ETERNUS

Disk storage systems

Server Connection Guide
(iSCSI)

for VMware® ESX
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Preface

This document briefly explains the operations that need to be performed by the user in order to connect an ETERNUS2000 model 100 or 200, ETERNUS4000 model 300, 400, 500, or 600, or ETERNUS8000 model 700, 800, 900, 1100, 1200, 2100, or 2200 Disk storage system to a server running VMware® ESX using iSCSI Software Initiator via an iSCSI interface.

This document should be used in conjunction with any other applicable user manuals, such as those for the ETERNUS2000 model 100 or 200, ETERNUS4000 model 300, 400, 500, or 600, or ETERNUS8000 model 700, 800, 900, 1100, 1200, 2100, or 2200 Disk storage system, server, OS, adapters, drivers, etc.

This document references the following documents:

- Server Support Matrix
- ETERNUS Disk storage systems Server Connection Guide (iSCSI) ETERNUS Disk Storage System Settings for ETERNUS2000
- ETERNUS Disk storage systems Server Connection Guide (iSCSI) ETERNUS Disk Storage System Settings for ETERNUS4000, ETERNUS8000
- ETERNUSmgr Install Guide
- ETERNUSmgr User Guide

Also, note that in this document the ETERNUS2000 models 100 and 200, ETERNUS4000 models 300, 400, 500, and 600, and ETERNUS8000 models 700, 800, 900, 1100, 1200, 2100, and 2200 Disk storage systems are collectively referred to as ETERNUS Disk storage systems.

Fourth Edition
December 2010

The Contents and Structure of this Manual

This document is composed of the following seven chapters.

- Chapter 1   Workflow
  This describes how to connect the ETERNUS Disk storage systems to a server running VMware ESX.

- Chapter 2   Checking the Server Environment
  This describes which servers can be connected to ETERNUS Disk storage systems.

- Chapter 3   Notes
  This describes issues that should be noted when connecting the ETERNUS Disk storage systems and server.
• Chapter 4  Installing and Setting Up ETERNUSmgr
  This describes how to install ETERNUSmgr.

• Chapter 5  Setting Up the ETERNUS Disk Storage Systems
  This describes how to set up the ETERNUS Disk storage systems.

• Chapter 6  Setting Up the VMware ESX Server
  This describes how to set up the VMware ESX server.

• Chapter 7  Virtual Machine
  This describes how to operate the Virtual Machine.

Safe Use of this Product

Using this manual

This manual contains important information to ensure the safe use of this product. Be sure to thoroughly read and understand its contents before using the product. After reading, store this manual in a safe place for future reference. FUJITSU has made every effort to ensure the safety of the users and other personnel, and to prevent property damage. When using this product, carefully follow the instructions described in this manual.

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Naming Conventions

- **Product names**
  - "VMware ESX" represents the following products.
    - VMware vSphere (ESX 4.1, ESXi 4.1, ESX 4.0, ESXi 4.0)
    - VMware Infrastructure 3 (ESX 3.5, ESXi 3.5)
  - "Windows Server® 2003" represents the following products.
    - Microsoft® Windows Server® 2003, Enterprise Edition
    - Microsoft® Windows Server® 2003, Standard x64 Edition
    - Microsoft® Windows Server® 2003, Enterprise x64 Edition
    - Microsoft® Windows Server® 2003 R2, Standard Edition
    - Microsoft® Windows Server® 2003 R2, Enterprise Edition
    - Microsoft® Windows Server® 2003 R2, Standard x64 Edition
    - Microsoft® Windows Server® 2003 R2, Enterprise x64 Edition
  - "Linux" represents the following products.
    - Red Hat Enterprise Linux 5 (for x86)
    - Red Hat Enterprise Linux 5 (for Intel64)
    - Red Hat Enterprise Linux AS (v.4 for x86)
    - Red Hat Enterprise Linux AS (v.4 for EM64T)
    - Red Hat Enterprise Linux ES (v.4 for x86)
    - Red Hat Enterprise Linux ES (v.4 for EM64T)
    - Red Hat Enterprise Linux WS (v.4)
    - SUSE Linux Enterprise Server
    - SUSE Linux Enterprise Server 11
    - SUSE Linux Enterprise Server 11 Service Packx
    - SUSE Linux Enterprise Server 11 for x86
    - SUSE Linux Enterprise Server 11 for EM64T
    - SUSE Linux Enterprise Server 11 Service Packx for x86
    - SUSE Linux Enterprise Server 11 Service Packx for EM64T
    - SUSE Linux Enterprise Server 10
    - SUSE Linux Enterprise Server 10 Service Packx
    - SUSE Linux Enterprise Server 10 for x86
    - SUSE Linux Enterprise Server 10 for EM64T
    - SUSE Linux Enterprise Server 10 Service Packx for x86
    - SUSE Linux Enterprise Server 10 Service Packx for EM64T
    - SUSE Linux Enterprise Server 9
    - SUSE Linux Enterprise Server 9 Service Packx
    - SUSE Linux Enterprise Server 9 for x86
    - SUSE Linux Enterprise Server 9 for EM64T
    - SUSE Linux Enterprise Server 9 for x86 Service Packx
    - SUSE Linux Enterprise Server 9 for EM64T Service Packx
Other names

