

# **VMware vSphere 5.1**

VMware ESX 5.1  
VMware vCenter Server 5.1

## **Supplementary Notes**

NEC Corporation  
November 2012

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# 1 Preface

## 1-1 This document

This document provides notes on using vSphere 5.1 (ESXi 5.1 and vCenter Server 5.1) on an NEC Express5800 series server and describes how to set it up.

*Before reading this document, be sure to check the new features and known issues described in the vSphere 5.1 release notes.*

This release notes is available at the VMware websites below.

- vSphere 5.1 Release Notes

<http://www.vmware.com/support/vsphere5/doc/vsphere-esx-vcenter-server-51-release-notes.html>

## 1-2 Related documents

The documents for vSphere 5.1 are available at the VMware websites below.

- VMware vSphere documents

<http://www.vmware.com/support/pubs/vsphere-esxi-vcenter-server-pubs.html>

- vSphere Upgrade

<http://pubs.vmware.com/vsphere-51/topic/com.vmware.ICbase/PDF/vsphere-esxi-vcenter-server-51-upgrade-guide.pdf>

- System requirements

<http://pubs.vmware.com/vsphere-51/topic/com.vmware.vsphere.install.doc/GUID-BE89A906-6D49-4793-88BB-C63112E3B131.html>

For details about the hardware and software compatibility, visit the VMware websites below.

- Hardware, Host Operating System, and Guest Operating System Compatibility Guide (VMware Compatibility Guide)

<http://www.vmware.com/resources/compatibility/search.php>

- VMware Product Interoperability Matrixes

[http://partnerweb.vmware.com/comp\\_guide2/sim/interop\\_matrix.php?](http://partnerweb.vmware.com/comp_guide2/sim/interop_matrix.php?)

- VMware 5.1 Configuration Maximums

<http://www.vmware.com/pdf/vsphere5/r51/vsphere-51-configuration-maximums.pdf>

## 1-3 Other information

- Trademarks

VMware products are protected by one or more of the patent numbers listed at <http://www.vmware.com/download/patents.html>. VMware is a trademark or registered trademark of VMware, Inc. in the United States and/or other jurisdictions. All other names and products are trademarks or registered trademarks of their respective owners.

In addition, all company names and product names in this document are trademarks or registered trademarks of their respective owners. The (R) and TM symbols have been omitted from this document.

- Abbreviations

In this document, each component of the VMware product is abbreviated as follows:

<b>Component Name</b>	<b>Abbreviation</b>
VMware vSphere	vSphere
VMware ESXi	ESXi
VMware vCenter Server	vCenter Server
VMware vSphere Client	vSphere Client
VMware vCenter Converter for vCenter Server	vCenter Converter
vSphere Data Protection	Data Protection
VMware vSphere Distributed Power Management	vSphere DPM
VMware vSphere Fault Tolerance	VMware FT
vCenter Single Sign On	SSO
VMware vSphere Update Manager	Update Manager
vCenter Inventory Service	Inventory Service
vSphere Web Client	Web Client
VMware VirtualCenter Management Webservices	Webservices

- URLs

The URLs in this document are subject to change or deletion without notice.

## 2 Notes Common to the VMware Products and Each Component

### 2-1 Obtaining the latest version

To obtain the latest components of VMware vSphere 5.1, download and install the NEC-dedicated module (NEC Custom Image) from the following VMware website:

[https://my.vmware.com/web/vmware/info/slug/datacenter\\_cloud\\_infrastructure/vmware\\_vsphere/5\\_1#drivers\\_tools](https://my.vmware.com/web/vmware/info/slug/datacenter_cloud_infrastructure/vmware_vsphere/5_1#drivers_tools)

Click on the **Drivers & Tools** tab, and then expand the **OEM Customized Installer CDs** category.

- \* Downloading of the NEC-dedicated module requires that you login to the account at the VMware portal site in which the VMware vSphere 5.1 license (serial key) was registered.

### 2-2 Applying the latest patch

NEC checks patches released by VMware Inc. and releases verified patches through its PP support service. To ensure stable system operation, apply the latest patches made available through this service.

### 2-3 Name resolution for ESXi and vCenter Server

For a vSphere 5.1 environment, it must be possible for each node (ESXi, vCenter Server, vSphere Client, or Web Client) to perform mutual name resolution according to the IP address, host name (FQDN), or host name (short name), and the ping function must be available.

Installation of vCenter Server might fail if the host name of vCenter Server cannot be resolved by FQDN reverse lookup.

It must also be possible for vSphere Client or Web Client to perform name resolution for each node (ESXi and vCenter Server), and the ping function must be available.

The DNS name must be able to be resolved to configure Data Protection.

## 2-4 System time of ESXi and vCenter Server

For an environment in which ESXi and vCenter are used, use NTP to synchronize all the physical machine times. To accomplish this, set up a configuration in which NTP clients run on both the ESXi hosts and the Windows servers on which vCenter Server is installed to synchronize the time with an external NTP server.

If the times for different ESXi hosts differ, the guest OS system time can become invalid when, for example, VMotion is used to migrate a virtual machine, which can cause jobs for that OS to execute incorrectly.

Set up synchronization with the NTP server time on an ESXi host following the procedure below:

### ■ vSphere Client

- (1) Connect to the ESXi host from vSphere Client.
- (2) Select the **Configuration** tab.
- (3) Select **Time Configuration** in the **Software** section, and then click **Properties...** at the upper right of the window.
- (4) Select the **NTP Client Enabled** check box in **NTP Settings**.
- (5) In **NTP Settings**, click **Options**.
- (6) Click **NTP Settings** and click **Add** to add an NTP server.
- (7) Enter the NTP server IP address, and then click **OK**.
- (8) Select the **Restart NTP service to apply changes** check box, and then click **OK**.
- (9) Select **Cancel** to close the **Time Configuration** dialog box.

