SP) Windows Server 2012 Standard/Datacenter(No SP)(*1)
Java Execution Environment	JRE7 Update9(*2)	

*1
   Full installation is supported. Always perform installations and other operations by an Administrator user.
*2
   This is included in the install media.

Important	Administrator authority is required to run Image Builder.

Tips	■Image Builder does not need to be installed on the machine in which the DPM Server has been installed. (A local console is automatically installed.) ■See the following for JRE. http://www.oracle.com/technetwork/java/javase/downloads/index.html

3.5. DPM Command Line

This section describes system requirements for DPM Command Line.

3.5.1. System Requirements

The system requirements for the DPM Command Line are as follows.

Hardware environment

CPU	Depend on the OS
Memory Size	Approximately 6.0MByte
Disk Size	Approximately 1MByte

Software environment

OS	x86	Windows Server 2008 Standard/Enterprise(No SP/SP2)(*1) Windows Vista Business/Enterprise/Ultimate(No SP) Windows 7 Professional/Ultimate/Enterprise(No SP/SP1) Windows 8 Pro/Enterprise(No SP)
	x64	Windows Server 2008 Standard x64/Enterprise x64(No SP/SP2)(*1) Windows Storage Server 2008 Standard x64/Enterprise x64(No SP/SP2)(*1) Windows Server 2008 R2 Standard/Enterprise/Datacenter (No SP/SP1)(*1) Windows Storage Server 2008 R2(SP1)(*1) Windows Server 2012 Standard/Datacenter(No SP) Windows 7 Professional x64/Ultimate x64/Enterprise x64(No SP/SP1) Windows 8 Pro x64/Enterprise x64(No SP)

*1
   Full installation is supported. Always perform installations and other operations by an Administrator user.

Note	Use the same version/revision of DPM Command Line and the DPM Server. For example, if you are using DPM Server of DPM Ver6.1, use DPM Command Line of DPM Ver6.1.

Tips	DPM Command Line does not need to be installed on the machine in which the DPM Server has been installed.

3.6. Package Web Server

This section describes system requirements for the Package Web Server.

3.6.1. System Requirements

The system requirements for the Package Web Server are as follows.

Hardware environment

CPU	Depend on the OS
Memory Size	Approximately 256MByte
Disk Size	Enough disk space is required to store the package. (Compressed files to distribute are created in addition to original files. Therefore the double volume is necessary.)

Software environment

OS	x86	Windows Server 2008 Standard/Enterprise(No SP/SP2)(*1) Windows 8 Pro/Enterprise(No SP)
	x64	Windows Server 2008 Standard x64/Enterprise x64(No SP/SP2)(*1) Windows Storage Server 2008 Standard x64/Enterprise x64 (No SP/SP2)(*1) Windows Server 2008 R2 Standard/Enterprise/Datacenter (No SP/SP1)(*1) Windows Storage Server 2008 R2(SP1)(*1) Windows 8 Pro x64/Enterprise x64(No SP) Windows Server 2012 Standard/Datacenter(No SP)(*1)
Other	Internet Information Service (IIS) 7.0/7.5/8.0	

*1
  Full installation is supported. Always perform installations and other operations by an Administrator user.

3.6.2. Precautions

When there are multiple Management Servers, you can commonly manage the packages to be registered on each Management Server by introducing a Package Web Server.

If you use Package Web Server, packages are automatically downloaded to each Management Server by registering them to Package Web Server. Therefore, you do not need to register the same package to multiple Management Servers. Use PackageDescriber to register packages to Package Web Server. HTTP protocol is used when packages are downloaded from Package Web Server to Management Server.

Package Web Server does not need to be configured if there is only one Management Server.

When Package Web Server and Management Server are on the same server, Package Web Server can be configured using the IIS used by the Management Server. Therefore, you do not need to install an HTTP server for Package Web Server.

Note	Use the PackageDescriber when creating or editing a package involves either of the settings described below. For more details on each setting, see Section 6, "PackageDescriber" in *Reference Guide*.

- ・ When specifying a hyphen (-), period (.), or underscore (_) in **MS number** under the **Basic** tab.
- ・ When specifying a file that includes the **msp** or **msu** extensions in **Execution file** under the **Execution settings** tab.
- ・ When specifying a path described in the registry as a file path in **File Condition List** under the **Dependency information** tab.
- ・ When specifying any of the following in **File Condition List** or **Registry Condition List** under the **Dependency information** tab.
  -Exists (smaller than version)
  -Exists (version or earlier)
  -Exists (larger than version)
  -Exists (version or later)
- ・ When specifying multiple conditions using **And** or **Or** in **Select Conditions** under the **Dependency information** tab.
- ・ When specifying a path described in the registry as the file path under the **ID information** tab.

3.7. PackageDescriber

This section describes system requirements for PackageDescriber.

3.7.1. System Requirements

The system requirements for the PackageDescriber are as follows.

Hardware environment

CPU	Depend on the OS
Memory Size	Approximately 64MByte
Disk Size	Approximately 1.1MByte (approximately 130MByte are separately needed for storing packages and installing JRE.)

Software environment

OS	x86	Windows Server 2008 Standard/Enterprise(No SP/SP2)(*1) Windows Vista Business/Enterprise/Ultimate(No SP) Windows 7 Professional/Ultimate/Enterprise(No SP/SP1) Windows 8 Pro/Enterprise(No SP)
	x64	Windows Server 2008 Standard x64/Enterprise x64(No SP/SP2)(*1) Windows Server 2008 R2 Standard/Enterprise/Datacenter (No SP/SP1)(*1) Windows Storage Server 2008 Standard x64/Enterprise x64 (No SP/SP2)(*1) Windows Storage Server 2008 R2(SP1)(*1) Windows Server 2012 Standard/Datacenter(No SP)(*1) Windows 7 Professional x64/Ultimate x64/Enterprise x64(No SP/SP1) Windows 8 Pro x64/Enterprise x64(No SP)
Other	JRE7 Update9(*2)	

*1
   Full installation is supported. Always perform installations and other operations by an Administrator user.
*2
   This is included in the install media.

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Tips	See the following for JRE. http://www.oracle.com/technetwork/java/javase/downloads/index.html

3.8. Managed Machines (Physical Machines)

This section describes system requirements for managed machines which are physical machines. DPM Client is installed in the managed machines and managed.

3.8.1. System Requirements

The system requirements for physical managed machines are as follows.