- "iSCSI port" or "Channel Adapter" (CA) refers to the iSCSI interface module used in the ETERNUS Disk storage systems to connect to the server.
- "LAN card" refers to the iSCSI interface module normally used in the server. An "onboard LAN", "network interface card" (NIC), "LAN adapter", or "LAN board" may be used instead.
- "iSCSI cable" refers to the cable that is used to connect the ETERNUS Disk storage system and server over an iSCSI interface. "Ethernet cable", "LAN cable", and "twisted pair cable" are alternative names for this cable.
- "VMware ESX" refers to "VMware vSphere" and "VMware Infrastructure 3", which are datacenter solutions from VMware that virtualize the storage and networking system. The name "VMware vSphere" and "VMware Infrastructure 3" are used in specific datacenter sections.
- Italics are used to show variables such as values and characters that appear in command parameters and output examples.
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Chapter 1   Workflow

This chapter describes how to connect the ETERNUS Disk storage systems to a "VMware ESX". The workflow is shown below.

Required Documents List

• Server Support Matrix
• ETERNUS Disk storage systems Server Connection Guide (ISCSI) ETERNUS Disk Storage System Settings for ETERNUS2000
• ETERNUS Disk storage systems Server Connection Guide (ISCSI) ETERNUS Disk Storage System Settings for ETERNUS4000, ETERNUS8000
• ETERNUS Disk storage systems Server Connection Guide (ISCSI) for VMware® ESX (this manual)
• ETERNUSmgr Install Guide
• ETERNUSmgr User Guide

Workflow

Install ETERNUSmgr and Set Up the ETERNUS Disk Storage System

If ETERNUSmgr is to be used, install it and set up the ETERNUS Disk storage system.

- "Chapter 4 Installing and Setting Up ETERNUSmgr" (page 18)
- "Chapter 5 Setting Up the ETERNUS Disk Storage Systems" (page 19)
- Install ETERNUSmgr.
  • "ETERNUSmgr Install Guide"
- Check ETERNUSmgr operation.
  • "ETERNUSmgr User Guide"
- Set up the ETERNUS Disk storage system.
  • "ETERNUS Disk storage systems Server Connection Guide (ISCSI) ETERNUS Disk Storage System Settings for ETERNUS2000"
  • "ETERNUS Disk storage systems Server Connection Guide (ISCSI) ETERNUS Disk Storage System Settings for ETERNUS4000, ETERNUS8000"
Chapter 1  Workflow

2

Set Up the VMware ESX Server
Install the LAN card in the server, then set up the VMware ESX server to recognize LUNs.

- "Chapter 6 Setting Up the VMware ESX Server" (page 20)

3

Start the Virtual Machine
Notes on Virtual Machine operation and related settings are given in this manual and other documents.

- "Chapter 7 Virtual Machine" (page 38)
Chapter 2   Checking the Server Environment

ETERNUS Disk storage systems can be connected in the following environments. Check the environment of your server.

2.1 Hardware

- VMware ESX connection requires the use of LAN switches.
- Use the guide at the following URL and the "Server Support Matrix" to check which servers are supported:

  Search the VMware Compatibility Guide
  http://www.vmware.com/resources/compatibility/search.php

2.2 LAN Cards

Refer to the "Server Support Matrix" to check which LAN cards are supported by the ETERNUS Disk storage system.