### ■ Web Client

- (1) Log onto Web Client as the root user.
- (2) Move to **vCenter**, and then to **Hosts and Clusters** from the navigator on the left of the Web Client window, and select the name of the host to be set up.
- (3) Select the **Manage** tab, and then **Settings**.
- (4) Under **System**, select **Time configuration**, and then click **Edit**.
- (5) Click **Use Network Time Protocol (Enable NTP client)** on the **Edit Time Configuration** dialog box.
- (6) Enter the IP address or host name of the NTP server to be used in the **NTP Servers** text box. Select an option for starting or stopping the NTP service from the **NTP Service Startup Policy** drop-down list.
- (7) Click **OK** on the **Edit Time Configuration** window to close the dialog box.

## 2-5 Restrictions on usable characters

For an environment in which ESXi or vCenter Server is used, do not use characters other than ASCII characters (including two-byte characters) for virtual machine names, the virtual machine comment field, virtual disk names, virtual network names, datastore names, resource pool names, image file names (CDs, DVDs, or FDDs), or other settings. If non-ASCII characters are used, some vSphere 5.1 features might not work correctly.

## 2-6 Application of license

If you start vSphere Client in the Japanese mode , connect to vCenter Server, and apply the license, the license application fails. You can avoid this by directly connecting to ESXi.

When connecting to vCenter Server before applying the license, use Web Client or start vSphere Client in the English mode.

- How to start vSphere Client in the English mode

Add `- locale en_US` to the argument in `VpxClient.exe` before starting vSphere Client.

Example: Execution example in which vSphere Client is installed in the default folder

```
C:\Program Files (x86)\VMware\Infrastructure\Virtual Infrastructure  
Client\Launcher\VpxClient.exe" -locale en_US
```

## 3 Notes Common to ESXi

### 3-1 BIOS settings on a physical machine

Set the BIOS time for a physical machine on which ESXi runs to a UTC time (Japan standard time - 9 hours). This is because ESXi always handle the physical machine BIOS time as a coordinated universal time (UTC).

### 3-2 BIOS NUMA setting

If the **NUMA Configuration** setting is available in the BIOS settings for the NEC Express5800 series, set it to **Enabled**.

#### Setup method

On the POST screen, press the **F2** key to display the **BIOS SETUP** screen, and then specify the following item.

#### Advanced - Memory Configuration

**NUMA Configuration: Enabled**

### 3-3 Notes on using snapshots of virtual machines

#### 3-3-1 Necessary virtual disk space

To use snapshots, allocate datastore space equal to twice the size of the parent virtual disk for each snapshot generation.

$$\text{Required free space} = \text{Parent virtual disk size} \times (\text{number of snapshots} + 1)$$

When the snapshot of a virtual machine is created, a differencing disk is created in addition to the parent virtual disk, and data subsequently written to the virtual disk is instead written to the differencing disk. The size of this disk might increase up to the same size as the parent virtual disk. A temporary area that potentially has the same size as the parent virtual disk at most is required for each virtual disk to delete snapshots.

Example: Maximum disk space required in the datastore when creating three snapshots in the virtual machine with a 10-GB virtual disk

$$10 \text{ GB (parent disk)} + \underbrace{10 \text{ GB} \times \{ 3 \text{ (number of snapshots)} + 1 \text{ (temporary area)} \}}_{\uparrow \text{ Required free space}} = 50\text{GB}$$

#### 3-3-2 Notes on deleting snapshots

When deleting snapshots, free space approximately equal to the size of the parent virtual disk is necessary as a temporary area. If this free area cannot be allocated, it is not possible to delete snapshots.

### 3-4 Notes on changing the LUN configuration of LUNs in a SAN

Do not make the following changes to the LUN configuration from the storage (SAN) while ESXi is running:

- Deleting LUNs
- Adding LUNs (such that the numbers of existing LUNs change)

If the above LUN configuration changes are made while ESXi is running, the ESXi host might stop responding or data might be damaged.

### 3-5 Path policy when using a SAN

If using a multi-path configuration in an FC SAN or iSCSI SAN environment, see the *Hardware, Host, Guest Operating System and Guest Operating System Compatibility Guides* for details about usable path policies:

**Note** For the document link, see *1-2 Related documents*.

### 3-6 Installing the Outbox driver

If the Outbox driver is not present on the installation media, it must be installed separately.

Download and install the Outbox driver as described below:

The correspondence between the onboard and option devices and drivers can be found at the following URL:

<http://www.nec.co.jp/vmware/vs5/driver.html>

If the Outbox driver is not present on the installation media, install it as described below:

(1) Download the latest driver file (zip file) from the following URL:

[https://my.vmware.com/web/vmware/info/slug/datacenter\\_cloud\\_infrastructure/vmware\\_vsphere/5\\_1#drivers\\_tools](https://my.vmware.com/web/vmware/info/slug/datacenter_cloud_infrastructure/vmware_vsphere/5_1#drivers_tools)

(2) Unzip the downloaded zip file and then copy the vib file from the unzipped file to the client terminal on which vSphere Client was installed.

For the procedures below, refer to the procedures for your client tool (vSphere Client or Web Client).

■ Installing the Outbox driver using vSphere Client

(1) Use vSphere Client to switch ESXi to maintenance mode.

**Switching ESXi to maintenance mode**

- i. Connect to ESXi on vSphere Client.
- ii. Right-click the ESXi icon in the inventory, and then select **Enter Maintenance Mode**.

(2) Select the ESXi icon in the inventory and then click the **Configuration** tab.

(3) Select **Storage** in the **Hardware** section.

A datastore list will appear. Right-click the datastore to which the vib file is to be uploaded and then select **Browse Datastore**.

(4) The Datastore Browser window will appear. Click the **Create New Folder** icon from the toolbar located in the upper part of the window to create a "vib" folder.

(5) From the toolbar located in the upper part of the Datastore Browser, click the **Upload** icon and then select **Upload File**.

(6) When an item upload window appears, select a vib file and then click **Open**.

(7) If a warning dialog box for upload/download appears, select **Yes**.

(8) When the **Uploading** dialog box disappears, upload is complete.

(9) Select **Troubleshooting Options** from a direct console, enable accessing ESXi Shell by SSH or the direct console, and then log into ESXi Shell. (To log into ESXi shell from the direct console, press **Alt + F1**.)