Hardware environment

Memory Size	·12MByte is needed when the DPM client is installed · 320MByte is needed during backup/restoring (768MByte or more is recommended)(*1)
Disk Size	·10MByte is needed when the DPM client is installed ·The maximum disk size that can be backed up is up to 8TByte(*3) ·The maximum partition size that can be backed up is up to 2TByte
Other	·100Mbps or faster LAN board(1Gbps or faster recommended) ·A LAN board supporting PXE boot (network boot) (when using DHCP) ·A LAN board enabling WOL (if remote power ON is needed) ·Deploy-OS supports devices on the managed machine.(when using backup/restore/disk configuration check or OS installation by disk duplication) ·You cannot operate DPM with additional LAN board. (when using backup/restore/disk configuration check or OS installation by disk duplication) ·Backup/restore/disk configuration check or OS installation by disk duplication cannot be performed when a security function, such as TPM(Trusted Platform Module) which is a function of HW, is enabled. ·When secure boot function, which is a function of UEFI FW, is enabled, the machine cannot be managed by DPM.(*2) ·When the machine, which is in UEFI mode, is managed, operate with the configuration using DHCP server. (Configuration that DHCP server is not used is not supported.)(*2) ·Single boot environment (The machine in multi boot environment cannot be managed.)

*1
  In the case of 320MByte (minimum), the followings are the maximum partition size.
  NTFS   : 256GByte
  ext2/ext3 : 512GByte
  Other   : 2TByte
*2
  About the function table and details of UEFI mode, see Appendix A, "Function Tables."
*3
  There is a case that the maximum disk size is 2TByte depending on the machine model.

Important	It may be necessary to install the module for the machine model according to the machine model. For more details, contact your sales or support representative.

Software environment

OS(*1)	x86	Windows 2000 Server/Advanced Server/Professional Windows Server 2003 Standard Edition/Enterprise Edition Windows Server 2003 R2 Standard Edition/Enterprise Edition Windows Server 2008 Standard/Enterprise Windows XP Professional Windows Vista Business/Enterprise/Ultimate Windows 7 Professional/Ultimate/Enterprise Windows 8 Pro/Enterprise Red Hat Enterprise Linux AS3/ES3/AS4/ES4/5(except for 5.0)/5 AP(except for 5.0)/6(*2) SUSE Linux Enterprise 9/10/11
	x64	Windows Server 2003 Standard x64 Edition/Enterprise x64 Edition/Datacenter x64 Edition Windows Server 2003 R2 Standard x64 Edition/Enterprise x64 Edition/Datacenter x64 Edition Windows Server 2008 Standard x64/Enterprise x64/Datacenter x64 Windows Server 2008 R2 Standard/Enterprise/Datacenter Windows Server 2012 Standard/Datacenter Windows 7 Professional x64/Ultimate x64/Enterprise x64 Windows 8 Pro x64/Enterprise x64 Red Hat Enterprise Linux AS4 for the x64 Edition/ES4 for the x64Edition/5(x64)(except for 5.0)/5 AP(x64)(except for 5.0)/6(x64)(*2) SUSE Linux Enterprise 9/10/11
	ARM	Windows CE 5.0(*3)

*1
 Supported function differs depending on the OS. See Appendix A, "Function Tables" for details.
*2
 The operation is confirmed to Red Hat Enterprise Linux 6.3.
*3
 Only NEC US110 is supported by VirtualPCCenter.

Note	If you are managing an NEC US110, see Section 10.2, "Notes when the Managed Machine is NEC US110" in *Reference Guide*.

Tips	Contact your sales or support representative about information on target OS service packs.

3.8.2.   Precautions

The precautions are as follows.

Boot Order of BIOS Configuration
<If there is a DHCP Server on the Network>
 In order to perform PXE boot (network boot), set the start order of the network in the BIOS settings to a position higher than the hard disk. If there are multiple LAN boards, set only the LAN board managed by DPM above HDD and others below HDD. Setting LAN boards on which the DPM management is not performed higher than the HDD can be the cause of such errors as scenario execution errors.

<If there is no DHCP Server on the Network>
   You will have to boot from the bootable CD to execute backup/restore scenarios. Configure the
   BIOS startup order so that CD is first.
      -The BIOS configuration procedure depends on the BIOS being used. See your hardware manual
       for details or contact the seller. Use extreme caution when changing the BIOS configuration.
      -LAN1 is set to a higher place in the startup order than LAN2 in the Express 5800/Blade Server
       factory settings, so the BIOS does not need to be configured if LAN1 is to be used.

LAN Boards
·If the LAN board configuration has been changed in a managed machine by doing any of the following,
reboot the managed machine so that the information held by the Management Server is updated.
      -LAN board added
      -LAN board removed
      -Installation position of LAN board changed
      -Startup order in BIOS changed

When switching a LAN board between managed machine in which UUID is registered to the
Management Server and a managed machine in which it is not, the UUID registered machine should
be rebooted before rebooting the UUID unregistered machine.

Remote Power On Function
·To use the remote power on function, the managed machine must meet the following requirements.
   - WOL is possible on the managed machine's on-board LAN.
     On the managed machine, WOL is possible from S5 state after shutting down from the OS. Also,
     the power state of the managed machine to be used with WOL must be S5 state. (S5 state = shut
     down)
   -BIOS must be configured for WOL.
     Settings include Wake On LAN, Remote Power On, Resume Power On, etc.
     The setting method of BIOS depends on the BIOS being used. See your hardware manual for
     details or contact the seller. Use extreme caution when changing the BIOS configuration.
   -Set the WOL settings in the OS LAN driver settings.
     This is needed for some machine model/OS combinations. See the hardware manual for the
     setting method.

·Precautions regarding the remote power on function are as follows.
   -Do not set a password for startup in the BIOS security settings.
   -Do not leave floppy disks or CD's in the managed machine.
   -WOL is not possible on Wireless LAN or mobile communication cards.
   -WOL is not possible on virtual machines.
   -Make sure the MAC addresses displayed in the main screen of the DPM Web Console are the
     same as the MAC addresses of the managed machines.
   -If a managed machine is forcibly shut down by, for example, long-pressing the power button, WOL
     might fail the next time depending on the hardware specifications. In this case, turn the machine on
     manually to start the OS and then shut it down so that the next WOL will work.
   -Some machine models of managed machine will not wake on LAN if the power is turned off after
     automatically registering the machine to DPM via network boot. If the power does not come on,
     turn it on manually.
   -With DPM, "Speed" and "Duplex" are negotiated using the "Auto" setting. Please set the "Speed"
     "Duplex" to the "Auto" for the switch setting. If it is not set to Auto, the DPM won't be able to do WOL.
     Check the LAN link-up with the managed machine off. If the LAN is not linked up, WOL may fail from
     DPM. Check the switch ports and the OS driver configuration, and set Link Speed and Duplex to
     Auto. If the power does not come on, turn it on manually.
   -Depending on the machine, WOL might fail if the LAN link speed is changed. Check the link lamp
     with the power off or contact the seller.

