ETERNUS
Disk storage systems

Server Connection Guide
(Fibre Channel)

for Oracle Solaris
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Preface

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

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

Note that this manual refers the following documents.

- Server Support Matrix
- Server Support Matrix for FC-SWITCH
- ETERNUS Disk storage systems Server Connection Guide (Fibre Channel)
  ETERNUS Disk Storage System Settings
- ETERNUS Disk storage systems Server Connection Guide (Fibre Channel)
  Fibre Channel Switch Settings
- ETERNUS Disk storage systems Server Connection Guide (Fibre Channel)
  for Oracle Solaris
  - Driver Settings for Fujitsu Fibre Channel Cards
  - Driver Settings for Sun Fibre Channel Cards
  - Driver Settings for Emulex Fibre Channel Cards
  - Driver Settings for QLogic Fibre Channel Cards
  - Multipath Driver Settings for ETERNUS Multipath Driver
  - Multipath Driver Settings for MPxI O Multipath Driver
  - Driver Settings for Brocade Fibre Channel Cards
- ETERNUSmgr Install Guide
- ETERNUSmgr User Guide

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

Fifth Edition
December 2010
The Contents and Structure of this Manual

This document is composed of the following 11 chapters.

- **Chapter 1  Workflow**
  This describes the workflow required to connect a server running Solaris OS to an ETERNUS Disk storage system.

- **Chapter 2  Checking the Server Environment**
  This describes the server settings that allow connection with ETERNUS Disk storage systems.

- **Chapter 3  Notes**
  This describes the notes for operation.

- **Chapter 4  Installing and Setting Up ETERNUSmgr**
  This describes how to install ETERNUSmgr.

- **Chapter 5  Setting Up the ETERNUS Disk Storage Systems**
  This describes the settings of ETERNUS Disk storage systems using ETERNUSmgr.

- **Chapter 6  Setting the Fibre Channel Switches**
  This describes the settings of a Fibre Channel switch.

- **Chapter 7  Installing the Driver and Setting Up the Server**
  This describes the installation of the Fibre Channel card driver and related server settings.

- **Chapter 8  Recognizing the Logical Units**
  This describes how to make a server recognize ETERNUS Disk storage systems's LUN(s) (logical unit).

- **Chapter 9  Setting the Multipaths**
  This describes how to set multipaths for multipath connection.

- **Chapter 10  Setting a File System**
  This describes how to create a file system.

- **Chapter 11  SAN Boot**
  This describes the SAN boot procedure.
Safe Use of this Product

■ Using this manual

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

Acknowledgments

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Naming Conventions

- **Product names**
  - Oracle Solaris might be described as Solaris, Solaris Operating System, or Solaris OS.

- **Other names**
  - "Channel Adapter" (CA) refers to the Fibre Channel interface module used in the ETERNUS Disk storage systems to connect to the server.
  - "Fibre Channel card" refers to the Fibre Channel interface module normally used by the server. A "Host Bus Adapter" (HBA) or "Channel Adapter" (CA) may be used instead, depending on the server.
  - Italics are used to show variables such as values and characters that appear in command parameters and output examples.
Contents

Chapter 1  Workflow .................................................................................................9
  1.1 For Fujitsu Drivers ......................................................................................... 9
  1.2 For Sun Drivers ............................................................................................. 14
  1.3 For Emulex Drivers ....................................................................................... 18
  1.4 For QLogic Drivers ....................................................................................... 22
  1.5 For Brocade Drivers ..................................................................................... 25

Chapter 2  Checking the Server Environment .....................................................29
  2.1 Hardware ....................................................................................................... 29
  2.2 OS .................................................................................................................. 29
  2.3 Fibre Channel Cards ....................................................................................... 29
  2.4 Multipath Driver ............................................................................................. 29
  2.5 Symantec VxVM ............................................................................................ 29
  2.6 Sun OEM VxVM ............................................................................................. 30
  2.7 SVM .............................................................................................................. 30
  2.8 VERITAS Cluster Server .............................................................................. 30
  2.9 Sun Cluster .................................................................................................... 30
  2.10 Fibre Channel Cards that Require a Sun-brand Driver .............................. 31

Chapter 3  Notes .....................................................................................................32
  3.1 Server Startup and Power Supply Control Notes ......................................... 32
  3.2 Instance Management Table Notes .............................................................. 32
  3.3 Design Sheet Notes ....................................................................................... 32
  3.4 Fibre Channel Switch Notes ......................................................................... 33
  3.5 VxVM Notes .................................................................................................. 34
    3.5.1 Driver Notes .............................................................................................. 34
    3.5.2 Symantec VxVM ..................................................................................... 34
    3.5.3 Sun OEM VxVM .................................................................................... 35
  3.6 VERITAS Cluster Server Notes .................................................................... 35
  3.7 MPxI/O Notes ................................................................................................ 35
  3.8 Sun Cluster Installation Notes ....................................................................... 36
    3.8.1 Supported Versions and Hardware ......................................................... 36
    3.8.2 Multipath Configuration ......................................................................... 36
    3.8.3 Reset Group Setting .............................................................................. 36
    3.8.4 Host Response Setting ........................................................................... 36
    3.8.5 Installing VxVM .................................................................................... 36
3.8.6 Number of Nodes
3.8.7 Sun Cluster Data Service for Oracle Application Server (RAC)
3.9 hddv Driver Notes

Chapter 4 Installing and Setting Up ETERNUSmgr
Chapter 5 Setting Up the ETERNUS Disk Storage Systems
Chapter 6 Setting the Fibre Channel Switches
Chapter 7 Installing the Driver and Setting Up the Server
Chapter 8 Recognizing the Logical Units
Chapter 9 Setting the Multipaths
Chapter 10 Setting a File System
  10.1 Creating a File System
  10.2 Setting Up Automatic Disk Mounting
Chapter 11 SAN Boot
Chapter 1 Workflow

This chapter describes the procedure for connecting ETERNUS Disk storage systems to a server running Solaris OS. Procedures may vary according to the Fibre Channel card driver type and connection method.