2.3 Connection Compatibility of ETERNUS Disk Storage Systems to VMware ESX

Use the following URL to determine which ETERNUS Disk storage system models may be connected to VMware ESX:

  Search the VMware Compatibility Guide
  http://www.vmware.com/resources/compatibility/search.php
2.4 Virtual Machine

Virtual Machine is a virtual machine created on the VMware ESX server. Details of how to install an OS on the VMware ESX Virtual Machine may be checked via the following URL:

Chapter 3   Notes

This chapter describes notes when the ETERNUS Disk storage systems are connected to the server via iSCSI interface.

3.1 Connection Notes

3.1.1 For VMware vSphere

Dedicated IP addresses must be allocated to the iSCSI LAN. An IP address must be allocated to each VMkernel that corresponds to an iSCSI Initiator, and a LAN card and VMkernel must be connected via a virtual switch. For example, a total of four IP addresses are required by the following iSCSI connection setup.

**Example connection configuration**

![Diagram of iSCSI connection setup]

- VMware ESX server
- VMkernel (iSCSI Software Initiator) IP address (1)
- VMkernel (iSCSI Software Initiator) IP address (2)
- LAN card
- LAN switch
- IP address for iSCSI port (3)
- ETERNUS Disk storage system
- IP address for iSCSI port (4)
3.1.2 For VMware Infrastructure 3

Dedicated IP addresses must be allocated to the iSCSI LAN. An IP address must be allocated to each VMkernel that corresponds to an iSCSI Initiator, and a LAN card and VMkernel must be connected via a virtual switch. For example, a total of six IP addresses are required by the following iSCSI connection setup.

Example connection configuration

3.2 VMware ESX Operating Notes

- Refer to the following web-site for the number of LUNs that VMware ESX can recognize. http://www.vmware.com/support/pubs/
- When Windows® is used on the Virtual Machine, the registry will need to be modified after Windows® is installed. For details, refer to "Chapter 7 Virtual Machine" (page 38).
- The VMware ESX multipath function supports path failover, meaning that server access can continue unaffected by any problems that might arise in the iSCSI cables or LAN switches. It should be noted that path failover can fail to occur when multiple SCSI sense codes are repeatedly and simultaneously received.
- Set the "Path Selection Policy" (per-LUN) as follows:
  For VMware vSphere: "Most Recently Used (VMware)"
  For VMware Infrastructure 3 and earlier versions: "Fixed"
- ETERNUS Multipath Driver and GR Multipath Driver do not need to be installed on the VMware ESX Virtual Machine. Multipath function of VMware ESX provides path redundancy.
3.3 ETERNUS Disk Storage System Setup Notes

- When connecting the ETERNUS Disk storage system to VMware ESX, check that the firmware version is as specified in the "Server Support Matrix".
- Host Response must be set before connecting the ETERNUS Disk storage system to VMware ESX.
- Assign Affinity Group values starting from LUN0 in ascending order. The server cannot recognize the ETERNUS Disk storage system LUNs if some other assignment order is used.
- When LUNs are shared among multiple physical servers (in a VMotion configuration, for example), an Affinity Group mapping should be used to ensure that each shared LUN is assigned the same LUN number across every physical server.
- When connecting to VMware ESX with multiple paths sharing a single LUN, a Reset Group setting is required for the ETERNUS Disk storage system device.

3.4 SAN Boot Notes

The ETERNUS Disk storage systems do not support SAN Boot when they are connected via iSCSI Software Initiator.

3.5 Server Startup and Power Supply Control Notes

Before turning the server on, check that the ETERNUS Disk storage systems and LAN switches are all "Ready". If the server is turned on and they are not "Ready", the server will not be able to recognize the ETERNUS Disk storage systems.

Also, when the ETERNUS Disk storage system power supply is being controlled by a connected server, make sure that the ETERNUS Disk storage system does not shut down before the connected servers. Similarly, the LAN switches must also be turned off after the connected servers have been shut down.