-If the LAN port of the managed machine is configured for Teaming, make sure the MAC address of the virtual LAN that is using Teaming is the same value as the MAC address of the physical LAN of the actual machine (i.e., the MAC address that is registered to the Management Server).
Note that if Teaming is set up using Out-of-Band (OOB) Management, the virtual LAN and the physical LAN cannot be set to the same value, so powering on using DPM (i.e., WOL) will not be available.
-Configure the following settings if the DPM Management Server is on a different segment from a managed machine.
-Set the network device for direct broadcast routing.
-Set the gateway and subnet mask to the managed machine registered to DPM.
-Because powering on with DPM (i.e., WOL) depends on the hardware configuration, check the hardware configuration if the problem is not resolved after performing the above checks.

DPM Client

Install the DPM Client in the managed machines. See Section 2.2, "Installing the DPM Client" in *Installation Guide* for the installation method.

| Important | Always use a DPM Client that is of the same version/revision as the DPM Server. If you are using an older version of the DPM Client, see Section 3.3, "Upgrading the DPM Client" in *Installation Guide* to upgrade the DPM Client. |

| Note | Available function differs depending on the OS. See Appendix A, "Function Tables" for details. |

| Tips | DPM Client is automatically installed if an OS clear installation is performed using DPM. |

IP Addresses of Managed Machines

Network connection IP addresses in the OS of managed machines can be obtained either by using automatic acquisition by DHCP or by using a fixed IP addresses.

| Note | Make sure the number of IP addresses of machines in which DPM Client is installed does not exceed the following.
・ 16 per LAN board, 128 total for all LAN boards |

Windows Managed Machine

The maximum number of LAN board that enable obtaining the LAN board information, installing applications/patch files, sending the information of the managed machine, and shutting down by DPM Client can be recognized up to 8.

Linux Managed Machine
・ The maximum number of LAN board that enable obtaining the LAN board information, installing applications/patch files, sending the information of the managed machine, and shutting down by DPM Client can be recognized up to 8.
・ For the bonding driver to work correctly, a proc file system (/proc) must be mounted.
Also, the current version of DPM Client supports only the active-backup operation mode of the bonding driver.
・ Configure the MAC address for PXE boot if the LAN board for PXE boot (network boot) is duplicated by the bonding driver.
・ The bonding drivers for Red Hat Enterprise Linux AS3, ES3, AS4, ES4, 5 (except 5.0), 5 AP (except 5.0), 6, and SUSE Linux Enterprise 10 and 11 are supported.

3.9. Managed Machines (Virtual Environment)

This section describes system requirements for virtual environments which are managed machines.

3.9.1. System Requirements

The system requirements for virtual environments which are managed are as follows.

Hardware environment

Memory Size	·12MByte is needed when the DPM client is installed ·320MByte is needed during backup/restoring (768MByte or more is recommended)(*1)
Disk Size	·10MByte is needed when the DPM client is installed ·The maximum disk size that can be backed up/restored is up to 8TByte ·The maximum partition size that can be backed up/restored is up to 2TByte
Other	·100Mbps or faster LAN board(1Gbps or faster recommended) ·A LAN board supporting PXE boot (network boot) (when using DHCP) ·A LAN board enabling WOL (if remote power ON is needed) ·Deploy-OS supports devices on the managed machine.(when using backup/restore/disk configuration check or OS installation by disk duplication) ·You cannot operate DPM with additional LAN board. (when using backup/restore/disk configuration check or OS installation by disk duplication) ·When secure boot function, which is a function of UEFI FW, is enabled, the machine cannot be managed by DPM.(*2) ·When the machine, which is in UEFI mode, is managed, operate with the configuration using DHCP server. (Configuration that DHCP server is not used is not supported.)(*2)

*1
    In the case of 320MByte (minimum), the followings are the maximum partition size.
    NTFS   : 256GByte
    ext2/ext3   : 512GByte
    Other   : 2TByte
*2
    About the function table and details of UEFI mode, see Appendix A, "Function Tables."

Virtual Environment

Virtualization Software(*1)	VMware ESX Server 3.5/4.0/4.1 VMware ESXi 3.5/4.0/4.1/5.0/5.1 Microsoft Hyper-V/Hyper-V2.0(*2) Microsoft Windows Server 2012 Hyper-V Citrix XenServer Enterprise Edition 5.0/5.5/5.6/5.6 FP1
Guest OS(*3)	Guest OS on VMware ESX Server 3.5/4.0/4.1 Guest OS on VMware ESXi 3.5/4.0/4.1/5.0/5.1 Guest OS on Microsoft Hyper-V/Hyper-V2.0 (*2) Guest OS on Microsoft Windows Server 2012 Hyper-V

*1
    Supported functions differ depending on the virtualization software and version. See Appendix A, "Function Tables" for details.
*2
    The guest OS on the following virtualization software can be managed.
      ·Hyper-V on Windows Server 2008 x64
      ·Hyper-V2.0 on Windows Server 2008 R2

*3

The following both of conditions must be met.
·An OS that the each virtualization software supports
·An OS that is supported as a DPM managed machine
  (See 3.8, "Managed Machines (Physical Machines)")
For OS that each virtualization software supports, see the user's guide or product site of the each product.

3.9.2.　Precautions

See Section 3.8.2, "Precautions" and Appendix A, "Functions Tables" -> "Support for Virtualization Environments as Managed Machines."