(10) Execute the following command to install the driver:

```
esxcli software vib install -v <vib file>
```

\* In <vib file>, specify an absolute path like /vmfs/volumes/datastore1/vib/XXXXXX.vib.

Once the driver installation is complete, the following message will appear.

```
Installation Result
```

```
Message: The update completed successfully, but the system needs to  
be rebooted for the changes to be effective.
```

```
Reboot Required: true
```

```
VIBs Installed: <Driver Name>
```

```
VIBs Removed:
```

```
VIBs Skipped:
```

(11) Execute the reboot command to restart the server.

(12) Log into ESXi Shell and then execute the following command to check that the driver has been successfully installed:

```
esxcli software vib list | less
```

(13) Delete the uploaded vib file and then log out from ESXi Shell. (If you logged into ESXi Shell from the direct console, execute the exit command and then press **Alt + F2**.)

(14) Select **Troubleshooting Options** from the direct console and then return the ESXi Shell access settings to their original values.

(15) Connect to ESXi from vSphere Client and then exit maintenance mode.

■ Installing the Outbox driver using Web Client

**Switching ESXi to maintenance mode**

- i. Log onto Web Client as the root user.
- ii. Select **vCenter**, and then **Hosts and Clusters** from the navigator on the left of the Web Client window and move to the ESXi host in the inventory.
- iii. Right-click the ESXi icon in the inventory and select **Enter Maintenance Mode**.
- iv. Move to **vCenter**, and then to **Storage** from the navigator on the left of the Web Client window, and select the datastore name.

(1) Use Web Client to switch ESXi to maintenance mode.

(2) Select the **Manage** tab and select **File**.

(3) Select the **New folder** icon on the top right of the window.

(4) Enter the new folder name, `vib`, on the **New folder** window and select **Create**.

(5) Select the **Upload file to datastore** icon on the top right of the window.

The balloon showing **Install the client integration plug-in to enable file transfer** appears when you place the mouse cursor over the icon, download and install the plug-in installation module. (Internet Explorer must be closed before this operation.)

After completing installation, repeat the procedure from step (3) again.

(6) Select the `vib` file on the **Open** window and click **Open**.

(7) Wait until the upload process is complete.

(8) Select **Troubleshooting Options** from a direct console, enable accessing ESXi Shell by SSH or the direct console, and then log into ESXi Shell. (To log into ESXi shell from the direct console, press **Alt + F1**.)

(9) Execute the following command to install the driver:

```
esxcli software vib install -v <vib file>
```

\* In `<vib file>`, specify an absolute path like `/vmfs/volumes/datastore1/vib/XXXXXX.vib`.

Once the driver installation is complete, the following message will appear.

```
Installation Result
```

```
Message: The update completed successfully, but the system needs to  
be rebooted for the changes to be effective.
```

```
Reboot Required: true
```

```
VIBs Installed: <Driver Name>
```

```
VIBs Removed:
```

```
VIBs Skipped:
```

(10) Execute the reboot command to restart the server.

(11) Log into ESXi Shell and then execute the following command to check that the driver has been successfully installed:

```
esxcli software vib list | less
```

(12) Delete the uploaded vib file and then log out from ESXi Shell. (If you logged into ESXi Shell from the direct console, execute the exit command and then press **Alt + F2**.)

(13) Select **Troubleshooting Options** from the direct console and then return the ESXi Shell access settings to their original values.

(14) Connect to ESXi from vSphere Client and then exit maintenance mode.

### 3-7 BIOS device boot order

When installing ESXi to a USB flash device, In the BIOS settings for the device boot order of the physical machine, set **USB HDD** to a higher priority than **PCI SCSI**. If the device boot order is specified incorrectly, ESXi cannot be started.

#### Setup method

On the POST screen, press the **F2** key to display the **BIOS SETUP** screen, and then specify the following item.

#### Boot

Specify the settings so that **USB HDD** is higher than **PCI SCSI**.

Note that the device boot order is sometimes reverted to the default when upgrading the BIOS. After upgrading the BIOS, check the device boot order settings.

### 3-8 Scratch partition

Check whether the scratch partition is set up appropriately by performing the procedure below.

#### Checking the scratch partition

- vSphere Client
  - 1) Connect to the ESXi host from vSphere Client, and then select the ESXi host from the inventory.
  - 2) On the **Configuration** tab, click **Advanced Settings** in the **Software** section, to display the **Advanced Settings** dialog box.
  - 3) Select **ScratchConfig**, and then check the following item:  
**ScratchConfig.CurrentScratchLocation**  
If the **CurrentScratchLocation** value is `/tmp/scratch`, the scratch partition has not been set up appropriately. Set it up by performing the procedure below.
  
- Web Client
  - 1) Log onto Web Client as the root user.
  - 2) Move to **vCenter**, and then to **Hosts and Clusters** from the navigator on the left of the Web Client window and select the name of the host to be set up.
  - 3) Select the **Manage** tab and select **Settings**.
  - 4) Under **System**, select **Detailed system settings**.
  - 5) Search for the following phrase in the list to see the settings:  
**ScratchConfig.CurrentScratchLocation**  
If the **CurrentScratchLocation** value is `/tmp/scratch`, the scratch partition has not been set up appropriately. Set it up by performing the procedure below.

## Setting up the scratch partition

- vSphere Client
  - 1) Connect to the ESXi host from vSphere Client, and then select the ESXi host from the inventory.
  - 2) On the **Configuration** tab, select **Storage** in the **Hardware** section.
  - 3) Right-click the datastore in which to create the scratch partition, and then click **Browse Datastore**.
  - 4) Create a folder by using the Datastore browser window.  
Do not use non-ASCII characters (including two-byte characters) for the folder name.  
Folder name example: <hostname-scratch>
  - 5) On the **Configuration** tab, click **Advanced Settings** in the **Software** section, to display the **Advanced Settings** dialog box.
  - 6) Select **ScratchConfig**, and then enter the full path of the folder specified above in 4) for **ScratchConfig.ConfiguredScratchLocation**.  
Input example: /vmfs/volumes/<datastorename>/<hostname-scratch>
  - 7) Connect to the ESXi host from vSphere Client, turn off the running virtual machine by using the inventory, right-click the ESXi host, and then click **Restart**.
  