If turned off, data writes from the running server cannot be saved to the ETERNUS Disk storage systems, and already saved data may also be affected.
3.6 LAN Switch Connection Notes

- As with an FC-SAN, because of the large data flows (traffic volumes) the iSCSI LAN is assumed to be a dedicated LAN separate from the business and management LANs, and constructed with its own LAN switch.
- iSCSI LAN redundancy is achieved by the use of multipaths.
- For IP network security reasons too, it is useful to separate the iSCSI LAN (for data transfers) and management LAN (for administration) to prevent cross-access between them (use of VLAN to separate the LAN segments is recommended).

Example LAN switch connection configuration

*1: In this system configuration, multipaths provide redundant connections between the servers and storage system. LAN switches #1 and #2 provide physical separation of the network paths.
*2: A separate LAN segment is provided in the LAN switch (using the switch VLAN function) for each grouping of business servers and disk storage systems (equivalent to the FC zones).
3.7 LAN Switch Setting Notes

When using a LAN switch that supports the flow control function, disable the flow control function according to the following notes:

- For access paths that use iSCSI, disable the flow control function on the sending and receiving ends of the port.
- When a cascade connection is used to connect to LAN switches, disable the function for the LAN switch that is directly connected to the ETERNUS Disk storage system.

For details on how to set the flow control function of the LAN switch, refer to the LAN switch manual.
Chapter 4   Installing and Setting Up ETERNUSmgr

If ETERNUSmgr is to be used, install it according to the directions given in the "ETERNUSmgr Install Guide". After the installation, set up ETERNUSmgr following the instructions in the "ETERNUSmgr User Guide".
Chapter 5   Setting Up the ETERNUS Disk Storage Systems

Set up the ETERNUS Disk storage systems using the ETERNUSmgr.

ETERNUS Disk storage systems' setup can be performed independently of server setup. For details on how to perform these settings, refer to the "ETERNUS Disk storage systems Server Connection Guide (iSCSI) ETERNUS Disk Storage System Settings for ETERNUS2000" or "ETERNUS Disk storage systems Server Connection Guide (iSCSI) ETERNUS Disk Storage System Settings for ETERNUS4000, ETERNUS8000", and "ETERNUSmgr User Guide".
Chapter 6  Setting Up the VMware ESX Server

This chapter describes settings related to the server iSCSI interface.

6.1  Setting Up for VMware vSphere

Set up the VMware ESX server using the vSphere Client. The procedures described here are based on the following multipath configuration.

Example connection configuration

![Diagram of connection configuration]

**6.1.1 Turning on the Devices**

To turn on the connected devices, use the following procedures:

**Procedure**

1. Turn on the LAN switch power.
2. Check that the LAN switch’s Ready (or equivalent) LED is lit.
3. Turn on the ETERNUS Disk storage systems.
4. Check that the ETERNUS Disk storage systems’ Ready LED is lit.
5. Turn on the server.

End of procedure

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6.1.2 Checking the LAN Cards

**Procedure**

1. Log in to VMware ESX from the vSphere Client and select the [Configuration] tab.
2. Click [Network Adapters] in the [Hardware] list. "vmnic1" and "vmnic2" in the following example.

   ![Image of Network Adapters]

   End of procedure

6.1.3 Creating the Virtual Switches

Add two virtual switches (vSwitch) for iSCSI to VMware ESX. Add a "VMkernel" and "vmnic" for each vSwitch.

Perform the following procedure to each vmnic that configures iSCSI SAN.

**Procedure**

1. Open the network window by selecting the [Configuration] tab on vSphere Client and click [Add Network] in the upper right of the window.
2. Select [VMkernel] and click the [Next] button.
3. Select the checkbox of the target network adapter and click the [Next] button.
4. Set properties of port groups as required, and click the [Next] button.
5 Set the IP address and subnet mask of "VMkernel", and click the [Next] button.

6 Repeat Step 1 through Step 5 to add another virtual switch (vSwitch2).

7 Confirm that a virtual switch and VMkernel are set for each vmnic.

End of procedure

6.1.4 Setting the Software Initiator

Enable Software Initiator in VMware ESX.

Procedure

1 Select the [Configuration] tab on vSphere Client and click [Storage Adapters].
2. Select the target iSCSI Software Adapter and click [Properties...].