1.1 For Fujitsu Drivers

The following documents may be relevant when using a Fujitsu driver. Exactly which documents are required depends on the connection environment, see the "Workflow" section that follows for details.

Required Documents

- Server Support Matrix
- Server Support Matrix for FC-SWITCH
- ETERNUS Disk storage systems Server Connection Guide (Fibre Channel) ETERNUS Disk Storage System Settings
- ETERNUS Disk storage systems Server Connection Guide (Fibre Channel) Fibre Channel Switch Settings
- ETERNUS Disk storage systems Server Connection Guide (Fibre Channel) for Oracle Solaris (this document)
  - Driver Settings for Fujitsu Fibre Channel Cards
  - Multipath Driver Settings for ETERNUS Multipath Driver
- ETERNUSmgr Install Guide
- ETERNUSmgr User Guide
- Individual product manuals (for the Fibre Channel card, multipath driver and VxVM)

Note: When a Fibre Channel switch is used to make the connection, refer to the "ETERNUS Disk storage systems Server Connection Guide (Fibre Channel) Fibre Channel Switch Settings" and use the procedure described.
Chapter 1  Workflow
>  1.1  For Fujitsu Drivers

ETERNUSmgr Installation and ETERNUS Disk Storage System’s Setup
If ETERNUSmgr is to be used, install it and set up the ETERNUS Disk storage system.

- "Chapter 4 Installing and Setting Up ETERNUSmgr" (page 39)
- "Chapter 5 Setting Up the ETERNUS Disk Storage Systems" (page 40)
- Install ETERNUSmgr:
  - "ETERNUSmgr Install Guide"
- Check ETERNUSmgr operation:
  - "ETERNUSmgr User Guide"
- Set up the ETERNUS Disk storage system:
  - "ETERNUS Disk storage systems Server Connection Guide (Fibre Channel) ETERNUS Disk Storage System Settings"

Fibre Channel Switch Setup
If a Fibre Channel switch is to be used, set it up and connect it now.

- "Chapter 6 Setting the Fibre Channel Switches" (page 41)
- Set up the Fibre Channel switch:
  - "ETERNUS Disk storage systems Server Connection Guide (Fibre Channel) Fibre Channel Switch Settings"
- Check the Fibre Channel switch connection requirements:
  - "Server Support Matrix for FC-SWITCH"
**Driver Installation**

Install the appropriate driver for the Fibre Channel card being used.

- "Chapter 7 Installing the Driver and Setting Up the Server" (page 42)
- Mount Fibre Channel cards and install drivers.
  - "ETERNUS Disk storage systems Server Connection Guide (Fibre Channel) for Oracle Solaris Driver Settings for Fujitsu Fibre Channel Cards"
- Check the Fibre Channel card driver versions.
  - "Server Support Matrix"

---

**Server Setup**

Edit the setup file (/kernel/drv/fjpfca.conf) to set the parameters required for connection.

- "Chapter 7 Installing the Driver and Setting Up the Server" (page 42)
- Set up the server.
  - "ETERNUS Disk storage systems Server Connection Guide (Fibre Channel) for Oracle Solaris Driver Settings for Fujitsu Fibre Channel Cards"
<table>
<thead>
<tr>
<th>If the ETERNUS Multipath Driver or GR Multipath Driver is used</th>
<th>If the ETERNUS Multipath Driver or GR Multipath Driver is not used</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Driver-side LUN Recognition</strong></td>
<td></td>
</tr>
<tr>
<td>The sd or hddv driver is used to recognize the ETERNUS Disk storage system's logical units. Label the LUNs using the &quot;format&quot; command.</td>
<td></td>
</tr>
<tr>
<td>- &quot;Chapter 8 Recognizing the Logical Units&quot; (page 43)</td>
<td></td>
</tr>
<tr>
<td>- Have the server recognize the ETERNUS Disk storage system LUNs.</td>
<td></td>
</tr>
<tr>
<td>- ETERNUS Disk storage systems Server Connection Guide (Fibre Channel) for Oracle Solaris Driver Settings for Fujitsu Fibre Channel Cards*</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>If VxVM is used</th>
<th>If VxVM is not used</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jump to Step 7</td>
<td>Volume Creation</td>
</tr>
</tbody>
</table>
If the ETERNUS Multipath Driver or GR Multipath Driver is used

### Multipath Setup

- Install the multipath software and set up the multipath connections. Settings will depend on which multipath software is being used.
  - "Chapter 9 Setting the Multipaths" (page 44)
  - "ETERNUS Disk storage systems Server Connection Guide (Fibre Channel) for Oracle Solaris Multipath Driver Settings for ETERNUS Multipath Driver"
- Install and set up the Multipath Driver.
  - Multipath Driver product manual
- Check the corresponding Multipath Driver.
  - "Server Support Matrix"

If VxVM is used

### VxVM Setup

- Install and set up VxVM when VxVM is used.
  - "3.5 VxVM Notes" (page 34)
  - "Chapter 9 Setting the Multipaths" (page 44)
- Install and set up the VERITAS Volume Manager.
  - VxVM product documentation
  - Check the supported version and use environment.
  - "Server Support Matrix"

#### Volume Creation

Create slices, exactly the same as for a regular disk.

#### File System Creation

Create a file system, exactly the same as for a regular disk.

- "Chapter 10 Setting a File System" (page 45)
1.2 For Sun Drivers

The following documents may be relevant when using a Sun driver. Exactly which documents are required depends on the connection environment, see the "Workflow" section that follows for details.