4. Latest Version Information

4.1. New Additional Functions

■The followings are the main newly added functions and enhanced functions from DPM Ver6.11 to DPM Ver6.12.
  ・The followings are supported as OS of the managed machine.
      -Windows 8 Pro/Enterprise
      -Red Hat Enterprise Linux 6.3
      Also, the following restrictions are removed for Windows Server 2012 Standard/Datacenter.
      - OS installation by disk duplication
      - Installing service packs, hotfixes, and applications
  ・The machine in UEFI(Unified Extensible Firmware Interface) mode can be managed.
  ・Windows Server 2012 Hyper-V is supported as a managed machine(virtual environment).
  ・Windows Server 2012 Standard/Datacenter are supported as OS of the DPM Server.
  ・The following OSs are supported as OS of Image Builder(Remote Console), DPM Command Line, Package Web Server, and PackageDescriber.
      -Windows Server 2012 Standard/Datacenter
      -Windows 8 Pro/Enterprise
  ・The login authentication of Web Console can be performed by directory server which implements LDAP(Lightweight Directory Access Protocol).
  ・Internet Explorer 10 is supported as a browser for Web Console.
  ・IIS 8.0 is supported as an environment of the DPM Server.
  ・Operation in the master machine for OS installation by disk duplication(Windows)(preparation for Sysprep/executing sysprep.bat) can be executed automatically by scenarios which are already installed.
  ・Management and configuration of IPv6 address can be done for the following functions of DPM.
      -Setting of IPv6 address for the managed machine by OS installation by disk duplication
      -Collecting the IPv6 address information from DPM Client.
  ・The status of license use can be confirmed from Web Console and DPM Command Line.
  ・When searching the Management Server in the environment where the Management Server and the managed machine are on the different segment, port 4011 had to be forwarded by a network device in the earlier DPM versions. In this version, the Management Server can be searched only by configuring the DHCP Relay Agent.

■The followings are the main newly added functions and enhanced functions from DPM Ver6.10 to DPM Ver6.11.
  ・As the managed machine (virtual environment), vSphere 5.1 is supported.
  ・As the OS of the managed machine, Windows Server 2012 Standard/Datacenter are supported.

■The followings are the main newly added functions and enhanced functions from DPM Ver6.03 to DPM Ver6.1.
  ・DPM Client can search DPM Server.
    DPM Client searches DPM Server when DPM Client cannot connect to DPM Server by the IP address configured on the DPM Client such as that the IP Address of DPM Server was changed. By this function, it is not necessary to change the configuration on DPM Client when the system of the test environment is switched to the production environment by changing the IP address. Even if the IP address of DPM Server is not configured when installing DPM Client, DPM Client searches the IP address of DPM Server. Therefore, by not configuring the IP address of DPM Server when you create a master image for OS installation by disk duplication, the master image which was used on a DPM Server can be used on another DPM Server. It is not necessary to recreate a master image.
  ・The port number used by DPM can be customized
    The communication port number used by DPM can be customized. It is possible to configure the environment by changing the port number used by DPM even if the port number is duplicated

with other applications. The port number can be configured in the file on DPM Server. Also, the port number used by DPM Client can be configured in the file on DPM Server. When DPM Client is started, it connects to DPM Server by the default port. If DPM Client cannot connect to DPM Server, the configuration file(Port.ini) that describes the port number is downloaded from DPM Server to DPM Client by using well known port and DPM Client gets the port number.

・The full sector option of backup/restore scenario can be configured on Web Console.

・More than one machine group or scenario group can be deleted collectively.

・The following OS for managed machines is supported.
  - Red Hat Enterprise Linux 6.2

・When DPM Server is upgraded, the configuration for Deploy-OS can be taken over.

4.2.　Changed and Removed Functions

■The followings are the major changes from DPM Ver6.11 to DPM Ver6.12.
　　・ Following software included in the install media is upgraded.
　　　- Upgraded from SQL Server 2008 R2 Express to SQL Server 2012 Express
　　　- Upgraded from JRE6 Update32 to JRE7 Update9
　　　- Upgraded from .Net Framework 3.5 SP1 to .Net Framework 4

■The followings are the major changes from DPM Ver6.10 to DPM Ver6.11.
　　・ When the managed machine is registered by PXE boot, the machine is not powered off by default.

■These are the major changes from DPM Ver6.03 to DPM Ver6.1.
　　・ The default values of the port number used by DPM were changed.
　　・ The followings are deleted from the operating environment of DPM Server, Image Builder, DPM Command Line, Package Web Server, and Package Describer.
　　　- Windows Server 2003/Windows Server 2003 R2/Windows Storage Server 2003 R2

Appendix A   Function Tables

Support for Managed Machine OS's

Support for managed machine OS's is as follows.
Confirm that the managed machine(hardware) supports the following OS in addition to the following table.
DPM may not work normally if the managed machine(hardware) does not support the OS even if DPM supports it.
See the manual of each hardware product, etc. about OS which are supported by the managed machine(hardware).

Function Tables(Windows OS)

Function	Windows 2000/ Windows XP/ Windows Vista	Windows Server 2003/ Windows Server 2003 R2/ Windows Server 2008/ Windows Server 2008 R2/ Windows 7/ Windows 8	Windows Server 2012	Windows CE (*1)
	x86	x86/x64	x64	ARM
Backup/restore/disk configuration check(*2)	Yes	Yes	Yes	No
OS installation by disk duplication(*2)	Yes	Yes	Yes	No
OS clear installation	No	No	No	No
Installing service packs/hotfixes/Linux patch files/applications (scenario type)	Yes	Yes	Yes	Yes
Distribution of floppy Disk Images for BIOS/firmware(*2)	Yes	Yes	Yes	No
Installing service packs/hotfixes/ applications(automatic update type)	Yes	Yes	Yes	Yes
DPM Client automatic upgrade	Yes	Yes	Yes	Yes
Power ON	Yes	Yes	Yes	No
Shutdown	Yes	Yes	Yes	Yes
Power ON/OFF state check	Yes	Yes	Yes	Yes
Acquisition of OS/service packs/hotfixes/ Linux patch files/applications Information	Yes	Yes	Yes	Yes(*3)

*1
The NEC US110 is supported for VirtualPCCenter only. In addition to the description in this chapter, specialized procedures are required for Windows CE(NEC US110). See also Section 10.2, "Notes when the Managed Machine is NEC US110" in *Reference Guide*.

*2

Support for these functions depends on the machine model. Contact your sales or support representative about the support for each machine model.

*3

Only OS information can be obtained.

Function Tables(Linux OS)

Function	Red Hat Enterprise Linux AS3/ES3	Red Hat Enterprise Linux AS4/ES4/5 (excluding 5.0), 5 AP(excluding 5.0)/6	SUSE Linux Enterprise 9/10/11
	x86	x86/x64	x86/x64
Backup/restore/disk configuration check(*1)	Yes	Yes	Yes(*2)
OS installation by disk duplication(*1)	Yes	Yes	Yes(*3)
OS clear installation	Yes(*4)	Yes	No
Installing service packs/hotfixes/Linux patch files/applications (scenario type)	Yes	Yes	Yes
Distribution of floppy Disk Images for BIOS/firmware(*1)	Yes	Yes	Yes
Installing service packs/hotfixes/ applications (automatic update type)	No	No	No
DPM Client automatic upgrade	Yes	Yes	Yes
Power ON	Yes	Yes	Yes
Shutdown	Yes	Yes	Yes
Power ON/OFF state check	Yes	Yes	Yes
Acquisition of OS/service packs/hotfixes/ Linux patch files/applications Information	Yes	Yes	Yes

*1

Support for these functions depends on the machine model. Contact your sales or support representative about the support for each machine model.

