FUJITSU Storage ETERNUS AF, ETERNUS DX

Configuration Guide -Server Connection-



(iSCSI) for Windows[®]



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This manual briefly explains the operations that need to be performed by the user in order to connect an ETERNUS AF/DX to a server running Windows[®] via an iSCSI interface.

This manual should be used in conjunction with any other applicable user manuals, such as those for the ETERNUS AF/DX, server, OS, adapters, and drivers.

Use the default values for parameters that are not described in this manual.

Refer to "Configuration Guide -Server Connection- Notations" for the notations used in this manual such as product trademarks and product names. For storage systems that are supported by the OS, refer to the Server Support Matrix of the ETERNUS AF/DX.

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The Contents and Structure of this Manual

This manual is composed of the following six chapters and two appendices.

"Chapter 1 Workflow" (page 6)

This chapter describes how to connect a server to the ETERNUS AF/DX.

"Chapter 2 Checking the Server Environment" (page 9)

This chapter describes which servers can be connected to ETERNUS AF/DX storage systems.

• "Chapter 3 Notes" (page 10)

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

• "Chapter 4 Setting Up the Server" (page 21)

This chapter describes how to connect a server running Windows[®] to the ETERNUS AF/DX.

"Chapter 5 Notes on Operation" (page 46)

This chapter describes various settings required for operation.

"Chapter 6 Setting the iSCSI QueueDepth Value" (page 48)

This chapter describes how to set the iSCSI QueueDepth value.

"Microsoft[®] iSCSI Software Initiator iSCSICLI Commands" and "iSCSICLI Setting Examples" are provided as appendices.

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Chapter 1 Workflow

1.1 Connecting the ETERNUS AF/DX

This section describes how to connect the ETERNUS AF/DX storage systems to a server. IPv4 is used for IP address examples in this manual. The workflow is shown below.

Required Documents

- "Server Support Matrix"
- "Configuration Guide -Server Connection- Storage System Settings" that corresponds to the ETERNUS AF/DX to be connected

Workflow

Checking the Server

Check that the OS, LAN cards, and onboard LANs of the server will allow the ETERNUS AF/DX to be connected to.

Also, check the notes for operation.

- "Chapter 2 Checking the Server Environment" (page 9)
- "Chapter 3 Notes" (page 10)





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Chapter 2 Checking the Server Environment

Connection to servers is possible in the following environments. Check the "Server Support Matrix" for server environment conditions.

2.1 Hardware

Refer to the "Server Support Matrix".

2.2 Operating System (OS)

Refer to the "Server Support Matrix".

2.3 Network Interface Card

Refer to the "Server Support Matrix".

2.4 Multipath Configuration

Refer to the "Server Support Matrix".

Chapter 3 Notes

Note the following issues when connecting the ETERNUS AF/DX to a server.

3.1 LAN Card Connection Notes

- The following operation conditions are recommended to maintain storage system reliability:
 - Connection via multiple paths
 - Use of drivers for ETERNUS AF/DX storage systems which support path redundancy control

Configure a multipath environment and select a driver for ETERNUS AF/DX storage systems that supports path redundancy control to increase redundancy and reliability of the connection between the ETERNUS AF/DX storage systems and the server.

- When the PRIMEQUEST 500/400 series is connected to an ETERNUS AF/DX, LUN recognition by the Windows[®] Plug and Play function is not guaranteed.
- For a multi-port LAN card, a configuration that connects the two ports on the LAN card to different storage systems is recommended.

3.2 Multiple LAN Cards Installation Notes

When installing multiple LAN cards, record the relation between the PCI slot location and the port name of the LAN card as you install the LAN cards one by one. You can check the port name of the LAN card by click-ing [Start] - [Settings] - [Network Connection].

3.3 Driver Notes

Some drivers for ETERNUS AF/DX storage systems support the use of path redundancy (path fail-over). For product information, refer to the following URL:

https://www.fujitsu.com/global/products/computing/storage/software/eternus-mpd/

3.4 LAN Switch Notes

- When multiple ETERNUS AF/DX storage systems are connected to a single server, each iSCSI name of the ETERNUS AF/DX storage systems must be different.
- When installing two LAN cards to one server for path redundancy, connect each LAN card to different LAN switches. If they are connected to the same LAN switch, a single point of failure results in loss of redundancy.
 - Recommended configuration



- Incorrect configuration (loss of redundancy)



3.5 LAN Environment Notes

• Configure the iSCSI LAN as a dedicated LAN that is separate from the business LAN or the management LAN by segmenting the IP address.

Example:

- IP address of the LAN for iSCSI: 192.168.10.x/24
- IP address of the business/management LAN: 192.168.70.y/24

The iSCSI LAN and the business/management LAN must be configured with different network addresses (up to the value "192.168.10.") as shown in the above example.

If it is not a dedicated LAN, the following may occur.

- Processes may be delayed in the LANs due to traffic conflicts.
- In terms of security, SAN data may leak or the iSCSI port may hang due to DoS attacks.
- iSCSI LAN redundancy is achieved by the use of multipaths. The LAN must be configured as a dedicated LAN for each path from a server to the ETERNUS AF/DX.



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 storage systems (equivalent to the FC zones).

Example of a network address configuration

The following example shows a configuration in which multiple servers are connected to multiple CAs.



The following example shows a configuration in which a single server is connected to multiple CAs.



3.6 Network Setting Notes

With an iSCSI connection, SCSI commands are sent between the server and ETERNUS AF/DX via an IP network. Because IP addresses are used to identify devices on the IP network, a network-unique IP address will be required for each server and ETERNUS AF/DX iSCSI adapter used.

Caution

- The iSCSI name, Alias name, and CHAP authentication information should be specified according to the following conditions:
 - iSCSI name
 - Up to 221 characters comprising some iqn or eui format combination of lower-case alphanumerics, "-" (minus), ":" (colon), and "." (dot) symbols.
 - Alias name
 - Used by the administrator to simplify network management. (Optional)
 - Up to 16 arbitrary alphanumeric characters
 - User name
 - Up to 223 alphanumeric characters
 - Password
 - 12 to 16 alphanumeric characters
- Make sure normal LAN connections and iSCSI LAN connections (for the ETERNUS AF/DX) are separated from each other.

3.7 Notes about Standard Multipath Driver (msdsm) for Windows Server[®]

Various settings, such as the load balance policy and retry count, can be adjusted by using the standard multipath drivers (msdsm) for Windows Server[®] 2019, Windows Server[®] 2016, Windows Server[®] 2012 R2, Windows Server[®] 2012, Windows Server[®] 2008 R2 or Windows Server[®] 2008. For the ETERNUS AF/DX, the following settings should not be changed from their default values.

Screen name	Parameters that may not be changed
MPIO tab of Multi-Path Disk Device properties	Load balance policy, [Details] button, [Edit] button
Details of DSM	Timer counter (path checking period, enable path checking, number of retires, retry interval, PDO deletion period)
Details of MPIO paths	Path status

3.8 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 OS 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 AF/DX is 9,000 bytes.

3.9 Notes when Multiple Disk Devices are Connected to a Single Server

When multiple disks devices are connected in a Windows[®] environment, some LUNs may not be recognized when the OS is restarted. This problem can be avoided by setting target binding in the server.

Target binding must be set using the iSCSICLI, which is the iSCSI Software Initiator command line tool. Since this setting is overwritten when settings are performed via Microsoft[®] iSCSI Software Initiator, other iSCSI-related settings must also be performed using the iSCSICLI.

Refer to "Appendix A Microsoft[®] iSCSI Software Initiator iSCSICLI Commands" (page 50) for details about iSC-SICLI commands that are necessary for target binding and ETERNUS AF/DX connection. Also, examples of settings via batch files using the iSCSICLI are described in "Appendix B iSCSICLI Setting Examples" (page 53).

3.10 Notes about Connections with a Windows Server[®] 2008 R2 and Windows Server[®] 2008

In both Windows Server[®] 2008 R2 and Windows Server[®] 2008, if the file copy and other operations are performed for a disk device that is connected using iSCSI, an iScsiPrt error may be output to the system event log.

In this case, this event can be prevented by disabling the Delayed ACK. For more details, refer to the Microsoft web-site for KB981482.

3.11 Notes about Connections with a Windows Server[®] 2019, Windows Server[®] 2016, Windows Server[®] 2012 R2 and Windows Server[®] 2012

When a virtual machine is configured using the Hyper-V function in a state where multiple volumes are connected, the setting screen of the virtual machine may take tens of minutes to display.

In this case, this event can be prevented by disabling the Delayed ACK.

For more details, refer to the Microsoft web-site for KB981482. If a modification method for the relevant version is not described, modify the setting with the method used for Windows Server[®] 2008 R2 and Windows Server[®] 2008.

3.12 Notes about Connections with a Windows Server[®]

When Windows Server[®] is connected to the ETERNUS AF series (excluding the ETERNUS AF S3 series), the ETERNUS DX S4/S3 series (excluding the ETERNUS DX8900 S4), or the ETERNUS DX200F, and Windows Server[®] is rebooted after a firmware is applied to the storage system, the status of the disks on Windows Server[®] may become offline.

The status of the disks on Windows Server[®] can be checked with the following procedure.

Click the [Start] button, select [Computer Management] under [Administrative Tools] and then select [Manage Discs] (or [Disk Management]) in the left pane.

Note that the occurrence condition and the workaround differ depending on the path configuration of Windows Server[®].

For single-path configurations, change the SAN Policy setting before a firmware is applied to prevent the disk from becoming offline after the firmware is applied.

For multi-path configurations, there is no workaround. The procedure in • Measure to take after a problem occurs" (page 18) must be performed to recover from the offline status.

Single-path configuration

The offline status can be avoided only when updating the firmware by changing the SAN Policy setting to "Online All".

If operations are possible with the SAN Policy setting set to "Online All", Step 4 in "
Method for proactively preventing occurrences" (page 16) is not required.

Checking the SAN Policy setting

The following shows how to check the SAN Policy setting.

- 1 Execute the "diskpart" command in the command prompt. The prompt changes to DISKPART.
- 2 Enter "san" and press the [Enter] key.

DISKPART> san

- 3 One of the following SAN Policies appears.
 - "Offline Shared"
 - "Offline All"
 - "Online All"
- 4 Enter "exit" and press the [Enter] key to complete the "diskpart" command.
- Method for proactively preventing occurrences

Change the SAN Policy setting by performing the following procedure and then update the firmware.

- 1 Change the SAN Policy setting.
 - (1) Execute the "diskpart" command in the command prompt. The prompt changes to DISKPART.

(2) Enter "san policy=onlineall" and press the [Enter] key.

Example:

```
DISKPART> san policy=onlineall
```

- (3) To apply the SAN Policy setting, reboot Windows Server[®].
- 2 Execute the "diskpart" command again in the command prompt and confirm that "Online All" is specified for the SAN Policy setting.

