

# **DeploymentManager Ver6.2**

## **First Step Guide**

**-First Edition-**

# Contents

<b>Introduction</b> .....	<b>4</b>
Target Audience and Purpose .....	4
Document Structure .....	4
DeploymentManager Manual Organization .....	4
Documentation Guidelines.....	5
<b>1. About DeploymentManager</b> .....	<b>8</b>
1.1. DeploymentManager.....	8
1.1.1.Advantages of Adopting DeploymentManager .....	8
1.2. DeploymentManager Basic Functions .....	9
1.2.1.Backup/Restore .....	9
1.2.2.OS Installation by Disk Duplication.....	11
1.2.3.OS Clear Installation.....	12
1.2.4.Service Packs/HotFixes/Linux Patch Files/Application Installation .....	12
<b>2. System Design</b> .....	<b>14</b>
2.1. Examining the System Configuration of DeploymentManager .....	14
2.1.1.System Configuration .....	14
2.1.2.Component Configuration of the DeploymentManager.....	16
2.1.3.Technologies Used in DeploymentManager .....	18
2.1.3.1.Wake On LAN (WOL) .....	18
2.1.3.2.Network Boot.....	19
2.1.3.3.UUID.....	22
2.1.3.4.Deploy-OS.....	22
2.1.3.5.Multicast Distribution .....	23
2.1.4.How DeploymentManager Works .....	23
2.1.4.1.OS Installation by Disk Duplication.....	24
2.1.4.2.OS Clear Installation.....	26
2.1.4.3.Service Packs/HotFixes/Linux Patch Files/Application Installation .....	27
2.1.5.System Configuration .....	30
2.2. Precautions Regarding System Configuration.....	32
2.2.1.Regarding the Network Environment.....	32
2.2.2.Regarding Backup/Restore .....	36
2.2.3.Regarding OS Installation by Disk Duplication .....	40
2.2.4.Regarding OS Clear Installation .....	41
2.2.5. Other.....	41
2.3. DeploymentManager Product Line and Licenses .....	42
2.3.1.Product Line .....	42
2.3.2.Product Configurations and Licenses .....	43
2.4. DeploymentManager Process up to DeploymentManager Operation .....	44
<b>3. Operating Environment</b> .....	<b>45</b>
3.1. Information on Included Software .....	45
3.2. Management Server .....	46
3.2.1.System Requirements .....	46
3.2.2.Precautions .....	48
3.3. Database Server .....	48
3.3.1.System Requirements .....	48
3.3.2.Precautions .....	48
3.4. Web Console.....	48
3.4.1.System Requirements .....	48
3.4.2.Precautions .....	49
3.5. Image Builder(Remote Console).....	50
3.5.1.System Requirements .....	50
3.6. DPM Command Line.....	51
3.6.1.System Requirements .....	51
3.7. Package Web Server .....	52
3.7.1.System Requirements .....	52

3.7.2.Precautions .....	52
3.8. PackageDescriber.....	53
3.8.1.System Requirements .....	53
3.9. Managed Machines (Physical Machines) .....	53
3.9.1.System Requirements .....	53
3.9.2.Precautions .....	55
3.10. Managed Machines (Virtual Environment).....	58
3.10.1.System Requirements .....	58
3.10.2.Precautions .....	59
<b>4. Latest Version Information .....</b>	<b>60</b>
4.1. New Additional Functions .....	60
4.2. Changed and Removed Functions .....	60
<b>Appendix A Function Tables .....</b>	<b>61</b>
Support for Managed Machine OS's.....	61
Support for Virtualization Environments as Managed Machines.....	63
Support for File System and Disk Type .....	67
Support for iSCSI Boot.....	71
Support for Machines in UEFI Mode as Managed Machines .....	72
Combinations of Functions in Scenarios .....	73
<b>Appendix B For Customers Who Cannot Easily Install a DHCP Server.....</b>	<b>74</b>
<b>Appendix C For Customers Who Cannot Easily Install DPM Client .....</b>	<b>76</b>
<b>Appendix D For Customers Who Configure RAID on the Managed Machine.....</b>	<b>77</b>
<b>Appendix E For Customers Who Manage the Machine with HDDs of Multi Vendors .....</b>	<b>78</b>
<b>Appendix F Supplementary Information.....</b>	<b>80</b>
Regarding Source Code .....	80
<b>Appendix G Revision History .....</b>	<b>80</b>

# 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 Cannot Easily Install DPM Client

Appendix D For Customers Who Configure RAID on the Managed Machine

Appendix E For Customers Who Manage the Machine with HDDs of Multi Vendors

Appendix F Supplementary Information

Appendix G 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".

<b>Name of Manual</b>	<b>Name in this Manual</b>	<b>Role of Manual</b>
DeploymentManager Ver6.2 First Step Guide	First Step Guide	Intended for DPM users. Provides a product overview, and describes the various functions, system design methods, operating environment and so on.
DeploymentManager Ver6.2 Installation Guide	Installation Guide	Intended for system administrators who install DPM. Describes tasks such as how to install, upgrade, and uninstall DPM.
DeploymentManager Ver6.2 Operation Guide	Operation Guide	Intended for system administrators who operate DPM. Describes the environment setup procedure for the operation and the operational procedure based on an actual flow.
DeploymentManager Ver6.2 Reference Guide	Reference Guide	Intended for system administrators who operate DPM. Describes DPM operations on the screen, 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 installation 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 Ver6.2
SSC product	DeploymentManager Ver6.2 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 Ver6.2: DPM Ver6.2  
Specific description for DPM Ver6.2x: DPM Ver6.2x  
\* **x** means revision number.
- The installation media included with the DPM product is called "Installation 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 following if there is no notice in particular.

DPM installation 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 meaning of each icon used in this manual is as follows:

Icon	Explanation
	Important items. These are items you need to be careful when you operate DPM not depending on the using environment.
	Cautionary items. These are items you need to be careful in the specific environment or operations.
	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:

- In Windows desktop, set the mouse pointer in the upper right (or the lower right) and select **Settings** from the charm.

- 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).

- Right-click **Name** in the center of the screen, and select **More**.

- In the **Choose Details** screen, select the **Version** check box and click **OK**.

- For an OS except the above

- From the **Start** menu, click **Control Panel -> Add or Remove Programs.(or Add or Remove Applications)**

- Select the applicable component, and click **Click here for support information**.

- About Windows Server 2003 R2 or Windows Server 2008 R2, follow explanation of Windows Server 2003 or Windows Server 2008 unless Windows Server 2003 R2 or Windows Server 2008 R2 is specified explicitly.

- In descriptions of operation procedures, arbitrary names to be specified by the user(instance name of the database and so on) are described in bold and italics as follows: ***Instance Name***.

Example)

- Restart the following service.

SQL Server(***Instance Name***)

- In the tree view, click **Resource** icon -> **Scenarios** icon -> **Scenario Group** icon.

- The description of SQL Server in this manual is based on SQL Server 2012 SP1 Express that is included in the installation media. Replace it when you use the product except SQL Server 2012 SP1 Express.

Example)

DPM database path

- For SQL Server 2012 SP1 Express x86:

C:\Program Files\Microsoft SQL Server\MSSQL11.***Instance Name***\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

\* **x** means the number of the instance.

- Execute following procedures when **Finish DPM related tasks** appears in this document.
  - If a scenario is running, wait until the scenario is completed.
  - If an automatic update is in progress, wait until the automatic update is completed.
  - If you are operating the Web Console or the DPM tools, 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 and so on) 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

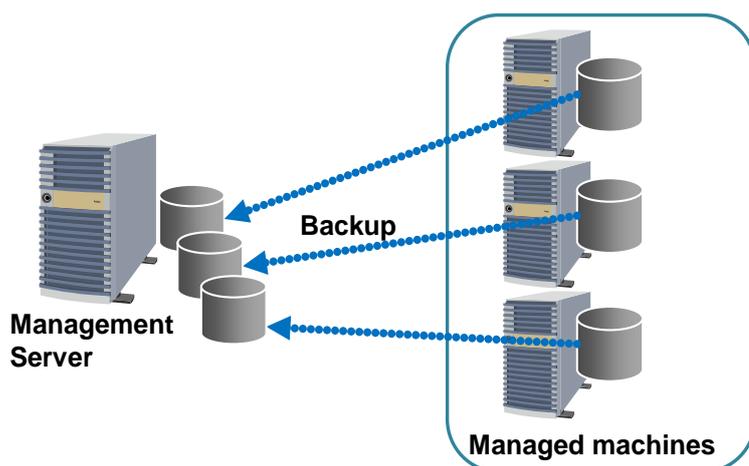
The following is an explanation of the basic functions of DPM.

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.



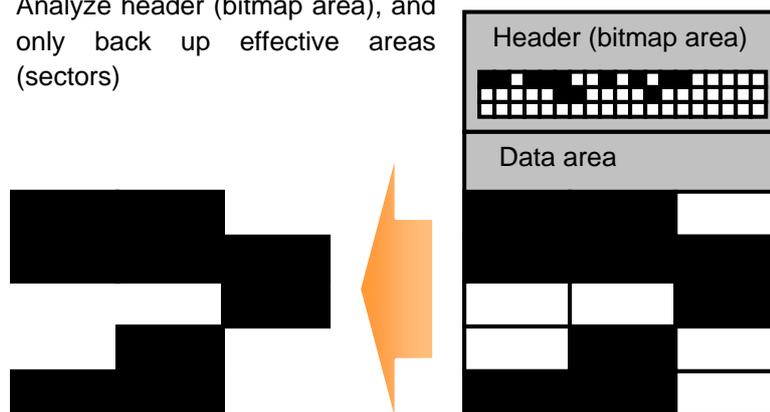
Backup Types(*1)	
Effective Sector Backup	Effective sector backup is a type of backup that only backups regions (sectors) actually being used by partition. Using effective sector backup can makes the backup response time and backup image size as small as possible. (For further details on the support 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 of an entire disk is performed, it can be restored to an empty disk.
- When you restore the backup image of partition unit, it can be restored to an empty disk. See "Support for File System and Disk Type" in Appendix A, "Function Tables" for details.
- When you restore the backup image of partition unit to the disk in use, specify the partition in the same place of the original disk. Also, the type of the file system and the partition size needs to be the same between the original partition and the target partition.

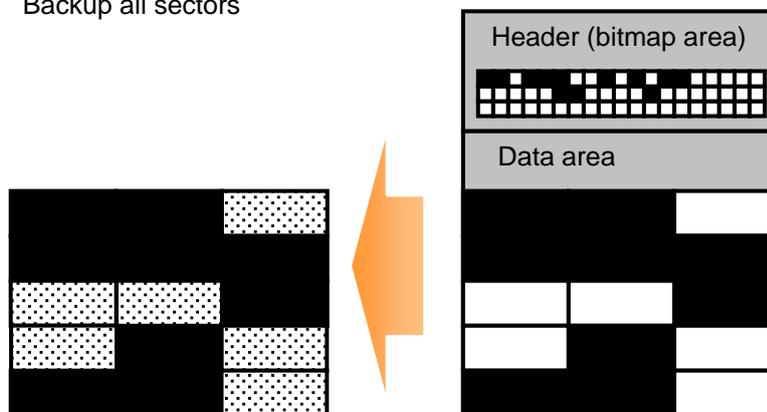
<For Effective Sector Backup>

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



<For Full Sector Backup>

Backup all sectors



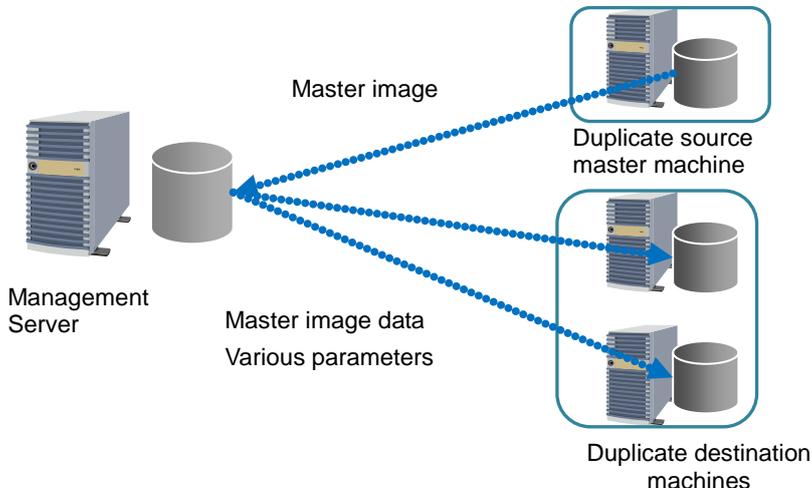
\*The bitmap area is the area where the disk sector information is managed.