- Web Client
  - 1) Log onto Web Client as the root user.
  - 2) Move to **vCenter**, and then to **Storage** from the navigator on the left of the Web Client window, and select the datastore name.
  - 3) Select the **Manage** tab, and then **File**.
  - 4) Select the **New folder** icon on the top right, enter the new folder name on the **New folder** window and select **Create**.
  - 5) Move to **vCenter**, and then to **Hosts and Clusters** from the navigator on the left of the Web Client window, and select the name of the host to be set up.
  - 6) Click the **Manage** tab, and then select **Settings**.
  - 7) Under **System**, select **Detailed system settings**.
  - 8) Select the following item from the list and select the **Edit** icon at the left top.  
**ScratchConfig.CurrentScratchLocation**.
  - 9) Enter the full path for the folder name specified in **Edit detailed option** in step (4).  
Entry example: /vmfs/volumes/<datastorename>/<hostname-scratch>
  - 10) Move to **vCenter**, and then to **Hosts and Clusters** from the navigator on the left of the Web Client window, right-click the virtual machine operating in ESXi, and select **Shutdown guest OS** to turn the power off.
  - 11) After turning off the virtual machine, right-click the ESXi host, and then click **Restart**.

### 3-9 Hot Plug Display of Guest OS Network Adapter

If the NIC is removed using **Safely Remove Hardware** in the hot plug display on the taskbar of the guest OS, the virtual NIC configuration is deleted even if **Edit Settings** is not performed from the virtual machine.

ESXi supports virtual NIC hot plug, so the virtual NIC is displayed under **Safely Remove Hardware** on the guest OS.

For this reason, if the NIC is removed when **Safely Remove Hardware** is performed on the guest OS, the virtual NIC is deleted from the virtual machine.

To prevent the deletion of the virtual NIC from the guest OS, disable the virtual NIC hot plug function and hide the virtual NIC in **Safely Remove Hardware**.

#### ■ vSphere Client

- (1) Connect to ESXi from vSphere Client.
- (2) Shut down the target guest OS.
- (3) Right-click the target guest OS list and then select **Edit Settings**.
- (4) Under **Virtual Machine Properties**, select the **Options** tab.
- (5) Click **Advanced, General**, and then **Configuration Parameters**.
- (6) Select the **Add Row** button, and then type `devices.hotplug` for the name and `false` for the value, and click **OK**.
- (7) Under **Virtual Machine Properties**, click **OK**.

#### ■ Web Client

- (1) Log onto Web Client as the root user.
- (2) Move to **vCenter**, and then to **Virtual machine and template** from the navigator on the left of the Web Client window.
- (3) Shut down the target guest OS.
- (4) Right-click the target guest OS and select **Edit Settings**.
- (5) Select **Virtual machine options** on the **Edit Settings** window.
- (6) Click **Edit configuration** in **Configuration Parameters** of **Advanced**, and then click **Add row** in the **Configuration Parameters** window.
- (7) Enter `devices.hotplug` for the name and `false` for the value, click **OK** on the **Configuration Parameters** window, and click **OK** in **Edit Settings**.
- (8) Right-click the target guest OS and select **ON** to start operation.

### 3-10 ESXi Behavior When an APD (ALL Path Down) Occurs

If an APD occurs on a communication network such as a network or FC cable, ESXi will not be able to access devices. This might cause indefinite ESXi behavior or the virtual machine might fail to respond.

For this reason, we strongly recommend that you configure your system with a redundant communication path so that a single point of failure does not disable the system.

For details about the ESXi behavior when an APD occurs, see the following VMware knowledge base:

Permanent Device Loss (PDL) and All-Paths-Down (APD) in vSphere 5.0  
<http://kb.vmware.com/kb/2004684>

### 3-11 Notes on the environment in which the blade server is used

If you connect and disconnect a USB connected DVD drive while ESXi is operating, the drive might not be usable from the guest OS even if you select "Host device" as the device type of the CD/DVD drive in the virtual machine.

This description applies to the DVD drive incorporated in the blade housing unit, which is connected via USB.

Perform one of the following workarounds to prevent this.

- Select **Client Device** or **Datastore ISO File** for the device type of the CD/DVD drive in the virtual machine.
- Execute the following command in the ESXi direct console to restart hostd.  
`/etc/init.d/hostd restart`

For details about this phenomenon, refer to the VMware knowledge base shown below.

"Physical USB CD-ROM devices attached to ESX/ESXi hosts are not listed as available choices for adding SCSI passthrough devices to a virtual machine"

<http://kb.vmware.com/kb/1036339>

### 3-12 Notes on adding a datastore

The following error is output and the datastore cannot be created if you start vSphere Client in the Japanese mode and add the datastore from **Storage** on the **Configuration** tab.

```
Error: Internal error in vSphere Client.  
Details: The format of entered string is not correct.
```

To create a datastore, use Web Client or start vSphere Client in the English mode.

#### To start vSphere Client in the English mode

Add `- locale en_US` to the argument in `VpxClient.exe` before starting vSphere Client.

Example: Execution example in which vSphere Client is installed in the default folder

```
"C:\Program Files (x86)\VMware\Infrastructure\Virtual Infrastructure  
Client\Launcher\VpxClient.exe" -locale en_US
```

### 3-13 Use of passthrough PCI device in the virtual machine

There is a known problem that ESXi stops if you configure a passthrough PCI device in the virtual machine on ESXi 5.1.

Do not configure a passthrough PCI device in the virtual machine on ESXi 5.1.

For details about this problem, refer to the VMware knowledge base shown below.

"ESXi 5.1 host fails with a purple diagnostic window when powering on a virtual machine with a PCI passthru device"

<http://kb.vmware.com/kb/2039030>

## 4 Notes on vCenter Server

### 4-1 Notes on the vCenter Server database

#### 4-1-1 Usable databases

For details about the types and versions of databases that can be used as the vCenter Server, SSO, or Update Manager database, see the *VMware Product Interoperability Matrixes*.