Example:

```
DISKPART> san
SANPolicy : Online All
```

- 3 Update the firmware.
 - (1) Update the firmware of the ETERNUS AF/DX.
 - (2) To get OS to recognize the new instance ID, reboot Windows Server[®].
- 4 Revert the SAN Policy setting to the previous value.
 - (1) Execute the following command to revert the SAN Policy setting.

Example:

DISKPART> san policy=Offline Shared

- (2) To apply the SAN Policy setting, reboot Windows Server[®].
- (3) Execute the "diskpart" command again in the command prompt and confirm that the previous value is specified for the SAN Policy setting.

Example:

```
DISKPART> san
SANPolicy : Offline Shared
```

• Measure to take after a problem occurs

Manually change the offline disks to online with the following procedure.

- 1 Click the [Start] button, select [Computer Management] under [Administrative Tools] and then select [Manage Discs] (or [Disk Management]) in the left pane.
- 2 Select each offline disk, then right-click the selected disk to change the status to online.

If a firmware update of the ETERNUS AF/DX is performed in a Hyper-V environment where a pass-through disk is configured for the guest OS, the disk is recognized as a new disk and the pass-through disk is removed from the physical hard disk. Therefore, the pass-through disk must be manually reconfigured to be restored.

The procedure for restoring (or reconfiguring) the disk is as follows:

1 Start "Hyper-V Manager".

- 2 Select the offline guest OS and click [Settings] in the right pane. The settings pop-up for the guest OS appears.
- 3 In the settings pop-up under [SCSI Controller], select the hard drive that has the message "Physical drive not found".
- 4 Select the appropriate disk for the [Physical hard disk] area in the right side of the window.
- 5 Click the [OK] button.

• SAN Policy supported OSs

- Windows Server[®] 2022
- Windows Server[®] 2019
- Windows Server[®] 2016
- Windows Server[®] 2012 R2
- Windows Server[®] 2012

• SAN Policy default value

05	SAN Policy default value
Windows Server [®] 2022 (all editions)	Offline Shared
Windows Server [®] 2019 (all editions)	
Windows Server [®] 2016 (all editions)	
Windows Server [®] 2012 R2 (all editions)	
Windows Server [®] 2012 (all editions)	

Multipath configuration

The server starts up with the same disk status (online or offline) as when the multipathing was set up regardless of the SAN Policy setting.

- When the multipathing of an online disk is set up during the configuration of the environment The multipath disk starts up in the online status after the firmware is updated.
- When the multipathing of an offline disk is set up during the configuration of the environment The multipath disk starts up in the offline status after the firmware is updated.
- Method for proactively preventing occurrences

For multi-path configurations, there are no proactive measures (such as a setting change) to prevent the disk from becoming offline after the environment is configured. In addition, the disk status when multipathing was set up cannot be checked after the environment is configured.

Perform the procedure in " Measure to take after a problem occurs" (page 18) if the disk becomes offline while the firmware is updated.

- Measure to take after a problem occurs
 - When the OS can be started up

Manually change the offline disks to online by following the procedure below.

- 1 Click the [Start] button, select [Computer Management] under [Administrative Tools] and then select [Manage Discs] (or [Disk Management]) in the left pane.
- 2 Select each offline disk, then right-click the selected disk to change the status to online.
- When the OS cannot be started up

If the Active Directory database is located in a disk other than the OS area, the OS may not be able to start up because the disk is offline and the OS cannot access the Active Directory database.

In this case, the disk can be recovered by starting the OS in the Directory Services Restore Mode and changing the disk status to online.

The procedure for restoring (or reconfiguring) the disk is as follows:

- 1 Start the server.
- 2 Press the [F8] key on the server start-up screen.
- 3 The Advanced Boot Options screen appears.
- 4 Select Directory Services Restore Mode.
- 5 Log in as Administrator after the OS starts.
- 6 Select [Computer Management] under [Administrative Tools] and then select [Manage Discs] (or [Disk Management]) in the left pane.
- 7 Select each offline disk, then right-click the selected disk to change the status to online.
- 8 Restart the OS.

If a firmware update of the ETERNUS AF/DX is performed in a Hyper-V environment where a pass-through disk is configured for the guest OS, the disk is recognized as a new disk and the pass-through disk is removed from the physical hard disk. Therefore, the pass-through disk must be manually reconfigured to be restored.

The procedure for restoring (or reconfiguring) the disk is as follows:

- 1 Start "Hyper-V Manager".
- 2 Select the offline guest OS and click [Settings] in the right pane. The settings pop-up for the guest OS appears.
- 3 In the settings pop-up under [SCSI Controller], select the hard drive that has the message "Physical drive not found".
- 4 Select the appropriate disk for the [Physical hard disk] area in the right side of the window.
- 5 Click the [OK] button.

3.13 Notes for Formatting a LUN of the ETERNUS AF/DX from a Windows Server[®]

If a LUN of the ETERNUS AF/DX is formatted from a Windows Server[®], the following problems may occur.

- The formatting operation takes longer to complete.
- If the formatting operation is canceled, the canceled operation becomes unresponsive.

These are the problems caused by performance degradation due to the command being issued to release the storage capacity for the entire formatting area.

Performance degradation can be prevented by executing the following command to change the parameter value to stop the command from releasing the storage capacity of all the volumes.

```
# fsutil behavior set disabledeletenotify 1
```

After all formatting operations have been completed, execute the following command to re-enable the command that releases the storage capacity of all the volumes.

fsutil behavior set disabledeletenotify 0

Chapter 4 Setting Up the Server

This chapter describes how to connect the ETERNUS AF/DX to a server using a LAN card.

4.1 Installing the LAN Cards

Install the LAN card when the server is turned off.

For the installation procedure, refer to the User's Guide provided with the server. When using the onboard LAN card, skip this procedure and go to the next step.

Caution

When installing multiple LAN cards, record the relation between the PCI slot location and the port name of the LAN card as you install the LAN cards one by one.

You can check the port name of the LAN card by clicking [Start] – [Settings] – [Network Connection].

4.2 Installing the Driver

Start the server and install necessary drivers.

The drivers listed below are necessary:

- LAN card driver
 - LAN driver
 - Supported version of Microsoft[®] iSCSI Software Initiator
- Driver for ETERNUS AF/DX storage systems

Install either of the following drivers depending on the type of connection.

- Single-path configuration

Driver for ETERNUS AF/DX (ETERNUS Device Driver) is not required.

- Multipath configuration

Install one of the following drivers.

- ETERNUS Multipath Driver
- Standard multipath driver (msdsm) for Windows Server[®] 2019, Windows Server[®] 2016, Windows Server[®] 2012, Windows Server[®] 2008 R2, or Windows Server[®] 2008

4.2.1 Installing the LAN Driver

Install the LAN driver according to the procedure below.

When using the onboard LAN card, skip this procedure and go to the next step.

iSCSI network connection IP addresses must be set before the ETERNUS AF/DX is connected.

Procedure

- 1 When installing the LAN driver, refer to the instructions provided with the LAN card.
- 2 Check that the driver has correctly been installed.

End of procedure

4.2.2 Installing the Driver for ETERNUS AF/DX Storage Systems (ETERNUS Multipath Driver)

• Install the ETERNUS Multipath Driver as required.

Refer to "3.3 Driver Notes" (page 10) for notes about the ETERNUS Multipath Driver in cases such as when connecting the server to the ETERNUS AF/DX in multipath configuration and using the path redundancy control (path fail-over) function, and for when single-path connection is used between the ETERNUS AF/DX and server.

• For the procedure about how to install (or uninstall), set up, and use the drivers for ETERNUS AF/DX storage systems, refer to the software manuals.

4.2.3 Installing the Driver for ETERNUS AF/DX Storage Systems (Standard Multipath Driver (msdsm) for Windows Server[®])

This section describes how to install the standard multipath driver (msdsm) for Windows Server[®] 2019, Windows Server[®] 2016, Windows Server[®] 2012 R2, Windows Server[®] 2012, Windows Server[®] 2008 R2, and Windows Server[®] 2008, which supports the ETERNUS AF/DX.

4.2.3.1 Installing Multipath I/O

Procedure

- 1 Click [Add Function] in the "Server Manager" screen.
- 2 Select the "Multipath I/O" checkbox in the "Select Features" screen of the Add Features wizard, and install the Multipath I/O function.

Add Features Wizard		2
Select Features	Select one or more features to install on this server. Eatures: BNET Framework 3.0 Features B. Bit Server Extensions Connection Manager Administration Kit Desktop Experience Fallover Clustering (Instaled) Group Policy Management Internet Printing Clent Internet Storage Name Serveri PR Port Monitor Message Queuing Message Queuing Metwork Load Balancing Peer Name Resolution Protocol Quilty Windows Audo Video Experience Remote Differential Compression B. Remote Server Administration Tools (Instaled) Remote Server Administration Tools (Instaled) Remote Conference Server Administration Tools (Instaled) Remote Server Administration Tools (Instaled) Remote Conference Server Administration Tools (Instaled) Remote Conference Server Administration Tools (Instaled) Remote Conference Server Servers	Description: <u>Multipath I(0</u> , along with the Microsoft DeviceSpecific Module (DSM) or a third-party DSM, provides support for using multiple deta paths to a storage device on Windows.
	More about features <pre>previous least</pre>	> Install Cancel

3 Reboot the server.

End of procedure

4.2.3.2 Detailed Setup for MPIO

Perform settings to apply the installed Multipath I/O to the ETERNUS AF/DX.

Procedure

Click [Control Panel] – [MPIO].
 The MPIO properties window appears.

2 In the MPIO properties window, select the [MIPO-ed Devices] tab, and click the [Add] button.

PIO Properties			
MPIO-ed Devices Discover Multi-	Paths DSI	M Install	
To add support for a new device Product Ids as a string of 8 char Devices can be specified using se	e, <mark>click</mark> Add a acters follov emi-colon as	and enter the ved by 16 cha the delimiter.	Vendor and racters. Multiple
To remove support for currently then click Remove.	MPIO'd dev	ices, select th	e devices and
Device Hardware Id			
Vendor 8Product 16			
<	Add		Remove
<u>111</u>			102712

3 Enter the ID of the ETERNUS AF/DX that is to be connected in the [Device Hardware ID] field.

Add MPIO Support		×
Enter the Vendor and Product Ids (as a 16 characters) of the devices you wan	string of 8 characters followed t to add MPIO support for.	lby
Device Hardware ID:		
FUJITSU ETERNUS_DX400		
	<u>Q</u> K <u>C</u> ancel	

The device hardware ID that must be entered for the ETERNUS AF/DX can be checked with the following table.

