ETERNUS

P3AM-3412-11ENZ0

ETERNUS DX

Disk storage systems

User's Guide
- Server Connection -

(iSCSI)
for VMware® ESX

FUJITSU

This page is intentionally left blank.

Preface

This manual briefly explains the operations that need to be performed by the user in order to connect an ETERNUS DX60 S2/DX80 S2/DX90 S2, ETERNUS DX410 S2/DX440 S2, ETERNUS DX8100 S2/DX8700 S2, ETERNUS DX60/DX80, ETERNUS DX410/DX440, or ETERNUS DX8100/DX8400/DX8700 Disk storage system to a server running VMware ESX using iSCSI Software Initiator via an iSCSI interface.

This manual should be used in conjunction with any other applicable user manuals, such as those for the ETERNUS DX60 S2/DX80 S2/DX90 S2, ETERNUS DX410 S2/DX440 S2, ETERNUS DX8100 S2/DX8700 S2, ETERNUS DX60/DX80, ETERNUS DX410/DX440, or ETERNUS DX8100/DX8400/DX8700 Disk storage system, server, OS, adapters, and drivers.

This manual references the following documents:

- Server Support Matrix
- ETERNUS DX Disk storage systems User's Guide -Server Connection- (iSCSI)
  Disk Storage System Settings (ETERNUS DX80 S2/DX90 S2, ETERNUS DX410 S2/DX440 S2, ETERNUS DX8100 S2/DX8700 S2)
- ETERNUS DX Disk storage systems Server Connection Guide (iSCSI)
  ETERNUS DX Disk Storage System Settings for ETERNUS DX60/DX60 S2, DX80
- ETERNUS DX Disk storage systems Server Connection Guide (iSCSI)
  ETERNUS DX Disk Storage System Settings for ETERNUS DX400/DX8000 series
- Web GUI User’s Guide
- ETERNUSmgr Install Guide
- ETERNUSmgr User Guide

Also, note that in this manual the ETERNUS DX60 S2/DX80 S2/DX90 S2, ETERNUS DX410 S2/DX440 S2, ETERNUS DX8100 S2/DX8700 S2, ETERNUS DX60/DX80, ETERNUS DX410/DX440, and ETERNUS DX8100/DX8400/DX8700 Disk storage systems are collectively referred to as ETERNUS DX Disk storage systems.

Eleventh Edition
September 2012

The Contents and Structure of this Manual

This manual is composed of the following seven chapters.

- Chapter 1 Workflow

  This describes how to connect the ETERNUS DX Disk storage systems to a server running VMware ESX.

- Chapter 2 Checking the Server Environment

  This describes which servers can be connected to ETERNUS DX Disk storage systems.

- Chapter 3 Notes

  This describes issues that should be noted when connecting the ETERNUS DX Disk storage systems and server.

- Chapter 4 Installing and Setting Up ETERNUSmgr

  This describes how to install ETERNUSmgr.

- Chapter 5 Setting Up the ETERNUS DX Disk Storage Systems

  This describes how to set up the ETERNUS DX 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.

Acknowledgments

Naming Conventions

Product names

- "VMware ESX" represents the following products.
  - VMware vSphere (ESXi 5.1, ESXi 5.0, 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, Standard Edition
  - 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" refers to an iSCSI interface module used in the ETERNUS DX 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 DX 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.

ETERNUS Disk storage system models

The following naming conventions are used to describe ETERNUS Disk storage system models in this manual.

ETERNUS Disk storage system model	Naming conventions
ETERNUS DX60 S2/DX80 S2/DX90 S2 ETERNUS DX410 S2/DX440 S2 ETERNUS DX8100 S2/DX8700 S2 ETERNUS DX60/DX80 ETERNUS DX410/DX440 ETERNUS DX8100/DX8400/DX8700	ETERNUS DX Disk storage system
ETERNUS DX60/DX80 ETERNUS DX410/DX440 ETERNUS DX8100/DX8400/DX8700	ETERNUS DX Disk storage system (excluding S2)
ETERNUS DX410 S2/DX440 S2	ETERNUS DX400 S2 series
ETERNUS DX8100 S2/DX8700 S2	ETERNUS DX8000 S2 series
ETERNUS DX410/DX440	ETERNUS DX400 series
ETERNUS DX8100/DX8400/DX8700	ETERNUS DX8000 series

Table of Contents

Chapter 1 Workflow

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

Required Documents List

- Server Support Matrix
- ETERNUS DX Disk storage systems User's Guide -Server Connection- (iSCSI)
  Disk Storage System Settings (ETERNUS DX80 S2/DX90 S2, ETERNUS DX410 S2/DX440 S2, ETERNUS DX8100 S2/DX8700 S2)
- ETERNUS DX Disk storage systems Server Connection Guide (iSCSI)
  ETERNUS DX Disk Storage System Settings for ETERNUS DX60/DX60 S2, DX80
- ETERNUS DX Disk storage systems Server Connection Guide (iSCSI)
  ETERNUS DX Disk Storage System Settings for ETERNUS DX400/DX8000 series
- ETERNUS DX Disk storage systems User's Guide -Server Connection- (iSCSI)
  for VMware® ESX (this manual)
- Web GUI User's Guide
- ETERNUSmgr Install Guide
- ETERNUSmgr User Guide

Workflow

1

Install ETERNUSmgr and Set Up the ETERNUS DX Disk Storage System

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

Refer

- "Chapter 4 Installing and Setting Up ETERNUSmgr" (page 18)
- "Chapter 5 Setting Up the ETERNUS DX Disk Storage Systems" (page 19)
- Checking the setup and maintenance procedures.
  - "Web GUI User's Guide
  - "ETERNUSmgr Install Guide"
  - "ETERNUSmgr User Guide"
- Setting up the ETERNUS DX Disk storage system.
  - ETERNUS DX Disk storage systems User's Guide -Server Connection- (iSCSI) Disk Storage System Settings (ETERNUS DX80 S2/DX90 S2, ETERNUS DX410 S2/DX440 S2, ETERNUS DX8100 S2/DX8700 S2)
  - ETERNUS DX Disk storage systems Server Connection Guide (iSCSI) ETERNUS DX Disk Storage System Settings for ETERNUS DX60/DX 60 S2, DX80
  - ETERNUS DX Disk storage systems Server Connection Guide (iSCSI) ETERNUS DX Disk Storage System Settings for ETERNUS DX400/DX8000 series

2

Set Up the VMware ESX Server

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

Refer

- "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.