**Required Documents**

- Server Support Matrix
- Server Support Matrix for FC-SWITCH
- ETERNUS Disk storage systems Server Connection Guide (Fibre Channel) ETERNUS Disk Storage System Settings
- ETERNUS Disk storage systems Server Connection Guide (Fibre Channel) Fibre Channel Switch Settings
- ETERNUS Disk storage systems Server Connection Guide (Fibre Channel) for Oracle Solaris (this document)
  - Driver Settings for Sun Fibre Channel Cards
  - Multipath Driver Settings for MPxIO Multipath Driver
- ETERNUSMgr Install Guide
- ETERNUSMgr User Guide
- Individual product manuals (for the Fibre Channel card, MPxIO and VxVM)

**Workflow**

**ETERNUSMgr Installation and ETERNUS Disk Storage System's Setup**

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

Refer

- "Chapter 4 Installing and Setting Up ETERNUSMgr" (page 39)
- "Chapter 5 Setting Up the ETERNUS Disk Storage Systems" (page 40)
- Install ETERNUSMgr.
  - "ETERNUSMgr Install Guide"
- Check ETERNUSMgr operation.
  - "ETERNUSMgr User Guide"
- Set up the ETERNUS Disk storage system.
  - "ETERNUS Disk storage systems Server Connection Guide (Fibre Channel) ETERNUS Disk Storage System Settings"
Chapter 1  Workflow

> 1.2 For Sun Drivers

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**Fibre Channel Switch Setup**

If a Fibre Channel switch is to be used, set it up and connect it now.

- Refer to "Chapter 6 Setting the Fibre Channel Switches" (page 41)
- Set up the Fibre Channel switch.
  - "ETERNUS Disk storage systems Server Connection Guide (Fibre Channel) Fibre Channel Switch Settings"
  - Check the Fibre Channel switch connection requirements.
    - "Server Support Matrix for FC-SWITCH"

---

**Driver Installation**

Install the appropriate driver for the Fibre Channel card being used.

- Refer to "Chapter 7 Installing the Driver and Setting Up the Server" (page 42)
- Mount Fibre Channel cards and install drivers.
  - "ETERNUS Disk storage systems Server Connection Guide (Fibre Channel) for Oracle Solaris Driver Settings for Sun Fibre Channel Cards"
  - Check the Fibre Channel card driver versions.
    - "Server Support Matrix"

---

**Server Setup**

Edit the setup file to set the parameters required for connection.

- Refer to "Chapter 7 Installing the Driver and Setting Up the Server" (page 42)
- Set up the server.
  - "ETERNUS Disk storage systems Server Connection Guide (Fibre Channel) for Oracle Solaris Driver Settings for Sun Fibre Channel Cards"
LUN Recognition
Recognize the ETERNUS Disk storage systems' logical units.

- "Chapter 8 Recognizing the Logical Units" (page 43)
- Have the server recognize the ETERNUS Disk storage system LUNs.
  - "ETERNUS Disk storage systems Server Connection Guide (Fibre Channel) for Oracle Solaris Driver Settings for Sun Fibre Channel Cards"

LUN Labeling
Format the ETERNUS Disk storage systems' logical units using the "format" utility.

If MPxIO or VxVM is used
If MPxIO or VxVM is not used

Multipath Setup
Install and set up the multipath driver or VxVM. Settings will depend on what multipath software is being used.

- "Chapter 9 Setting the Multipaths" (page 44)
- Install and set up the Multipath Driver.
  - "ETERNUS Disk storage systems Server Connection Guide (Fibre Channel) for Oracle Solaris Multipath Driver Settings for MPxIO Multipath Driver"
- Check the corresponding Multipath Driver.
  - "Server Support Matrix"
Volume Creation
Create slices, exactly the same as for a regular disk. When using VxVM or SVM, refer to the individual product documentation to create volumes.

File System Creation
Create a file system, exactly the same as for a regular disk.

Refer to "Chapter 10 Setting a File System" (page 45)
1.3 For Emulex Drivers

The following documents may be relevant when using an Emulex driver. Exactly which documents are required depends on the connection environment, see the "Workflow" section that follows for details.

Required Documents

- Server Support Matrix
- Server Support Matrix for FC-SWITCH
- ETERNUS Disk storage systems Server Connection Guide (Fibre Channel)
- ETERNUS Disk Storage System Settings
- ETERNUS Disk storage systems Server Connection Guide (Fibre Channel) Fibre Channel Switch Settings
- ETERNUS Disk storage systems Server Connection Guide (Fibre Channel) for Oracle Solaris (this document)
  - Driver Settings for Emulex Fibre Channel Cards
  - Multipath Driver Settings for ETERNUS Multipath Driver
- ETERNUSmgr Install Guide
- ETERNUSmgr User Guide
- Individual product manuals (for the Fibre Channel card, multipath driver and VxVM)

Workflow

ETERNUSmgr Installation and ETERNUS Disk Storage System's Setup

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

- "Chapter 4 Installing and Setting Up ETERNUSmgr" (page 39)
- "Chapter 5 Setting Up the ETERNUS Disk Storage Systems" (page 40)
- Install ETERNUSmgr.
  - "ETERNUSmgr Install Guide"
- Check ETERNUSmgr operation.
  - "ETERNUSmgr User Guide"
- Set up the ETERNUS Disk storage system.
  - "ETERNUS Disk storage systems Server Connection Guide (Fibre Channel) ETERNUS Disk Storage System Settings"
Fibre Channel Switch Setup

If a Fibre Channel switch is to be used, set it up and connect it now.

- "Chapter 6 Setting the Fibre Channel Switches" (page 41)
- Set up the Fibre Channel switch.
  - "ETERNUS Disk storage systems Server Connection Guide (Fibre Channel) Fibre Channel Switch Settings"
- Check the Fibre Channel switch connection requirements.
  - "Server Support Matrix for FC-SWITCH"

Driver Installation

Install the appropriate driver for the Fibre Channel card being used.