**Note** For the document link, see *1-2 Related documents*.

#### 4-1-2 Database configuration

For details about the configuration of and how to set up the vCenter Server, SSO, or Update Manager database, see the VMware documents.

**Note** For the document link, see *1-2 Related documents*.

#### 4-1-3 Automatic tablespace expansion

If the tablespace for the vCenter Server is insufficient, the **VirtualCenter Server** service stops or can no longer be started. Therefore, when setting up the vCenter Server database, configure the tablespace to automatically extend.

#### 4-1-4 Use of the same instance by multiple applications

Set up the configuration so that different instances are used for applications other than vCenter Server and SSO. Configurations in which applications other than vCenter Server use the vCenter Server instance are not supported.

#### 4-1-5 When SQL Server is set up as the vCenter Server database

- Data source drivers that can be used for the system DSN  
Only an SQL Native Client data source driver can be used for the vCenter Server system DSN.
- ODBC connection configuration  
Create a vCenter Server-dedicated database. Do not use the SQL Server master database.
- Database recovery model  
If the *full recovery model* is specified as the database recovery model, the disk space might become insufficient if the transaction log gets too big. To prevent the disk space from becoming insufficient, it is recommended to periodically back up the transaction log or specify the *simple recovery model* as the database recovery model.
- Required services  
The SQL Server services required for vCenter Server are **SQL Server** and **SQL Server Agent**. If the **SQL Server Agent** service is not running, rollup processing is not executed on the statistics data, and the performance chart might not be displayed correctly.

#### 4-1-6 When Oracle 10g is set up as the vCenter Server database

If using Oracle 10g, version 10.2.0.4 must be used.

#### 4-1-7 When the SSO database is set up

When using SQL Server or Oracle as the SSO database, create an SSO database before installing SSO.

To create the database, execute the script `rsaIMSLite<DBName>SetupTablespaces.sql`.

This script is included in the download package of the vCenter Server installer located at:

```
<vCenter Server installation directory>\Single Sign  
On\DBScripts\SSOserver\Schema\<existing database>
```

When using SQL Server as the SSO database, create an SQL authentication instance. The Windows authentication instance is not supported.

#### 4-2 When vCenter Server has not yet booted when the vCenter Server service is starting

In an environment in which Oracle is used as a vCenter Server database, vCenter Server might not yet have booted when the vCenter Server service is starting.

This occurs when the password expiration date of the vCenter Server database user has already passed. This phenomenon occurs because the validity period of the database password is set to 180 days by default in Oracle 11g.

If this symptom occurs, first start **ODBC Data Source Administrator** according to steps (1) to (3) below and then check the password expiration date of the vCenter Server database user. If the password expiration date has already passed, perform steps (4) to (8) below.

For the Oracle account for vCenter Server, change the validity period of the database password to indefinite or perform maintenance so that the password does not expire, for example by periodically renewing the password.

- (1) From the **Start** menu, select **Administrative Tools** and then **Data Sources (ODBC)** to open the **ODBC Data Source Administrator** dialog box.
- (2) Select the **System DSN** tab. On the **System DSN** tab, select **System DSN for vCenter Server** and then click the **Configure** button.
- (3) Click the **Test Connection** button. Enter the password of the database connection user and then click **OK**.

If the **Oracle Change Expired Password** window appears during the connection test, it indicates that this symptom occurred because the password expiration date of the vCenter Server database user has passed.

- (4) In the **Oracle Change Expired Password** window, enter the old and new passwords and then click **OK**.
- (5) Click **OK** to exit **ODBC Data Source Administrator**.
- (6) Select **Start** and then **Run**.

Enter `cmd` in the **Open** field and then click **OK** to start the command prompt.

- (7) Execute the following command:

```
> <vCenter Server install path>\vpxd.exe -p
```

Execution example:

```
> "C:\Program Files\VMware\Infrastructure\VirtualCenter  
Server\vpxd.exe" -p
```

- (8) When **Enter new DB Password:** (password input request) appears, enter the new password.

### 4-3 The vCenter Server service does not start after the system restarts

This phenomenon occurs in an environment in which SQL Server 2008 R2 Express bundled with the vCenter Server installer is used as the SSO database when SSO and vCenter Server are installed in the same server.

This phenomenon occurs because the port number that SQL Server 2008 R2 Express uses changes after the system restarts.

Take the following action if this phenomenon occurs.

- (1) Check the port number that SQL Server 2008 R2 Express uses.

The currently used port number can be checked by executing the `netstat -ano` command or using the SQL Server Configuration Manager (by selecting **Programs, Microsoft SQL Server 2008 R2**, and then **Configuration Tools**).

Refer to the knowledge base shown below as well.

“Update vCenter Single Sign On settings after you change the host name or port of the database server”

<http://kb.vmware.com/kb/2033516>

- (2) Stop the SSO service.

- (3) Open the command prompt on the server where SSO is installed and enter the following command:

```
<ssoserver folder>\utils> ssocli configure-riat -a configure-db  
--database-port <new database port> -m <master password>
```

- The default value for `<ssoserver folder>` is as follows:  
C:\Program Files\VMware\Infrastructure\SSOserver
- Specify the port number for SQL Server 2008 R2 Express checked in step (1) in `<new database port>`.

- (4) Edit the `config.properties` file in the folder below.

```
<ssoserver folder>\webapps\lookupservice\WEB-INF\classes\  
config.properties
```

Replace the value in `portNumber=` with the new port number on the line beginning with `db.url=`.

- The default value for `<ssoserver folder>` is as follows:  
C:\Program Files\VMware\Infrastructure\SSOserver

- (5) Start the SSO service.

- (6) Start the Webservices service. (Start the dependent vCenter Server services as well.)

## 4-4 Notes on virtual machine deployment using a template

### 4-4-1 Customization for Windows guest OS deployment

When using a template for virtual machine deployment and changing the administrator password during customization, specify a blank administrator password for the template-source virtual machine before creating the template. If any other password is specified, the password is not applied and the administrator password of the template-source is set.

## 4-5 Notes on vCenter Server Related Products

### 4-5-1 vCenter Converter

vCenter Converter can be used to create, edit, or manage a task for migrating from a physical machine to a virtual machine (P2V) or from one virtual machine to another (V2V).