Refer

- "Chapter 7 Virtual Machine" (page 38)

Chapter 2 Checking the Server Environment

ETERNUS DX 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 DX Disk storage system.

2.3 Connection Compatibility of ETERNUS DX Disk Storage Systems to VMware ESX

Use the guide at the following URL to determine which ETERNUS DX 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:

http://partnerweb.vmware.com/GOSIG/home.html

Chapter 3 Notes

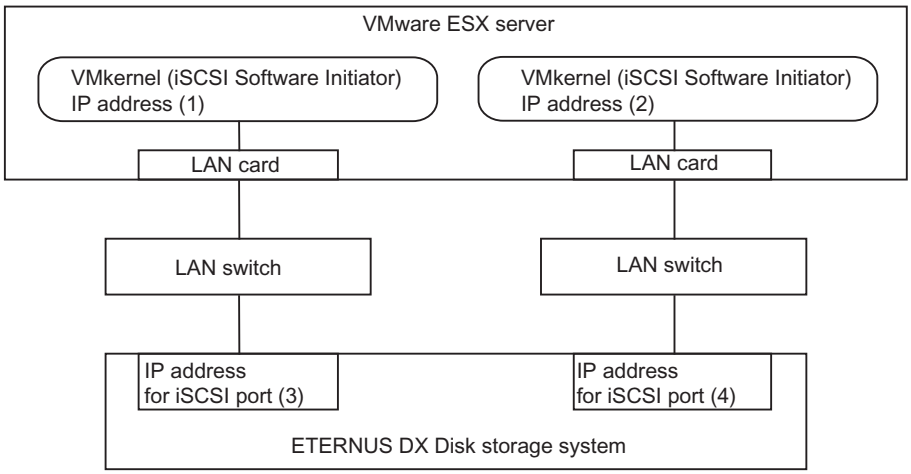
This chapter describes notes when the ETERNUS DX Disk storage systems are connected to the server via iSCSI interface.

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.

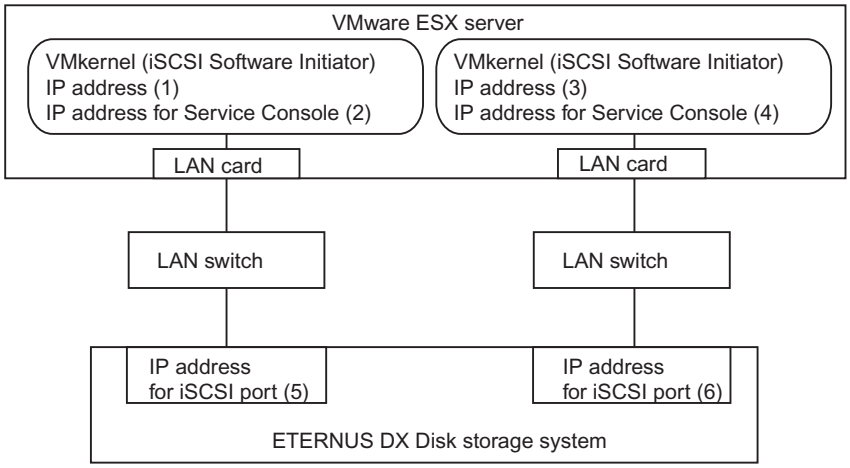
Example connection configuration



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: "RoundRobin" is recommended
  - For VMware Infrastructure 3: "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 DX Disk Storage System Setup Notes

- When connecting the ETERNUS DX Disk storage system to VMware ESX, check that the firmware version is as specified in the "Server Support Matrix".
- Assign Affinity Group values starting from LUN0 in ascending order.
  The server cannot recognize the ETERNUS DX 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 DX Disk storage system.

3.4 SAN Boot Notes

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

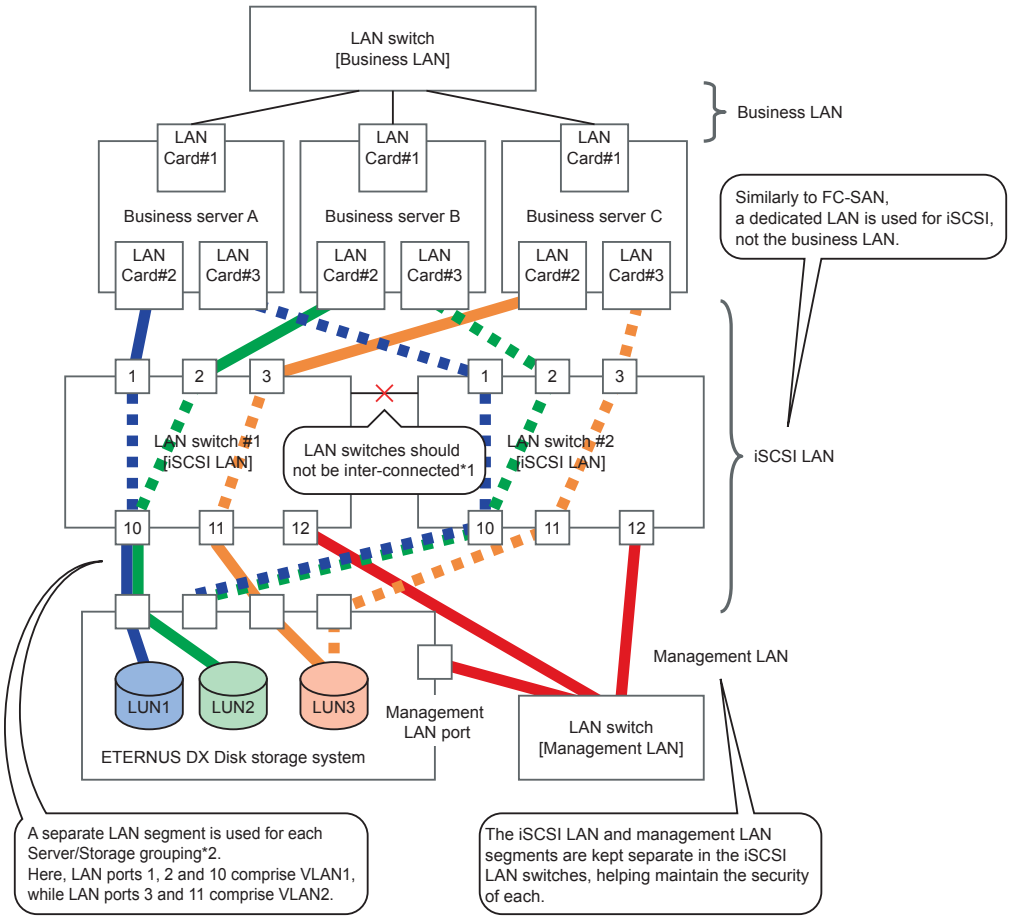
3.5 Server Startup and Power Supply Control Notes