Backup of a RAID Configuration	
<b>Backup of Hardware RAID</b>	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.
<b>Backup of Software RAID</b>	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	
<b>Disk Configuration Check</b>	The disk configuration check function allows the hard disk configuration of the managed machines to be checked before performing backup/restore functions.
<b>CD Boot</b>	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 <i>Operation Guide</i> .

### 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.



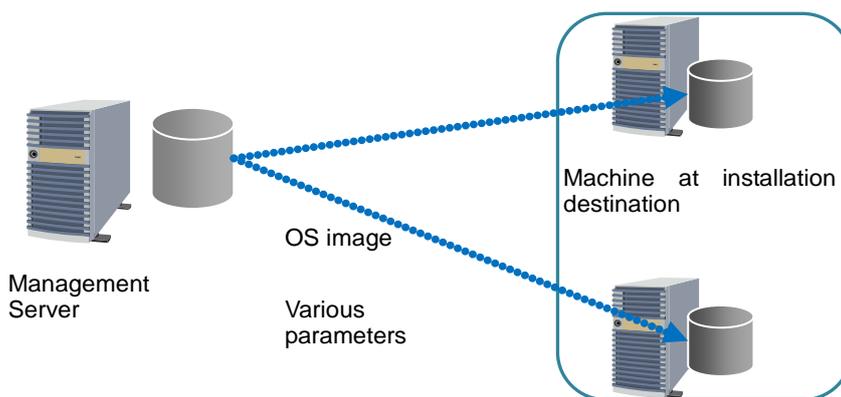
By preparing individual information for each machine (IP address, computer name, and so on) as parameters in advance, the setting of this individual information will also be made automatically when

deploying the master image, meaning no control on the managed machine side is required. In addition, including patches, applications, and so on 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.

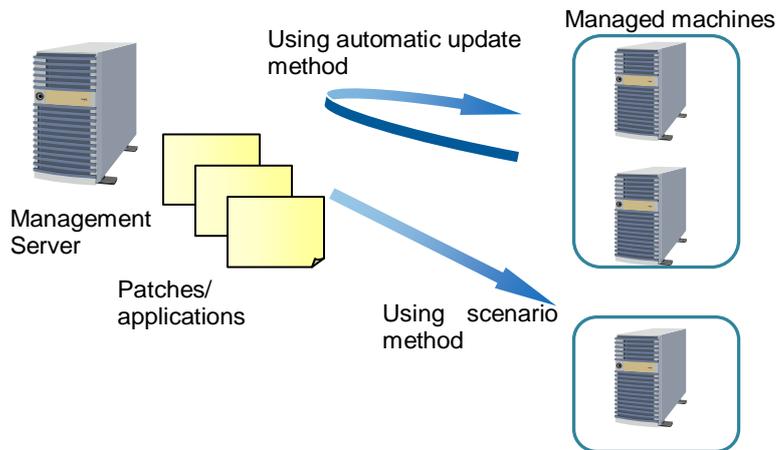


An OS clear installation can be controlled entirely remotely, with no control on the managed machine side required. By initially creating all required settings as parameters, those operations that would normally be performed by a local set up, such as the creation of partitions, formatting and setting of individual information (IP address, computer name, and so on) 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 the 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

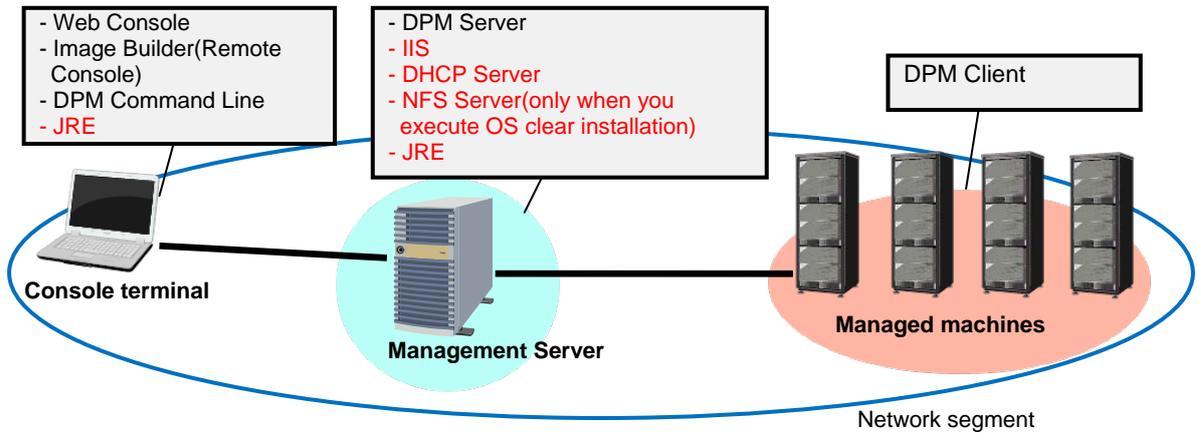
Explains the configuration of DPM. The role of each machine when you use DPM is as following.

Role	Description	Installed components
<b>Management Server (Required)</b>	The machine which manages managed machines.	<ul style="list-style-type: none"> <li>- DPM Server(Required)(*1)</li> <li>- IIS(Required)</li> <li>- DHCP Server(Optional)</li> <li>- NFS Server(Optional)</li> <li>- JRE(Optional)</li> </ul>
<b>Database Server (Option)</b>	<p>The machine for the database which manages the configuration information of managed machines and so on.</p> <p>By configuring the Database Server, the Management Server and the database(SQL Server) can be separated. When you configure the database on the Management Server, the Database Server is not necessary.</p>	<ul style="list-style-type: none"> <li>- SQL Server(Required)</li> </ul>
<b>Package Web Server (Option)</b>	<p>The machine which shares packages between multiple Management Servers.</p> <p>The packages saved in the Package Web Server are downloaded to the Management Server by HTTP protocol. You can also configure the Package Web Server on the Management Server.</p>	<ul style="list-style-type: none"> <li>- IIS(Required)</li> <li>- JRE(Required)</li> <li>- PackageDescriber(Required)</li> </ul>
<b>Console terminal (Option)</b>	The machine which operates the Management Server.	<ul style="list-style-type: none"> <li>- Web Console (It is not required to install)</li> <li>- Image Builder(Remote Console)(Optional)</li> <li>- DPM Command Line(Optional)</li> <li>- JRE(Optional)</li> </ul>
<b>Managed machine (Required)</b>	The machine on which DPM functions are executed.	<ul style="list-style-type: none"> <li>- DPM Client(Optional)</li> </ul>

\*1

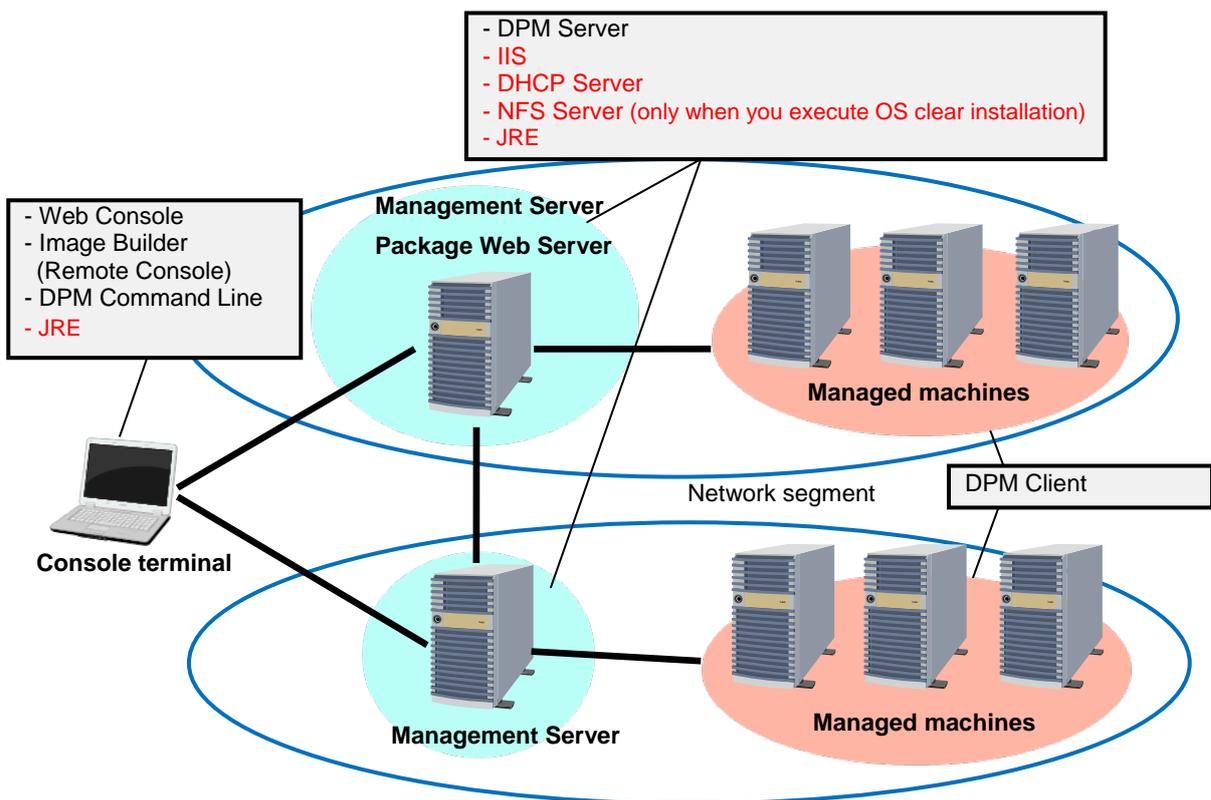
If you install DPM Server, you can install SQL Server 2012 SP1 Express at the same time.

When the Management Server is single, the example of the configuration is as following.



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

When multiple Management Servers are configured, the example of the configuration is as following.



\* The components with black characters are included in the installation 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
<b>DPM Server</b>	Manages managed machines and executes processes to managed machines by instructions from the Web Console or DPM Command Line.	Required
<b>SQL Server</b>	Manages the information of managed machines and so on by the database of SQL Server.	This is required when you configure the Database Server(different machine from the Management Server). (You need to prepare SQL Server to configure the Database Server separately.) Also, when you configure the database on the Management Server, SQL Server 2012 SP1 Express is installed at the same time as installing DPM Server.
<b>Web Console</b>	The user interface from which the status of the managed machines can be checked, and processes to the managed machines can be executed.	No installation operation is required. (Required components will be downloaded from the Management Server via web browser).
<b>IIS</b>	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).
<b>DHCP Server</b>	Uses DHCP server to assign IP addresses in the operation by network boot. If it is difficult to install DHCP server, you can operate DPM without DHCP server(You can boot managed machines by bootable CD). 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 address in the installed OS on each managed machine.	This is required for the following functions. <ul style="list-style-type: none"> <li>▪ Backup/restore/disk configuration check by network boot</li> <li>▪ OS installation by disk duplication</li> <li>▪ OS clear installation</li> <li>▪ BIOS/firmware update</li> </ul> (As this is not included in the DPM installation media, you need to prepare this separately.)