However, migration is not 100% guaranteed by vCenter Converter. Even if the vCenter Converter migration task finishes, migration might fail for reasons such as the guest OS not starting up correctly depending on the migration-source hardware configuration, operating system settings, and types of used applications.

The type of host bus adapter or network adapter might change to match the virtual machine environment due to migration. Therefore, the used driver, MAC address, and other settings for the migration-target virtual machine environment might change.

The keyboard settings, mouse settings, and other settings might also change.

For migration by a hot clone, stop as many services as possible, other than those needed for OS start, on the physical machine of the migration source and then apply migration.

For details about vCenter Converter, refer to the VMware knowledge base shown below.

“Best practices for using and troubleshooting VMware Converter”

<http://kb.vmware.com/kb/1004588>

“Troubleshooting checklist for VMware Converter”

<http://kb.vmware.com/kb/1016330>

### 4-5-2 Update Manager

NEC only supports ESXi host scanning and correction (patch application). Virtual machine and application scanning and correction are not supported. Apply only the patches disclosed for the NEC PP support service to ESXi correction (patch application).

### 4-5-3 Data Protection

Data Protection is provided as a virtual appliance created based on SUSE Linux Enterprise 11. The default keyboard type for VMware Data Protection is an English keyboard. When logging in to Data Protection, an English keyboard arrangement must be used to enter the user name and password.

**Reference** Perform the following steps to change to the Japanese keyboard sequence.

- (1) Log into the Data Protection appliance.
- (2) Open `/etc/sysconfig/keyboard` by using `vi` or another editor.
- (3) Change `KEYTABLE=us` to `KEYTABLE=jp106` and save the `keyboard` file.
- (4) Restart the Data Protection appliance.

Data Protection requires DNS name resolution. Set up the DNS before building Data Protection.

Data Protection can be managed only from Web Client. Note that vSphere Client cannot be used to manage Data Protection.

Register the SSO admin user as the vCenter Server user before using Data Protection. For the registration procedure, refer to *User Account Configuration* in the document shown below.  
“vSphere Data Protection Administration Guide”

<http://pubs.vmware.com/vsphere-51/topic/com.vmware.ICbase/PDF/vmware-data-protection-administration-guide-5120.pdf>  
“User Account Configuration” on pg.18

When using Data Protection, refer to the chapter about troubleshooting in the document shown below.

“vSphere Data Protection Administration Guide”

<http://pubs.vmware.com/vsphere-51/topic/com.vmware.ICbase/PDF/vmware-data-protection-administration-guide-5120.pdf>  
“vSphere Data Protection Troubleshooting ” on pg. 97

## 4-6 Notes on installing vCenter Server

### 4-6-1 Port number used in vCenter Server

If you want to change the default HTTP and HTTPS port numbers (80 and 443) used in vCenter Server 5.1, specify TCP ports other than 10080 and 10443, respectively, at installation. (The ports cannot be changed after installation.)

Example: TCP port 20080

In vSphere 5.1, TCP ports 10080 and 10443 are used for the HTTP port for Inventory Service and the HTTPS port, respectively.

The HTTP port cannot be changed though the HTTPS port can be changed during reinstallation.

### 4-6-2 Message recorded in the vCenter Server event log

#### 4-6-2-1 ADAM VMwareVCMSDS

The following event might be recorded in the OS event log in the environment where vCenter Server 5.x is installed on Windows 2008 R2.

Event source: ADAM\_VMWareVCMSDS

Event ID: 1209

You can ignore this message, which is harmless. To prevent this message from appearing, take the action described in the VMware knowledge base shown below.

“Active Directory Web Services fails to read the settings for the specified Active Directory Lightweight Directory Services instance”

<http://kb.vmware.com/kb/1023864>

#### 4-6-2-2 VMware vCenter Server

The following message is recorded in the event log on the Windows machine where vCenter Server is installed.

Event source: VMware VirtualCenter Server

Event ID: 1000

Description: There is no description about event ID 1000 from the source "VMware VirtualCenter Server."

(omitted)

This event includes the following information:

Log directory: C:\Users\Administrator\AppData\Local\VMwarevpx.

Although the message resource exists, the message cannot be found in the string and message tables.

To normally output the message, copy `vmeventmsg.dll` from the vCenter Server installation media.

- File to be copied  
`vmeventmsg.dll`
- Copy source (vCenter Server installation media)  
`\vCenter-Server\dbupgrade\bin\`
- Copy destination  
Copy `vmeventmsg.dll` to the folder registered in the following registry.  
`\HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\services\eventlog\Appli  
cation\`

```
VMware VirtualCenter Server\EventMessageFile  
(for installation using default settings)  
C:\Program Files\VMware\Infrastructure\VirtualCenter Server\
```

This matter is described in the VMware knowledge base shown below.

“Windows MOM monitor indicates that vmeventmsg.dll is missing”

<http://kb.vmware.com/kb/1008268>

#### **4-6-3 When using the latest version of vCenter Server 5.1**

When using vCenter Server 5.1, use the latest version of vCenter Server 5.1b (Build 947939) for stable system operation.

For known issues corrected in vCenter Server 5.1b, refer to the VMware release notes shown below.

“vSphere 5.1.0b Release Notes”

<http://www.vmware.com/support/vsphere5/doc/vsphere-vcenter-server-510b-release-notes.html#resolvedissues>

“vCenter Server Services hang on startup after upgrading to vCenter Server 5.1”

<http://kb.vmware.com/kb/2035623>

## 5 Notes on vSphere Client and Web Client

### 5-1 Obtaining the vSphere Client installation file

To install vSphere Client in an environment for which the vSphere Client license has not been purchased, download the vSphere Client installation file from the following website:

“VMware vCenter Server 5.1.0b and modules”

<https://my.vmware.com/web/vmware/details?downloadGroup=VCL-VSP510-VC-510B-EN&productId=327&rPId=3495>

Click **Manually Download** to download VMware vCenter Server 5.1.0b and modules (VMware-viclient-all-5.1.0-941839.exe).