Before turning the server on, check that the ETERNUS DX Disk storage systems and LAN switches are all "Ready". Specifically, check that the Ready LED is lit for ETERNUS DX Disk storage systems. If the server is turned on and they are not "Ready", the server will not be able to recognize the ETERNUS DX Disk storage systems.
Also, when the ETERNUS DX Disk storage system power supply is being controlled by a connected server, make sure that the ETERNUS DX 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 DX Disk storage systems, and already saved data may also be affected.

3.6 LAN Switch Connection Notes

- Since an iSCSI LAN handles large amounts of data (traffic volumes) like an FC-SAN, the iSCSI LAN must have its own switch and be a dedicated LAN separate from the business LANs.
- iSCSI LAN redundancy is achieved by the use of multipaths.
- For IP network security, the iSCSI LAN assumed to be a dedicated LAN separated from the management LAN (for administration).
- The iSCSI LAN must be configured as a dedicated LAN for each path from a server to the ETERNUS DX Disk storage system.

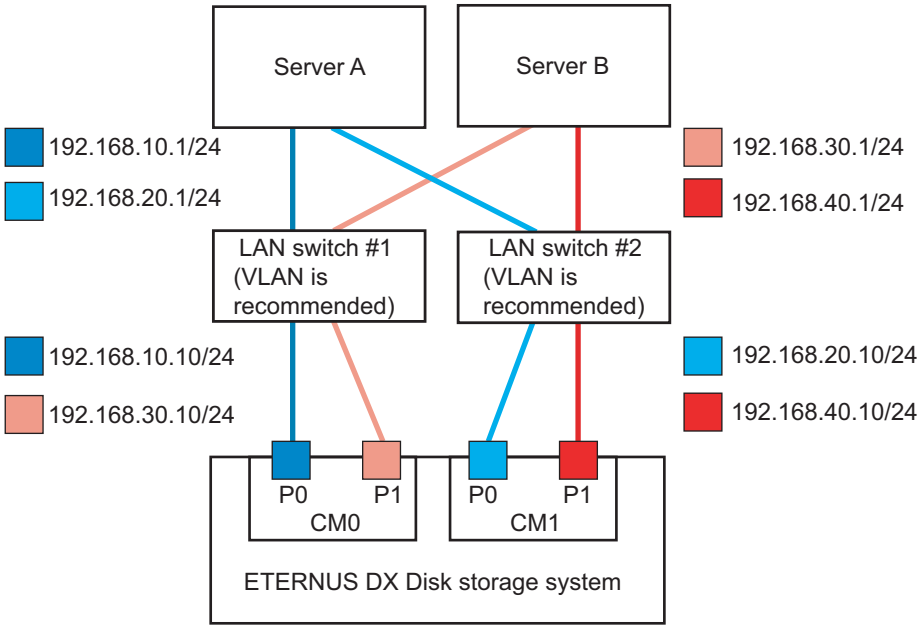
Example of a LAN switch connection configuration



*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).

Example of a network address configuration



3.7 Jumbo Frame Setting Notes

- To enable Jumbo Frame, all the connected devices must support Jumbo Frame. Set the appropriate values for various parameters (such as the MTU size) on each connected device.
- For details about how to set Jumbo Frame for a LAN card and LAN switch, refer to the VMware ESX and each device's manuals. Rebooting the server may be required to apply the new settings.
- The MTU size that is supported by the ETERNUS DX60/DX60 S2, DX80/DX80 S2, and DX90 S2 is 9000 bytes.

3.8 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 DX 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 DX Disk Storage Systems

Set up the ETERNUS DX Disk storage systems using Web GUI or ETERNUSmgr.

ETERNUS DX Disk storage systems' setup can be performed independently of server setup. For details on how to perform these settings, refer to the following documents:

- ETERNUS DX Disk storage systems User's Guide -Server Connection- (iSCSI)
  Disk Storage System Settings (ETERNUS DX80 S2/DX90 S2, ETERNUS DX410 S2/DX440 S2, ETERNUS DX8100 S2/DX8700 S2)
- ETERNUS DX Disk storage systems Server Connection Guide (iSCSI)
  ETERNUS DX Disk Storage System Settings for ETERNUS DX60/DX 60 S2, DX80
- ETERNUS DX Disk storage systems Server Connection Guide (iSCSI)
  ETERNUS DX Disk Storage System Settings for ETERNUS DX400/DX8000 series
- "Web GUI User’s Guide" or "ETERNUSmgr User Guide"