*2

To restore a backup image to another managed machine, see the Novell website Knowledgebase (Support TID:3048119).

*3

OS installation by disk duplication can be performed only for SUSE Linux Enterprise 10/11.

*4

When installing Red Hat Enterprise Linux ES3/AS3 on Express 5800/120Ba-4, the product of update3 or later is needed.

Support for Virtualization Environments as Managed Machines

> **Important** When managing virtualization environment as a managed machine, there are some precautions to execute scenarios. Operate them after reading the description of each function in *Operation Guide* in addition to the description of this chapter.

Virtualization Software

■ The function support table for virtualization software of VMware ESX Server 3.5/4.0/4.1 and ESXi 3.5/4.0/4.1/5.0/5.1 is as below.

Function	ESX Server 3.5/4.0/4.1	ESXi 3.5/4.0/4.1/5.0/5.1
Backup/restore/disk configuration check	No	No
OS installation by disk duplication	No	No
OS clear installation	No(*1)	No(*1)
Installing service packs/hotfixes/Linux patch file/ application(scenario type)	Yes	No
Distribution of floppy Disk Images for BIOS/firmware (*4)	Yes	Yes
Installing service packs/hotfixes/applications (automatic update type)	No	No
DPM Client automatic upgrade	Yes	No
Power ON	Yes	Yes(*2)
Shutdown	Yes	No
Power ON/OFF state check	Yes	Yes(*3)
Acquisition of OS/service packs/hotfixes/ Linux patch files/applications Information	Yes	No

*1
  OS clear installation can be performed for SSC products. When using ESXi, ESXi 4.1/5.0/5.1 are supported. See the SigmaSystemCenter reference guide for details.
*2
  DPM Client cannot be installed on ESXi. PXE boot needs to be executed to detect that Power ON is completed.
*3
  It is necessary to register IP address on DPM.
*4
  Support for these functions depends on the machine model. Contact your sales or support representative about the support for each machine model.

■ The function support table for virtualization software of Citrix XenServer Enterprise Edition Version 5.0/5.5/5.6 is as below.

Function	Citrix XenServer Enterprise Edition 5.0/5.5/5,6
Backup/restore/disk configuration check(*1)	Yes
OS installation by disk duplication	No
OS clear installation	No
Installing service packs/hotfixes/Linux patch files/applications (scenario type)	Yes
Distribution of floppy Disk Images for BIOS/firmware(*1)	Yes
Installing service packs/hotfixes/applications (automatic update type)	No
DPM Client automatic upgrade	Yes
Power ON	Yes
Shutdown	Yes
Power ON/OFF state check	Yes
Acquisition of OS/service packs/hotfixes/ Linux patch files/applications Information	Yes

*1
Support for these functions depends on the machine model. Contact your sales or support representative about the support for each machine model.

■ The function support table for virtualization software of Hyper-V1.0/2.0, Windows Server 2012 Hyper-V is as below.

Function	Hyper-V 1.0/2.0 Windows Server 2012 Hyper-V
Backup/restore/disk configuration check(*1)	Yes(*2)
OS installation by disk duplication	No
OS clear installation	No
Installing service packs/hotfixes/Linux patch files/applications (scenario type)	Yes
Distribution of floppy Disk Images for BIOS/firmware(*2)	Yes
Installing service packs/hotfixes/applications (automatic update type)	Yes
DPM Client automatic upgrade	Yes
Power ON	Yes
Shutdown	Yes
Power ON/OFF state check	Yes
Acquisition of OS/service packs/hotfixes/ Linux patch files/applications Information	Yes

*1
Support for these functions depends on the machine model. Contact your sales or support representative about the support for each machine model.
*2
Do not configure the virtual switch to the LAN over which DPM performs backup/restore functions. Because the MAC address of the virtual switch is passed on when restoring to another server, if a server is replaced due to a breakdown or the like, the MAC address of the server before breakdown is used, which can cause problems such as remote powering not being possible.

Guest OS

> **Note** See also the above "Support for Managed Machine OS's" in addition to this chapter("Guest OS") about the functions which are supported by guest OS.

■ The function support table for guest OS of VMware ESX Server 3.5/4.0/4.1, ESXi 3.5/4.0/4.1/5.0/5.1 is as below.

Function	VMware ESX 3.5/ESXi 3.5 Guest OS		VMware ESX 4.0/4.1 ESXi 4.0/4.1/5.0/5.1 Guest OS	
	Windows	Linux	Windows	Linux
Backup/restore/disk configuration check(*1)	Yes (*2)(*3)	Yes (*2)(*3)	Yes (*5)(*6)(*7)	Yes (*5)(*6)
OS installation by disk duplication(*1)	Yes (*2)(*3)	Yes (*2)(*3)(*4)	Yes (*5)(*6)(*7)	Yes (*4)(*5)(*6)
OS clear installation	No	No	No	No
Installing service packs/hotfixes/Linux patch files/applications(scenario type)	Yes	Yes	Yes	Yes
Distribution of floppy Disk Images for BIOS/firmware	-	-	-	-
Installing service packs/hotfixes/ applications (automatic update type)	Yes	No	Yes	No
DPM Client automatic upgrade	Yes	Yes	Yes	Yes
Power ON	No(*8)	No(*8)	No(*8)	No(*8)
Shutdown	Yes	Yes	Yes	Yes
Power ON/OFF state check	Yes	Yes	Yes	Yes
Acquisition of OS/service packs/hotfixes/ Linux patch files/applications Information	Yes	Yes	Yes	Yes

*1
   Support for these functions depends on the machine model. Contact your sales or support representative about the support for each machine model.

*2
   If the following devices are specified in the virtual machine, backup/restore/disk configuration check and OS installation by disk duplication functions cannot be performed. See the product's user's guide for details on configuration of the virtual machine.
   ・vmxnet
   ・Extended vmxnet

*3
   Network boot may fail if "E1000" is used as the network adapter type for the virtual machine, due to a problem with VMware ESX3.5.
   The function itself can be run if "E1000" is set, but the scenario will not finish.
   This problem is corrected in VMware ESX 3.5 Update 4.

*4
   OS installation by disk duplication can be performed only for Red Hat Enterprise Linux.