\* You must log in with the VMware portal site account for which the VMware vSphere 5.x or vCenter Server 5.x license (serial key) is registered to download these modules.

### 5-2 Notes on connecting from a client terminal to vCenter Server

#### 5-2-1 Port numbers used for a connection between a client terminal and vCenter Server

For the port numbers used for communication between vSphere Client and vCenter Server, as well as Web Client and vCenter Server, refer to the VMware knowledge base shown below.

“TCP and UDP Ports required to access vCenter Server, ESXi/ESX hosts, and other network components”

<http://kb.vmware.com/kb/1012382>

If there is a router, firewall or other network device that blocks port number communication between vSphere Client and vCenter Server, open the port specified in the knowledge base.

#### 5-2-2 Notes on changing the vCenter Server HTTPS port number

When a vCenter Server HTTPS port number other than the default 443 is specified, specify a value for the host name field in the format <host name>:<HTTPS port number> when connecting from vSphere Client. If the port number is omitted, the attempt to connect to vCenter Server fails.

Example of specifying the HTTPS port number 20443:

hostname:20443

#### 5-2-3 Setting up name resolution for the ESXi by using the client terminal

Specify settings so that it is possible to perform name resolution for the ESXi by using the client terminal on which vSphere Client or Web Client is installed. If name resolution is not possible, the following message is displayed, and the virtual machine console cannot be opened:

Unable to connect to the MKS: Failed to connect to server XXXXXXXXXXXX:902.

### 5-3 Logging into vCenter Server from Web Client

Open the browser and enter `https://<web client-hostname>:<port>/vsphere-client` as the URL of Web Client.

The default port is 9443.

### 5-4 Setting up Web Client

It is necessary to install Web Client on the server to use it.

The browser listed below and Adobe Flash Player version 11.1.0 or later, with which Web Client operates, are required to use Web Client from the client terminal.

Microsoft Internet Explorer 7, 8, or 9

Mozilla Firefox 3.6 or later

Google Chrome 14 or later

For the system requirements required to install Web Client, refer to *Hardware Requirements for Web Client* and *Software Requirements for vSphere Client and Web Client* in the VMware document *vSphere Installation and Setup*.

\* For the document link, see *1-2 Related documents*.

The client integration plug-in must be installed on the client terminal to access the virtual machine console using Web Client.

If the client integration plug-in is not installed, the virtual device cannot be accessed. For example, the **Connect to CD/DVD Image on Local Disk** function cannot be used.

#### To install the client integration plug-in

(1) Download the client integration plug-in installation module by following one of the procedures below.

##### **Procedure 1** If you have not logged into Web Client

Start the browser and enter the following URL.

`https://<web client-hostname>:<port>/vsphere-client`

The default port number is 9443.

When the login window is displayed, click **Download Client Integration Plug-in** at the bottom of the window to download the client integration plug-in installation module.

##### **Procedure 2** If you have already logged in Web Client

Select the version information of VMware vSphere from the menu help window.

Click **Download Client Integration Plug-in** in the **Client Integration Plug-in** field to download the client integration plug-in installation module.

\* The download link is not displayed in an environment in which the client integration plug-in is already installed both for **Procedure 1** and **Procedure 2**.

(2) Execute the downloaded installation module,

`VMware-ClientIntegrationPlugin-5.1.0.exe`, with the browser window closed.

For details, refer to *Install the Client Integration Plug-in on the vSphere Web Client* in the

VMware document *vSphere Virtual Machine Administration Guide*.

\* For the document link, see *1-2 Related documents*.

## 5-5 Notes on using vSphere Client in a Windows XP or Windows 2003 environment

The following functions cannot be used when vSphere Client is used in a Windows XP or Windows 2003 environment.

Viewing the **Performance Summary** page

Displaying the **Hardware Status** tab

Displaying the **vCenter Service Status**

The above functions can be used when Web Client is used.

There is no workaround for the Windows XP (32-bit) environment.

For Windows 2003 or Windows XP 64-bit, apply the hotfix released from Microsoft to resolve this issue.

For details about this issue and where to obtain the hotfix, refer to the *vSphere 5.1 Release Notes* shown below.

<http://www.vmware.com/support/vsphere5/doc/vsphere-esx-vcenter-server-51-release-notes.html>

- Search fails and Hardware Health and Health Status plug-ins are disabled in the vSphere Client

## 5-6 Notes on using the CD/DVD image of a virtual machine from Web Client

When the CD/DVD image of a virtual machine is used from Web Client, the extension might not be properly displayed when the ISO file to be mounted on the virtual machine is selected.

To resolve this issue, change the browser language setting to English.

For example, if your browser is Internet Explorer, select **Internet Options**, **General** tab, and then **Languages**. Next, add **English (United States) [en-us]** in the **Language Preference** dialog box and assign top priority to it.

## 6 Notes on Other Components

### 6-1 vSphere HA

#### 6-1-1 Preventing a warning message in a vSphere HA cluster configuration

In an environment in which a vSphere HA cluster is set up, the following warning message might be displayed on the vSphere Client or Web Client ESXi **Summary** tab:

```
Host xxx currently has no management network redundancy
```

The above message is displayed when there is no network redundancy for vmkernel.

This message can be prevented either by establishing network redundancy for vmkernel or by setting `das.ignoreRedundantNetWarning` to `true` in **Advanced Options** of **VMware HA**.

#### 6-1-2 Automatically starting or stopping virtual machines

In an environment in which a vSphere HA cluster is set up, do not use the ESXi host feature for automatically starting or stopping virtual machines. For details, refer to the VMware document *vSphere Virtual Machine Administration Guide*.

\* For the document link, see *1-2 Related documents*.