- "Chapter 7 Installing the Driver and Setting Up the Server" (page 42)
- Mount Fibre Channel cards and install drivers.
  - "ETERNUS Disk storage systems Server Connection Guide (Fibre Channel) for Oracle Solaris Driver Settings for Emulex Fibre Channel Cards"
- Check the Fibre Channel card driver versions.
  - "Server Support Matrix"

Server Setup

Edit the setup file (/etc/system) to set the parameters required for connection.

- "Chapter 7 Installing the Driver and Setting Up the Server" (page 42)
- Set up the server.
  - "ETERNUS Disk storage systems Server Connection Guide (Fibre Channel) for Oracle Solaris Driver Settings for Emulex Fibre Channel Cards"

If the ETERNUS Multipath Driver or GR Multipath Driver is used If the ETERNUS Multipath Driver or GR Multipath Driver is not used
If the ETERNUS Multipath Driver or GR Multipath Driver is used

Driver-side LUN Recognition
The sd driver is used to recognize the ETERNUS Disk storage system's logical units. Label the LUNs using the "format" command.

- "Chapter 8 Recognizing the Logical Units" (page 43)
- Have the server recognize the ETERNUS Disk storage system LUNs.
  - "ETERNUS Disk storage systems Server Connection Guide (Fibre Channel) for Oracle Solaris Driver Settings for Emulex Fibre Channel Cards"

If VxVM is used

Jump to Step 7
Volume Creation

If VxVM is not used

If the ETERNUS Multipath Driver or GR Multipath Driver is not used
Chapter 1  Workflow

1.3 For Emulex Drivers

If the ETERNUS Multipath Driver or GR Multipath Driver is used

**Multipath Setup**
Install the multipath software and set up the multipath connections. Settings will depend on which multipath software is being used.

- "Chapter 9 Setting the Multipaths" (page 44)
- "ETERNUS Disk storage systems Server Connection Guide (Fibre Channel) for Oracle Solaris Multipath Driver Settings for ETERNUS Multipath Driver"
- Install and set up the Multipath Driver.
  - Multipath Driver product manual
- Check the corresponding Multipath Driver.
  - "Server Support Matrix"

If VxVM is used

**VxVM Setup**
Install and set up VxVM.

- "3.5 VxVM Notes" (page 34)
- "Chapter 9 Setting the Multipaths" (page 44)
- Install and set up the VERITAS Volume Manager.
  - VxVM product documentation
- Check the supported version and use environment.
  - "Server Support Matrix"

Volume Creation
Create slices, exactly the same as for a regular disk.

File System Creation
Create a file system, exactly the same as for a regular disk.

- "Chapter 10 Setting a File System" (page 45)
1.4 For QLogic Drivers

The following documents may be relevant when using a QLogic driver. Exactly which documents are required depends on the connection environment, see the "Workflow" section that follows for details.

Required Documents

- Server Support Matrix
- Server Support Matrix for FC-SWITCH
- ETERNUS Disk storage systems Server Connection Guide (Fibre Channel)
- ETERNUS Disk Storage System Settings
- ETERNUS Disk storage systems Server Connection Guide (Fibre Channel) Fibre Channel Switch Settings
- ETERNUS Disk storage systems Server Connection Guide (Fibre Channel) for Oracle Solaris (this document)
  - Driver Settings for QLogic Fibre Channel Cards
- ETERNUSmgr Install Guide
- ETERNUSmgr User Guide
- Individual product manuals (for the Fibre Channel card and VxVM)

Workflow

ETERNUSmgr Installation and ETERNUS Disk Storage System's Setup

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

- "Chapter 4 Installing and Setting Up ETERNUSmgr" (page 39)
- "Chapter 5 Setting Up the ETERNUS Disk Storage Systems" (page 40)
- Install ETERNUSmgr:
  - "ETERNUSmgr Install Guide"
- Check ETERNUSmgr operation.
  - "ETERNUSmgr User Guide"
- Set up the ETERNUS Disk storage system.
  - "ETERNUS Disk storage systems Server Connection Guide (Fibre Channel)
    ETERNUS Disk Storage System Settings"
Fibre Channel Switch Setup
If a Fibre Channel switch is to be used, set it up and connect it now.

- “Chapter 6 Setting the Fibre Channel Switches” (page 41)
- Set up the Fibre Channel switch.
  - “ETERNUS Disk storage systems Server Connection Guide (Fibre Channel) Fibre Channel Switch Settings”
- Check the Fibre Channel switch connection requirements.
  - “Server Support Matrix for FC-SWITCH”

Driver Installation
Install the appropriate driver for the Fibre Channel card being used.

- “Chapter 7 Installing the Driver and Setting Up the Server” (page 42)
- Mount Fibre Channel cards and install drivers.
  - “ETERNUS Disk storage systems Server Connection Guide (Fibre Channel) for Oracle Solaris Driver Settings for QLogic Fibre Channel Cards”
- Check the Fibre Channel card driver versions.
  - “Server Support Matrix”

Server Setup
Edit the setup file (/kernel/drv/qla2300.conf) to set the parameters required for connection.

- “Chapter 7 Installing the Driver and Setting Up the Server” (page 42)
- Set up the server.
  - “ETERNUS Disk storage systems Server Connection Guide (Fibre Channel) for Oracle Solaris Driver Settings for QLogic Fibre Channel Cards”
sd Driver-side LUN Recognition
Edit the setup file (/kernel/drv/sd.conf) to allow the sd driver to recognize the ETERNUS Disk storage systems' logical units. Then, label the LUNs using the "format" command.

- Set up the server.
  - "ETERNUS Disk storage systems Server Connection Guide (Fibre Channel) for Oracle Solaris Driver Settings for QLogic Fibre Channel Cards"

For multipath configuration with VxVM
VxVM Setup
Install and set up VxVM.