<b>NFS Server</b>	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 installation media, you need to prepare this separately.)
<b>JRE</b>	Uses JRE as Java execution environment when you execute Image Builder or PackageDescriber.	This is required when you use following functions. <ul style="list-style-type: none"> <li>• To create Linux installation parameter files for OS clear installation</li> <li>• To create Linux disk duplication parameter files</li> <li>• To create packages by PackageDescriber</li> </ul> (This is not included in the installation media of DPM. You need to prepare it separately.)
<b>Image Builder</b>	This is a tool for creating packages and disk duplication data file and so on. And registering the created files in the Management Server.	Installed at the same time as DPM Server. You need to install Image Builder or DPM Command Line separately when you use them from a different machine than the Management Server. (Under these circumstances, it will be referred to as Image Builder (Remote Console) for Image Builder).
<b>DPM Command Line</b>	The command line interface that executes command on the managed machines and checks the result of their execution.	
<b>PackageDescriber</b>	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
<b>DPM Client</b>	Transfers data with 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. See Appendix C, "For Customers Who Cannot Easily Install DPM Client" for details.	This is required for the following functions. <ul style="list-style-type: none"> <li>• OS installation by disk duplication</li> <li>• Installing service packs/hotfixes/Linux patch files/applications</li> <li>• Shutdown</li> </ul> Also, this is required to enable the following settings. <ul style="list-style-type: none"> <li>• <b>Check the completion of a scenario by the communication with DPM Client</b> in the setting of DPM Server</li> <li>• <b>Forced Execution Of A Reboot Is Performed Before Execution in Scenario Execution Option Setting</b></li> </ul>

### 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)

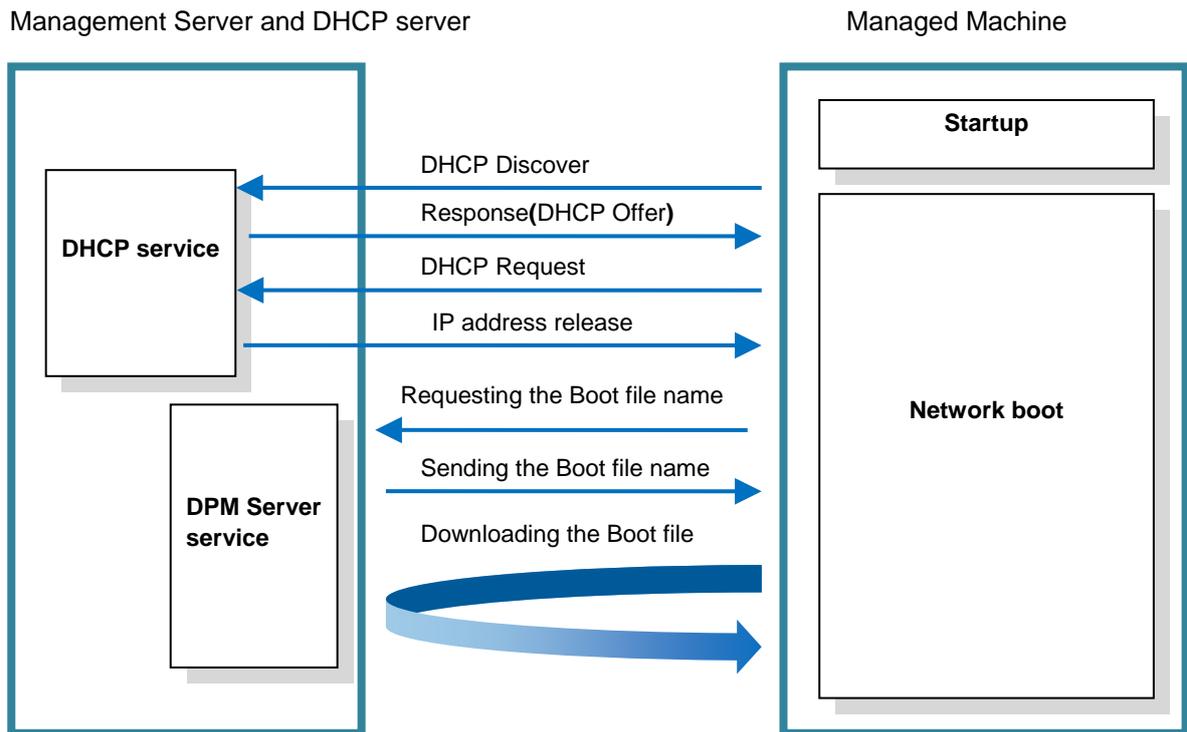
The DPM uses **Wake On LAN (WOL)** in order to power on a managed machine, which is powered off, remotely. Powering on using WOL is a function that broadcasts a packet called a magic packet, which includes the MAC address of the managed machine. By configuring direct broadcast routing settings on the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

<b>Used Function</b>	Power On
<b>Conditions required to perform WOL</b>	<ul style="list-style-type: none"> <li>·Have a LAN board that supports WOL.</li> <li>·Configure WOL settings in BIOS menu or the LAN driver settings of OS, and so on.</li> </ul> For more details of the conditions required to perform WOL, see the description on managed machines in Section 3.9.2, "Precautions." If you manage the machine with a LAN board that does not support WOL, then power on it manually.
<b>Precautions</b>	For precautions concerning WOL, see the description on managed machines in Section 3.9.2, "Precautions."

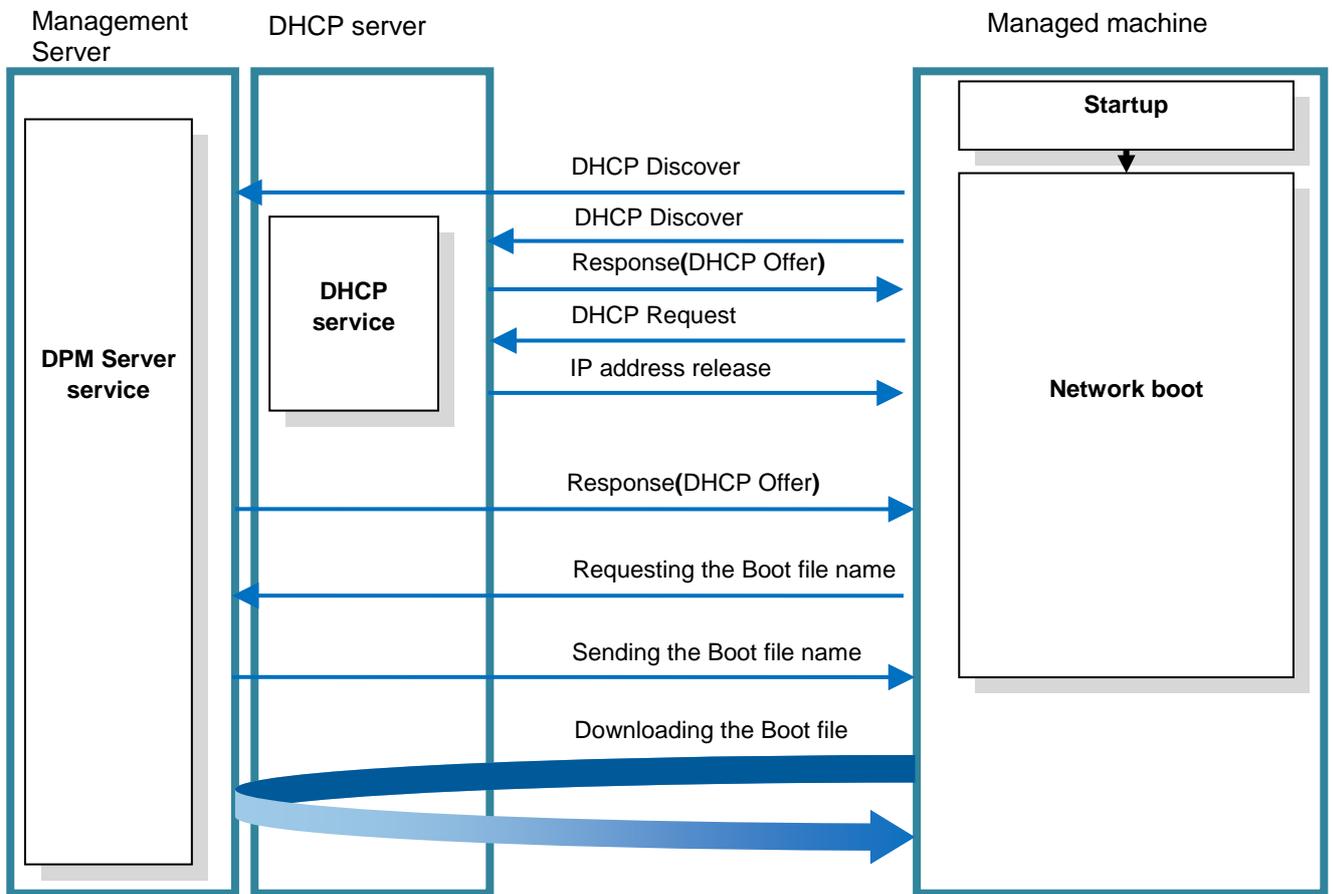
### 2.1.3.2. Network Boot

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 (HDD), 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 the Management Server and DHCP server are on the same Server)



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



<b>Used Functions</b>	<ul style="list-style-type: none"> <li>• Backup/Restore/Disk Configuration Check (when operating using DHCP server)</li> <li>• OS Installation by Disk Duplication</li> <li>• OS clear installation</li> <li>• BIOS/firmware update</li> <li>• Register a New Managed Machine</li> </ul>
<b>Conditions required to perform a network boot</b>	<ul style="list-style-type: none"> <li>• A DHCP server is active on the network.</li> <li>• The managed machine's LAN board can boot by PXE.</li> <li>• 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.</li> </ul>
<b>Precautions</b>	<ul style="list-style-type: none"> <li>• You should use the managed machine's onboard LAN card to perform a network boot.</li> <li>• When the DHCP server and managed machine are in different segments, you should set a DHCP relay agent on the network device.</li> <li>• 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.</li> <li>• DPM has TFTP service. When another software which has TFTP service is on the DPM Management Server, you need to stop either of TFTP services. Install and configure, seeing the procedure in Section 2.1.1, "Installing the DPM Server by Standard Installation" in <i>Installation Guide</i>.</li> <li>• 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.</li> <li>• 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."</li> <li>• 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.</li> </ul>

### 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 identify hardware.

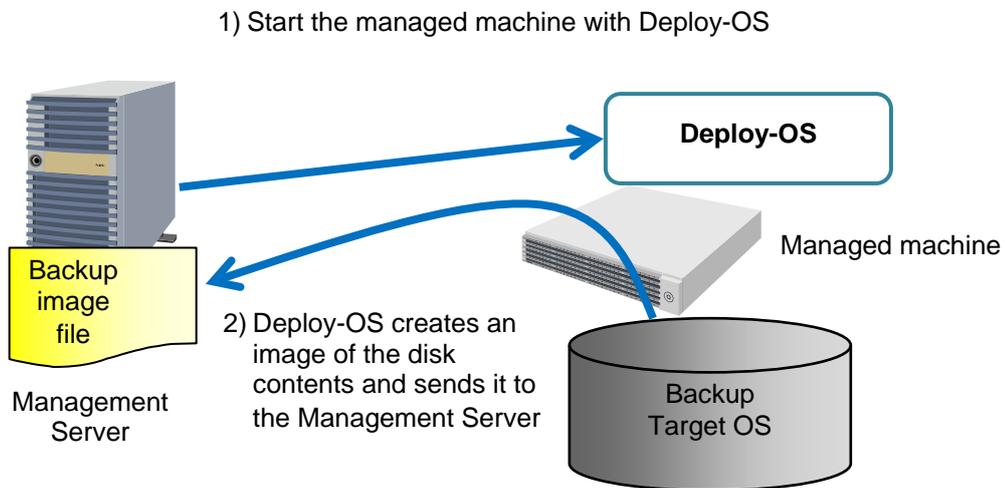
In order to manage the managed machines, the DPM stores their MAC address and UUID information. The MAC address is used as the key for processes such as turning the power on using WOL, but for machine that have multiple LAN boards (multiple MAC addresses), UUID is used to uniquely identify them. Even 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.