ETERNUS AF/DX to be used	Device Hardware ID
ETERNUS AF150 S3/AF250 S3,	FUJITSU ETERNUS_DXL
ETERNUS AF250 S2,	
ETERNUS AF250,	
ETERNUS DX60 S5/DX100 S5/DX200 S5,	
ETERNUS DX60 S4/DX100 S4/DX200 S4,	
ETERNUS DX60 S3/DX100 S3/DX200 S3,	
ETERNUS DX60 S2/DX80 S2/DX90 S2,	
ETERNUS DX200F	

ETERNUS AF/DX to be used	Device Hardware ID
ETERNUS AF650 S3,	FUJITSU ETERNUS_DXM
ETERNUS AF650 S2,	
ETERNUS AF650,	
ETERNUS DX500 S5/DX600 S5,	
ETERNUS DX500 S4/DX600 S4,	
ETERNUS DX500 S3/DX600 S3	
ETERNUS DX900 S5,	FUJITSU ETERNUS_DXH
ETERNUS DX8900 S4,	
ETERNUS DX8100 S3/DX8700 S3/DX8900 S3	
ETERNUS DX400 S2 series	FUJITSU ETERNUS_DX400
ETERNUS DX8000 S2 series	FUJITSU ETERNUS_DX8000
Caution	

A space is required between the "FUJITSU" and the "ETERNUS_....".

4 Connect the ETERNUS AF/DX using multipath configuration with the server turned off, and then turn the server on.

End of procedure

4.3 Connecting the Cables

Check that the ETERNUS AF/DX and server are both turned off.

Connect the ETERNUS AF/DX iSCSI port and server LAN card port using an iSCSI cable.

When connecting a server to the ETERNUS AF/DX through a LAN switch, make sure it is turned off too, and then use an iSCSI cable to connect the ETERNUS AF/DX iSCSI port and LAN switch port and another iSCSI cable to connect the server LAN card port and (different) LAN switch port.

• Direct connection





• Switching hub connection

: iSCSI cable

4.4 Turning on the Devices

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

Procedure

- 1 Turn on the LAN switch power (if used).
- 2 Check that the LAN switch's Ready (or equivalent) LED is lit.
- 3 Turn on the ETERNUS AF/DX.
- 4 Check that the Ready LED is lit on the ETERNUS AF/DX.
- 5 Turn on the server.

Caution

Before turning the server on, check that the ETERNUS AF/DX 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 AF/DX storage systems. Also, when the ETERNUS AF/DX power supply is being controlled by a connected server, make sure that the ETERNUS AF/DX 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 AF/DX storage systems, and already saved data may also be affected.

End of procedure

4.5 Setting Up the iSCSI Initiator Driver Parameters

Use the iSCSI Initiator to set the iSCSI initiator driver parameters.

Procedure

- 1 Start the iSCSI Initiator.
- 2 Click the [Configuration] tab.

3 The current iSCSI name is displayed in [Initiator Name]. To change the iSCSI name, click the [Change] button.

When using the default iSCSI name displayed in [Initiator Name], also click the [Change] button. This allows you to continue to use the above iSCSI name even after changing the "computer name" of the server.

argets	Discovery	Favorite Targets	Volumes and Devices	RADIUS	Configuration
Configu the initi	iration settini ator,	gs here are global an	id will affect any futuri	e connectio	ons made with
Any exi the initi	sting connec ator otherwis	tions may continue to se tries to reconnect	o work, but can fail if t to a target.	he system	restarts or
When c particul	onnecting to ar connectior	a target, advanced n.	connection features a	llow specifi	c control of a
Initiator	Name:				
iqn.19	91-05.com.n	icrosoft: fujitsu			
To modi	ify the initiat	or name, click Chang	e.	<	Change)
To set t click CH	he initiator C AP.	HAP secret for use v	with mutual CHAP,		CHAP
To set u click IPs	up the IPsec ec.	tunnel mode address	es for the initiator,		IPsec
To gene the sys	erate a repor tem, click Rej	t of all connected tar port.	rgets and devices on		Report
More at	bout Configu	ration			

Caution

If changing the LAN card's iSCSI name results in inconsistency with the ETERNUS AF/DX settings ("4.6.1 CHAP Authentication" (page 34)), redo Step 9 and the rest of the procedure given in "4.6.1 CHAP Authentication" (page 34) to set the changed iSCSI name.

4 Enter the iSCSI name and click the [OK] button.

iSCSI Initiator Name	×
The ISCSI initiator name is used to uniquely identify a system to ISCSI storage devices on the network. The default name is based on the standard ISCSI naming scheme and uses the system's full machine name.	
New initiator name:	
gn. 1991-05. com. microsoft: fujitsu	
(Use caution in changing the name as your currently connected targets may not be available after system restart.)	
Use Default Cancel]

The [iSCSI Initiator Properties] window will appear.

5 Click the [Discovery] tab and then click the [Discover Portal] button.

and the second se	he system will look for Targets on following portals:		
Address	Port	Adapter	IP address
'o add a taroe	t portal, click Discover	Portal	Discover Portal
o remove a ta nen click Remo	rget portal, select the ive.	e address above and	Remove
VS servers — he system is r	egistered on the follo	wing iSNS servers:	Refresh
lame			
o add an iSNS	server, click Add Ser SNS server, select the	ver. e server above and	Add Server Remove
o remove an i pen click Remo	WG.		

6 In the [IP address or DNS name] field, enter the IP address of the ETERNUS AF/DX iSCSI port that is to be connected to, and click the [Advanced] button.

Discover Target Portal	×
Enter the IP address or DNS name and p want to add.	ort number of the portal you
To change the default settings of the dis the Advanced button.	covery of the target portal, click
IP address or DNS name:	Port: (Default is 3260.)
Advanced	OK Cancel

The address set in the ETERNUS AF/DX iSCSI TCP/IP settings should be entered as the IP address of the ETERNUS AF/DX. For details on the confirmation method, refer to "Setting the To-server Connection Type" in "Configuration Guide -Server Connection- Storage System Settings" that corresponds to the ETERNUS AF/DX to be connected.

The [Advanced Settings] window appears.

7 Click the [General] tab.

Caution

8 Select "Microsoft iSCSI Initiator" for [Local adapter] and set the Initiator server IP address in [Initiator IP] under [Connect using]. Then, click the [OK] button.

neral IPsec	
Connect using	
.ocal adapter:	Microsoft iSCSI Initiator
Initiator IP:	192.168.1.30
Farget portal IP:	
CRC / Checksum	
🗌 Data digest	Header digest
HAP helps ensure of in initiator. To use, specify the s nitiator. The name of the second	onnection security by providing authentication between a target and ame name and CHAP secret that was configured on the target for this will default to the Initiator Name of the system unless another name is
CHAP helps ensure c an initiator. Fo use, specify the s nitiator. The name v specified.	onnection security by providing authentication between a target and ame name and CHAP secret that was configured on the target for this will default to the Initiator Name of the system unless another name is
CHAP helps ensure c an initiator. Fo use, specify the s nitiator. The name s specified. Vame:	onnection security by providing authentication between a target and ame name and CHAP secret that was configured on the target for this will default to the Initiator Name of the system unless another name is lign.1991-05.com.microsoft:win-gw.mslogo.fujitsu.com
CHAP helps ensure o an initiator. To use, specify the s nitiator. The name u specified. Vame: Farget secret:	amection security by providing authentication between a target and ame name and CHAP secret that was configured on the target for this will default to the Initiator Name of the system unless another name is Ign. 1991-05. com. microsoft win-gw. mslogo. fujitsucom
CHAP helps ensure o an initiator. To use, specify the s nitiator. The name v specified. Name: Farget secret:	amection security by providing authentication between a target and ame name and CHAP secret that was configured on the target for this will default to the Initiator Name of the system unless another name is [ign.1991-05.com.microsoft:win-gw.mslogo.fujitsu.com
HAP helps ensure o an initiator. To use, specify the s initiator. The name u specified. Vame: Farget secret: Perform mutual a to use mutual CHAP. RADIUS.	ame connection security by providing authentication between a target and ame name and CHAP secret that was configured on the target for this will default to the Initiator Name of the system unless another name is ign. 1991-05.com.microsoft:win-gw.mslogo.fujitsu.com uthentication either specify an initiator secret on the Configuration page or use
HAP helps ensure c an initiator. To use, specify the s initiator. The name u specified. Vame: Farget secret: Farget secret: Perform mutual et to use mutual CHAP, VADIUS.	ame tion security by providing authentication between a target and ame name and CHAP secret that was configured on the target for this will default to the Initiator Name of the system unless another name is ign. 1991-05.com.microsoft:win-gw.mslogo.fujitsu.com ign. fight of the Initiator secret on the Configuration page or use enerate user authentication credentials
HAP helps ensure c an initiator. To use, specify the s initiator. The name u specified. Name: arget secret: Perform mutual le suse mutual CHAP, IADIUS. Use RADIUS to g Use RADIUS to a	ame tion security by providing authentication between a target and ame name and CHAP secret that was configured on the target for this will default to the Initiator Name of the system unless another name is [ign:1991-05.com.microsoft:win-gw.mslogo.fujitsu.com] uthentication .either specify an initiator secret on the Configuration page or use enerate user authentication credentials uthenticate target credentials

The settings of CHAP authentication can also be made. For details of the settings, refer to "4.6 Setting CHAP Authentication" (page 34).

9 Click the [OK] button.

Discover Target Portal	×
Enter the IP address or DNS name as want to add.	nd port number of the portal you
To change the default settings of the the Advanced button.	e discovery of the target portal, click
IP address or DNS name:	Port: (Default is 3260.)
192.168.1.130	3260
<u>A</u> dvanced	

10 Click the [Targets] tab.

11 Check the connection and click the [Connect] button.

If the connection is OK, the ETERNUS AF/DX iSCSI name should appear in [Discovered targets] and the [Status] should be "Inactive".

SI Initiator F	Properties			
argets Disco	very Favorite Targets Volumes and D	evices RA	DIUS Configurat	ion
Quick Connect	t			· ·
To discover a	nd log on to a target using a basic conne	tion, type t	he IP address or	
DNS name of	the target and then click Quick Connect.			
Tanada			Quiel Comment	
Target:	J			
Discovered ta	rgets			
			<u>R</u> efresh	
Namo				
lign.2000-09	.com.fujitsu:storage-system.dxl:0000000	0.cm0port0	Inactive >	
•				
To coppect u	sing advanced options, select a target an	d then		
click Connect	, sing advanced options, select a target an		Connect	2
To completely	disconnect a target coloct the target a	.d		1
then click Disc	connect.	iu	Disconnect	
For target pro	operties, including configuration of sessio get and click Properties	ns,	Properties	.
select the tar	get and title Properties.			
For configura	tion of devices associated with a target, d then dick Devices	select	De <u>v</u> ices	
une target an	u then tlick Devices.			
More about ba	sic iSCSI connections and targets			
		_		
	ОК	(Cancel 6	spply

Caution

Even if the connection is correctly made, the ETERNUS AF/DX iSCSI name may not appear in [Discovered targets]. Perform the following steps.