- "Chapter 9 Setting the Multipaths" (page 44)
- Install and set up the VERITAS Volume Manager.
  - VxVM product documentation
  - Check the supported version and use environment.
    - "Server Support Matrix"

Volume Creation
Create slices, exactly the same as for a regular disk.

File System Creation
Create a file system, exactly the same as for a regular disk.

- "Chapter 10 Setting a File System" (page 45)
1.5 For Brocade Drivers

The following documents may be relevant when using a Brocade driver. Exactly which documents are required depends on the connection environment, see the "Workflow" section that follows for details.

Required Documents

- Server Support Matrix
- Server Support Matrix for FC-SWITCH
- ETERNUS Disk storage systems Server Connection Guide (Fibre Channel)
- ETERNUS Disk Storage System Settings
- ETERNUS Disk storage systems Server Connection Guide (Fibre Channel)
- Fibre Channel Switch Settings
- ETERNUS Disk storage systems Server Connection Guide (Fibre Channel)
  for Oracle Solaris (this document)
  - Driver Settings for Brocade Fibre Channel Cards
  - Multipath Driver Settings for MPxIO Multipath Driver
- ETERNUSmgr Install Guide
- ETERNUSmgr User Guide
- Individual product manuals (for the Fibre Channel card and MPxIO)

Workflow

ETERNUSmgr Installation and ETERNUS Disk Storage System's Setup

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

- "Chapter 4 Installing and Setting Up ETERNUSmgr" (page 39)
- "Chapter 5 Setting Up the ETERNUS Disk Storage Systems" (page 40)
- Install ETERNUSmgr.
  - "ETERNUSmgr Install Guide"
- Check ETERNUSmgr operation.
  - "ETERNUSmgr User Guide"
- Set up the ETERNUS Disk storage system.
  - "ETERNUS Disk storage systems Server Connection Guide (Fibre Channel)
    ETERNUS Disk Storage System Settings"
Fibre Channel Switch Setup

If a Fibre Channel switch is to be used, set it up and connect it now.

- "Chapter 6 Setting the Fibre Channel Switches" (page 41)
- Set up the Fibre Channel switch.
  - "ETERNUS Disk storage systems Server Connection Guide (Fibre Channel) Fibre Channel Switch Settings"
- Check the Fibre Channel switch connection requirements.
  - "Server Support Matrix for FC-SWITCH"

Driver Installation

Install the appropriate driver for the Fibre Channel card being used.

- "Chapter 7 Installing the Driver and Setting Up the Server" (page 42)
- Mount Fibre Channel cards and install drivers.
  - "ETERNUS Disk storage systems Server Connection Guide (Fibre Channel) for Oracle Solaris Driver Settings for Brocade Fibre Channel Cards"
- Check the Fibre Channel card driver versions.
  - "Server Support Matrix"

Server Setup

Edit the setup file to set the parameters required for connection.

- "Chapter 7 Installing the Driver and Setting Up the Server" (page 42)
- Set up the server.
  - "ETERNUS Disk storage systems Server Connection Guide (Fibre Channel) for Oracle Solaris Driver Settings for Brocade Fibre Channel Cards"
5 LUN Recognition
Recognize the ETERNUS Disk storage systems' logical units.

- "Chapter 8 Recognizing the Logical Units" (page 43)
- Have the server recognize the ETERNUS Disk storage system LUNs.
  - "ETERNUS Disk storage systems Server Connection Guide (Fibre Channel) for Oracle Solaris Driver Settings for Brocade Fibre Channel Cards"

6 LUN Labeling
Format the ETERNUS Disk storage systems' logical units using the "format" utility.

If MPxIO is used

7 Multipath Setup
Install and set up the multipath driver.

- "Chapter 9 Setting the Multipaths" (page 44)
- Install and set up the Multipath Driver.
  - "ETERNUS Disk storage systems Server Connection Guide (Fibre Channel) for Oracle Solaris Multipath Driver Settings for MPxIO Multipath Driver"
- Check the corresponding Multipath Driver.
  - "Server Support Matrix"
Volume Creation
Create slices, exactly the same as for a regular disk.

File System Creation
Create a file system, exactly the same as for a regular disk.
Refer to "Chapter 10 Setting a File System" (page 45)
Chapter 2   Checking the Server Environment

Refer to the "Server Support Matrix" to check the server environment being used.

2.1 Hardware

Refer to the "Server Support Matrix".

2.2 OS

Refer to the "Server Support Matrix".

2.3 Fibre Channel Cards

Refer to the "Server Support Matrix".

2.4 Multipath Driver

When using the ETERNUS Multipath Driver, GR Multipath Driver or MPxIO, check the "Server Support Matrix".

2.5 Symantec VxVM

When using Symantec VxVM, check the "Server Support Matrix" for Symantec VxVM usage conditions.
2.6 Sun OEM VxVM

When using Sun OEM VxVM, check the "Server Support Matrix" for Sun OEM VxVM usage conditions.

2.7 SVM

When using SVM, check the "Server Support Matrix" for SVM usage conditions.

2.8 VERITAS Cluster Server

When using VERITAS Cluster Server, check the "Server Support Matrix" for VERITAS Cluster Server usage conditions.

2.9 Sun Cluster

When using Sun Cluster, check the "Server Support Matrix" for Sun Cluster usage conditions.
### 2.10 Fibre Channel Cards that Require a Sun-brand Driver

Irrespective of their actual origin, the Fibre Channel cards listed in the following table require the use of a Sun-brand Fibre Channel card driver. Similarly, install and set up these Fibre Channel cards according to the procedures in the "ETERNUS Disk storage systems Server Connection Guide (Fibre Channel) for Oracle Solaris Driver Settings for Sun Fibre Channel Cards".