<b>Used Function</b>	Management of managed machines
<b>Precautions</b>	If the motherboard 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, Deploy-OS is required to contain a disk controller and LAN board device driver.

By specifying 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 procedure to obtain Deploy-OS, which is not included in the installation media.



<b>Used Function</b>	<ul style="list-style-type: none"> <li>• Backup/restore/disk configuration check</li> <li>• OS Installation by Disk Duplication</li> </ul>
<b>Precautions</b>	When using backup/restore/disk configuration check or OS installation by disk duplication, 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.

<b>Function Used</b>	<ul style="list-style-type: none"><li>• Install patch/application</li><li>• OS Installation by Disk Duplication (used when restoring)</li></ul>
<b>Precautions</b>	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

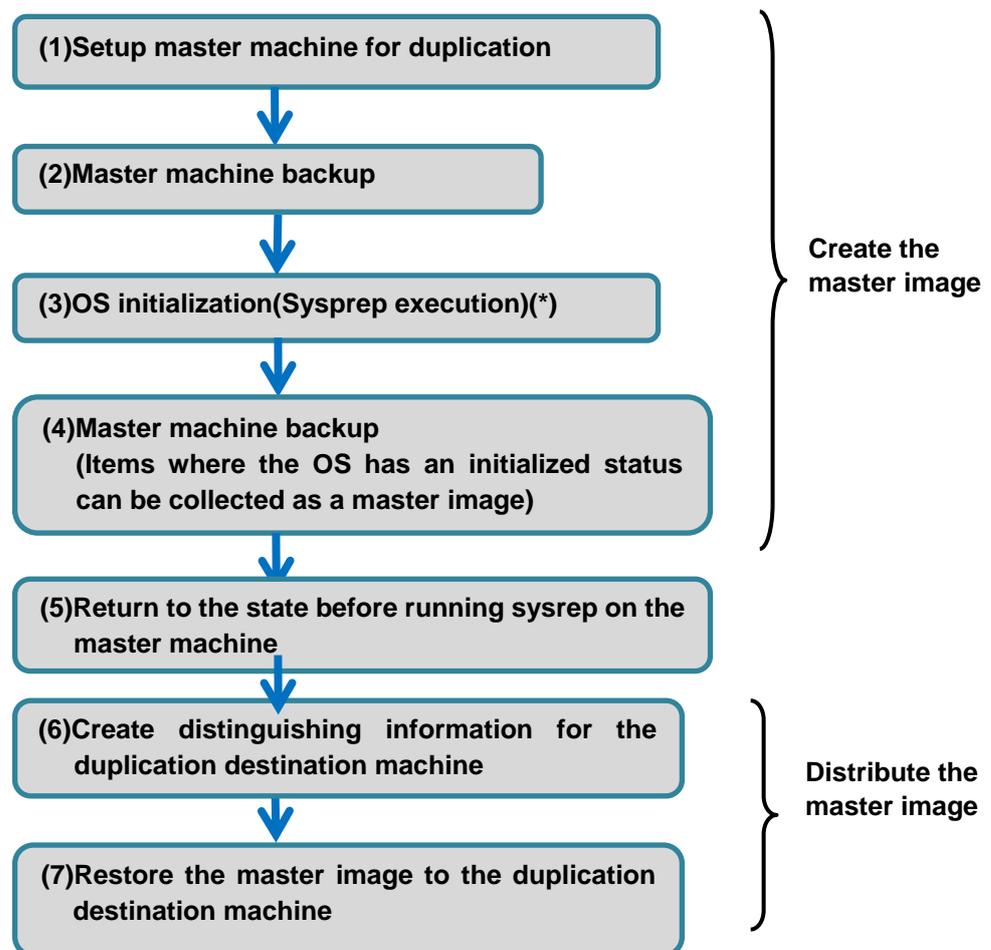
The following is an explanation of how the DPM operates. See the explanation in this section and design your system.

### 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)>



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

- (1) Prepare the master machine used for duplication. Set up manually such as each setting, installing applications, and so on, on the master machine.
- (2) Perform a backup of the master machine using the Web Console or DPM Command Line. This is performed so that the master machine can be returned to the state before 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.

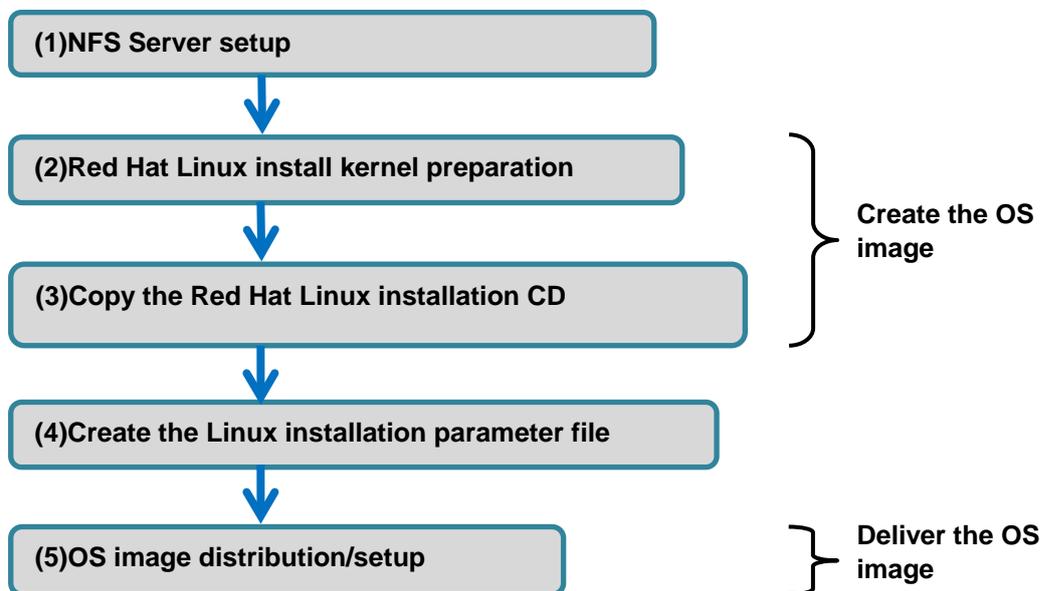
- (4) Backup the master machine using the Web Console or DPM Command Line. This backup image file, after Sysprep has been executed, will be the master image used to perform the duplication.
- (5) In order to return the master machine to the state before execution of Sysprep, now restore the backup image 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 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 before 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.

<b>Precautions</b>	See Section 2.2.3, "Regarding OS Installation by Disk Duplication" about precautions.
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## 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) 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 and so on.
- (3) Use 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.

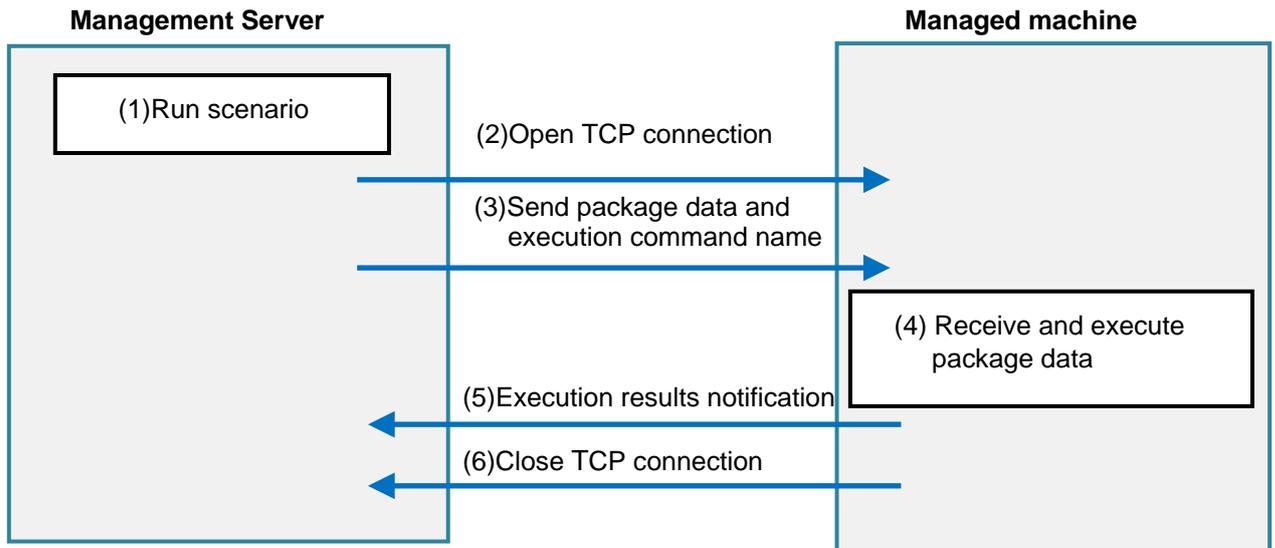
Precautions	
	See Section 2.2.4, "Regarding OS Clear Installation" about precautions.

### 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 and so on) and script files (.bat/.vbs/.sh and so on) and then executes them.

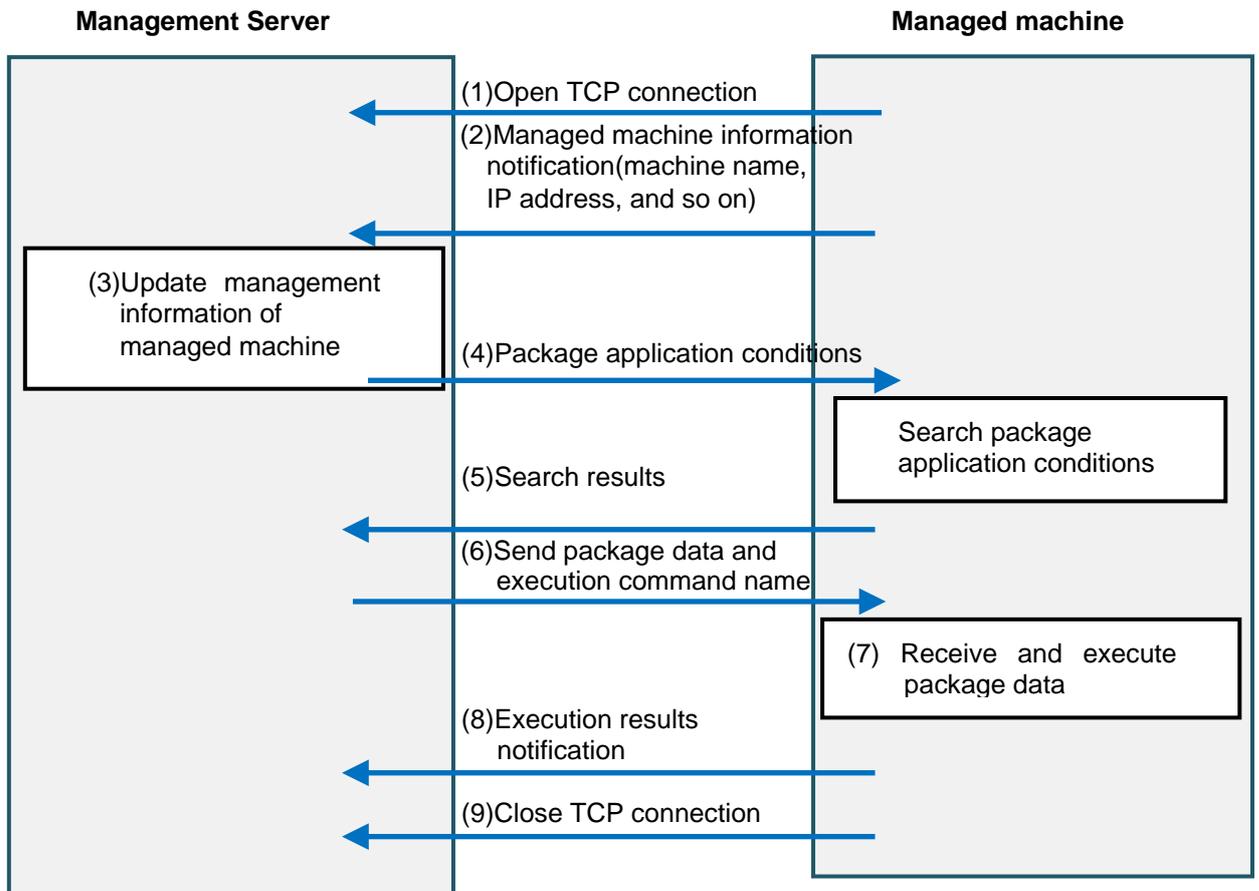
There are two distribution types: scenario type and automatic update type.