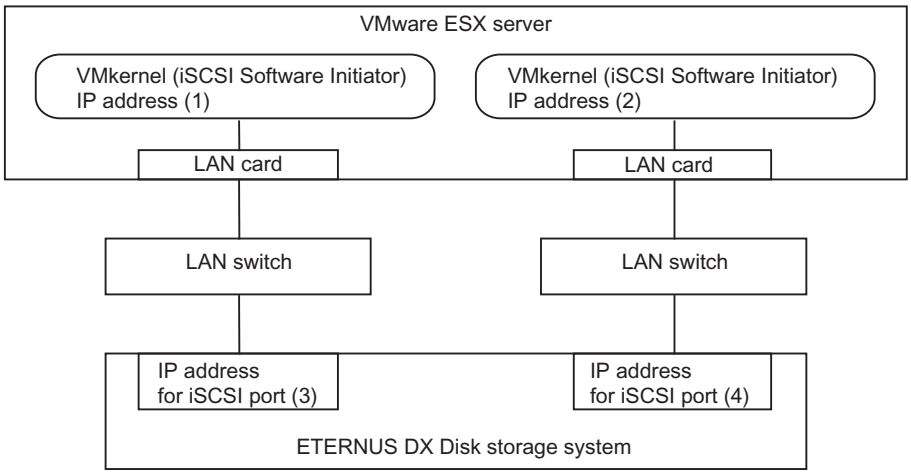
Chapter 6 Setting Up the VMware ESX Server

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



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 DX Disk storage systems.
4. Check that the ETERNUS DX Disk storage systems' Ready LED is lit.

5 Turn on the server.

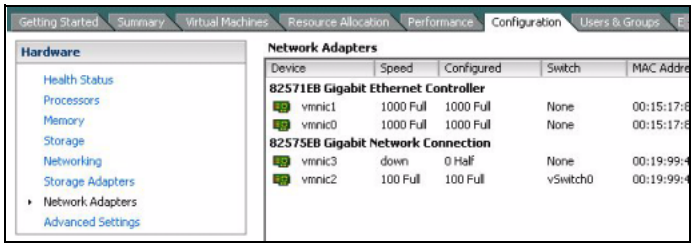
End of procedure

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.



End of procedure

6.1.3 Creating the Virtual Switches

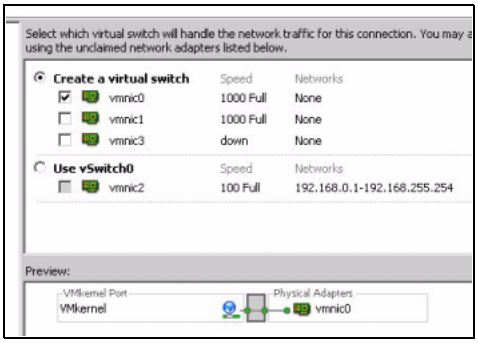
Add two virtual switches (vSwitch) for iSCSI to VMware ESX. Add a "VMkernel" and "vmnic" for each vSwitch.
Perform the following procedure to each vmnic that configures iSCSI SAN.

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.

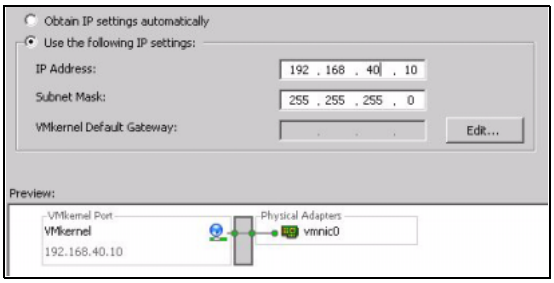
2 Select [VMkernel] and click the [Next] button.

3 Select the checkbox of the target network adapter and click the [Next] button.



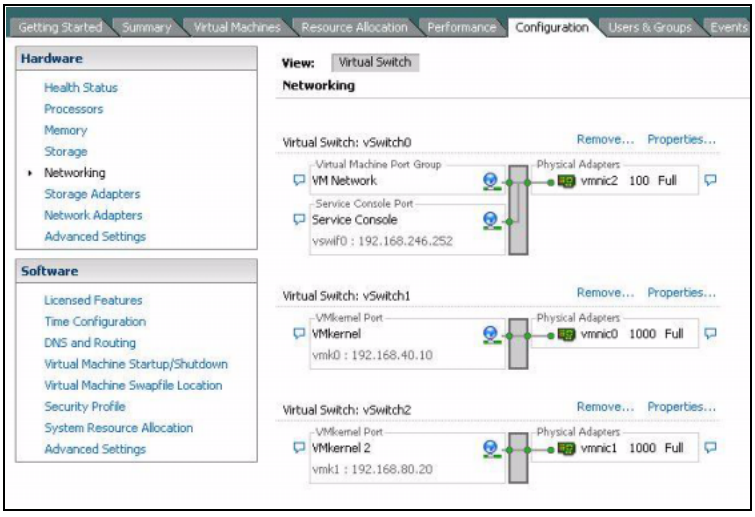
4 Set properties of port groups as required, and click the [Next] button.

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.



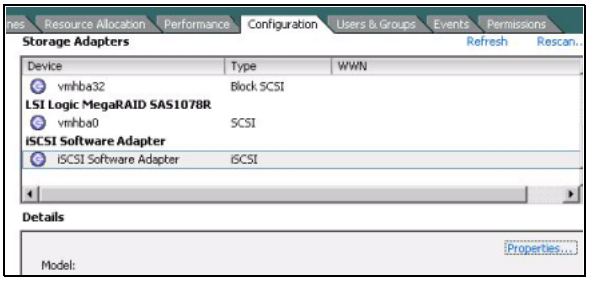
End of procedure

6.1.4 Setting the Software Initiator

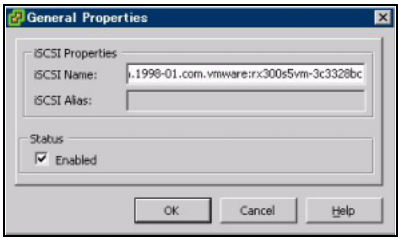
Enable Software Initiator in VMware ESX.