<table>
<thead>
<tr>
<th>Supplier</th>
<th>Fibre Channel card product ID</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fujitsu</td>
<td>• SE0X7F22F</td>
</tr>
<tr>
<td></td>
<td>• SE0X7F21F</td>
</tr>
<tr>
<td></td>
<td>• XSEFC402AF</td>
</tr>
<tr>
<td></td>
<td>• XSEFC402A</td>
</tr>
<tr>
<td></td>
<td>• XSEFC401AF</td>
</tr>
<tr>
<td></td>
<td>• XSEFC401A</td>
</tr>
<tr>
<td></td>
<td>• XSPFC212A</td>
</tr>
<tr>
<td></td>
<td>• XSPFC211A</td>
</tr>
<tr>
<td></td>
<td>• XSPFC202A</td>
</tr>
<tr>
<td></td>
<td>• XSPFC201A</td>
</tr>
<tr>
<td></td>
<td>• X6799A</td>
</tr>
<tr>
<td></td>
<td>• X6768A</td>
</tr>
<tr>
<td></td>
<td>• X6767A</td>
</tr>
<tr>
<td></td>
<td>• X6727A</td>
</tr>
<tr>
<td>Sun</td>
<td>• SG-XPCIE2FC-QF8-Z</td>
</tr>
<tr>
<td></td>
<td>• SG-XPCIE1FC-QF8-Z</td>
</tr>
<tr>
<td></td>
<td>• SG-XPCIE2FC-EM8-Z</td>
</tr>
<tr>
<td></td>
<td>• SG-XPCIE1FC-EM8-Z</td>
</tr>
<tr>
<td></td>
<td>• SG-XPCIE2FC-QF4</td>
</tr>
<tr>
<td></td>
<td>• SG-XPCIE1FC-QF4</td>
</tr>
<tr>
<td></td>
<td>• SG-XPCI2FC-QF4</td>
</tr>
<tr>
<td></td>
<td>• SG-XPCI1FC-QF4</td>
</tr>
<tr>
<td></td>
<td>• SG-XPCI2FC-EM4-Z</td>
</tr>
<tr>
<td></td>
<td>• SG-XPCI1FC-EM4-Z</td>
</tr>
<tr>
<td></td>
<td>• SG-XPE2FC-EM4</td>
</tr>
<tr>
<td></td>
<td>• SG-XPE1FC-EM4</td>
</tr>
<tr>
<td></td>
<td>• SG-XPCI2FC-QF2-Z</td>
</tr>
<tr>
<td></td>
<td>• SG-XPCI2FC-QF2</td>
</tr>
<tr>
<td></td>
<td>• SG-XPCI1FC-QF2</td>
</tr>
<tr>
<td></td>
<td>• SG-XPCI1FC-QL2</td>
</tr>
<tr>
<td></td>
<td>• SG-XPCI2FC-EM2</td>
</tr>
<tr>
<td></td>
<td>• SG-XPCI1FC-EM2</td>
</tr>
</tbody>
</table>


Chapter 3  Notes

3.1 Server Startup and Power Supply Control Notes

Before turning the server on, check that the ETERNUS Disk storage systems and Fibre Channel switches are all "Ready". If the server is turned on and they are not "Ready", the server will not be able to recognize the ETERNUS Disk storage systems. Also, when the ETERNUS Disk storage system power supply is being controlled by a connected server, make sure that the ETERNUS Disk storage system does not shut down before the connected servers. Similarly, the Fibre Channel switches must also be turned off after the connected servers have been shut down. If turned off, data writes from the running server cannot be saved to the ETERNUS Disk storage systems, and already saved data may also be affected.

3.2 Instance Management Table Notes

The instance management table is a worksheet that helps make installation, setting up and maintenance of a system easy. It is important that the system details be recorded after first installing the system and also each time the system is subsequently modified, expanded, or has maintenance work performed on it. Creating an instance management table makes installation and maintenance of the system easy. Use the template instance management tables provided in the "Various Management Table Templates" appendix of the "ETERNUS Disk storage systems Server Connection Guide (Fibre Channel) for Oracle Solaris Driver Settings" for type of Fibre Channel cards being used.

3.3 Design Sheet Notes

The design sheet is a spreadsheet program work sheet that is used to simplify the process of installing the ETERNUS Disk storage systems. It is important to save the current environment after first installing the system and also after each postinstallation system modification, addition, or maintenance operation. Creating a design sheet makes installation and maintenance of the system easy.
3.4 Fibre Channel Switch Notes

When a Fibre Channel switch (ETERNUS SN200 series, Brocade DCX series) is to be used between the server and ETERNUS Disk storage system, follow the preparation-in-advance and Fibre Channel switch set up procedures given in the "ETERNUS Disk storage systems Server Connection Guide (Fibre Channel) Fibre Channel Switch Settings".

- Check the "Server Support Matrix for FC-SWITCH" for which Fibre Channel switches are supported by each server OS and ETERNUS Disk storage system model.
- When connecting any of the following Fibre Channel cards to a Fibre Channel switch, Fibre Channel switch ports must be set:
  - SE0X7F21X
  - SE0X7F22X
  - XSPFC212A
  - XSPFC202A
  - XSPFC211A
  - XSPFC201A
  - Sun Fibre Channel cards (with a "QF" or "QL" designation model name)
  - QLogic Fibre Channel cards (using Sun brand drivers)

Set the link speeds of the Fibre Channel switch ports that connect to the Fibre Channel cards installed in the server according to the following table:

<table>
<thead>
<tr>
<th>Combination of the devices</th>
<th>Maximum link speed of Fibre Channel card</th>
<th>Maximum link speed of Fibre Channel switch</th>
<th>Set the Fibre Channel switch port link speed to ...</th>
</tr>
</thead>
<tbody>
<tr>
<td>8Gbps</td>
<td>8Gbps</td>
<td>8Gbps</td>
<td>8Gbps fixed</td>
</tr>
<tr>
<td></td>
<td>4Gbps</td>
<td>4Gbps</td>
<td>4Gbps fixed</td>
</tr>
<tr>
<td></td>
<td>2Gbps</td>
<td>2Gbps</td>
<td>2Gbps fixed</td>
</tr>
<tr>
<td>4Gbps</td>
<td>8Gbps</td>
<td>4Gbps</td>
<td>4Gbps fixed</td>
</tr>
<tr>
<td></td>
<td>4Gbps</td>
<td>4Gbps</td>
<td>4Gbps fixed</td>
</tr>
<tr>
<td></td>
<td>2Gbps</td>
<td>2Gbps</td>
<td>2Gbps fixed</td>
</tr>
<tr>
<td>2Gbps</td>
<td>8Gbps</td>
<td>2Gbps</td>
<td>2Gbps fixed</td>
</tr>
<tr>
<td></td>
<td>4Gbps</td>
<td>2Gbps</td>
<td>2Gbps fixed</td>
</tr>
<tr>
<td></td>
<td>2Gbps</td>
<td>2Gbps</td>
<td>2Gbps fixed</td>
</tr>
</tbody>
</table>
3.5 VxVM Notes

3.5.1 Driver Notes

The hddv driver cannot be used with VxVM. The required driver varies depending on Fibre Channel card manufacturer.

<table>
<thead>
<tr>
<th>Fibre Channel card</th>
<th>Driver</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fujitsu-brand</td>
<td>sd</td>
</tr>
<tr>
<td>Emulex-brand</td>
<td>sd</td>
</tr>
<tr>
<td>QLogic-brand</td>
<td>sd</td>
</tr>
<tr>
<td>Sun-brand</td>
<td>ssd</td>
</tr>
</tbody>
</table>

3.5.2 Symantec VxVM

- Install VERITAS Array Support Library (ASL) after installing VxVM.
- Installing VxVM
  VxVM should be installed as specified in its accompanying documentation.
- When using VxVM 4.1 or VxVM 5.0
  If the ETERNUS Disk storage systems are connected to a configuration that uses the VxVM, the VERITAS Array Support Library (ASL) will also need to be installed.
  Which version of VERITAS ASL is required will depend on the storage system and version of VxVM used. Download the VERITAS ASL version that matches your environment from the following Symantec web-site.
  Refer to the Symantec web-site for VERITAS ASL installation details.

<table>
<thead>
<tr>
<th>Storage system</th>
<th>VxVM</th>
<th>ASL download URL</th>
</tr>
</thead>
<tbody>
<tr>
<td>ETERNUS2000</td>
<td>VxVM 5.0 MP1 or later</td>
<td><a href="http://www.symantec.com/docs/TECH70029">http://www.symantec.com/docs/TECH70029</a></td>
</tr>
<tr>
<td>ETERNUS4000</td>
<td>VxVM 4.1 MP1 or later</td>
<td><a href="http://www.symantec.com/docs/TECH48387">http://www.symantec.com/docs/TECH48387</a></td>
</tr>
<tr>
<td>ETERNUS8000</td>
<td>VxVM 5.0 MP1 or later</td>
<td><a href="http://www.symantec.com/docs/TECH77672">http://www.symantec.com/docs/TECH77672</a></td>
</tr>
</tbody>
</table>

- When using VxVM 5.1
  ASL does not need to be installed.
3.5.3 Sun OEM VxVM

- When installing VxVM in Sun Cluster configuration, use Sun OEM version of VxVM.
- Install VERITAS Array Support Library (ASL) after installing VxVM.
- Installing VxVM
  VxVM should be installed as specified in its accompanying documentation.
- When using VxVM 4.1 or VxVM 5.0
  If the ETERNUS Disk storage systems are connected to a configuration that uses the VxVM, the VERITAS Array Support Library (ASL) will also need to be installed. Which version of VERITAS ASL is required will depend on the storage system and version of VxVM used. Download the VERITAS ASL version that matches your environment from the following Symantec web-site. Refer to the Symantec web-site for VERITAS ASL installation details.

<table>
<thead>
<tr>
<th>Storage system</th>
<th>VxVM</th>
<th>ASL download URL</th>
</tr>
</thead>
<tbody>
<tr>
<td>ETERNUS2000</td>
<td>VxVM 5.0 MP1 or later</td>
<td><a href="http://www.symantec.com/docs/TECH70029">http://www.symantec.com/docs/TECH70029</a></td>
</tr>
<tr>
<td>ETERNUS4000</td>
<td>VxVM 4.1 MP1 or later</td>
<td><a href="http://www.symantec.com/docs/TECH48387">http://www.symantec.com/docs/TECH48387</a></td>
</tr>
<tr>
<td>ETERNUS8000</td>
<td>VxVM 5.0 MP1 or later</td>
<td><a href="http://www.symantec.com/docs/TECH77672">http://www.symantec.com/docs/TECH77672</a></td>
</tr>
</tbody>
</table>

- When using MPxIO as the multipath driver, disable the "dmp_fast_recovery" DMP kernel parameter. Refer to the Symantec Web-site for details.

3.6 VERITAS Cluster Server Notes

- Installing VERITAS Cluster Server
  VERITAS Cluster Server should be installed as specified in its accompanying documentation.

3.7 MPxIO Notes

When connecting the ETERNUS Disk storage systems to a server with MPxIO installed, host responses must be set for the ETERNUS Disk storage systems. Also, check the "Server Support Matrix" for MPxIO support conditions. MPxIO must be disabled in the setup file for the paths of connected devices that MPxIO does not support (such as a tape device).
3.8 Sun Cluster Installation Notes

Before installing the Sun Cluster software, carefully read the following notes and check the Oracle web-site (http://www.oracle.com/), etc.