<The sequence of the scenario type>



- (1) Execute the scenario using the Web Console or DPM Command Line.
- (2) Connect the Management Server to the managed machine.
- (3) The 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 executable file or the script file that is included in the package data, you can install the patch or 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.

<The sequence of the automatic update type>



- (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 executable file or the script file that is included in the package data, you can install the patch or 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.

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

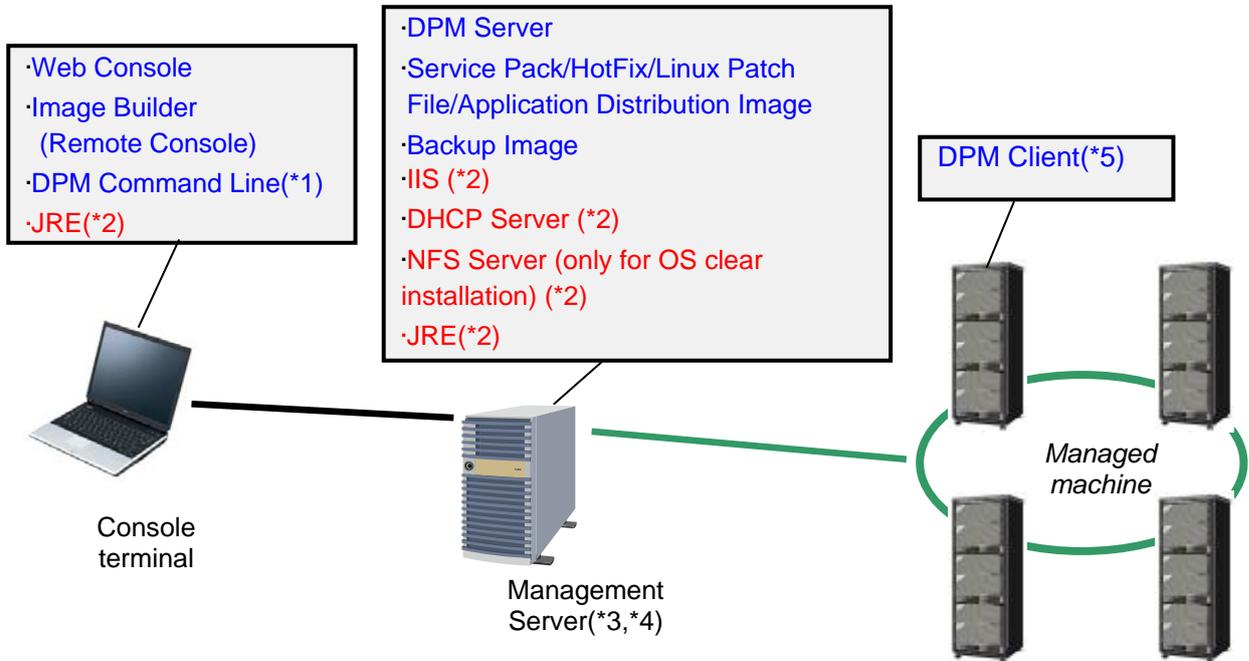
- The package is intended for the targeted OS of automatic update.
- The package urgency is **high** or **highest**.
- In the case of a service pack, the major version and minor version, or ID information are/is entered.
- In the case of a hotfix, the MS number or ID information is entered.
- In the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

<b>Precautions</b>	<p>The following conditions must be met about the service pack, hotfix, Linux patch file or application that can be distributed by DPM.</p> <ul style="list-style-type: none"> <li>· 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)).</li> <li>· A reboot of the OS must not occur during installation.</li> <li>· 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.</li> <li>· The size of the patch/application and so on does not exceed 2GByte.</li> <li>· When an executable file(setup.exe/update.exe and so on), which installs the patch/application and so on, generates descendant processes(executable file-&gt;child process-&gt; grandchild process) during the installation of the patch/application, generated child process finishes after grandchild process finishes. Also, when an executable file is a script file such as bat/sh, the executable file finishes after generated child process finishes.</li> </ul>
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## 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 on the same machine as the Management Server.

\*2

This is not included in the installation media.

\*3

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

\*4

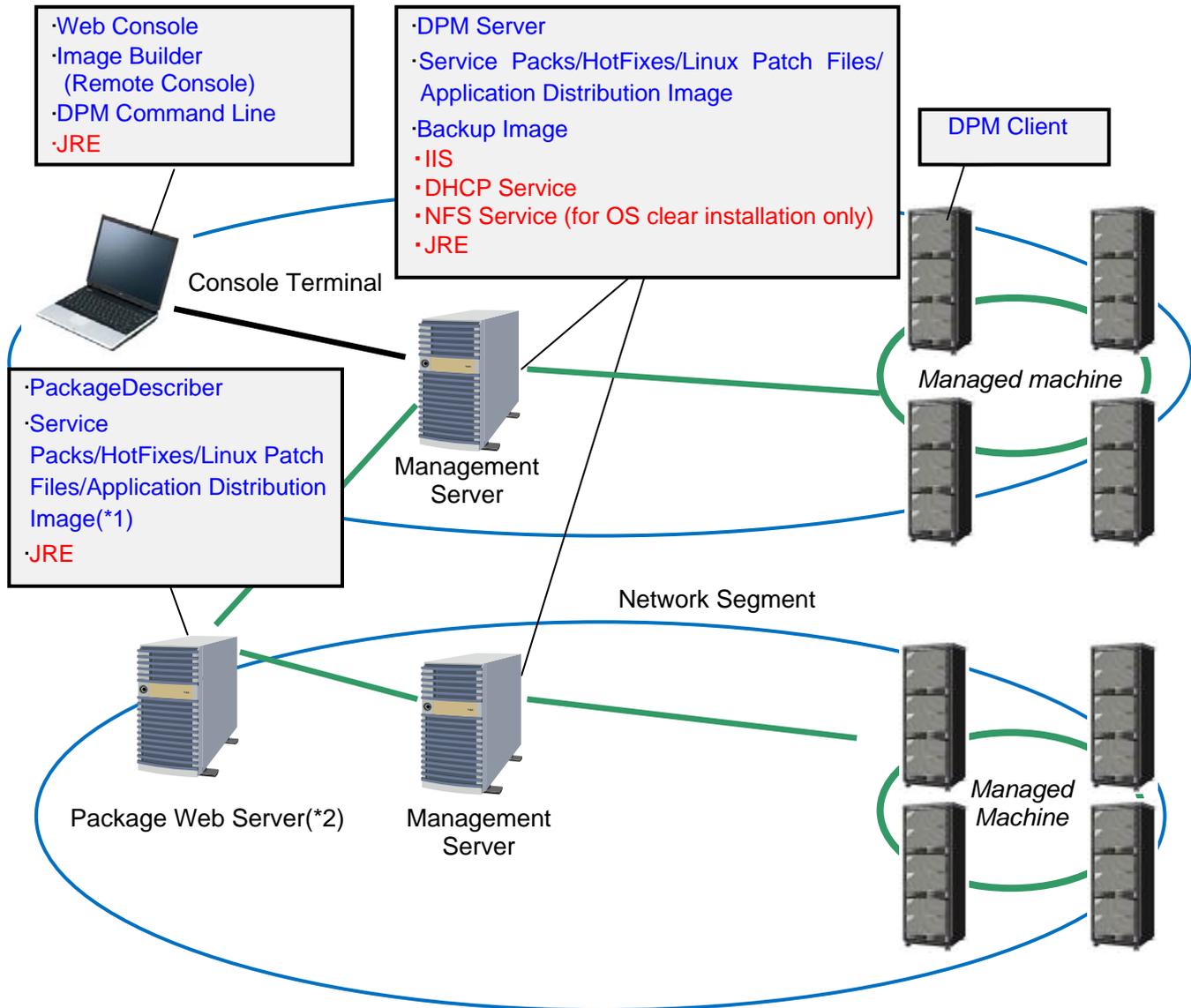
- A DHCP server configured on the Management Server, or the one configured on a different server can be used, but when using the one configured on the Management Server, that DHCP server must be the only DHCP server on that network. When using a DHCP server configured on a different server, multiple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

\*5

You can also operate DPM without installing DPM Client.(Some functions cannot be used.)

The following is a configuration that includes multiple Management Servers. By registering packages such as patches and applications to the Package Web Server, they do not have to be registered individually to each Management Server.



\*1

The distribution image is downloaded from the Package Web Server to the Management Servers. The other cautions and notes will be the same as those in the example of basic configuration.

\*2

You can also configure the Package Web Server on the Management Server.

## 2.2. Precautions Regarding System Configuration

### 2.2.1. Regarding the Network Environment

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

#### Hardware environment

<b>LAN Configuration</b>	The Management Server and managed machine are connected using a LAN of 100Mbps or higher. (1Gbps or higher is recommended)
<b>Other</b>	<ul style="list-style-type: none"> <li>• 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 cannot 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 will not network boot properly. Even if the STP is set for ports connecting to devices except managed machines, when an operating LAN is disconnected because of network failure and so on, it takes some time as well to find a new route. Therefore, the communication cannot be available at this time.</li> <li>• On 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 will not be able to do WOL. Also, the backup/restore capability will be reduced if you are operating at a fixed value (100Mbps FULL) and so on.</li> </ul>

#### Software environment

<b>DHCP Server</b>	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 DPM server. Use the Windows standard DHCP server if setting up the DHCP server on the same machine.
<b>NFS Server</b>	An NFS Server is required to perform OS clear installation by DPM.

Note

- You cannot start services of 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 and so on are using a TFTP (Trivial File Transfer Protocol) port or communication port described in Appendix D, "Network Port and Protocol List" in *Reference Guide*.  
Confirm the usage status of ports by other applications.
- You cannot change the limit (MTU. Normally 1500Byte) for TFTP communication packets when using DPM.

Tips

- It is recommended that the DHCP server be set before DPM server is installed. See Section 1.2.2, "Setting Up the DHCP Server" in *Installation Guide* if you set the DHCP server after 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, confirm if the DHCP server was able to assign an IP address to the managed machine. 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 the above "Hardware environment".)

### 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, also set the router/switch to 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.

Tips

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, and so on) 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 effect 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 cannot 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 does not exist.

<b>Key</b>	HKEY_LOCAL_MACHINE¥SYSTEM¥CurrentControlSet¥Services¥Tcpip¥Parameters
<b>Name</b>	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]

Add the following registry to reserve the ports to be used by DPM. Add the following value if it already exists.