- Check that the cables are connected correctly.
- Click the [Refresh] button.
- 12 Select the [Add this connection to the list of Favorite Targets.] checkbox and click the [Advanced] button.

Connect To Target	×
Target name:	
iqn.2000-09.com.fujitsu:storage-system.dxl:00000000.cm0port0	
Widd this connection to the list of Favorite Targets. This will make the system automatically attempt to restore the connection every time this computer restarts.	
Enable multi-path	
Advanced OK Ca	incel

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FUJITSU Storage ETERNUS AF, ETERNUS DX Configuration Guide -Server Connection- (iSCSI) for Windows[®] Copyright 2022 FUJITSU LIMITED 13 Select "Microsoft iSCSI Initiator" for [Local adapter]. Next, set the Initiator server IP address and the ETERNUS AF/DX IP address/port number (for example, 192.168.1.130 / 3260), in [Initiator IP] and [Target portal IP] respectively under [Connect using]. Then, click the [OK] button.

Connect using	
Local adapter:	Microsoft iSCSI Initiator
Initiator i	192.168.1.30
Target portal IP:	192.168.1.130 / 3260
CRC / Checksum	
🗂 Data digest	Header digest
Enable CHAP log CHAP Log on inform CHAP helps ensure of an initiator. To use, specify the s nitiator. The name v specified	an auton menction security by providing authentication between a target and ame name and CHAP secret that was configured on the target for this all default to the Initiator Name of the system unless another name is
Enable CHAP log CHAP Log on inform CHAP helps ensure cl an initiator. To use, specify the s initiator. The name v specified. Name:	an auton innection security by providing authentication between a target and ame name and CHAP secret that was configured on the target for this all default to the Initiator Name of the system unless another name is
Enable CHAP log CHAP Log on inform CHAP helps ensure ci an initiator. To use, specify the s initiator. The name v specified. Name: Target secret:	an ablon ablon amename and CHAP secret that was configured on the target and ame name and CHAP secret that was configured on the target for this all default to the Initiator Name of the system unless another name is
Enable CHAP log CHAP log on inform CHAP holos ensure or an initiator. To use, specify the s nitiator. The name v specified. Name: Target secret: Perform mutual a ro use mutual (AAP), RADUS.	an ation annection security by providing authentication between a target and annection security by providing authentication between a target for this all default to the Initiator Name of the system unless another name is authentication either specify an initiator secret on the Configuration page or use.
Enable CHAP log CHAP log on inform CHAP holos ensure or an initiator. To use, specify the s nitiator. The name v specified. Name: Target secret: Perform mutual a To use mutual (AFAP) KADIUS. Use RADIUS to g	an ation ation action security by providing authentication between a target and ame name and CHAP secret that was configured on the target for this all default to the Initiator Name of the system unless another name is authentication wither specify an initiator secret on the Configuration page or use enerate user authentication credentials

14 Click the [OK] button.

Connect To Target	×
Target name:	
iqn.2000-09.com.fujitsu:storage-system.dxl:00000000.cm0port0	
Add this connection to the list of Favorite Targets. This will make the system automatically attempt to restore the connection every time this computer restarts.	
Enable multi-path	
Advanced	

If the logon is successful, the [Status] of the ETERNUS AF/DX iSCSI name displayed in the [Targets] tab window should change to "Connected".

51 Initiator P	roperties		
argets Disco Quick Connect To discover a DNS name of	very Favorite Targets Volumes ar	d Devices RAI	DIUS Configuration
<u>T</u> arget:			Quick Connect
Discovered ta	gets		<u>R</u> efresh
iqn.2000-09.	com.fujitsu:storage-system.dxl:0000	0000.cm0port0	Connected
			×
To connect us	ing advanced options, select a targe	t and then	Connect
To connect us click Connect. To completely then click Disc	ing advanced options, select a targe disconnect a target, select the targe onnect.	t and then	Connect
To connect us click Connect. To completely then click Disc For target pro select the tar	ing advanced options, select a targe disconnect a target, select the targe onnect. perties, including configuration of se get and click Properties.	t and then It and ssions,	Connect Disconnect Properties
To connect us click Connect. To completely then click Disc For target pro select the tar For configural the target an	ing advanced options, select a targe disconnect a target, select the targe onnect. perties, including configuration of se get and click Properties. ion of devices associated with a targ I then click Devices.	t and then at and ssions, et, select	Connect Disconnect Properties Devices
To connect us click Connect. To completely then click Disc For target pro select the tar For configura the target an <u>fore about ba</u>	ing advanced options, select a targe disconnect a target, select the targe onnect. perties, including configuration of se jet and click Properties. ion of devices associated with a targ I then click Devices.	t and then et and ssions, et, select	Connect Disconnect Properties Devices

End of procedure

4.6 Setting CHAP Authentication

The following two types of authentication are available:

CHAP Authentication

The ETERNUS AF/DX authenticates the server.

Secrets are set to the target only and all servers attempting to access the target need to start logon sessions with target using the same secrets.

Bidirectional CHAP Authentication

The ETERNUS AF/DX and the server authenticate each other. Different secrets are set to each target in the Storage Area Network (SAN) and to each side of the transmission.

If authentication is to be used, certain type-dependent settings are required. The similar settings also need to be performed for the ETERNUS AF/DX.

If these authentication settings are omitted, unauthenticated connections will be established.

If CHAP authentication is set up on the ETERNUS AF/DX side only, a result of "Authentication Failure" will be produced when the server attempts to log on.

4.6.1 CHAP Authentication

CHAP authentication should be set up on the server as follows:

Procedure

- 1 Start the iSCSI Initiator.
- 2 Click the [Discovery] tab.
- 3 Click the [Discover Portal] button.

l'he system wil Address	l look for Targets Port	on following portals: Adapter	Refresh IP address
Fo add a targe Fo remove a ta	it portal, click Disc arget portal, selec nve.	over Portal. t the address above and	Discover Portal Remove
5NS servers The system is I Name	registered on the	following ISNS servers:	Refresh
To add an iSNS	5 server, click Add	Server.	Add Server
To remove an then click Rem	iSNS server, selec ove.	t the server above and	Remove
	iccouper and iCNIS		

The [Discover Target Portal] window will appear.

4 In the [IP address or DNS name] field, enter the IP address of the ETERNUS AF/DX iSCSI port that is to be connected to, and click the [Advanced] button.

Discover Target Portal	×
Enter the IP address or DNS name and want to add.	d port number of the portal you
To change the default settings of the o the Advanced button.	discovery of the target portal, click
IP address or DNS name:	Port: (Default is 3260.)
Advanced	QK <u>C</u> ancel

The [Advanced Settings] window appears.

5 Set "Microsoft iSCSI Initiator" in [Local adapter], set the Initiator server IP address in [Initiator IP] under [Connect using], and click the [OK] button.

Then, select the [Enable CHAP log on] checkbox, specify [Name] and [Target secret], and click the [OK] button.

Advanced Settings ?	×
General IPsec	1
Connect using	l
Local adapter: Microsoft iSCSI Initiator	
Initiator IP: 192.168.1.30	
Iarget portal IP:	
CRC / Checksum	
🗖 Data digest 🗖 Header digest	
CHAP Log on CHAP Log on information CHAP helps ensure connection security by providing authentication between a target and an initiator.	
To use, specify the same name and CHAP secret that was configured on the target for this initiator. The name will default to the Initiator Name of the system unless another name is specified.	
Name: fujitsu	
Target secret:	
Perform mutual authentication	L
To use mutual CHAP, either specify an initiator secret on the Configuration page or use RADIUS.	
Les RADIUS to generate user authentication credentials	
Use <u>R</u> ADIUS to authenticate target credentials	
OK Cancel Apply	

Caution

The [Name] and [Target secret] set here must match the [CHAP User ID] and [CHAP Password] set for the ETERNUS AF/DX. For details on the confirmation method, refer to "Setting CHAP Authentication" in "Configuration Guide -Server Connection- Storage System Settings" that corresponds to the ETER-NUS AF/DX to be connected.

6 Click the [OK] button.



- 7 Click the [Targets] tab.
- 8 Check the connection and click the [Connect] button.

When CHAP authentication is complete and the connection is OK, the ETERNUS AF/DX iSCSI name should appear in [Discovered targets] and the [Status] should be "Inactive".

argets					
	Discovery	Favorite Targets	Volumes and Devices	RADIUS Cor	nfiguration
Ouick (Ionnect			1	· · · · · ·
To disc DNS na	cover and log ame of the ta	g on to a target usi arget and then click	ng a basic connection, t < Quick Connect.	ype the IP addr	ress or
<u>T</u> arget				Quick (Connect
Discov	ered targets			Re	efresh
Name				Status	
lign.20	000-09.com.	fujitsu:storage-sys	stem.dxl:00000000.cm0	port0 Inactive	\geq
•					
То соп					
click C	inect using a onnect.	avancea options, s	elect a target and then		nnect
click Co To con then c	nect using a onnect. npletely disco lick Disconne	ovanceo options, s onnect a target, se ct.	elect a target and then		onnect
click Co To con then c For tar select	nect using a onnect. npletely disco lick Disconne rget properti the target a	avanced options, s prinect a target, se ct. es, including config nd click Properties.	elect a target and then lect the target and guration of sessions,	Co Disc Prop	onnect
click Co To con then c For tar select For co the tar	nect using a onnect. npletely disco lick Disconne rget properti the target an nfiguration o rget and the	avanced options, s onnect a target, se ct. es, including config nd click Properties. f devices associate n click Devices.	elect a target and then lect the target and juration of sessions, ad with a target, select		nnect
click Co To con then c For tar select For co the tar	nect using a onnect. Inpletely disco lick Disconne rget properti the target a nfiguration o rget and the	avanced options, s onnect a target, se ct. es, including config nd click Properties. f devices associate n click Devices.	elect a target and then lect the target and juration of sessions, ad with a target, select	Co Disc Prop Dey	nnect
click Co To con then c For tar select For co the tar	nect using a onnect. npletely disco lick Disconne rget properti the target a nfiguration o rget and the	avanced options, s onnect a target, se ct. es, including config nd click Properties. f devices associate n click Devices.	elect a target and then lect the target and guration of sessions, ad with a target, select ad targets	Co Disc Prop Dey	nnect
click Co To con then cl For tar select For co the tar <u>More at</u>	nect using a onnect. npletely disco lick Disconne rget properti the target an nfiguration o rget and the <u>pout basic iS</u>	avanced options, s prinect a target, se ct. es, including config nd click Properties. f devices associate n click Devices. <u>CSI connections an</u>	elect a target and then lect the target and juration of sessions, ad with a target, select id targets	Co Disc Prop Dey	erties
click Co To con then c For tar select For co the tar <u>More at</u>	nect using a onnect. npletely disco lick Disconne rget properti the target an nfiguration o rget and the pout basic iSt	avanced options, s onnect a target, se ct. es, including config nd click Properties. f devices associate n click Devices. <u>CSI connections an</u>	elect a target and then lect the target and juration of sessions, ad with a target, select id targets	Ca Disc Prop	ionnect
click Co To con then c For tar select For co the tar	nect using a onnect. npletely disco lick Disconne rget properti the target an nfiguration o rget and thei <u>pout basic iS</u>	avanced options, s onnect a target, se ct. es, including config nd click Properties. f devices associate n click Devices.	elect a target and then lect the target and juration of sessions, ad with a target, select id targets	Co Disc Prop	ionnect
click Co To con then c For tar select For co the tar	nect using a onnect. npletely disco lick Disconne rget properti the target an nfiguration o rget and the pout basic iSi	avanced options, s onnect a target, se ct. es, including config nd click Properties. f devices associate n click Devices.	elect the target and then Juration of sessions, ad with a target, select id targets	Co Disc Prop Dey	erties

Caution

Even if CHAP authentication is working, the ETERNUS AF/DX iSCSI name sometimes fails to appear in [Discovered targets]. Clicking the [Refresh] button may help.