4. Select the [Status-Enabled] checkbox and click the [OK] button.


6. Confirm that the iSCSI name is displayed as follows and click the [Cancel] button.

7. Select the [Dynamic Discovery] tab and click the [Add] button.

8. Enter the IP address for the iSCSI port of the connected ETERNUS Disk storage system as the iSCSI server IP address, confirm that the port is set to "Port 3260" (default), and click the [OK] button.

9. Confirm that the IP address for the iSCSI port of the ETERNUS Disk storage system is displayed as follows.
If the connected ETERNUS Disk storage system uses multiple iSCSI ports, repeat the IP address addition process for each iSCSI port. (Repeat Step 7 through Step 9.)

End of procedure

6.1.5 Enabling ALUA

IMPORTANT This procedure is only required when VMware vSphere contains VMware ESX 4.0/VMware ESXi 4.0. It does not need to be performed when VMware vSphere contains VMware ESX 4.0 Update 1/VMware ESXi 4.0 Update 1 or later versions. In this case, proceed to "6.1.6 Checking the LUNs" (page 26).

After the VMware ESX server has been installed, Asymmetric Logical Unit Access (ALUA) should be enabled according to the following procedure.

Procedure

1. Press the [Alt] + [F1] keys on the VMware ESX server to open a service console, and log in as root.
2. Execute the following command in the service console.
   - When connecting to an ETERNUS2000
     
     ```
     esxcli nmp satp addrule --satp="VMW_SATP_ALUA" --vendor="FUJITSU" --model="E2000" --description="ETERNUS2000 with ALUA" --claim-option tpgs_on
     ```
   - When connecting to an ETERNUS4000
     
     ```
     esxcli nmp satp addrule --satp="VMW_SATP_ALUA" --vendor="FUJITSU" --model="E4000" --description="ETERNUS4000 with ALUA" --claim-option tpgs_on
     ```
   - When connecting to an ETERNUS8000
     
     ```
     esxcli nmp satp addrule --satp="VMW_SATP_ALUA" --vendor="FUJITSU" --model="E8000" --description="ETERNUS8000 with ALUA" --claim-option tpgs_on
     ```
3 Execute the following command in the service console.

```
esxcli corestorage claiming unclaim --type location
```

**Caution**

Ignore the following error message if it appears when the preceding command is executed:

```
Errors:
Unable to perform unclaim. Error message was : Unable to unclaim paths. Busy or in use devices detected. See VMkernel logs for more information.
```

4 Execute the following command in the service console.

```
esxcli corestorage claimrule run
```

5 Check that the connected ETERNUS Disk storage system is shown when the following command is executed in the service console:

```
esxcli nmp satp listrules --satp VMW_SATP_ALUA
```

Display result

- When connecting to an ETERNUS2000

  `VMW_SATP_ALUA FUJITSU E2000 tpgs_on E2000 with ALUA`

- When connecting to an ETERNUS4000

  `VMW_SATP_ALUA FUJITSU E4000 tpgs_on E4000 with ALUA`

- When connecting to an ETERNUS8000

  `VMW_SATP_ALUA FUJITSU E8000 tpgs_on E8000 with ALUA`

6 Log out of the service console, and restart the VMware ESX server.

End of procedure
### 6.1.6 Checking the LUNs

The following procedure describes how to check LUN recognition using the vSphere Client. Log in to VMware ESX from the vSphere Client, and then check whether the ETERNUS Disk storage system LUNs have been recognized. The procedure is as follows:

**Procedure**

1. Use the vSphere Client to login to VMware ESX as "root".
2. Select the [Configuration] tab.
3. Select [Storage Adapters] from the [Hardware] list.
4. Select [Rescan...].

**Note** After selecting [Rescan...], VMware ESX should attempt to recognize the ETERNUS Disk storage systems' LUNs again.

5. If the iSCSI Software Adapter (vmhba34 in this example) is selected from the [Storage Adapters] area, the recognized devices will be shown in the [Details] area, as follows.
Confirm that the [Path Selection:] is set to "Most Recently Used (VMware)" for each ETERNUS Disk storage system LUN. If not, set the LUN's [Path Selection:] to "Most Recently Used (VMware)".