<b>Key</b>	HKEY_LOCAL_MACHINE¥SYSTEM¥CurrentControlSet¥Services¥Tcpip¥Parameters
<b>Name</b>	ReservedPorts
<b>Value</b>	26509,26510,26511,26529
<b>Type</b>	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]

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 does not 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 start order of DPM Client 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 may 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 disk unit, the disk management information will be restored on the disk along with the disk contents. On the other hand, for backup/restoring of partition unit, when you restore the backup image of partition unit on the disk in use, only the contents of the partition are restored. When you restore the backup image on an empty disk, the management information of the disk is also restored.(\*1)

Therefore, handle disk physical failures and logical failures as follows.

- In the case of a physical failure, you can recover from it by using the backup image file of either of disk unit or partition unit after replacing with a hard disk that works properly.
- In the case of a logical failure, you can recover from it without replacement of the hard disk if you use a backup image file of either of disk unit or partition unit.(\*2)

(\*1)

See "Support for File System and Disk Type" in Appendix A, "Function Tables" for details.

(\*2)

You may not be able to recover it with partition unit backup, depending on the location of the failure.

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.
- Take measures in advance seeing Appendix E, "For Customers Who Manage the Machine with HDDs of Multi Vendors" in the following cases.
  - HDD is supported by multi vendors and you need to restore the backup image on the disk whose vendor is different from the original disk.
  - HDD with a different size may be supported as maintenance parts in the future.

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

<p><b>The entire disk is designated</b></p>	<p>·When restoring to a disk with a different type (IDE/SCSI and so on) than the backup disk.</p>
<p><b>When partition unit is designated</b></p>	<ul style="list-style-type: none"> <li>· 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.</li> <li>· The following error may occur when restoring the backup image on a partition with a different size.  <b>Cannot restore the data to a partition of a different size than the size you backed up.</b>  <b>Specify a partition with the following size.</b>  <b>(required size of a partition to restore)</b>  <b>(size of the specified partition)</b>  <b>(##### bytes)</b>  <b>(##### bytes)</b> </li> <li>· The following error may occur when restoring the backup image on a partition with a different file system.  <b>Cannot restore the data to a partition of a different type than the type you backed up.</b>  <b>Specify a partition with the type same as you backed up.</b>  <b>(ID of the backed-up partition)</b>  <b>(ID of the specified partition)</b>  <b>(0x##)</b>  <b>(0x##)</b> </li> </ul>

-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.

Confirm if there are bad sectors by running Scan Disk or 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 or Check Disk.

It is recommended that you run Scan Disk or 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 cannot 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 not to 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 does not 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, and so on)

### •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.

<b>For Windows OS</b>	Approximately 60%
<b>For Linux OS</b>	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  $5\text{GByte} \times (5+1+1) = 35\text{GByte}$  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]

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**

- Confirm the OS license rules sufficiently 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 or Windows 7.  
This partition may be necessary for the operation of Windows. Be careful of the following for backup/restoring of a Windows system partition using partition units.
  - If partition with the volume name "System Reserved" exists when confirming the partition structure from the Windows disk management, be sure to backup/restore this with the Windows system partition.
  - 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, and so on 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) on the HDD with a different size from the master machine is not recommended. However, as an exception, you can restore to a larger size disk than at the time of backup. Take measures in advance seeing Appendix E, "For Customers Who Manage the Machine with HDDs of Multi Vendors" in the following cases.
  - HDD is supported by multi vendors and you need to restore the backup image on the disk whose vendor is different from the original disk.
  - HDD with a different size may be supported as maintenance parts in the future.
- Confirm the OS license rules sufficiently so that there is no violation when performing 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 properly if there is installed software that depends on the SID (Security Identifier) or the computer name. In this case, uninstall the software from the machine that will be the duplication source or execute the OS installation by disk duplication before installing.
- 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. Also, if a drive is added or changed, the drive letter may be changed after the disk duplication. See Section 3.3.4, "Precautions/Other" in *Operation Guide* for details.  
Also, when you perform OS installation by disk duplication, install DPM Client on the drive which is not affected by reassigning the drive letter. (C drive is recommended.)
- When you combine an OS image created by DPM Ver6.2 with a disk duplication data file created by an old version (DPM Ver4.0 - 6.1) or combine an OS image created by an old version with a disk duplication data file created by DPM Ver6.2, 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. 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 Ver6.2 with a Linux install parameter file created by an old version (DPM Ver4.0 - 6.1) or combine an OS image created by an old version with a Linux install parameter file created by DPM Ver6.2, 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."
- If it is difficult to install DPM Client on managed machines, you can also operate DPM without installing DPM Client. (Some functions cannot be used.) See Appendix C, "For Customers Who Cannot Easily Install DPM Client" for details.

## 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	6.20.000
DPM Client(Windows)	6.20.000
DPM Client(Linux)	6.2
Image Builder(Remote Console)	6.20.000
DPM Command Line	6.20.000
PackageDescriber	6.20.000

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 Ver6.2	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 Ver6.2 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 Ver6.2 Server Target License(5)	-A server license is needed if the OS is a Linux OS (Red Hat Enterprise Linux, SUSE Linux Enterprise).
DeploymentManager Ver6.2 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 Ver6.2 Client Target License (1)	This license is needed when managed machines use a client OS. Example)
DeploymentManager Ver6.2 Client Target License (10)	-Windows XP/Windows Vista /Windows 7/Windows 8 are client OSs.
DeploymentManager Ver6.2 Client Target License (50)	-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 Ver6.2 Client Target License (100)	

- Licensing Policy

- 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 hardware of managed machine, 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 Ver6.2, a license for the new version is required.
    - In case of the minor version-up from DPM Ver6.1 to DPM Ver6.2, the existing license can continue to be used.

## 2.4. DeploymentManager Process up to DeploymentManager Operation

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

- (1) Confirm 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 according to the configuration decided by system design.
  - See Section 2, "Installing DPM" in *Installation Guide* for details.
- (4) Prepare before operating 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) Prepare before executing a scenario. What should be done at this point depends on the used functions. 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 and so on.

### **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 SP1 Express x86/x64
- Windows Installer 4.5
- .NET Framework 4

## 3.2. Management Server

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

### 3.2.1. System Requirements

The system requirements for the Management Server are as follows.

#### Hardware environment

<b>CPU</b>	2GHz or higher, Multiple core	
<b>Memory Size</b>	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 one machine that is registered	Approximately 0.3MByte
	For creating one scenario	Approximately 0.07MByte
	For one machine on which a scenario is run simultaneously	Approximately 8.5MByte
	For one machine running automatic update	Approximately 0.2MByte
	When using Image Builder	Approximately 40MByte
<b>Disk Size</b>	<p>Refer to the following total space for disk.</p> <ul style="list-style-type: none"> <li>▪ DPM Server module: Approximately 360MByte</li> <li>▪ SQL Server 2012 SP1 Express: Approximately 900MByte(*1)</li> <li>▪ .NET Framework: Approximately 900MByte</li> <li>▪ Database(*1) <ul style="list-style-type: none"> <li>- DPM Server install: Approximately 256MByte</li> <li>- Space for data by the following calculation process. <ul style="list-style-type: none"> <li>Number of registered machines x 10KByte + number of registered packages x 3KByte + number of registered machines x 0.15KByte x number of registered packages</li> <li>Example) This will be approximately 1.0GByte for 40,000 registered machines, and 100 registered packages.</li> </ul> </li> </ul> </li> <li>▪ 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. )</li> <li>▪ Additionally, approximately 6GByte is temporarily necessary when installing DPM Server.</li> </ul>	
<b>Other</b>	100Mbps or faster LAN board (1Gbps or faster recommended) CD/DVD drive	

\*1

This is not required when you configure the Database Server(different machine from the Management Server).

## Software environment

<b>OS</b>	x86	Windows Server 2008 Standard/Enterprise(SP2)(*2)
	x64	Windows Server 2008 Standard x64/Enterprise x64 (SP2)(*2) Windows Storage Server 2008 Standard x64/Enterprise x64 (SP2)(*2) Windows Server 2008 R2 Standard/Enterprise/Datacenter (No SP/SP1)(*2)(*3) Windows Storage Server 2008 R2(SP1)(*2) Windows Server 2012 Standard/Datacenter(No SP)(*2) Windows Storage Server 2012 Standard(No SP)(*2)
<b>Database Engine(*1)</b>		Microsoft SQL Server 2012 SP1 Express x86/x64(*4) 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
<b>Java Execution Environment</b>		JRE7(*5)
<b>Other</b>		Internet Information Service (IIS) 7.0/7.5/8.0 .NET Framework(*4)(*6) ASP .NET(*6) DHCP server Windows Installer 4.5 or later (*7)

\*1

When you configure the Database Server(different machine from the Management Server), see Section 3.3, "Database Server."

\*2

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

\*3

When SQL Server 2012 is used as the database engine, "No SP" is not supported.

\*4

This is included in the installation media.

About .NET Framework, .NET Framework 4 is included.

\*5

Download JRE7(Windows x86) from the site of Oracle Corporation.

<http://www.oracle.com/technetwork/java/javase/downloads/index.html>

\*6

The following are necessary according to OS version.

- For Windows Server 2008
  - .NET Framework 4
  - ASP.NET 4.0
- For Windows Server 2012
  - .NET Framework 4.5
  - ASP.NET 4.5

\*7

If Windows Installer 4.5 is not installed, it is included in the installation media, so install it. Windows Installer 4.5 is already installed with Windows Server 2008 R2/Windows Server 2012.

### 3.2.2. Precautions

The precautions are as follows.

- 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.

It is not recommended by Microsoft Corporation that you install SQL Server on the domain controller. Therefore, when you configure the database on the Management Server, you cannot install DPM Server and use it on the domain controller.

## 3.3. Database Server

This section describes system requirements for the Database Server.

### 3.3.1. System Requirements

The system requirements for the Database Server are as follows.

#### Hardware environment

<b>General</b>	This is based on system requirements of "OS" and "Database Engine" in the following "Software environment." See "Hardware environment" - "Disk Size" in Section 3.2.1, "System Requirements" about the procedure to estimate the disk size which is used by DPM instance.
----------------	--

#### Software environment

<b>OS</b>	This is based on system requirements of the database engine.
<b>Database Engine</b>	Microsoft SQL Server 2012 SP1 Express x86/x64 Microsoft SQL Server 2012 Standard/Enterprise x86 Microsoft SQL Server 2012 Standard/Enterprise x64

### 3.3.2. Precautions

When you configure the database on the Management Server, the Database Server is not necessary.

## 3.4. Web Console

This section describes system requirements for the Web Console.

### 3.4.1. System Requirements

The system requirements for the Web Console are as follows.

#### Hardware environment

<b>Display</b>	A display with a resolution of at least 1024 x 768 Graphics card able to display at least 256 colors is required.
----------------	--

### Software environment

<b>OS</b>	Any OS can be used.
<b>Web Browser</b>	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, use by the compatible mode. To set the compatible mode, click **Compatibility View** () on the Address bar of Internet Explorer.

### 3.4.2. Precautions

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

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

## 3.5. Image Builder(Remote Console)

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

### 3.5.1. System Requirements

The system requirements for Image Builder are as follows.

#### Hardware environment

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

#### Software environment

<b>OS</b>	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) Windows Storage Server 2012 Standard(No SP)(*1)
<b>Java Execution Environment</b>	JRE7(*2)	

\*1

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

\*2

Download JRE7(Windows x86) from the site of Oracle Corporation.  
<http://www.oracle.com/technetwork/java/javase/downloads/index.html>

**Important**

Administrator authority is required to run Image Builder.

**Tips**

Image Builder does not need to be installed on the machine in which DPM Server has been installed. (A local console is automatically installed.)

## 3.6. DPM Command Line

This section describes system requirements for DPM Command Line.

### 3.6.1. System Requirements

The system requirements for DPM Command Line are as follows.