Procedure

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

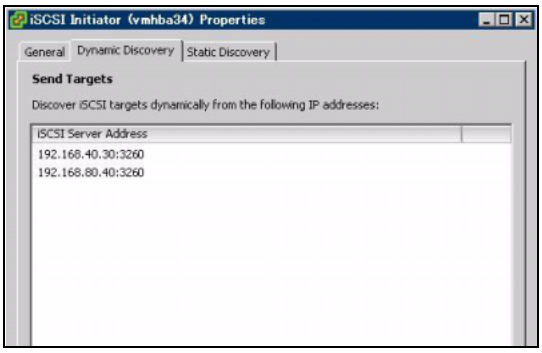


3. Click [Configure] on the [General] tab.
4. Select the [Status-Enabled] checkbox and click the [OK] button.
5. Confirm that the [Enabled] checkbox is selected under "Status" on the [General] tab and click [Configure] again.
6. Confirm that the iSCSI name is displayed in the "iSCSI Name" column and 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 DX 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 DX Disk storage system is displayed as follows.



10 If the connected ETERNUS DX 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 Use the terminal to log in to VMware ESX as "root".

2 Execute the following command in the terminal.

- When connecting to an ETERNUS DX60/DX60 S2, DX80/DX80 S2, or DX90 S2

```
esxcli nmp satp addrule --satp="VMW_SATP_ALUA" --vendor="FUJITSU" --
model="ETERNUS_DXL" --description="ETERNUS DX with ALUA" --claim-
option tpgs_on
```

- When connecting to an ETERNUS DX400/DX400 S2 series

```
esxcli nmp satp addrule --satp="VMW_SATP_ALUA" --vendor="FUJITSU" --
model="ETERNUS_DX400" --description="ETERNUS DX400 with ALUA"
--claim-option tpgs_on
```

- When connecting to an ETERNUS DX8000/DX8000 S2 series

```
esxcli nmp satp addrule --satp="VMW_SATP_ALUA" --vendor="FUJITSU" --
model="ETERNUS_DX8000" --description="ETERNUS DX8000 with ALUA"
--claim-option tpgs_on
```

3 Execute the following command in the terminal.

```
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 terminal.

```
esxcli corestorage claimrule run
```

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

Command

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

Display result

- When connecting to an ETERNUS DX60/DX60 S2, DX80/DX80 S2, or DX90 S2

```
VMW_SATP_ALUA FUJITSU ETERNUS_DXL tpgs_on ETERNUS_DXL with ALUA
```

- When connecting to an ETERNUS DX400/DX400 S2 series

```
VMW_SATP_ALUA FUJITSU ETERNUS_DX400 tpgs_on ETERNUS_DX400 with ALUA
```

- When connecting to an ETERNUS DX8000/DX8000 S2 series