Refer to the following for details of the above commands:

- URL
  http://www.vmware.com/support/pubs/
- Document
  "vSphere Command-Line Interface Installation and Reference Guide"
7 For a multipath configuration, confirm that the paths of all the LUNs in the ETERNUS Disk storage system are configured with multipath. When paths for a LUN are configured with multipath, multiple Runtime Names and Targets are displayed in [Paths].

![Image showing Paths configuration]

**End of procedure**

### 6.1.7 Setting the CHAP Authentication

CHAP and mutual CHAP authentication can be set for VMware ESX connections.

Log in to VMware ESX from the vSphere Client, check whether the ETERNUS Disk storage system LUNs have been recognized, and then enable the CHAP authentication. The procedure is as follows:

**Procedure**

1. Select the [Configuration] tab on vSphere Client and select [Storage Adapters].
2. Select the target iSCSI Software Adapter and click [Properties].
3. Select the [General] tab and click [CHAP].
4 Set CHAP.

- When setting CHAP only
  Select [Required] for [Select option:] under "CHAP" and set the [Name:] and [Secret:].

- When setting CHAP and mutual CHAP
  Select [Required] for [Select option:] under "CHAP" and "Mutual CHAP" and set the [Name:] and [Secret:].

End of procedure
6.2 Setting Up for VMware Infrastructure 3

Set up the VMware ESX server using the VMware Infrastructure Client. The procedures described here are based on the following multipath configuration.

Example connection configuration

![Connection Diagram]

6.2.1 Turning on the Devices

To turn on the connected devices, use the following procedures:

**Procedure**

1. Turn on the LAN switch power.
2. Check that the LAN switch’s Ready (or equivalent) LED is lit.
3. Turn on the ETERNUS Disk storage systems.
4. Check that the ETERNUS Disk storage systems’ Ready LED is lit.
5. Turn on the server.

End of procedure
6.2.2 Checking the LAN Cards

**Procedure**

1. Select the [Configuration] tab on VMware Infrastructure Client.
2. Check the iSCSI SAN configuration Network Adapters. "vmnic1" and "vmnic2" in the following example.

![Network Adapters Table]

End of procedure

6.2.3 Creating the Virtual Switches

Add two virtual switches (vSwitch) for iSCSI to VMware ESX. Define two virtual network port types ("Service Console" and "VMkernel") for the added vSwitch. Also assign IP addresses on the same subnet to the defined Service Console and VMkernel.

6.2.3.1 Adding a Service Console

**Procedure**

1. Select the [Configuration] tab on VMware Infrastructure Client and click [Add Networking].
2. Select [Service Console] and click the [Next] button.
3. Select the checkbox of the target network adapter and click the [Next] button.
4. Check the [Service Console] details, set an arbitrary VLAN ID, IP address, and subnet mask, and click the [Next] button.
5 Check the [Service Console] IP address and click the [Finish] button. Confirm that the virtual switch (vSwitch1) has been created as follows.

6 Repeat Step 1 though Step 5 to add Service Console to vSwitch2.

6.2.3.2 Adding a VMkernel

Procedure

1 Select the [Configuration] tab on VMware Infrastructure Client and select the target virtual switch's [Properties].

2 Click [Add].

3 Select the [VMkernel] radio button, and click the [Next] button.

4 Confirm that the VMkernel is displayed, set the IP address (an optional VLAN ID may be set, as necessary), and click the [Next] button.

5 Confirm the settings shown on the confirmation screen and click the [Finish] button. A message about Gateway settings appears.

6 Perform any further settings as necessary and click the [Close] button. The VMkernel has been added to the target vSwitch.

7 Repeat Step 1 though Step 6 to add VMkernel to another vSwitch.
8 Confirm that a virtual switch and VMkernel are set for each vmnic.

End of procedure

6.2.4 Setting the Software Initiator

Enable Software Initiator in VMware ESX.

Procedure

1 Select the [Configuration] tab on VMware Infrastructure Client and click [Storage Adapters].
2. Select the target iSCSI Software Adapter and click [Properties].