#### Hardware environment

<b>CPU</b>	Depend on the OS
<b>Memory Size</b>	Approximately 6.0MByte
<b>Disk Size</b>	Approximately 1MByte

#### Software environment

<b>OS</b>	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)(*1) Windows Storage Server 2012 Standard(No SP)(*1) 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 DPM Server. For example, if you are using DPM Server of DPM Ver6.2, use DPM Command Line of DPM Ver6.2.

#### Tips

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

## 3.7. Package Web Server

This section describes system requirements for the Package Web Server.

### 3.7.1. System Requirements

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

#### Hardware environment

<b>CPU</b>	Depend on the OS
<b>Memory Size</b>	Approximately 256MByte
<b>Disk Size</b>	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

<b>OS</b>	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) Windows Storage Server 2012 Standard(No SP)(*1)
<b>Other</b>	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.

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

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

When the Package Web Server and the Management Server are on the same server, the 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 the Package Web Server.

Note

About configuring the Package Web Server, see Appendix B, "Configuring the Package Web Server" in *Installation Guide*.

## 3.8. PackageDescriber

This section describes system requirements for PackageDescriber.

### 3.8.1. System Requirements

The system requirements for PackageDescriber are as follows.

#### Hardware environment

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

#### Software environment

<b>OS</b>	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 Storage Server 2012 Standard(No SP)(*1) Windows 7 Professional x64/Ultimate x64/Enterprise x64(No SP/SP1) Windows 8 Pro x64/Enterprise x64(No SP)
<b>Other</b>	JRE7(*2)	

\*1

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

\*2

Download JRE7(Windows x86) from the site of Oracle Corporation.  
<http://www.oracle.com/technetwork/java/javase/downloads/index.html>

## 3.9. 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.

### 3.9.1. System Requirements

The system requirements for physical managed machines are as follows.

## Hardware environment

<b>Memory Size</b>	<ul style="list-style-type: none"> <li>·12MByte is needed when DPM Client is installed</li> <li>· 320MByte is needed during backup/restoring (768MByte or more is recommended)(*1)</li> </ul>
<b>Disk Size</b>	<ul style="list-style-type: none"> <li>·10MByte is needed when DPM Client is installed</li> <li>·The maximum disk size that can be backed up is up to 8TByte(*3)</li> <li>·The maximum partition size that can be backed up is up to 2TByte</li> </ul>
<b>Other</b>	<ul style="list-style-type: none"> <li>·100Mbps or faster LAN board(1Gbps or faster recommended)</li> <li>·A LAN board supporting PXE boot (network boot) (when using DHCP)</li> <li>·A LAN board enabling WOL (if remote power ON is needed)</li> <li>·Deploy-OS supports devices on the managed machine.(when using backup/restore/disk configuration check or OS installation by disk duplication)</li> <li>·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.</li> <li>·When secure boot function, which is a function of UEFI FW, is enabled, the machine cannot be managed by DPM.(*2)</li> <li>·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)</li> <li>·Single boot environment (The machine in multi boot environment cannot be managed.)</li> </ul>

\*1

In the case of 320MByte (minimum), the following 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.  
 For more details, contact your sales or support representative.

**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**

<b>OS(*1)</b>	x86	Windows 2000 Server/Advanced Server/Professional (No SP/SP1/SP2/SP3/SP4) Windows Server 2003 Standard Edition/Enterprise Edition (No SP/SP1/SP2) Windows Server 2003 R2 Standard Edition/Enterprise Edition (No SP/SP2) Windows Server 2008 Standard/Enterprise(No SP/SP1/SP2) Windows XP Professional(No SP/SP1/SP2/SP3) Windows Vista Business/Enterprise/Ultimate(No SP/SP1/SP2) Windows 7 Professional/Ultimate/Enterprise(No SP/SP1) Windows 8 Pro/Enterprise(No SP) Red Hat Enterprise Linux AS3/ES3/AS4/ES4/5(except for 5.0)/5 AP(except for 5.0)/6 SUSE Linux Enterprise 9/10/11
	x64	Windows Server 2003 Standard x64 Edition/Enterprise x64 Edition/Datacenter x64 Edition(No SP/SP2) Windows Server 2003 R2 Standard x64 Edition/Enterprise x64 Edition/Datacenter x64 Edition(No SP/SP2) Windows Server 2008 Standard x64/Enterprise x64/Datacenter x64(No SP/SP1/SP2) Windows Server 2008 R2 Standard/Enterprise/Datacenter (No SP/SP1) 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) 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) SUSE Linux Enterprise 9/10/11

\*1

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

**3.9.2. Precautions**

The precautions are as follows.

**Boot Order of BIOS Configuration**

BIOS configuration differs depending on the used BIOS. For details, see the hardware manual or contact your sales or support representative. When you changed the BIOS configuration, be careful sufficiently.

<If there is a DHCP Server on the network>

In order to perform PXE boot (network boot), set the network higher than HDD(hard disk drive) in the boot order of BIOS. If there are multiple LAN boards, set only the LAN board managed by DPM higher than HDD and others lower than HDD. If you set the LAN board which is not managed by DPM higher than HDD, a scenario execution error may occur.

Even when you configure multiple LAN boards by teaming, set only the LAN board to be booted by PXE higher than HDD. DPM uses UUID, and MAC address of the LAN board to be booted by PXE as the key to identify the managed machine. Therefore, if the LAN board to be booted by PXE out of teamed LAN boards have a failure, you need to reconfigure the boot order of BIOS.

In the case of Express5800/Blade Servers, LAN1 is higher than LAN2 in the boot order when shipped. When you use LAN1, you do not need to configure BIOS.

<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 boot order of BIOS so that CD is the top.

### **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, and so on.  
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 powered off 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 will not 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 your sales or support representative.
- 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 (the MAC address that is registered to the Management Server).
- When you configure teaming of LAN(AFT, SFT, or ALB) by Intel PROSet, the MAC address of the teamed virtual LAN and that of the physical LAN(the MAC address which is registered on the Management Server) need to be the same to power on the managed machine remotely from DPM.
- 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 (WOL) depends on the hardware configuration, check the hardware configuration if the problem is not resolved after performing the above checks.

### DPM Client

Install 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 DPM Server. If you are using an older version of DPM Client, see Section 3.3, "Upgrading the DPM Client" in *Installation Guide* to upgrade DPM Client.

#### Note

- Available function differs depending on the OS. See Appendix A, "Function Tables" for details.
- When you perform OS installation by disk duplication, install DPM Client on the drive which is not affected by reassigning the drive letter. (C drive is recommended.)

#### Tips

- DPM Client is automatically installed if an OS clear installation or OS installation by disk duplication is performed using DPM.
- When it is difficult to install DPM Client, it is possible to operate without DPM Client. (Some functions cannot be used.) See Appendix C, "For Customers Who Cannot Easily Install DPM Client" for details.

### 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 one 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.
- 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.

## 3.10. Managed Machines (Virtual Environment)

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

### 3.10.1. System Requirements

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

#### Hardware environment

<b>Memory Size</b>	<ul style="list-style-type: none"> <li>·12MByte is needed when DPM Client is installed</li> <li>·320MByte is needed during backup/restoring (768MByte or more is recommended)(*1)</li> </ul>
<b>Disk Size</b>	<ul style="list-style-type: none"> <li>·10MByte is needed when DPM Client is installed</li> <li>·The maximum disk size that can be backed up/restored is up to 8TByte</li> <li>·The maximum partition size that can be backed up/restored is up to 2TByte</li> </ul>
<b>Other</b>	<ul style="list-style-type: none"> <li>·100Mbps or faster LAN board(1Gbps or faster recommended)</li> <li>·A LAN board supporting PXE boot (network boot) (when using DHCP)</li> <li>·A LAN board enabling WOL (if remote power ON is needed)</li> <li>·Deploy-OS supports devices on the managed machine.(when using backup/restore/disk configuration check or OS installation by disk duplication)</li> <li>·When secure boot function, which is a function of UEFI FW, is enabled, the machine cannot be managed by DPM.(*2)</li> <li>·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)</li> </ul>

\*1

In the case of 320MByte (minimum), the following 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

<b>Virtualization Software(*1)</b>	<ul style="list-style-type: none"> <li>VMware ESX Server 3.5/4.0/4.1</li> <li>VMware ESXi 3.5/4.0/4.1/5.0/5.1</li> <li>Microsoft Hyper-V/Hyper-V2.0(*2)</li> <li>Microsoft Windows Server 2012 Hyper-V</li> <li>Citrix XenServer Enterprise Edition 5.0/5.5/5.6/5.6 FP1</li> </ul>
<b>Guest OS(*3)</b>	<ul style="list-style-type: none"> <li>Guest OS on VMware ESX Server 3.5/4.0/4.1</li> <li>Guest OS on VMware ESXi 3.5/4.0/4.1/5.0/5.1</li> <li>Guest OS on Microsoft Hyper-V/Hyper-V2.0 (*2)</li> <li>Guest OS on Microsoft Windows Server 2012 Hyper-V</li> </ul>

\*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 3.9, "Managed Machines (Physical Machines).")

For OS that each virtualization software supports, see the user's guide or product site of the each product.

### **3.10.2. Precautions**

See Section 3.9.2, "Precautions" and Appendix A, "Functions Tables" -> "Support for Virtualization Environments as Managed Machines."

## 4. Latest Version Information

### 4.1. New Additional Functions

- The following are the main newly added functions and enhanced functions from DPM Ver6.13 to DPM Ver6.2.
  - You can confirm the folder structure of the managed machine on the Web Console.
  - You can modify the setup parameter, which was specified when creating a package by Image Builder or PackageDescriber, when you add or edit the scenario. The modified parameter is valid only when the scenario is executed.
  - When you configure DPM Server and software which has TFTP service used by PXE boot as DPM Server (NEC MasterScope Network Manager and so on) on the same machine, you can specify which TFTP is used when DPM Server is installed.
  - You can specify the installation folder of DPM Client.
  - When you restore the backup image of partition unit in Windows OS, it can be restored on an empty disk. By this function, you do not need to create partitions in advance when replacing the disk and you can operate so that OS can be booted only by restoring only the system(OS) partition.
  - You can use the database, which is configured on the different machine from the Management Server. Also, you can specify the instance name of the database.

### 4.2. Changed and Removed Functions

- The following are the major changes from DPM Ver6.13 to DPM Ver6.2.
  - The following software included in the installation media is upgraded.
    - Upgraded from SQL Server 2012 Express to SQL Server 2012 Express SP1
  - The following software included in the installation media is deleted.
    - JRE(You need to install it separately in advance.)
  - Support for US110 as managed machines is ended.

# 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 properly if the managed machine(hardware) does not support the OS even if DPM supports it.

See the manual of each hardware product and so on 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
	x86	x86/x64	x64
Backup/restore/disk configuration check(*1)	Yes	Yes	Yes
OS installation by disk duplication(*1)	Yes	Yes	Yes
OS clear installation	No	No	No
Installing service packs/hotfixes/Linux patch files/applications (scenario type)	Yes	Yes	Yes
Distribution of floppy disk image for BIOS/firmware(*1)	Yes	Yes	Yes
Installing service packs/hotfixes/applications(automatic update type)	Yes	Yes	Yes
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.

**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 image 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 image 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 image 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-V 1.0/2.0, 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 image 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 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 user's guide for details on configuration of the virtual machine.

- vmxnet 2
- vmxnet 3
- vmware paravirtualization

\*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 "2". Run a disk configuration check to check the disk number before executing a backup/restore scenario.