```
VMW_SATP_ALUA FUJITSU ETERNUS_DX8000 tpgs_on ETERNUS_DX8000 with ALUA
```

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

End of procedure

6.1.6 Checking the LUNs

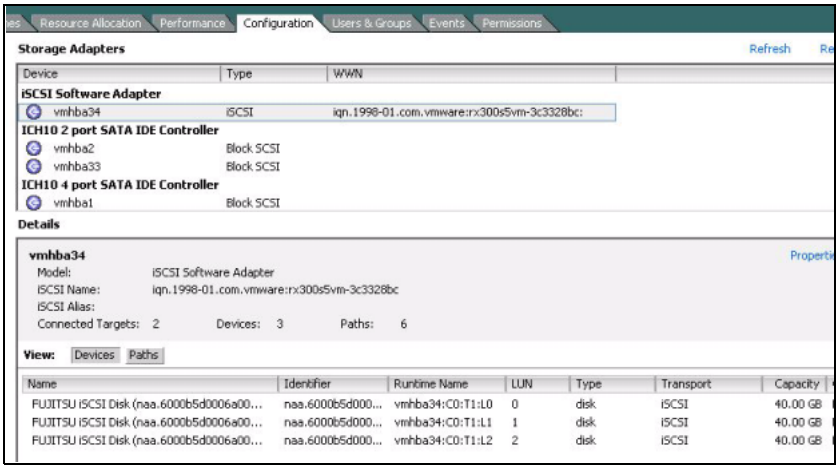
The following procedure describes how to check LUN recognition using the vSphere Client.
Log in to VMware ESX from the vSphere Client, and then check whether the ETERNUS DX Disk storage system LUNs have been recognized.
The procedure is as follows:

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...].

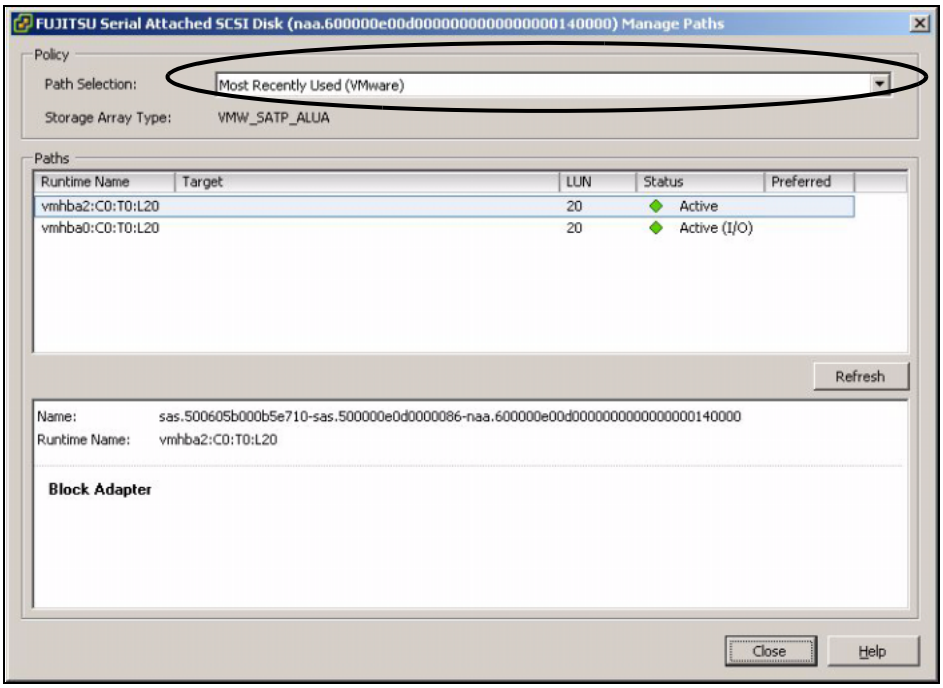
> **Note** After selecting [Rescan...], VMware ESX should attempt to recognize the ETERNUS DX Disk storage systems' LUNs again.

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.



6 Check the [Path Selection] for all the LUNs in the ETERNUS DX Disk storage system.

When the VMware ESX recognizes the LUN, an active path for each LUN is automatically specified. Even though [Path Selection] is set to [Most Recently Used (VMware)], changing the [Path Selection] for all the LUNs to [RoundRobin] is recommended.

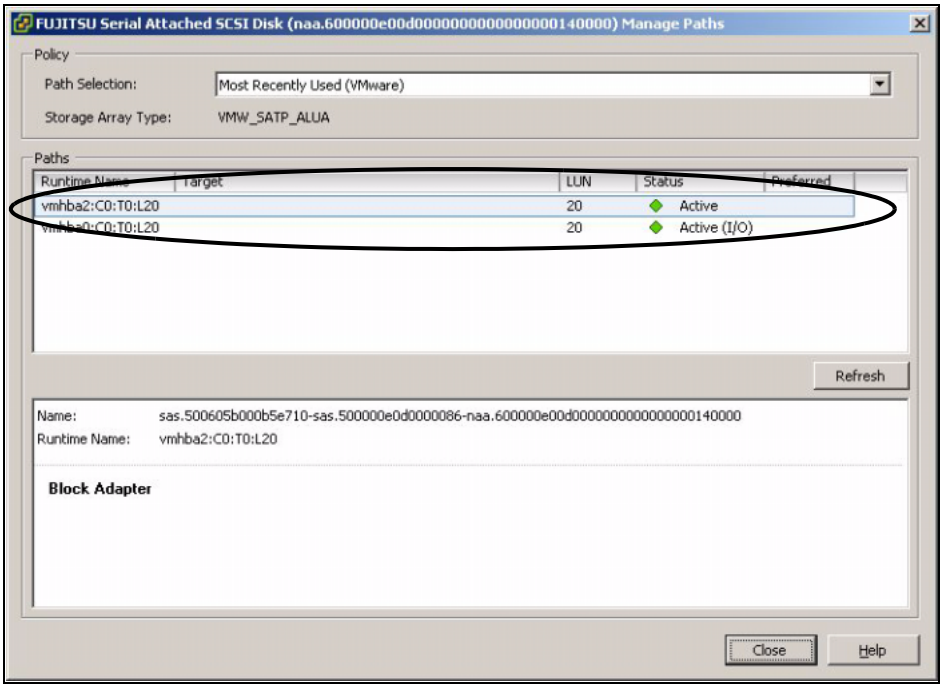


Refer to the following URL or guide for details about the command above:

URL : http://www.vmware.com/support/pubs/

Guide : "vSphere Command-Line Interface Concepts and Examples"

7 For a multipath configuration, confirm that the paths of all the LUNs in the ETERNUS DX 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].



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 DX 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].

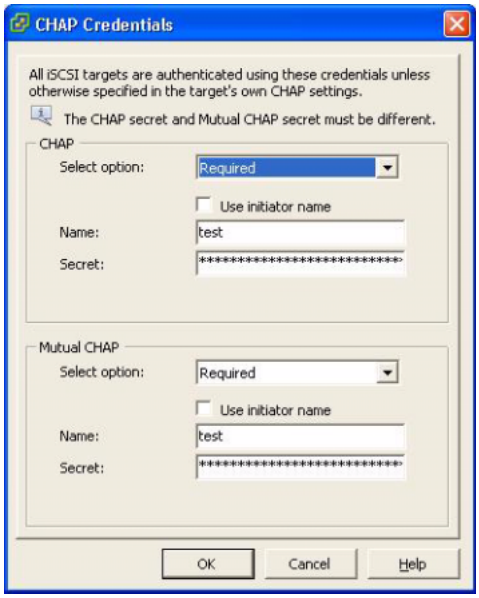
4 Set CHAP.

- 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:].

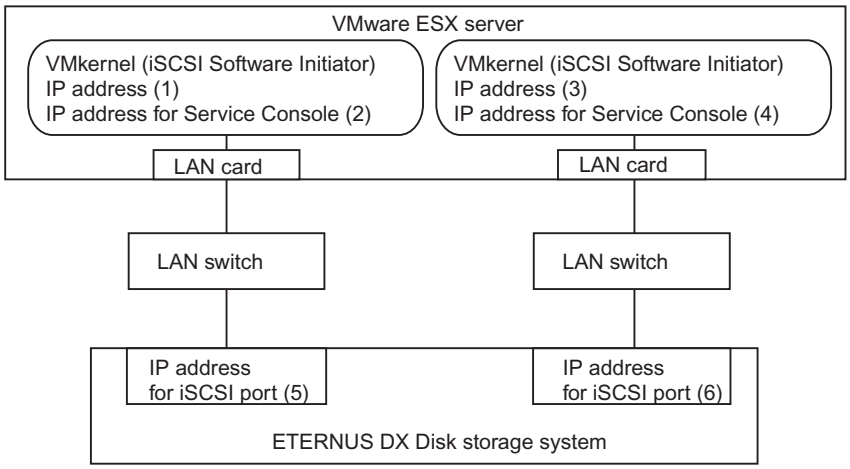


End of procedure

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



6.2.1 Turning on the Devices

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