The [Connect To Target] window appears.

9 Select the [Add this connection to the list of Favorite Targets.] checkbox and click the [Advanced] button.



10 Check that "Microsoft iSCSI Initiator" is set for [Local adapter], Initiator server IP address is set in [Initiator IP], and the ETERNUS AF/DX IP address/port number (for example, 192.168.1.130 / 3260) is set in [Target portal IP] under [Connect using].

Then, select the [Enable CHAP log on] checkbox, specify [Name] and [Target secret], and click the [OK] button.

vanced Settings	· · · · · · · · · · · · · · · · · · ·
ieneral IPsec	
Connect using	
Local advetory	Microsoft ISCST Toltistor
Local adapter:	Initiation in the state of the
Initiator IP:	192.168.1.30
Target portal IP:	192.168.1.130 / 3260
CRC / Checksum	
🗖 Data digest	Header digest
To use, specify the sar initiator. The name will specified.	ne name and CHAP secret that was configured on the target for this default to the Initiator Name of the system unless another name is
Name:	fujitsu
Target <u>s</u> ecret:	
Perform mutual aut	hentication
To use mutual CHAP, e RADIUS.	ither specify an initiator secret on the Configuration page or use
Use RADIUS to ger	erate user authentication credentials
Use <u>R</u> ADIUS to aut	henticate target credentials
	OK Cancel Apply

11 Click the [OK] button.



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If the logon is successful, the [Status] of the ETERNUS AF/DX iSCSI name displayed in [Discovered targets] of the [Targets] tab should change to "Connected".

T Initiator Pi	opercies	
rgets Discov Quick Connect	ery Favorite Targets Volumes and Devices F	RADIUS Configuration
DNS name of t	he target and then click Quick Connect.	
Target:		Quick Connect
Discovered tar	gets	<u>R</u> efresh
Name		1
ign.2000-09.c	om.fujitsu:storage-system.dxl:00000000.cm0port	0 Connected
4		
◀ To connect usi click Connect.	ng advanced options, select a target and then	Connect
Connect usi click Connect. To completely then click Disco	ng advanced options, select a target and then disconnect a target, select the target and nnect.	Connect
Connect usi dick Connect. To completely then click Disco For target proj select the targ	ng advanced options, select a target and then disconnect a target, select the target and nnect. perties, including configuration of sessions, et and click Properties.	Connect Disconnect Properties
◀ To connect usi click Connect. To completely then click Disco For target proj select the targ For configurati the target and	ng advanced options, select a target and then disconnect a target, select the target and nnect. perties, including configuration of sessions, et and click Properties. on of devices associated with a target, select then click Devices.	Connect Disconnect Properties Devices
To connect usi Cick Connect. To completely then click Disco For target proj select the targe For configurati the target and the target and tore about bas	ng advanced options, select a target and then disconnect a target, select the target and nnect. berties, including configuration of sessions, et and click Properties. on of devices associated with a target, select then click Devices.	Connect Disconnect Properties Deyjces
To connect usi Click Connect. To completely then click Disco For target pro select the targe For configurati the target and lore about bas	ng advanced options, select a target and then disconnect a target, select the target and onnect. Derties, including configuration of sessions, et and click Properties. on of devices associated with a target, select then click Devices.	Connect Disconnect Properties Devices

End of procedure

4.6.2 Bidirectional CHAP Authentication

Bidirectional CHAP authentication should be set up on the server as follows:

Procedure

- 1 Start the iSCSI Initiator.
- 2 Select the [Configuration] tab and click the [CHAP] button.

tor Properties					
Discovery Favo	rite Targets Vo	umes and Devices	RADIUS	Configuration	
ation settings here or,	are global and v	ill affect any futu	re connecti	ions made with	
ing connections m or otherwise tries	ay continue to w to reconnect to	ork, but can fail if a target.	the system	n restarts or	
nnecting to a targ connection.	et, advanced cor	nection features	allow specif	ic control of a	
Vame:					
1-05.com.microso	t:fujitsu				
/ the initiator nam	e, click Change.			Change]
e initiator CHAP se P.	ecret for use with	mutual CHAP,	<	CHAP	>
the IPsec tunnel	mode addresses	for the initiator,		IPsec	J
ate a report of all m, click Report.	connected targe	ts and devices on		Report]
ut Configuration					
		ок (Cance	el Apr	əly
	Confronterios Discovery Favor tion settings here or, ing connections m or otherwise tries uncerting to a targe connection. Iame: -05.com.microsof the initiator CHAP se or the initiator CHAP se or the IPsec tunnel the IPsec tunnel the IPsec tunnel the IPsec tunnel the IPsec tunnel the IPsec tunnel the IPsec tunnel	Cor Propercises Discovery Favorite Targets Vol tion settings here are global and word, ing connections may continue to word otherwise tries to reconnect to - ing connection, lame: -05.com,microsoft:fujitsu -the initiator CHAP secret for use with otherwise tries to reconnected target, advanced target, and the initiator CHAP secret for use with otherwise target, and the initiator CHAP secret for use with otherwise target of all connected target m, click Report, ut Configuration	tor Properties Discovery Favorite Targets Volumes and Devices tion settings here are global and will affect any futu or. Ing connections may continue to work, but can fail if or otherwise tries to reconnect to a target. Inecting to a target, advanced connection features connection. Iame:	Cor Properties Discovery Favorite Targets Volumes and Devices RADIUS tion settings here are global and will affect any future connect or, ing connections may continue to work, but can fail if the system or otherwise tries to reconnect to a target, inecting to a target, advanced connection features allow speci connection, lame: -05.com.microsoft;fujitsu	Configuration Discovery Favorite Targets Volumes and Devices RADIUS Configuration tion settings here are global and will affect any future connections made with or. International and will affect any future connections made with or. ing connections may continue to work, but can fail if the system restarts or or otherwise tries to reconnect to a target. International and will affect any future connections made with or. ing connections may continue to work, but can fail if the system restarts or or otherwise tries to reconnect to a target. International and will affect any future connection of a connection. inenting to a target, advanced connection features allow specific control of a connection. International and will affect any future connection features allow specific control of a connection. iame: -05.com.microsoft: fujitsu Change off-connected tor use with mutual CHAP, or otherwise the initiator of all connected targets and devices on m, click Report. IPsec ut Configuration ut Configuration Report

3 Enter the password under [Initiator CHAP secret] and then click the [OK] button.

[Initiator CHAP secret] must be specified with 12 to 16 alphanumeric characters. Clicking the [OK] button makes the password specified in [Initiator CHAP secret] disappear.

The iSCSI initiator mutual CHAP sec here will have to be configured on e	ret is used to authenticate the target. The secret entered each target that you wish to use mutual CHAP.
Mutual CHAP requires the use of init be done by using the advanced opti	tiator authentication when connecting to the target, this ca ions when making connections to the target.
To clear the secret from the initiato	r, click Clear and then Cancel.
Initiator CHAP secret:	
Clear	OK Cancel

Caution

The password for [Initiator CHAP secret] must match the [New Password] of the CHAP authentication setting for the iSCSI port parameters of the ETERNUS AF/DX.

4 Click the [Discovery] tab.

5 Click the [Discover Portal] button.

The system will	look for Targets	on following portals:	Refresh
Address	Porc	Adapter	IP address
To add a targe	t portal, click Disc	over Portal.	Discover Portal
fo remove a ta then click Remo	rget portal, selec ove.	t the address above and	Remove
Nome -			
Fo add an iSNS	server, click Add	Server.	Add Server
fo remove an i hen dick Remo	SNS server, selec ove.	t the server above and	Remove

The [Discover Target Portal] window will appear.

6 In the [IP address or DNS name] field, enter the IP address of the ETERNUS AF/DX iSCSI port that is to be connected to, and click the [Advanced] button.



The [Advanced Settings] window appears.

7 Set "Microsoft iSCSI Initiator" in [Local adapter], set the Initiator server IP address in [Initiator IP] under [Connect using], and click the [OK] button.

Then, select the [Enable CHAP log on] checkbox, and specify [Name] and [Target secret]. When setting the password for [Target secret], use a different password from the password that was set for [Initiator CHAP secret] in Step 3. Select the [Perform mutual authentication] checkbox, and click the [OK] button.

dvanced Settings	? 2
General IPsec	
Connect using	
Local adapter:	Microsoft iSCSI Initiator
Initiator IP:	192.168.1.30
Target portal IP:	
CRC / Checksum	
🗖 Data digest	Header digest
CHAP Log on informal CHAP helps ensure con an initiator. To use, specify the san initiator. The name will specified.	tion nection security by providing authentication between a target and ne name and CHAP secret that was configured on the target for this default to the Initiator Name of the system unless another name is
Name:	fujitsu
Target <u>s</u> ecret:	
Perform mutual aut To use mutual CHAP, e RADIUS.	hentication Ither specify an initiator secret on the Configuration page or use
Use <u>RADIUS</u> to aut	erate user adulerindation credentials
	OK Cancel Apply

Caution

The [Name] and [Target secret] set here must match the [CHAP User ID] and [CHAP Password] in the iSCSI host settings for the ETERNUS AF/DX. For details on the confirmation method, refer to "Setting CHAP Authentication" in "Configuration Guide -Server Connection- Storage System Settings" that corresponds to the ETERNUS AF/DX to be connected.

8 Click the [OK] button.

Discover Target Portal	×
Enter the IP address or DNS name and want to add.	port number of the portal you
To change the default settings of the d the Advanced button.	iscovery of the target portal, click
IP address or DNS name:	Port: (Default is 3260.)
192.168.1.130	3260
<u>A</u> dvanced	

9 Click the [Targets] tab.

10 Check the connection and click the [Connect] button.

When bidirectional CHAP authentication is complete and the connection is OK, the ETERNUS AF/DX iSCSI name should appear in [Discovered targets] and the [Status] should be "Inactive".