\*7

If you configure the virtual machine that all the following conditions are met in ESXi 5.1, network may not be used properly 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)(*2)	Yes(*3)(*4)(*5)	Yes(*3)(*4)(*5)
OS installation by disk duplication(*1)(*2)	Yes(*3)(*4)(*5)(*6)	Yes(*3)(*4)(*5)
OS clear installation(*2)	No	Yes(*3)(*4)
Installing service packs/hotfixes/Linux patch files/applications(scenario type)	Yes	Yes(*3)
Distribution of floppy disk image for BIOS/firmware	-	-
Installing service packs/hotfixes/applications (automatic update type)	Yes	No
DPM Client automatic upgrade	Yes	Yes(*3)
Power ON	No(*7)	No(*7)
Shutdown	Yes	Yes(*3)
Power ON/OFF state check	Yes	Yes(*3)
Acquisition of OS/service packs/hotfixes/Linux patch files/applications information	Yes	Yes(*3)

\*1

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

\*2

When you use this function, configure so that static MAC address is assigned on the network device.

\*3

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

- \*4 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.
- \*5 When the disk type is GPT, backup or restore the entire disk by specifying the full sector option.
- \*6 OS installation by disk duplication cannot be performed for Windows 2003(x64).
- \*7 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)(*5)
	MBR	GPT(*6)	MBR	GPT(*6)	
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(*7)	Full sector option	Full sector option	Full sector option	Full sector option	Cannot be performed
Maintenance Partition(*8)	Effective sector	Effective sector	Effective sector	Full sector option	Effective sector
File systems created in Windows OS except the above	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 properly 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

You can restore the backup image of partition unit on an empty disk.

- When you restore multiple backup images of partition unit, restore all partitions without starting OS between restoring.
- DPM may recognize the disk without the management area as an empty disk. When you restore the backup image of partition unit, restore after confirming that the disk is empty.
- You cannot restore the backup image of partition unit that you backed up in the version earlier than DPM Ver6.2 on an empty disk.
- When you restore the backup image of partition unit on an empty disk, specify the partition in the same place with the original disk.

\*6

When the target is the guest OS of Hyper-V and the disk type is GPT, backup or restore the entire disk by specifying the full sector option.

\*7

- 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.

\*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.

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

File System Type /Partition Type	Backup/restore		
	Disk(*2)		Partition
	Basic disk		Basic disk(*3)(*4)
	MBR	GPT(*5)	MBR
EFI system partition	-	Automatic full sector	-
ext2/ext3	Effective sector	Effective sector	Effective sector
ext4(*6)	Full sector option	Full sector option	Cannot be performed
Linux Swap partition	Effective sector	Effective sector	Effective sector
LVM1(*7)	Automatic full sector	Automatic full sector	Automatic full sector
LVM2(*7),(*8)	Automatic full sector	Automatic full sector	Automatic full sector
ReiserFS/JFS/XFS	Automatic full sector	Automatic full sector	Automatic full sector
Encrypted partition(*9)	Full sector option	Full sector option	Cannot be performed
Maintenance Partition(*10)	Effective sector	Effective sector	Effective sector
File systems created in Linux OS except the above	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

You cannot restore the backup image of partition unit on an empty disk.  
The target disk need to have the same configuration(the number of partitions/location/size/file system) with the original disk. Also, restore the backup image on the same partition when you backed up.

\*5

When the target is the guest OS of Hyper-V and the disk type is GPT, backup or restore the entire disk by specifying the full sector option.

\*6

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.

\*7

·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 properly 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.

\*8

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
```

\*9

When the trusted boot function which is implemented in Red Hat Enterprise Linux 6.2 or later is enabled, DPM may not work properly. 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.

\*10

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 image 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 image 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.

# Appendix B For Customers Who Cannot Easily Install a DHCP Server

**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.

DPM can be operated without a DHCP server. 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 done 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 the procedure of the operation.

Function	Use a DHCP Server	Do not 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 image 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(*5)
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

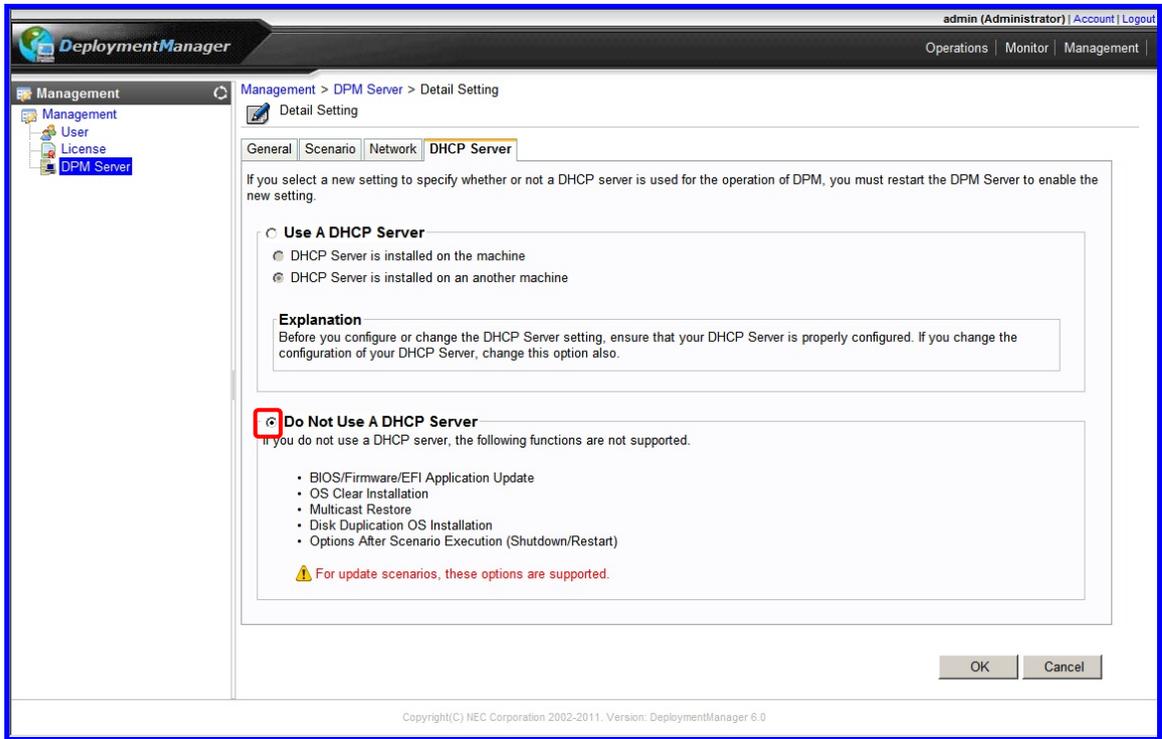
Backup/restore/disk configuration check of the managed machine operating by UEFI mode are not supported.

\*5

To detect the success of turning on the power on the DPM Web Console, it is necessary to install DPM Client on managed machines. If DPM Client is not installed, **Remote Power ON Error** is displayed after a certain period even if it succeeded in the power on.

- Configuring the System to Run Without a DHCP Server

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



**Important**

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

**Note**

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 Cannot Easily Install DPM Client

You can also operate DPM without installing DPM Client. However, when you do not install DPM Client, there are functional restrictions.

This chapter describes functions, which can be used when you do not install DPM Client.

Note

About the support status of each function, see also Appendix A, "Function Tables" in addition to this chapter.

Function	When you install DPM Client	When you do not install DPM Client (*1)(*2)(*3)
Backup/restore/disk configuration check	Yes	Yes
OS installation by disk duplication	Yes	No
OS clear installation	Yes	No
Installing service packs/hotfixes/Linux patch files/applications(scenario type)	Yes	No
Distribution of floppy disk image for BIOS/firmware	Yes	Yes
Installing service packs/hotfixes/applications (automatic update method)	Yes	No
DPM Client automatic upgrade	Yes	No
Power ON	Yes	Yes(*4)
Shutdown	Yes	No
Power ON/OFF state check	Yes	Yes(*5)
Acquisition of OS/service packs/hotfixes/Linux patch files/applications information	Yes	No

\*1

In the case of corresponding to any of the following, you cannot register managed machines on DPM by obtaining the information of managed machines automatically. Register managed machines manually or use the import function.

- Operation without a DHCP server
- Managed machines which do not support PXE boot

About registering managed machines, see 2.2, "Registering Managed Machines" in *Operation Guide*.

\*2

Even when **Forced Execution Of A Reboot Is Performed Before Execution** in **Scenario Execution Option Setting** is selected, the setting will not be valid. (OS cannot be restarted.)

\*3

Clear **Check the completion of a scenario by the communication with DPM Client** in the configuration of DPM Server.

\*4

To detect the success of turning on the power on the DPM Web Console, it is necessary to operate with DHCP server. In the case of the operation without DHCP server, **Remote Power ON Error** is displayed after a certain period even if it succeeded in the power on.

\*5

Specify the IP address necessarily when you register a managed machine on DPM.

# Appendix D For Customers Who Configure RAID on the Managed Machine

There is a case that restoring or OS installation by disk duplication cannot be executed correctly when you use a backup image file 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.

Appendix EDPM Ver6.0 (6.00.000~6.01.000)

When either of the following is set on Deploy-OS

- "Use Default Value"
- "NEC Express5800 002"

Appendix FDPM 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.

### • The target machine model

This problem occurs when you use internal SATA RAID configuration on the specific machine models.

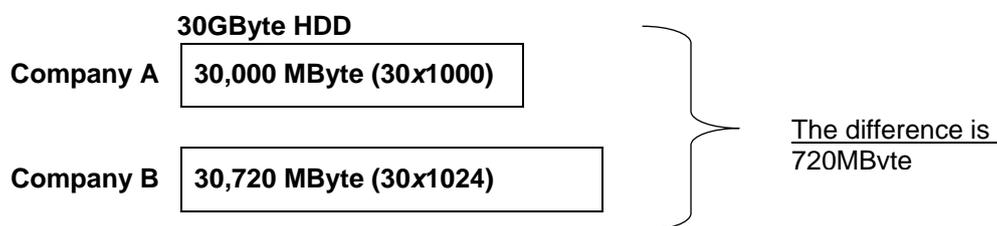
Contact your sales or support representative about the machine model.

## Appendix E For Customers Who Manage the Machine with HDDs of Multi Vendors

Even if machines have the same product name, the built-in HDDs of different vendors may be mounted. Therefore, even if the same model is released in the same time, HDDs of different manufacturers are mounted and the disk size may be different on each device. Typical case is as follows.

Example)

If Company A calculates 1GByte as 1000MByte and Company B calculates 1GByte as 1024MByte for the same disk sold as 30GByte, the following difference occurs:



DPM does not support restoring on HDD of different size when executing backup. However, considering devices of multi-vendor, DPM supports restoring on some HDDs of different size. It is recommended that you evaluate carefully before using because all HDDs are not supported,.

### Note

Conditions that you can restore on HDDs of different size when executing backup are the following.

- Disks larger than at the time of backup.
- Backup when the entire disk is specified.
- Configured as basic disks.
- NTFS file system.

For other notes, see Section 2.2.2, "Regarding Backup/Restore."

Considering that the devices are supported by multi-vendor, it is recommended that you do either of the following in advance. Note that the disk must be configured as a basic disk.

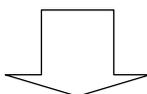
<Provision 1>

If the devices are supported by multi-vendor, execute backup from the smallest disk.

<Provision 2>

Considering for the possibility of changing to multi-vendor support in the future, create small partitions, configure the remainder as "Unassigned", and execute backup.

<b>C:NTFS</b>	<b>D:NTFS</b>	<b>Unassigned</b>
---------------	---------------	-------------------



You can restore to a smaller disk if actual partitions (in this example, C: and D:) are of the size that can be restored because unassigned area is not the target of backup.

<b>C:NTFS</b>	<b>D:NTFS</b>	<b>Unassigned</b>
---------------	---------------	-------------------

**Tips**

It is recommended that you create unassigned area with the margin of about 10% of the total area, in addition to the difference of 24MByte (1024-1000) per 1GByte as the above.

## **Appendix F 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.

We will disclose the source code upon request, so contact your sales or support representative for details.

\*

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## **Appendix G Revision History**

◆ First Edition(Rev.001)(2013.10): New

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