Procedure

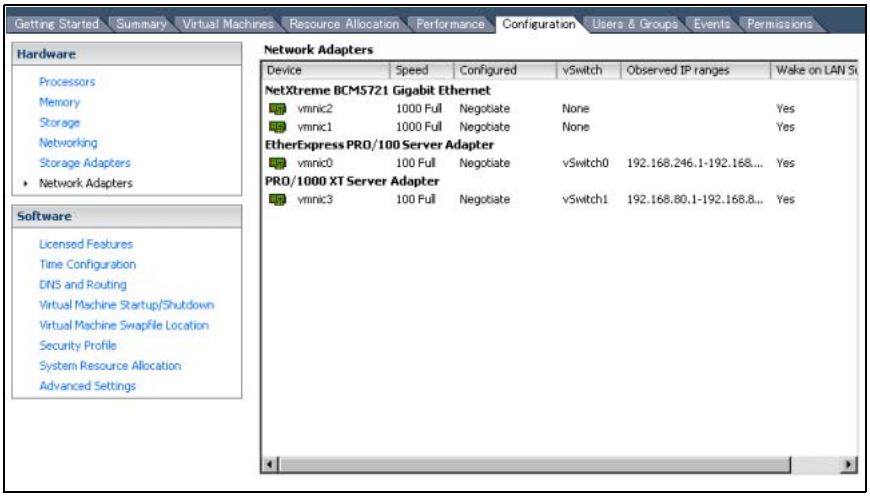
1. Turn on the LAN switch power.
2. Check that the LAN switch's Ready (or equivalent) LED is lit.
3. Turn on the ETERNUS DX Disk storage systems.
4. Check that the ETERNUS DX Disk storage systems' Ready LED is lit.
5. Turn on the server.

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.



End of procedure

6.2.3 Creating the Virtual Switches

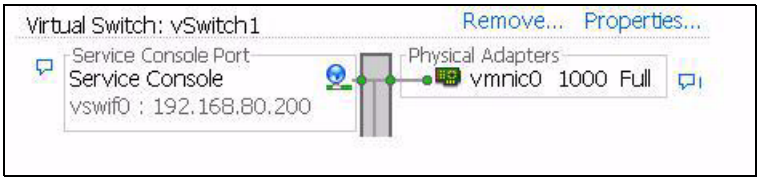
Add two virtual switches (vSwitch) for iSCSI to VMware ESX.
Define two virtual network port types ("Service Console" and "VMkernel") for the added vSwitch.
Also assign IP addresses on the same subnet to the defined Service Console and VMkernel.

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.

End of procedure

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].

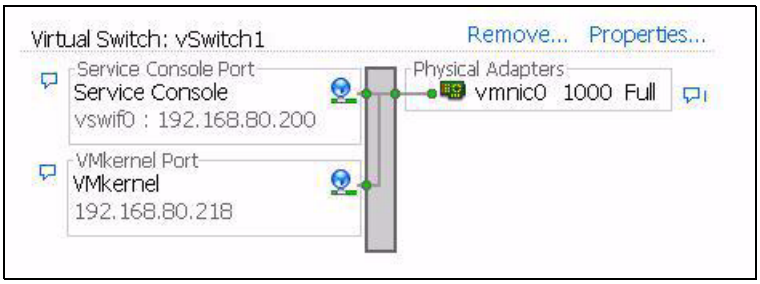
2 Click [Add].

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.

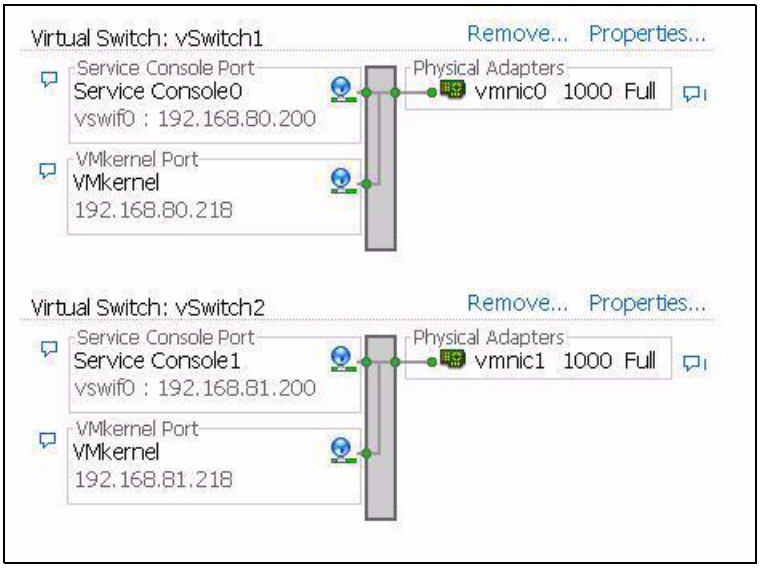
5 Confirm the settings shown on the confirmation screen and click the [Finish] button.
A message about Gateway settings appears.

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

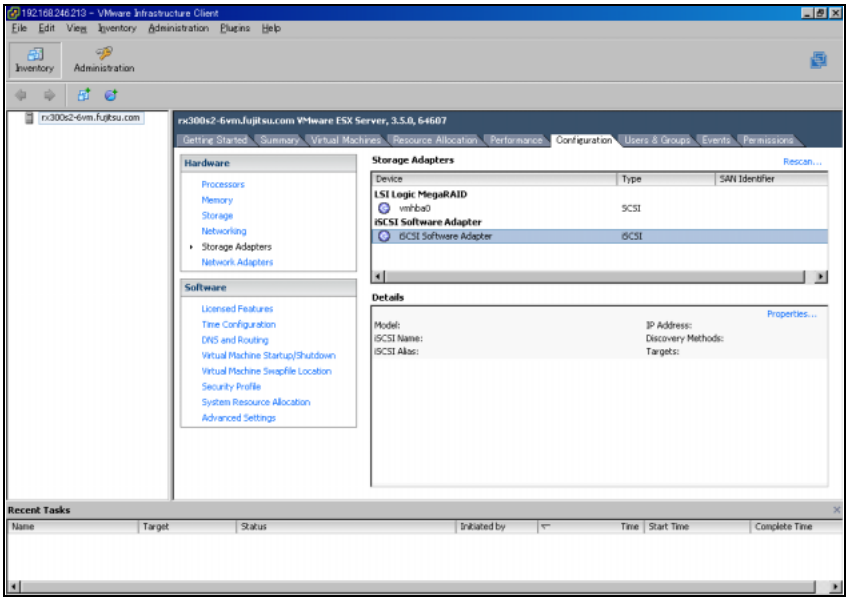
6.2.4 Setting the Software Initiator

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].

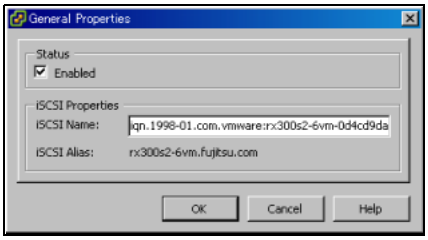


3 Click [Configure] on the [General] tab.

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

5 Confirm that the [Enabled] checkbox is selected under "Status" on the [General] tab and click [Configure] again.

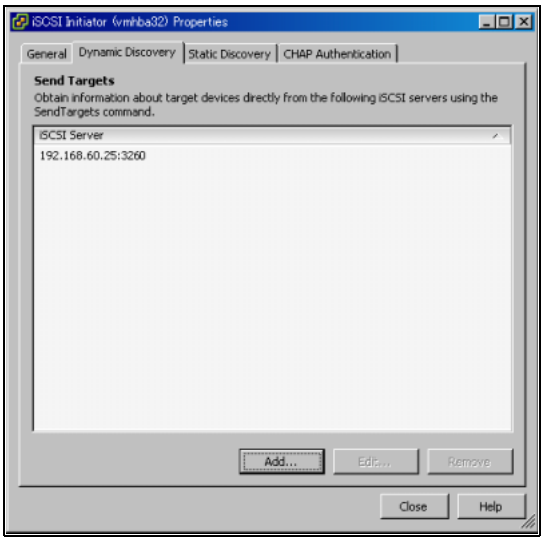
6 Confirm that the iSCSI name is displayed as follows and click the [Cancel] button.



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

8 Enter the IP address for the iSCSI port of the connected ETERNUS DX 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 DX Disk storage system is displayed as follows and click [Close].