ST Interactor TT	operties		
argets Discove	ery Favorite Targets Volum	nes and Devices R	ADIUS Configuration
Quick Connect -			
To discover and DNS name of th	d log on to a target using a bas ne target and then click Quick (sic connection, type Connect.	the IP address or
<u>T</u> arget:			Quick Connect,
Discovered targ	lets		<u>R</u> efresh
Name			Status
lign.2000-09.c	om.fujitsu:storage-system.dxl	:00000000.cm0port	:0 Inactive
▲	n advanced ontions, select a	target and then	
To connect usir click Connect.	ng advanced options, select a	target and then ,	Connect
To connect usir click Connect. To completely o then click Disco	ng advanced options, select a disconnect a target, select the nnect.	target and then ,	Connect Disconnect
To connect usir click Connect. To completely o then click Disco For target prop select the targe	ng advanced options, select a lisconnect a target, select the nnect. verties, including configuration at and click Properties.	target and then , target and of sessions,	Connect Disconnect Properties
To connect usin click Connect. To completely of then click Disco For target prop select the target For configuratin the target and	ng advanced options, select a disconnect a target, select the nnect. verties, including configuration at and click Properties. on of devices associated with a then click Devices.	target and then , target and of sessions, a target, select	Connect Disconnect Properties Deyices
To connect usin click Connect. To completely of then click Disco For target prop select the targe For configuratii the target and <u>More about basing</u>	ig advanced options, select a disconnect a target, select the nnect. erties, including configuration et and click Properties. on of devices associated with a then click Devices.	target and then , target and of sessions, a target, select	Connect Disconnect Properties Deyices

Caution

Even if bidirectional CHAP authentication is working, the ETERNUS AF/DX iSCSI name sometimes fails to appear in [Discovered targets]. Clicking the [Refresh] button may help.

The [Connect To Target] window appears.

11 Select the [Add this connection to the list of Favorite Targets.] checkbox and click the [Advanced] button.

Connect To Target
Target name:
iqn.2000-09.com.fujitsu:storage-system.dxl:00000000.cm0port0
Wind this connection to the list of Favorite Targets. This will make the system automatically attempt to restore the connection every time this computer restarts.
Enable multi-path
Advanced OK Cancel

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FUJITSU Storage ETERNUS AF, ETERNUS DX Configuration Guide -Server Connection- (iSCSI) for Windows[®] Copyright 2022 FUJITSU LIMITED 12 Check that "Microsoft iSCSI Initiator" is set for [Local adapter], Initiator server IP address is set in [Initiator IP], and the ETERNUS AF/DX IP address/port number (for example, 192.168.1.130 / 3260) is set in [Target portal IP] under [Connect using].

Then, select the [Enable CHAP log on] checkbox, and specify [Name] and [Target secret]. Use the [Name] and [Target secret] settings that were set for Step 7. Select the [Perform mutual authentication] checkbox, and click the [OK] button.

Advanced Settings		? X
General IPsec		
Connect using		
Local adapter:	Microsoft iSCSI Initiator	
Initiator <u>I</u> P:	192.168.1.30	
Target portal IP:	192.168.1.130 / 3260	
CRC / Checksum		
🗖 Data digest	E Header digest	
Rinable CHAP log or	1	
CHAP Log on informa CHAP helps ensure con an initiator.	tion nection security by providing authentication between a target and	
To use, specify the sar initiator. The name will specified.	ne name and CHAP secret that was configured on the target for this I default to the Initiator Name of the system unless another name is	
Name:	fujitsu	
Target <u>s</u> ecret:		
Perform mutual aut To use mutual CHAP, e RADIUS.	hentication ither specify an initiator secret on the Configuration page or use	
Use RADIUS to ger	verate user authentication credentials henticate target credentials	
	OK Cancel Apply	/

13 Click the [OK] button.

Connect To Target
Target name:
iqn.2000-09.com.fujitsu:storage-system.dxl:00000000.cm0port0
Add this connection to the list of Favorite Targets. This will make the system automatically attempt to restore the connection every time this computer restarts.
🔚 Enable multi-path
Advanced OK Cancel

If the logon is successful, the [Status] of the ETERNUS AF/DX iSCSI name displayed in [Discovered targets] of the [Targets] tab should change to "Connected".

argets Disc	overy Favorite Targets Volumes and D	Devices RADIUS Configuration
Quick Conne	ct	
To discover DNS name o	and log on to a target using a basic conne f the target and then click Quick Connect.	ction, type the IP address or
- .		Out the Connect
Larget:	1	Quick Connect
Discovered t	argets	
		<u>R</u> efresh
Name		
iqn.2000-0	9.com.fujitsu:storage-system.dxl:0000000	0.cm0port0 Connected
•		
I connect i	using advanced options, collect a tayout an	▶ ►
To connect	using advanced options, select a target an	nd then Connect
To connect click Connec	using advanced options, select a target an t.	nd then Cognect
To connect click Connec To complete	using advanced options, select a target an t.	nd then Cognect
To connect of click Connect of the complete the click District Distribution of the click Distributio	using advanced options, select a target an t. ly disconnect a target, select the target a	nd then Connect
To connect click Connec To complete then click Di	using advanced options, select a target an t. ly disconnect a target, select the target a sconnect.	nd then Connect
To connect of click Connect of Co	using advanced options, select a target an t. ly disconnect a target, select the target a connect.	nd then Cognect
▲ To connect click Connect To complete then click Di For target p click the	using advanced options, select a target an t. ly disconnect a target, select the target a sconnect. roperties, including configuration of sessio	nd then Cognect
To connect i click Connect To complete then click Di For target p select the ta	using advanced options, select a target an t. ly disconnect a target, select the target a sconnect. roperties, including configuration of sessio rget and click Properties.	nd then Connect nd Disconnect ons, Properties
To connect click Connect To complete then click Di For target p select the ta	using advanced options, select a target an t. ly disconnect a target, select the target a sconnect. roperties, including configuration of sessio arget and click Properties.	Ind then Cognect Cognect Cognect Cognect Disconnect Cognect Select Cognect
To connect click Connect To complete then click Di For target p select the ta For configur	using advanced options, select a target an t. ly disconnect a target, select the target an connect. roperties, including configuration of sessio irget and click Properties. ation of devices associated with a target, not then click Devices	nd then Cognect nd Disconnect ons, Broperties select Devices
To connect click Connect To complete then click Di For target p select the ta For configur the target a	using advanced options, select a target an t. ly disconnect a target, select the target a sconnect. roperties, including configuration of sessio rget and click Properties. ation of devices associated with a target, nd then click Devices.	Ind then Cognect Ind Disconnect Ind Disconnect Ins, Properties select Devices
To connect click Connect To complete then click Di For target p select the ta For configur the target a	using advanced options, select a target an t. ly disconnect a target, select the target an sconnect. roperties, including configuration of sessio rget and click Properties. ation of devices associated with a target, nd then click Devices.	Ind then Cognect Ind Disconnect Cognect Cognect Cognect Disconnect Cognect Cognect Disconnect Cognect Cognect Disconnect Cogne
To connect click Connect To complete then click Di For target p select the ta For configur the target a	using advanced options, select a target an t. ly disconnect a target, select the target an connect. roperties, including configuration of sessio rget and click Properties. ation of devices associated with a target, nd then click Devices.	nd then Cognect nd Disconnect ons, Broperties select Devices
To connect click Connect To complete then click Di For target p select the ta For configur the target a	using advanced options, select a target an t. ly disconnect a target, select the target an sconnect. roperties, including configuration of sessio rget and click Properties. ation of devices associated with a target, nd then click Devices.	nd then Cognect nd Disconnect ons, Properties select De <u>v</u> ices
To connect click Connect To complete then click Di For target p select the ta For configur the target a	using advanced options, select a target an t. ly disconnect a target, select the target an iconnect. roperties, including configuration of sessio irget and click Properties. ation of devices associated with a target, nd then click Devices.	Ind then Cognect Ind Disconnect Ons, Properties Select De <u>vi</u> ces
To connect click Connect to complete then click Di For target p select the ta For configur the target a	using advanced options, select a target an t. ly disconnect a target, select the target an sconnect. roperties, including configuration of sessio rget and click Properties. ation of devices associated with a target, nd then click Devices. asic iSCSI connections and targets	nd then Cognect nd Disconnect ons, Properties select Devices
To connect click Connect To complete then click Di For target p select the ta For configur the target a	using advanced options, select a target an t. ly disconnect a target, select the target an sconnect. roperties, including configuration of sessio irget and click Properties. ation of devices associated with a target, nd then click Devices. asic iSCSI connections and targets	nd then Cognect nd Disconnect ons, Properties select Devices
To connect click Connect To complete then click Di For target p select the ta For configur the target a	using advanced options, select a target an t. ly disconnect a target, select the target an iconnect. roperties, including configuration of sessio irget and click Properties. ation of devices associated with a target, nd then click Devices.	nd then Cognect nd Disconnect ons, Properties select De <u>vi</u> ces
✓ To connect click Connect to complete then click Di For target p select the ta For configur the target a	using advanced options, select a target an t. ly disconnect a target, select the target an sconnect. roperties, including configuration of sessio irget and click Properties. ation of devices associated with a target, nd then click Devices. asic iSCSI connections and targets	nd then Cognect nd Disconnect ons, Properties select Devices
To connect click Connect To complete then click Di For target p select the ta For configur the target a <u>fore about t</u>	using advanced options, select a target an t. ly disconnect a target, select the target an connect. roperties, including configuration of sessio rget and click Properties. ation of devices associated with a target, nd then click Devices.	nd then Cognect nd Disconnect ons, Properties select Devices
To connect click Connec To complete then click Di For target p select the target For configur the target a fore about t	using advanced options, select a target an t. ly disconnect a target, select the target an connect. roperties, including configuration of sessio rget and click Properties. ation of devices associated with a target, nd then click Devices. asic iSCSI connections and targets	nd then Cognect nd Disconnect ons, Broperties select Devices

End of procedure

4.7 Checking the ETERNUS AF/DX Storage Systems' Connection Status

The following items can be set and displayed in the "ETERNUS Multipath Manager" main window when the ETERNUS Multipath Driver is used.

- ETERNUS AF/DX storage systems' connection status
- Connected LUNs
- Path status
- Path restoration or release

These describe ETERNUS AF/DX storage systems' connection status and the checking of paths.

Procedure

- 1 Start up ETERNUS AF/DX storage systems (assuming that LUNs are already set up), and check that it is "Ready" before starting up the server.
- 2 When the server is Ready, start up Multipath Manager.
- 3 The main window will appear.

The status of the ETERNUS AF/DX storage systems connected to the server (connection status, path status) can be checked.

End of procedure

For details on ETERNUS Multipath Manager operations, refer to the manual provided with the ETERNUS Multipath Driver.