*5
   If the following devices are specified in the virtual machine, backup/restore/disk configuration check and OS installation by disk duplication functions cannot be performed. See the product's user's guide for details on configuration of the virtual machine.
   ・vmxnet 2
   ・vmxnet 3
   ・vmware paravirtulization

*6

Because the CD/DVD drive is recognized before the disk to be processed when performing backup/restore functions of guest OS in VMware ESX 4.1/ESXi 4.1 or later without using DHCP server, the disk number of the first disk to be backed up/restored is marked 2. Run a disk configuration check to check the disk number before executing a backup/restore scenario.

*7

When configuring the virtual machine that all the following conditions are met in ESXi 5.1, network may not be used normally after starting Windows OS. Configure the virtual machine so that not all of the conditions are met.

·**EFI** is selected as **boot firmware**.

·**E1000E** is select as **network adapter**.

·**Put the guest OS into standby mode and leave the virtual machine powered on** is selected in **Power Management** and a network adapter is not selected in **Wake on LAN for virtual machine traffic on**.

*8

Power ON does not work. Therefore, you cannot execute a scenario from Power Off status.

■ Guest OS of Citrix XenServer Enterprise Edition Version 5.0/5.5/5.6 cannot be managed.

■ The function support table for guest OS of Hyper-V1.0/2.0, Windows Server 2012 Hyper-V is as below.

Function	Guest OS of Hyper-V1.0/2.0, Windows Server 2012 Hyper-V	
	Windows	Linux
Backup/restore/disk configuration check(*1)	Yes (*2)(*3)	Yes(*2)(*3)
OS installation by disk duplication(*1)	Yes(*2)(*3)(*4)	Yes(*2)(*3)
OS clear installation	No	Yes(*2)(*3)
Installing service packs/hotfixes/Linux patch files/ applications(scenario type)	Yes	Yes (*2)
Distribution of floppy Disk Images for BIOS/firmware	-	-
Installing service packs/hotfixes/applications (automatic update type)	Yes	No
DPM Client automatic upgrade	Yes	Yes(*2)
Power ON	No(*5)	No(*5)
Shutdown	Yes	Yes(*2)
Power ON/OFF state check	Yes	Yes(*2)
Acquisition of OS/service packs/hotfixes/ Linux patch files/applications Information	Yes	Yes(*2)

*1

Support for these functions depends on the machine model. Contact your sales or support representative about the support for each machine model.

*2

Specify the following devices when creating a virtual machine.

·Legacy network adapter

·IDE controller

The scenario will not complete successfully if the following devices are selected.

·Network adapter

·SCSI controller

·Fibre channel adapter

See the user's guide that attached to the product for details on configuration

*3

When creating a virtual machine, set the "Legacy network adapter" as the top of BIOS boot order.

See the user's guide that attached to the product for details on configuration.

*4
　　OS installation by disk duplication cannot be performed for Windows 2003(x64).
*5
　　Power ON does not work. Therefore, you cannot execute a scenario from Power Off status.

Support for File System and Disk Type

The file system support status for the backup/restore functions is as below.

> Note
> ■The backup/restoring of software RAID volume (RAID0, RAID1, RAID1 Span, RAID5, and others) created by an OS function or a disk management application cannot be performed.
> ■The backup/restoring of the partition which is created or whose size is changed except by OS standard function cannot be performed.
> ■For Express5800/FT servers, depending on the machine model, backup after release of RAID or a full sector backup with RAID still in place can be performed. Contact your sales or support representative about details on the backup procedure for each machine model.

<Windows OS File System Support Table>(*1)

File System Type/ Partition Type	Backup/restore				
	Disk				Partition
	Basic disk(*2)		Dynamic disk(*3)		Basic disk(*4)
	MBR	GPT	MBR	GPT	MBR
EFI system partition	-	Automatic full sector	-	Full sector option	-
Microsoft reserved partition	-	Automatic full sector	-	Full sector option	-
FAT16/ FAT32/ NTFS	Effective sector	Effective sector	Effective sector	Full sector option	Effective sector
ReFS	Automatic full sector	Automatic full sector	Automatic full sector	Full sector option	Automatic full sector
Encrypted partition(*5)	Full sector option	Full sector option	Full sector option	Full sector option	Cannot be performed
Maintenance Partition(*6)	Effective sector	Effective sector	Effective sector	Full sector option	Effective sector
other	Automatic full sector	Automatic full sector	Automatic full sector	Full sector option	Automatic full sector

Effective sector: Backup/restoring by the effective sector.
Automatic full sector: Backup/restoring by the automatic full sector. (You do not need to configure the full sector option in the scenario.)
Full sector option: Backup/restoring by selecting the full sector option in the scenario.
Cannot be performed: Backup/restoring cannot be performed.
-: Partition type which cannot be created by MBR.

*1
　Backup/restoring of the disk, which uses the storage pool function in Windows Server 2012, cannot be performed.
*2
　Create at least one logical drive. (You cannot backup/restore disks that include an empty extended partition.)

*3
　·Backup/restoring of simple volume can be performed.
　·Backup/restoring of span volume, stripe volume, mirror volume, RAID5 volume, and the volume
　　whose size is extended cannot be performed.
　·Backup/restoring of the dynamic disk that Windows RE or a maintenance partition is installed
　　except in the first partition is cannot be performed.
　·If multiple dynamic-type disks are connected, do not start up Windows during backup/restoring
　　of each disk. If you start Windows during backup/restoring of each disk, Windows system may
　　not start normally after restoring.
*4
　·Backup/restoring of an extended partition as units of partitions cannot be performed.
　·Backup/restoring of a logical drive as units of partitions can be performed.
*5
　·Backup/restoring of disks which include a partition encrypted by Encrypting File System(EFS) of
　　NTFS are supported.
　·Backup/restoring of disks which include a partition encrypted by BitLocker drive encryption
　　cannot be performed.
*6
　A maintenance partition which is created by the EXPRESSBUILDER of the Express 5800 Series
　can be used. About the disk which includes a maintenance partition created except by the
　EXPRESSBUILDER, backup or restore the entire disk by specifying the full sector option.