4. Select the [Status-Enabled] checkbox and click the [OK] button.


6. Confirm that the iSCSI name is displayed as follows and click the [Cancel] button.

7. Select the [Dynamic Discovery] tab and click the [Add] button.

8. Enter the IP address for the iSCSI port of the connected ETERNUS Disk storage system as the iSCSI server IP address, confirm that the port is set to "Port 3260" (default), and click the [OK] button.
9 Confirm that the IP address for the iSCSI port of the ETERNUS Disk storage system is displayed as follows and click [Close].

![Image of iSCSI Initiator Properties window]

10 If the connected ETERNUS Disk storage system uses multiple iSCSI ports, repeat the IP address addition process for each iSCSI port. (Repeat Step 7 through Step 9.)

6.2.5 Setting the CHAP Authentication

For VMware ESX connections, the ETERNUS Disk storage system uses a one-way CHAP authentication to authenticate the Software Initiator access. Perform the following settings to enable CHAP authentication.

**Procedure**

1 Select the [Configuration] tab on VMware Infrastructure Client and select [Storage Adapters].
2 Select the target iSCSI Software Adapter and click [Properties].
3 Select the [CHAP Authentication] tab and click [Configure].
4 Select the [Use the following CHAP credentials] radio button.
5 Set arbitrary user name during the CHAP authentication.
**6** To set the VMware ESX iSCSI name for the user name, select the [Use initiator name] checkbox.

![Image of CHAP Authentication window]

**7** Enter the password in [CHAP Secret] and click the [OK] button. The CHAP Name is displayed as follows.

![Image of CHAP Authentication window with password]

---

**End of procedure**

### 6.2.6 Checking the LUNs

The VMware Infrastructure Client is used to login to VMware ESX and check the LUNs.

**Procedure**

1. Select the [Configuration] tab on VMware Infrastructure Client, and select the target iSCSI Adapter.
2 **Click [Rescan...].**

The LUNs are displayed under the SCSI Target 0 in the "Details" field. In this example, [Path:vmhba32:0:0] is displayed as follows:

![Storage Adapters](image)

- **Caution**: If VMware ESX is running (requiring dynamic LUN recognition), added LUNs should be recognized by performing the VMware Infrastructure Client "Rescan" operation after the LUN has been added to an Affinity Group.

3 **Check the multipath. Right-click the [Path:vmhba32:0:0] described in Step 2, and select "Manage Paths".**

When paths are configured with multipath, multiple paths are displayed in the "Path" field.

**End of procedure**
Chapter 7  Virtual Machine

This chapter describes the notes on the Virtual Machine and its settings.

To configure the Virtual Machine, access the following web-site and check the "Guest Operation System Installation Guide".

Guest Operation System Installation Guide

7.1 For Windows®

7.1.1 Setting the Disk TimeOutValue

Check the value of the "TimeOutValue" registry key. If the "TimeOutValue" registry key does not exist, it should be created.

Be sure to backup the registry before editing it.

Caution
If the "TimeOutValue" key does not exist, add a registry key with the following values:

<table>
<thead>
<tr>
<th>Name</th>
<th>TimeOutValue</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type</td>
<td>REG_DWORD</td>
</tr>
<tr>
<td>Radix</td>
<td>Hexadecimal</td>
</tr>
<tr>
<td>Data</td>
<td>3C</td>
</tr>
</tbody>
</table>

Procedure

1. Start the registry editor (regedit.exe).
2. Follow the path described below:

   \HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services\Disk

3. Check the value of the "TimeOutValue" registry key.
   Check that the value of the "TimeOutValue" registry key is "0x3C". If set to a different value, change it to "0x3C".
If the contents were modified, reboot the OS.

7.1.2 Applying Required Patches

Patches provided by Microsoft® are necessary for Windows Server® 2003 with Service Pack 1 applied and Windows Server® 2003 R2. Refer to VMware KB 2267 on the VMware web-site or check with Microsoft® for patch details.

7.2 For Linux

7.2.1 Applying Required Patches

For the following OSes, the Virtual Machine file system may be restricted to being read-only:

- Red Hat Enterprise Linux 5
- Red Hat Enterprise Linux AS v.4 Update 4
- Red Hat Enterprise Linux AS v.4 Update 3
- SUSE Linux Enterprise Server 10
- SUSE Linux Enterprise Server 9 Service Pack 3

If this is a problem, refer to "VMware KB Article 51306" on the VMware web-site for details, and patch the Virtual Machine as required.
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