### 6-2 vSphere FT

To use vSphere FT, the server must be certified for it. For the vSphere FT authentication status, visit the following website:

<http://www.nec.co.jp/vmware/vs5/FT.html>

## 7 Notes on Guest OSs

### 7-1 Notes on using a Linux guest OS in a SAN storage system

When running a virtual machine whose guest OS is RHEL5, RHEL4 U4, RHEL4 U3, SLES10, or SLES9 SP3 on a datastore allocated to a SAN storage system, the guest OS file system might become read-only if disk I/O operations occur frequently on the guest OS or if an FC path failover occurs. This problem is due to the device driver of LSI Corporation included in the above Linux guest OSs and does not occur for Windows guest OSs. When using any of the above OSs, take the action described in the following VMware knowledge base:

<http://kb.vmware.com/kb/51306> Linux based file systems become read-only

### 7-2 Installing VMware Tools in a Windows guest OS

#### 7-2-1 Installing the shared folder and virtual print (Thinprint) functions

The shared folder and virtual print (Thinprint) functions in VMware Tools are included for compatibility with VMware Tools in other VMware products such as VMware Workstation, and cannot be used in the ESXi environment.

The following phenomenon might occur if these functions are installed in the ESXi environment:

- Some of guest OS functions (such as the file search function) might not operate normally if the shared folder function is installed.
- The virtual print-related message is output to the event log if the virtual print (Thinprint) function is installed.

Therefore, do not install these VMware Tools functions in the Windows guest OS. (These functions are not installed by default.)

Install VMware Tools by performing the following procedure:

#### ■ vSphere Client

- (1) Start vSphere Client, and then select a virtual machine on the inventory window.  
Select **Install/Upgrade VMware Tools** from the menu, and then start the VMware Tools installation wizard on the guest OS interactively.
- (2) Click **Next** in the installation wizard window.
- (3) Select **Custom** in the Setup Type selection window, and then click **Next**.
- (4) Expand the **VMware Device Drivers** list.
- (5) Click the **Thin Print** icon and select **This feature will not be available**.  
Likewise, click the **Shared Folders** icon in **VMCI driver**, select **This feature will not be available**, and then click **Next**.  
\* **This feature will not be available** is selected for both functions by default.
- (6) Click **Install** to start the installation.
- (7) Click **Finish**, and then restart the guest OS.

■ Web Client

- (1) Start Web Client, select a virtual machine from **Hosts and Clusters** on the home window and click the relevant virtual machine.
- (2) Display the **Summary** tab, select **Install VMware Tools** at the top of the window, and start the VMware Tools installation wizard in the guest OS.
- (3) Click **Next** on the installation wizard window.
- (4) Select **Custom** in the Setup Type selection window, and then click **Next**.
- (5) Expand the **VMware Device Drivers** list.
- (6) Click the **Thin Print** icon and select **This feature will not be available**. Likewise, click the **Shared Folder** icon in **VMCI driver**, select **This feature will not be available**, and then click **Next**.  
\* **This feature will not be available** is selected for both functions by default.
- (7) Click **Install** to start the installation.
- (8) Click **Finish**, and then restart the guest OS.

In an environment in which these functions have been installed, start the VMware Tools installer as shown in step (2), and then select **Modify** in the Program Maintenance window. Next, perform step (6) and subsequent steps to uninstall the function.

### 7-2-2 Installing VMware Tools in a Windows 2000 guest OS

Installation of VMware Tools fails if neither the security issue correction program for Windows 2000 (KB835732) nor the update program rollup 1 for Windows 2000 SP4 is applied to the Windows 2000 guest OS.

Be sure to apply one of the following correction programs before installing VMware Tools in a Windows 2000 guest OS.

“Security Update for Windows 2000 (KB835732)”  
<http://www.microsoft.com/ja-jp/download/details.aspx?id=20806>

“Update Rollup 1 for Windows 2000 SP4”  
<http://www.microsoft.com/ja-jp/download/details.aspx?id=18997>

### 7-3 Setting up the keyboard for a guest OS

If a Japanese guest OS is installed and a Japanese keyboard is set up, the keyboard might be set to an English keyboard after VMware Tools is installed. In this case, change the keyboard to a Japanese keyboard by using the guest OS.

## 7-4 Synchronizing the guest OS time

Use either VMware Tools or the NTP client for time synchronization in the guest OS.

### 7-4-1 Time synchronization function using VMware Tools

- The time synchronization function that VMware Tools in vSphere 5.1 provides synchronizes the time at one-minute intervals.
- If the time in the guest OS is behind the time in ESXi, VMware Tools advances the clock in the guest OS so that the time in the guest OS becomes the same as the ESXi time.
- If the time in the guest OS is ahead of the time in ESXi, VMware Tools delays the clock in the guest OS until the time is synchronized.
- Because the time synchronization function in VMware Tools has the above specifications, it is recommended to operate the NTP client on each guest OS and synchronize the time with the external NTP server if more accurate time synchronization is required.

### 7-4-2 Disabling time synchronization in VMware Tools that functions when certain operations are performed

ESXi synchronizes time when one of the following operations is performed regardless of the settings for the time synchronization function in VMware Tools.

- The VMware Tools service is started. (The virtual machine is restarted or the power is turned on.)
- The suspended virtual machine is resumed.
- The snapshot is restored.
- The disk is compressed.

To prevent time synchronization with ESXi when the above operations are performed, specify the settings described in the VMware manual shown below.

“Installing and Configuring VMware Tools”

<http://www.vmware.com/pdf/vmware-tools-installation-configuration.pdf>

“Configure Time Synchronization Between Guest and Host Operating Systems” on p.32

### 7-4-3 Time synchronization using NTP client

If the clock skew is large in the Windows/Linux guest even though the NTP client is operating, take the action described in the knowledge bases shown below.

“Timekeeping best practices for Linux guests”

<http://kb.vmware.com/kb/1006427>

“Timekeeping best practices for Windows, including NTP”

<http://kb.vmware.com/kb/1318>

## 7-5 Network properties of a guest OS

On the **Network Properties** window of the guest OS, the network bandwidth of a guest OS is displayed as 10 Mbps or 1 Gbps. However, the actual bandwidth is the physical NIC's bandwidth, not the displayed one.

When the guest OS communicates with an external machine, the maximum speed is the communication speed of the physical NIC associated with the virtual switch with which the virtual machine is linked up.

Communication between virtual machines within the same virtual switch might be faster than the performance of the physical NIC because this communication does not go through the physical NIC.

It is therefore meaningless to check the network link speed or communication mode on the guest OS.