<Linux OS File System Support Table>(*1)

File System Type /Partition Type	Backup/restore		
	Disk(*2)		Partition
	Basic disk		Basic disk(*3)
	MBR	GPT	MBR
EFI system partition	-	Automatic full sector	-
ext2/ext3	Effective sector	Effective sector	Effective sector
ext4(*4)	Full sector option	Full sector option	Cannot be performed
Linux Swap partition	Effective sector	Effective sector	Effective sector
LVM1(*5)	Automatic full sector	Automatic full sector	Automatic full sector
LVM2(*5),(*6)	Automatic full sector	Automatic full sector	Automatic full sector
ReiserFS/JFS/XFS	Automatic full sector	Automatic full sector	Automatic full sector
Encrypted partition(*7)	Full sector option	Full sector option	Cannot be performed
Maintenance Partition(*8)	Effective sector	Effective sector	Effective sector
Other	Automatic full sector	Automatic full sector	Automatic full sector

Effective sector: Backup/restoring by the effective sector.
Automatic full sector: Backup/restoring by the automatic full sector. (You do not need to configure the full sector option in the scenario.)
Full sector option:　Backup/restoring by selecting the full sector option in the scenario.
Cannot be performed:　Backup/restoring cannot be performed.
-: Partition type which cannot be created by MBR.

*1

・When installing Red Hat Enterprise Linux on the managed machine, install the boot loader on MBR(Master Boot Record). (If you install on the top of the boot sector, backup/restore functions cannot be performed.)

*2

・Create at least one logical drive. (You cannot backup/restore disks that include an empty extended partition.)

*3

・Backup/restoring of an extended partition as units of partitions cannot be performed.

・Backup/restoring of a logical drive as units of partitions can be performed.

*4

Please backup/restore disks that contain ext4 after configure the full sector option in the scenario.

Example) Because /boot is ext4 in the default installation of Red Hat Enterprise Linux 6.0, the full sector option is required.

*5

・When PV(Physical Volume) is configured in the partition on the disk, backup/restoring are performed by the automatic full sector. When PV(Physical Volume) is configured in the entire physical disk, configure the full sector option.

・When you backup/restore VG(Volume Group) over multiple disks by the disk unit, you need to backup/restore all disks that include VG without starting up Linux. If you start Linux during multiple backup/restoring of each disk, Linux system may not start normally after restoring.

・You can specify the partition(PV(Physical Volume) in LVM) on the disk as the partition unit. You cannot specify LV(Logical Volume). When you backup/restore VG (Volume Group) over multiple partitions as the partition unit, execute backup/restoring of all partitions which are included in VG without starting up Linux.

*6

See the following steps for the method to confirm if the LVM partition created on the basic disk is an LVM2 partition or not.

Example)To confirm the backup target disk (/dev/sda) on Red Hat Enterprise Linux 5.1

1) Run the fdisk command and confirm the partition structure.
    #fdisk -l /dev/sda

    *The output will be a result as the following.

```
#fdisk -l /dev/sda

Disk /dev/sda: 164.6 GB, 164696555520 bytes
255 heads, 63 sectors/track, 20023 cylinders
Units = cylinders of 16065 * 512 = 8225280 bytes


Device Boot        Start       End         Blocks     Id  System
/dev/sda1   *        1         13          104391     83  Linux
/dev/sda2           14        20023       160730325   8e  Linux LVM
```

2) Run the pvdisplay command for each partition that shows "Linux LVM" in the output.
    If the output of executing the pvdisplay command shows "lvm2" in the "Fmt", then it is an LVM2 partition.
    #pvdisplay -C /dev/sda2

    *The output will be a result like the following.

```
#pvdisplay -C /dev/sda2
PV          VG          Fmt     Attr    PSize       PFree
/dev/sda2   VolGroup00  lvm2    a-      153.28G     0
```

*7

When the trusted boot function which is implemented in Red Hat Enterprise Linux 6.2 or later is enabled, DPM may not work normally. When using managed machine that the corresponding OS is installed, disable the trusted boot function and operate DPM. About the trusted boot function, see the manual of OS.

*8

A maintenance partition which is created by the EXPRESSBUILDER of the Express 5800 Series can be used. About the disk which includes a maintenance partition created except by the EXPRESSBUILDER, backup or restore the entire disk by specifying the full sector option.

Support for iSCSI Boot

Note	About the support status of each function, see also the above "Support for Managed Machine OS's" and "Support for Virtualization Environments as Managed Machines" in addition to this chapter.

■ The following is a function support table when a disk is connected to a managed machine using iSCSI and an iSCSI boot has been performed.

Function	Windows (*1)	Linux (*2)
Backup/restore/disk configuration check(*3)	Yes	Yes(*4)
OS installation by disk duplication(*3)	Yes	No
OS clear installation	No	No
Installing service packs/hotfixes/Linux patch files/applications (scenario type)	Yes	Yes
Distribution of floppy Disk Images for BIOS/firmware(*3)	Yes	Yes
Installing service packs/hotfixes/applications (automatic update type)	Yes	No
DPM Client automatic upgrade	Yes	Yes
Power ON	Yes	Yes
Shutdown	Yes	Yes
Power ON/OFF state check	Yes	Yes
Acquisition of OS/service packs/hotfixes/Linux patch files/ applications Information	Yes	Yes

*1

Only Windows Server 2008

*2

Only Red Hat Enterprise Linux 5.2-5.4 and 5.2 AP-5.4 AP

*3

Support for these functions depends on the machine model. Contact your sales or support representative about the support for each machine model.

*4

Restore function can be performed only for the managed machine from which the backup image was created and which has the same LAN board and iSCSI storage configuration.

Support for Machines in UEFI Mode as Managed Machines

> **Note**
> ■About the support status of each function, see also the above "Support for Managed Machine OS's" and "Support for Virtualization Environments as Managed Machines" in addition to this chapter.
> ■When UEFI secure boot function of UEFI FW is enabled, the machine cannot be managed by DPM.

■ The following is a function support table when the managed machine is operated by UEFI mode.

Function	Windows/ Linux
Backup/restore/disk configuration check(*1) (*2)	Yes
OS installation by disk duplication(*1)	Yes
OS clear installation	No
Installing service packs/hotfixes/Linux patch files/applications (scenario type)	Yes
Distribution of floppy Disk Images for BIOS/firmware(*1)	Yes
Installing service packs/hotfixes/applications (automatic update type)	Yes
DPM Client automatic upgrade	Yes
Power ON	Yes
Shutdown	Yes
Power ON/OFF state check	Yes
Acquisition of OS/service packs/hotfixes/Linux patch files/ applications Information	Yes

*1
  Support for these functions depends on the machine model. Contact your sales or support representative about the support for each machine model.
*2
  The operation cannot be supported with the configuration that DHCP server is not used.
  When the machine in UEFI mode is managed, operate with the configuration that DHCP server is used

Combinations of Functions in Scenarios

■ Multiple functions can be combined in a single scenario in DPM. Permissible function combinations are as below.