Chapter 5 Notes on Operation

5.1 Creating the Disk Partitions

Create disk partitions as necessary, using the following procedure.

Procedure

- Open [Disk Management] via [Computer Management].
 If unsigned disks exist, a query about whether or not to sign disks for the connected devices is made.
- 2 Sign disks and create partitions as necessary.

Note

- This setup can also be used to upgrade to dynamic disks.
- 2TB or larger disks must be converted to GPT disks.

End of procedure

5.2 Binding the Volumes

Caution

Bind the volumes after creating the partitions. After adding a volume or server, be sure to perform binding again.

Procedure

1 Start the iSCSI Initiator.

2 Select [Volumes and Devices], and click the [Autoconfigure] button.

General	Discovery	Targets
Favorite Targets	Volumes and Devices	RADIUS
Description The ISCSI initiator servic Tavorite target are avail if a program or service to volume or device to the SCSI initiator service de You must also specify th the Tarcets the dirk to	e ensures that all volumes and able. uses a particular volume or devi list below, or click Autoconfigur termine the list of volumes and e target as a favorite target. To on T from add or zemove a fo	devices on a ce, add that e to have the devices. o do this, on
are rungeto tuby chereto	g on, if you due of remove a lo	vorite target,
update the list of volume	es and devices.	ivorite target,
Volume/mount point/dev	vice	worite target,
Volume/mount point/der	vice	wonte target,
Volume/mount point/dev	y with the body of remove a re- s and devices.	vonte target,
Volume/mount point/dev	s and devices.	
Volume/mount point/dee	Remove Autoconfigure	Clear

3 Check that the assigned drive letter is displayed in the [Volume/mount point/device] field.

Favorite Targets Volumes and Devices RADIUS Description The iSCSI initiator service ensures that all volumes and devices on a favorite target are available. If a program or service uses a particular volume or device, add that volume or device to the last below, or cick Autoconfigure to have the ISCSI initiator service determine the list of volumes and devices. You must also specify the target as a favorite target, pddate the list of volumes and devices. Volumes and devices. You must also specify the target as a favorite target, pddate the list of volumes and devices. You must also specify the target as a favorite target. Yol end diverse in the persitive volume. Fit	Favorite Targets Volumes and Devices RADIUS Description The ISCSI initiator service ensures that all volumes and devices on a favorite target are available. If a program or service uses a particular volume or device, add that volume or device to the list below, or cick Autoconfigure to have the SCSI initiator service determine lists of volumes and devices. You must also specify the target as a favorite target. To do this, on the Targets tab, cick Log on. If you add or remove a favorite target, update list of volumes and devices. You must also specify the target as a favorite target. You must also specify the target as a favorite target. You must also specify the target as a favorite target. You must also specify the target as a favorite target. You must also specify the target as a favorite target. You must also specify the target as a favorite target.	General	Discovery	Targets
Description The ISCSI initiator service ensures that all volumes and devices on a favorite target are available. If a program or service uses a particular volume or device, add that volume or device to the lats below, or click Autoconfigure to have the ISCSI initiator service determine the list of volumes and devices. You must also specify the target as a favorite target. To do this, on the Targets tab, click Log on. If you add or remoive a favorite target, update the list of volumes and devices. Volume from the particular volume. Fil	Description The ISCSI initiator service ensures that all volumes and devices on a favorite target are available. If a program or service uses a particular volume or device, add that volume or device to the last below, or cick Autoconfigure to have the SCSI initiator service determine the list of volumes and devices. You must also specify the target as a favorite target. To do this, on the Targets tab, cick Log on. If you add or remove a favorite target, update the list of volumes and devices. Yoli enclaiment of the target target target target. Yol enclaiment of the target target target target.	Favorite Targets	Volumes and Devices	RADIUS
Fil	F4	Description The ISCSI initiator servic favorite target are avail If a program or service i volume or device to the SCSI initiator service de	ce ensures that all volumes and lable. List below, or click Autoconfig. termine the list of volumes an	d devices on a vice, add that ire to have the d devices.
		fou must also specify the the Targets tab, click Lo update the list of volume (always)	ne target as a favorite target. Ig on. If you add or remove a es and devices.	To do this, on favorite target,
Add Remove Autoconfigure Clear		You must also specify the Targets table, click Lo update the list of volume Volume (International Content Fil)	e target as a favorite target. gon. If you add or remove a es and devices.	To do this, on favorite target,

4 Click the [OK] button to exit the iSCSI initiator.

End of procedure

5.3 Setting Up the Cluster Configuration

If configuring a cluster (WSFC/MSCS), install the cluster related applications, as necessary.

Chapter 6 Setting the iSCSI QueueDepth Value

For Microsoft[®] iSCSI Software Initiator, set "CmdSN Count" of the ETERNUS AF/DX to manage the QueueDepth.

6.1 When Host Affinity Is Used

When Host Affinity is used, set the QueueDepth value according to the following procedure.

Procedure

- 1 Log in to the ETERNUS AF/DX from ETERNUS CLI.
- 2 Execute the "show host-iscsi-names" command to check "iSCSI Host No." of the iSCSI host that is registered in the system.
- 3 Execute the "set host-iscsi-name -host-number <iSCSI Host No.> -cmdsn-count <setting value>" command to set "CmdSN Count".

Check the following table and enter "CmdSN Count".

Number of bosts that are connected	CmdSN Count (*1)		
to a single CA port	AF S3 series, DX S5 series, DX8900 S4	Models that are not described in the left column	
4 or less	Unlimited (default)	Unlimited (default)	
5	Unlimited (default)	180	
6 to 8	Unlimited (default)	120	
9 to 12	120	80	
13 to 25	80	40	
26 to 51	40	20	
52 or more	20	20	

*1: To achieve maximum system performance, this value can be changed according to the server load and the peak operating times.

The maximum number of simultaneous command processes per CA port is limited to 2048 for the ETERNUS AF S3 series, ETERNUS DX S5 series, and ETERNUS DX8900 S4, and 1024 for the other models. The value is used by multiple servers that share the CA port. The commands are processed until the limit is reached.

4 Change "iSCSI Host No." for all paths that are connected to a single CA port and repeat Step 3.

5 Reboot the server that is connected to the ETERNUS AF/DX or perform a "Disconnect" - "Connect" for the target by using the iSCSI Initiator.

End of procedure

6.2 When LUN Mapping Is Used

When LUN Mapping is used, set the QueueDepth value according to the following procedure.

Procedure

- 1 Log in to the ETERNUS AF/DX from ETERNUS Web GUI.
- 2 Select [Connectivity] from the menu.
- 3 From the Category area, select [iSCSI] under [Port Group].
- 4 Select the checkbox for the port for which the parameter is set and click [Modify iSCSI Port Parameters].
- 5 Under General Settings, select the [CmdSN Count] value from the pull-down menu and click the [Modify] button.

Check the following table and select "CmdSN Count".

Number of bosts that are connected	CmdSN Count (*1)		
to a single CA port	AF S3 series, DX S5 series, DX8900 S4	Models that are not described in the left column	
4 or less	Unlimited (default)	Unlimited (default)	
5	Unlimited (default)	180	
6 to 8	Unlimited (default)	120	
9 to 12	120	80	
13 to 25	80	40	
26 to 51	40	20	
52 or more	20	20	

*1: To achieve maximum system performance, this value can be changed according to the server load and the peak operating times.

The maximum number of simultaneous command processes per CA port is limited to 2048 for the ETERNUS AF S3 series, ETERNUS DX S5 series, and ETERNUS DX8900 S4, and 1024 for the other models. The value is used by multiple servers that share the CA port. The commands are processed until the limit is reached.

- 6 Repeat Step 5 for all ports to be used.
- 7 Reboot the servers that are connected to the ETERNUS AF/DX or perform a "Disconnect" "Connect" for the target by using the iSCSI Initiator.

End of procedure

Appendix A Microsoft[®] iSCSI Software Initiator iSCSICLI Commands

The following section shows iSCSICLI commands that are related to iSCSI settings and an overview of these commands. For more details, refer to "Microsoft[®] iSCSI Software Initiator Users Guide".

1	Command	NodeName <node name=""></node>
	Parameter	<node name="">: iSCSI name of the initiator</node>
	Description	This command sets the iSCSI name of the iSCSI initiator.
2	Command	CHAPSecret <chap secret=""></chap>
	Parameter	<chap secret="">: Password of the initiator</chap>
	Description	This command sets the password of the iSCSI initiator (Only when bidirectional CHAP is used).
3	Command	AddiSNSServer <isns address="" server=""></isns>
	Parameter	<isns address="" server="">: IP address of the iSNS server</isns>
	Description	This command adds an iSNS server (Only when an iSNS server is used).
4	Command	QAddTargetPortal <portal address="" ip=""> [CHAP Username] [CHAP Password]</portal>
	Parameter	<portal address="" ip="">: IP address of the iSCSI port on the ETERNUS AF/DX</portal>
		[CHAP Username]: User name of the target (Only when CHAP is used)
		[CHAP Password]: Password of the target (Only when CHAP is used)
	Description	This command adds an iSCSI port of the ETERNUS AF/DX.
5	Command	ListTargets
	Parameter	None
	Description	This command displays the added iSCSI port of the ETERNUS AF/DX.

6	Command	LoginTarget <targetname> <reporttopnp> <targetportaladdress> <targetportalsocket> <ini- tiator Instance Name> <port number=""> <security flags=""> <login flags=""> <header digest=""> <data Digest> <max connections=""> <defaulttime2wait> <defaulttime2retain> <username> <pass- word> <authtype> <key> <mapping count=""> <target lun=""> <os bus=""> <os target=""> <os lun=""></os></os></os></target></mapping></key></authtype></pass- </username></defaulttime2retain></defaulttime2wait></max></data </header></login></security></port></ini- </targetportalsocket></targetportaladdress></reporttopnp></targetname>
	Parameter	<targetname>: iSCSI name of the target</targetname>
		<reporttopnp>: When "T" or "t" is input, a LUN is recognized as a device by the OS</reporttopnp>
		<targetportaladdress>: IP address of the iSCSI port on the ETERNUS AF/DX</targetportaladdress>
		<targetportalsocket>: TCP port number 3260</targetportalsocket>
		<username>: CHAP user name that is used to log in to the target</username>
		<password>: CHAP password that is used to log in to the target</password>
		<authtype>: The login authentication method</authtype>
		0 when not using CHAP
		1 when using CHAP
		2 when using bidirectional CHAP
		<mapping count=""> : The number of LUNs</mapping>
		<target lun="">: LUN of the ETERNUS AF/DX</target>
		<os bus="">: Bus number</os>
		<os target="">: Target ID that the OS uses</os>
		<os lun="">: LUN that the OS uses</os>
	Description	This command logs in to the target.
		This command specifies <os lun=""> from <target lun=""> for the same number of times as the number of LUNs that is specified in <mapping count="">.</mapping></target></os>
		Specify "*" (asterisk) for arguments that do not need to be specified.
7	Command	ReportTargetMappings
	Parameter	None
	Description	This command displays the target mapping status.