10 If the connected ETERNUS DX 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

6.2.5 Setting the CHAP Authentication

For VMware ESX connections, the ETERNUS DX 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].

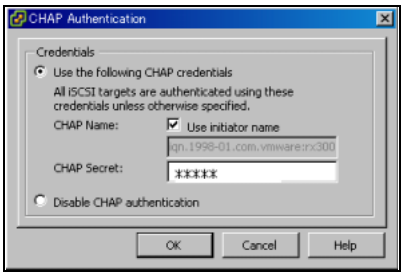
2 Select the target iSCSI Software Adapter and click [Properties].

3 Select the [CHAP Authentication] tab and click [Configure].

4 Select the [Use the following CHAP credentials] radio button.

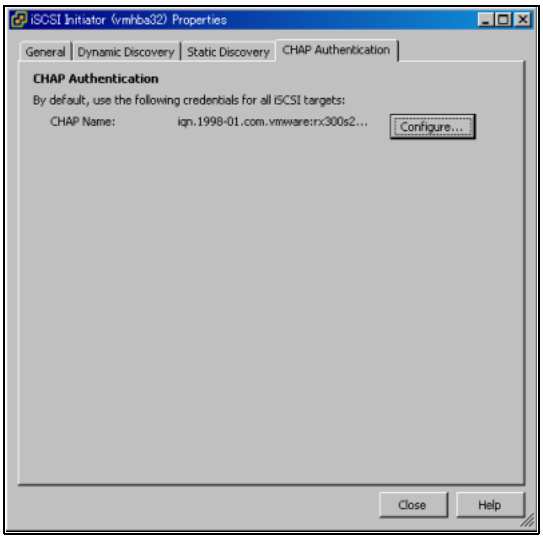
5 Set arbitrary user name during the CHAP authentication.

6 To set the VMware ESX iSCSI name for the user name, select the [Use initiator name] checkbox.



7 Enter the password in [CHAP Secret] and click the [OK] button.

The CHAP Name is displayed as follows.



End of procedure

6.2.6 Checking the LUNs

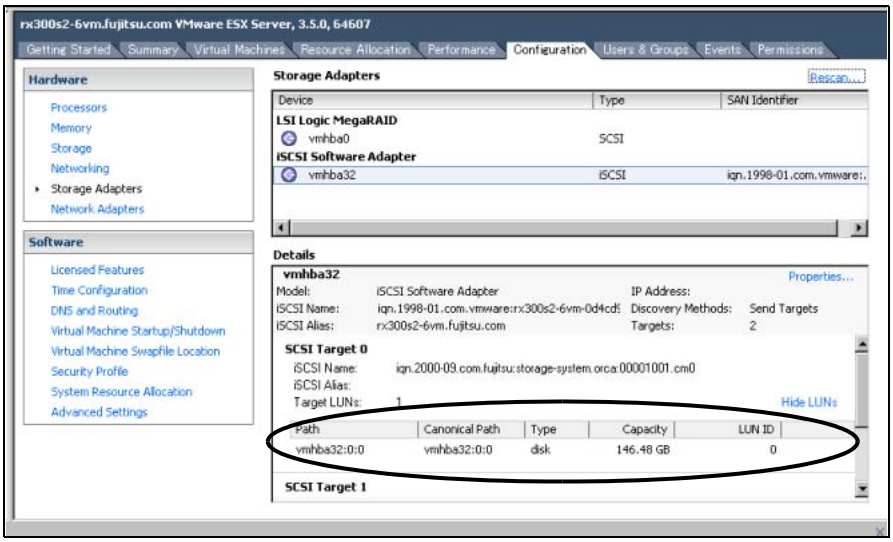
The VMware Infrastructure Client is used to login to VMware ESX and check the LUNs.

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:



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
http://partnerweb.vmware.com/GOSIG/home.html

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.

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

Name	TimeOutValue
Type	REG_DWORD
Radix	Hexadecimal
Data	3C

Be sure to backup the registry before editing it.

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".

4 If the contents were modified, reboot the OS.

End of procedure

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. 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.

- 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

ETERNUS DX Disk storage systems User's Guide -Server Connection- (iSCSI) for VMware® ESX

P3AM-3412-11ENZ0

Date of issuance: September 2012
Issuance responsibility: FUJITSU LIMITED

FUJITSU