Function	Backup	Restore	Disk configuration check	OS clear installation	Installing service packs/ hotfixes/ Linux patch files/ applications	Updating BIOS/firmware
Backup		No	No	Yes	Yes (*1)	Yes
Restore(*2)	No		No	No	No	Yes
Disk configuration check	No	No		No	No	No
OS clear installation	Yes	No	No		Yes	Yes
Installing service packs/hotfixes/ Linux patch files/ applications	Yes (*1)	No	No	Yes		Yes (*1)
Updating BIOS/firmware	Yes	Yes	No	Yes	Yes (*1)	

*1
  These can be executed only when configured concurrently with an OS clear installation.
  Example)
    Backup and installing service packs/hotfixes/Linux patch files/applications cannot be combined. Backup, OS clear installation, and service packs/hotfixes/Linux patch files/applications can be combined.
*2
  Restoring when executing OS installation by disk duplication is also included.

When installing multiple service packs/hotfixes/Linux patch files/applications or executing multiple different restore scenarios concurrently, configure not to duplicate multicast IP address on each scenario. See Section 3.13.3, "Package Tab" or Section 3.13.4, "Backup/Restore Tab" in *Reference Guide* for details about the configuration.

Appendix B For Customers Who Cannot Easily Install a DHCP Server

	■About the support status of each function, see also the above "Support for Managed Machine OS's" and "Support for Virtualization Environments as Managed Machines" in addition to this chapter.
Note	

DPM can be operated without a DHCP server (by booting managed machines from a bootable CD). However, the available functionality in DPM is limited if a DHCP server is not used.
This section describes supported functions and configurations that have to be made beforehand if no DHCP server is to be used.
See Appendix A, "Operating DPM without Using the DHCP Server" in *Operation Guide* for details about creating a bootable CD and operation.

Function	Use a DHCP Server	Don't use a DHCP server (*1)(*2)
Backup/restore/disk configuration check	Yes	Yes(*3)(*4)
OS installation by disk duplication	Yes	No
OS clear installation	Yes	No
Installing service packs/hotfixes/Linux patch files/applications(scenario type)	Yes	Yes
Distribution of floppy Disk Images for BIOS/firmware	Yes	No
Installing service packs/hotfixes/applications (automatic update method)	Yes	Yes
DPM Client automatic upgrade	Yes	Yes
Power ON	Yes	Yes
Shutdown	Yes	Yes
Power ON/OFF state Check	Yes	Yes
Acquisition of OS/service packs/hotfixes/Linux patch files/applications Information	Yes	Yes

*1
  Options (power off/reboot) after scenario execution are supported only when installing service packs/HotFixes/Linux patch files/applications.
*2
  Specify scenarios to backup/restore or install service packs/hotfixes/Linux patch files/applications independently. For example, a scenario in which the **Backup/Restore** tab and the **Hardware Configuration** tab are both selected is not supported.
*3
  Restoring using multicast communication cannot be performed.
*4
  Backup/restore/disk configuration check of the managed machine operating by UEFI mode are not supported.

・Configuring the System to Run Without a DHCP Server

Configure **Do Not Use A DHCP Server** in the **Detail Setting** screen when installing the DPM server or on the **Management** view -> **DPM Server** icon -> **Detail Setting** screen -> **DHCP Server** tab in the Web Console.(The following is the Web Console screen.)

When **Do Not Use A DHCP Server** is selected, PXE boot is unavailable even if there is a DHCP server in the network environment and the managed machine is equipped with a PXE boot (network boot)-compatible LAN board.

The Management Server must be rebooted when changing between using and not using a DHCP server.
The modified settings become active after restarting.

Appendix C   For Customers Who Configure RAID on the Managed Machine

There is a case that restore or OS installation by disk duplication cannot be executed correctly when you use a backup image or a master image for OS installation by disk duplication created in the environment described in "The target scope".
Contact your sales or support representative about how to deal with the problem.

■ Phenomenon and cause
When you use DPM in the environment as described in "The target scope", the problem occurs that RAID configuration cannot be recognized correctly when Deploy-OS recognizes the hardware in backup/restoring. For example, when configuring RAID by two disks, normally disks are recognized as one system drive. However, disks are recognized as two non-RAID disks in this case.
Therefore, when you execute disk configuration check, there is a case that multiple disks are visible on the screen or the backup image cannot be created correctly.

■ The target scope
　・DPM version
　　The target scope is when the backup image, which was created using the target Deploy-OS or the module for the machine model by the following version, is used by this version.
　　-DPM Ver6.0 (6.00.000~6.01.000)
　　　When either of the followings is set on Deploy-OS
　　　　-"Use Default Value"
　　　　-"NEC Express5800 002"
　　-DPM Ver5.1/5.2
　　　When the module for machine model (DPM51_52_013) is used

Note	There is a case that it occurs by the following module for machine model. ・ The module for machine model (DPM60_003) ・ The module for machine model (DPM51_52_014) Contact your sales or support representative for details.

Tips	About confirming the version of DPM Server, see "DPM Server" in Appendix F, "Procedure to Check the Version of Each Component" in *Reference Guide*.

　・The target machine model
　　This problem occurs when you use internal SATA RAID configuration on the specific machine models.
　　Contact your sales or support representative about the machine model.

Appendix D　Supplementary Information

Regarding Source Code

Some of the DPM modules include licensed software that is based on GNU General Public License Version 2.0(GPLv2). In addition to agreeing to the following precautions, customers who purchase DPM obtain the corresponding software source code and may duplicate, redistribute or revise it according to GPLv2.
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Appendix E　Revision History

◆ Third Edition(Rev.001)(2013.4): Revised to add the description about enhanced functions in DPM Ver6.12.

◆ Second Edition(Rev.001)(2012.10): Revised to add the description about enhanced functions in DPM Ver6.11.

◆ First Edition(Rev.001)(2012.08): New

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This is an excerpt from an email I received from the original author, allowing xinetd as maintained by me, to use the higher version numbers:

I appreciate your maintaining the version string guidelines as specified
    in the copyright. But I did not mean them to last as long as they did.

So, if you want, you may use any 2.N.* (N >= 3) version string for future
    xinetd versions that you release. Note that I am excluding the 2.2.* line;
    using that would only create confusion. Naming the next release 2.3.0
    would put to rest the confusion about 2.2.1 and 2.1.8.*.

- Some icons used in this program are based on Silk Icons released by Mark James under a Creative Commons Attribution 2.5 License. Visit http://www.famfamfam.com/lab/icons/silk/ for more details.
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