8	Command	PersistentLoginTarget <targetname> <reporttopnp> <targetportaladdress> <targetportal- Socket> <initiatorinstance> <port number=""> <security flags=""> <login flags=""> <header digest=""> <data digest=""> <max connections=""> <defaulttime2wait> <defaulttime2retain> <username> <password> <authtype> <key> <mapping count=""> <target lun=""> <os bus=""> <os target=""> <os Lun></os </os></os></target></mapping></key></authtype></password></username></defaulttime2retain></defaulttime2wait></max></data></header></login></security></port></initiatorinstance></targetportal- </targetportaladdress></reporttopnp></targetname>
	Parameter	<targetname>: iSCSI name of the target</targetname>
		<targettopnp>: When "T" or "t" is input, a LUN is reported to the OS as a device</targettopnp>
		<targetportaladdress>: IP address or DNS name of the iSCSI port on the ETERNUS AF/DX</targetportaladdress>
		<targetportalsocket>: TCP port number 3260</targetportalsocket>
		<username>: CHAP user name that is used to log in to the target</username>
		<password>: CHAP password that is used to log in to the target</password>
		<authtype>: The login authentication method</authtype>
		0 when not using CHAP
		1 when using CHAP
		2 when using bidirectional CHAP
		<mapping count=""> : The number of LUNs</mapping>
		<target lun="">: LUN of the ETERNUS AF/DX</target>
		<os bus="">: Bus number</os>
		<os target="">: Target ID that the OS uses</os>
		<os lun="">: LUN that the OS uses</os>
	Description	This command sets persistent login to the target.
		This command specifies <os lun=""> from <target lun=""> for the same number of times as the number of LUNs that is specified in <mapping count="">.</mapping></target></os>
		Specify "*" (asterisk) for arguments that do not need to be specified.
9	Command	ListPersistentTargets
	Parameter	None
	Description	This command displays the persistent login setting status.
10	Command	BindPersistentDevices
	Parameter	None
	Description	This command recognizes the device for which target binding is performed and links service startup.

Appendix B iSCSICLI Setting Examples

B.1 iSCSI Connection Setting Procedure using the iSCSICLI

The following section shows the procedure for performing iSCSI connection settings using the iSCSICLI:

Procedure

- 1 Stop the service that is running on the server.
- 2 Clear all the settings that are related to iSCSI.
 - (1) Execute the following command to start Microsoft[®] iSCSI Software Initiator.

C:\>iscsicpl

- (2) Click the [Discovery] tab to delete all the entries of the iSCSI port.
- (3) Click the [Favorite Targets] tab to delete all the entries of the favorite targets.
- (4) Click the [Volumes and Devices] tab to delete all the entries of the volume list.
- (5) Click the [OK] button.
- 3 Set target binding using the iSCSICLI.

To use the iSNS server and CHAP authentication, perform settings in this step. The following examples of settings that use batch files are provided.

• An example of a setting that only performs target binding

"B.2 Target Binding Setting Example" (page 55)

• An example of a target binding setting that includes iSNS server addition and CHAP authentication setting

"B.3 Target Binding Setting Example that Includes iSNS Server Addition and CHAP Authentication Setting" (page 58)

4 Check the target binding settings. Execute the following command:

```
C: \> iscsicli ListPersistentTargets
Microsoft iSCSI Initiator Version 6.1 Build 7600
Total of 2 persistent targets
  Target Name : iqn.2000-09.com.fujitsu:storage-system.eternus-dxl:00010345
  Address and Socket : 192.168.1.110 3260
  Session Type : Data
  Initiator Name : Root\ISCSIPRT\0000_0
  Port Number : < Any Port>
  Security Flags : 0x0
  Version : 0
  Information Specified: 0x20
  Login Flags : 0x0
  Username
  Session Id : 0-0
  Target Name :
  Initiator
  Initiator Scsi Device :
 Initiator Bus : 0
Initiator Target Id : 10
    Target Lun: 0x0 <--> OS Lun: 0x0
    Target Lun: 0x100 <--> OS Lun: 0x1
     Target Lun: 0x200 <--> OS Lun: 0x2
     Target Lun: 0x300 <--> OS Lun: 0x3
    Target Lun: 0x400 <--> OS Lun: 0x4
  Target Name : iqn.2000-09.com.fujitsu:storage-system.eternus-dxl:00010346
  Address and Socket : 192.168.2.110 3260
  Session Type : Data
  Initiator Name : Root\ISCSIPRT\0000_0
  Port Number : < Any Port>
  Security Flags : 0x0
Version : 0
  Information Specified: 0x20
  Login Flags : 0x0
  Username
  Session Id : 0-0
  Target Name
  Initiator
  Initiator Scsi Device :
  Initiator Bus: 0
  Initiator Target Id : 20
     Target Lun: 0x0 <--> OS Lun: 0x0
    Target Lun: 0x100 <--> OS Lun: 0x1
    Target Lun: 0x200 <--> OS Lun: 0x2
    Target Lun: 0x300 <--> OS Lun: 0x3
    Target Lun: 0x400 <--> OS Lun: 0x4
The operation completed successfully.
```

Check that the Initiator Target Id values are correctly set and that the LUNs (Target LUN) of the ETER-NUS AF/DX correspond to the LUNs that the OS uses (OS LUN).

- 5 Reboot the server.
- 6 Check that paths are normally configured using ETERNUS Multipath Manager. For more details, refer to the ETERNUS Multipath Driver manual.
- 7 Perform settings for device recognition and service startup synchronization.

Execute the following command to complete the settings that allow the device for which target binding is performed to be recognized at the next OS startup and that allow the service to start up synchronously at the next OS startup.

```
C:\>iscsicli BindPersistentDevices
```

🔵 Note

- Once settings are made, they are not deleted when the server is restarted.
- When the system configuration is changed (for example, LUNs are added or the iSCSI name is changed), perform the settings related to the iSCSI connection again by repeating Step 1 to Step 7.

End of procedure

B.2 Target Binding Setting Example

This section provides an example of a batch file that is used in the environment shown below to bind target ID: 10 with CM#0 CA#1 Port#0 and to bind target ID: 20 with CM#1 CA#1 Port#0. The settings of an iSNS server and CHAP are not included.



```
@echo off
rem # Configuration
rem # iSCSI initiator name
rem #-----
set INITIATOR NAME=iqn.1991-05.com.microsoft:rx300s5-4
rem # Target portal IP address
rem #----
set TARGET IP1=192.168.1.120
set TARGET IP2=192.168.2.120
rem # Target portal port number
rem #-
set TARGETPORTALSOCKET=3260
rem # Target IQN
rem #---
set TARGET IQN1=iqn.2000-09.com.fujitsu:storage-system.eternus-dx400:00000012-cm0port0
set TARGET IQN2=iqn.2000-09.com.fujitsu:storage-system.eternus-dx400:00000012-cmlport0
rem # Count of Logical Unit
rem #---
set MAPPINGCOUNT=3
rem # Logical Unit number(hex)
rem # You should input LUN like as following format;
rem #
rem # ETERNUS 0x0 = 0x00000000000000
rem # ...
rem # ETERNUS 0xff = 0x00000000000ff00
rem #--
                                   Use a 14-digit hexadecimal number + "00" between
set TARGET LUN1=0x00000000000000000
                                   0x0000000000000 and 0x00000000000ff to specify the logical
unit numbers that are set in the ETERNUS AF/DX.
                                    "0" cannot be omitted.
rem # TARGET ID(dec)
rem # You should assign fixed number for all target
rem # those are connected to a server.
rem #-----
set TARGET_ID1=10
set TARGET_ID2=20
                   Use decimal numbers between 0 and 254 to
                     specify any target IDs.
rem # Running iSCSICLI commands
rem #-----
rem # set Initiator IQN
rem #-----
iscsicli NodeName %INITIATOR_NAME%
rem #-----
rem # set target portal IP
rem #--
iscsicli QAddTargetPortal %TARGET_IP1%
iscsicli QAddTargetPortal %TARGET_IP2%
```



B.3 Target Binding Setting Example that Includes iSNS Server Addition and CHAP Authentication Setting

This section provides an example of a batch file that is used in the environment shown below to set the iSNS server and bidirectional CHAP, to bind target ID: 6 with CM#0 CA#1 Port#0, and to bind target ID:8 with CM#1 CA#1 Port#0.



```
@echo off
rem #
                 Configuration
rem # iSCSI initiator name
rem #----
set INITIATOR_NAME=iqn.1991-05.com.microsoft:rx300s5-4
rem # iSNS server IP address
rem #---
set ISNS_SERVER1=192.168.1.1
                                   These lines are not necessary when an iSNS
set ISNS SERVER2=192.168.2.1
                                    server is not used.
rem # Target portal IP address
rem #-
set TARGET_IP1=192.168.1.120
set TARGET_IP2=192.168.2.120
rem # Target portal port number
rem #---
set TARGETPORTALSOCKET=3260
rem # Target IQN
rem #----
set TARGET_IQN1=iqn.2000-09.com.fujitsu:storage-system.eternus-dx400:00000012-cm0port0
set TARGET_IQN2=iqn.2000-09.com.fujitsu:storage-system.eternus-dx400:00000012-cm1port0
rem # CHAP Secret: string of initiator CHAP secret
                 used for mutual CHAP authentication
rem #
rem # User name : string of CHAP username
rem # Password : string of target's CHAP secret
rem # Auth Type : 0 - no authentication
          1 - one-way CHAP
2 - mutual CHAP
rem #
rem #
rem
                                      This line is not necessary for
set CHAP SECRET=dx400-dx400-dx
                                      unidirectional CHAP.
set USER_NAME=fujitsu
set PASSWORD=irohanihoheto
set AUTHTYPE=2
rem # Count of Logical Unit
rem #-----
set MAPPINGCOUNT=4
rem # Logical Unit number(hex)
rem # You should input LUN like as following format;
rem #
rem # ETERNUS 0x0 = 0x00000000000000
rem # ETERNUS 0x1 = 0x0000000000000000
rem # ...
rem # ETERNUS 0xff = 0x00000000000ff00
rem #-----
set TARGET LUN1=0x000000000000000
                                           Use a 14-digit hexadecimal number + "00" between
0x000000000000 and 0x00000000000 to specify
set TARGET_LUN3=0x00000000000000200
                                           the logical unit numbers that are set in the ETERNUS AF/DX.
"0" cannot be omitted.
rem # TARGET ID
rem # You should assign fixed number for all target
rem # those are connected to a server.
rem #-----
set TARGET ID1=6
                       J Use decimal numbers between 0 and 254 to
set TARGET_ID2=8
                        specify any target IDs.
```



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