3.8.1 Supported Versions and Hardware

When installing Sun Cluster on a server that is connected to an ETERNUS Disk storage system, check the "Server Support Matrix" for usage conditions.

3.8.2 Multipath Configuration

When connecting a Sun Cluster server to ETERNUS Disk storage systems via a multipath configuration, the Sun StorEdge Traffic Manager (MPxIO) multipath driver must be installed.

3.8.3 Reset Group Setting

When connecting a Sun Cluster server to ETERNUS Disk storage systems, reset groups must be set for the ETERNUS Disk storage systems.

3.8.4 Host Response Setting

When connecting a Sun Cluster server to ETERNUS Disk storage systems, host responses must be set for the ETERNUS Disk storage systems.

3.8.5 Installing VxVM

If installing VxVM on a Sun Cluster server, use the Sun OEM version of VxVM. Refer to "3.5.3 Sun OEM VxVM" (page 35) for details.

3.8.6 Number of Nodes

The maximum number of nodes is four.
3.8.7 Sun Cluster Data Service for Oracle Application Server (RAC)

When multiple shared disks are configured in a Sun Cluster environment, symptoms such as server panics may occur. Increase parameter values if a problem occurs with the parameter values in the list. Refer to the Oracle web-site (http://www.oracle.com/) for setting procedure details.

When using VxVM in a Sun Cluster Data Service for Oracle environment

Set the following "SUNW.rac_cvm" resource advanced properties as indicated. Refer to the Oracle web-site (http://www.oracle.com/) for setting procedure details.

• Required parameter values

<table>
<thead>
<tr>
<th>SUNW.rac_cvm advanced property</th>
<th>Default value</th>
<th>Required value</th>
</tr>
</thead>
<tbody>
<tr>
<td>reservation_timeout</td>
<td>325</td>
<td>6000</td>
</tr>
<tr>
<td>cvm_start_step_timeout</td>
<td>120</td>
<td>120</td>
</tr>
<tr>
<td>cvm_stop_step_timeout</td>
<td>40</td>
<td>40</td>
</tr>
<tr>
<td>cvm_abort_step_timeout</td>
<td>40</td>
<td>40</td>
</tr>
<tr>
<td>cvm_return_step_timeout</td>
<td>120</td>
<td>120</td>
</tr>
<tr>
<td>cvm_step1_timeout</td>
<td>100</td>
<td>400</td>
</tr>
<tr>
<td>cvm_step2_timeout</td>
<td>100</td>
<td>400</td>
</tr>
<tr>
<td>cvm_step3_timeout</td>
<td>240</td>
<td>6000</td>
</tr>
<tr>
<td>cvm_step4_timeout</td>
<td>320</td>
<td>4000</td>
</tr>
</tbody>
</table>

• Examples
  • Sun Cluster 3.2
    Using the "clresource" command to change the value of the "cvm_step4_timeout" advanced property parameter to "4000".

    ```
    # clresource set -p cvm_step4_timeout=4000 rac_cvm-rs
    ```

  • Sun Cluster 3.1
    Using the "scrgadm" command to change the value of the "cvm_step2_timeout" advanced property parameter to "200".

    ```
    # scrgadm -c -j rac_cvm -x cvm_step2_timeout=200
    ```
When using SVM in a Sun Cluster Data Service for Oracle environment

Set the following "rac_udlm" and "rac_svm" resource advanced properties as indicated. Refer to the Oracle web-site (http://www.oracle.com/) for setting procedure details.

- Required "rac_udlm" advanced property parameter values

<table>
<thead>
<tr>
<th>rac_udlm advanced property</th>
<th>Default value</th>
<th>Required value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Udlm_start_step_timeout</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>Udlm_abort_step_timeout</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>Udlm_step1_timeout</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>Udlm_step2_timeout</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>Udlm_step3_timeout</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>Udlm_step4_timeout</td>
<td>100</td>
<td>1300</td>
</tr>
<tr>
<td>Udlm_step5_timeout</td>
<td>100</td>
<td>100</td>
</tr>
</tbody>
</table>

- Example
Using the "clresource" command to change the value of the "Udlm_step4_timeout" advanced property parameter to "1300".

```
# clresource set -p udlm_step4_timeout=1300 rac-udlm-rs
```

- Required "rac_svm" advanced property parameter values

<table>
<thead>
<tr>
<th>rac_svm advanced property</th>
<th>Default value</th>
<th>Required value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Svm_step1_timeout</td>
<td>120</td>
<td>120</td>
</tr>
<tr>
<td>Svm_step2_timeout</td>
<td>120</td>
<td>120</td>
</tr>
<tr>
<td>Svm_step3_timeout</td>
<td>120</td>
<td>120</td>
</tr>
<tr>
<td>Svm_step4_timeout</td>
<td>120</td>
<td>120</td>
</tr>
<tr>
<td>Svm_return_step_timeout</td>
<td>120</td>
<td>360</td>
</tr>
<tr>
<td>Svm_abort_step_timeout</td>
<td>120</td>
<td>120</td>
</tr>
<tr>
<td>Svm_stop_step_timeout</td>
<td>120</td>
<td>120</td>
</tr>
<tr>
<td>Svm_start_step_timeout</td>
<td>120</td>
<td>120</td>
</tr>
</tbody>
</table>

- Example
Using the "clresource" command to change the value of the "svm_return_step_timeout" advanced property parameter to "360".

```
# clresource set -p svm_return_step_timeout=360 rac-svm-rs
```

3.9 hddv Driver Notes

Use the hddv driver if it is already installed and used. Do not use the hddv driver for new connections.
Chapter 4  Installing and Setting Up ETERNUSmgr

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

Set up the ETERNUS Disk storage systems using ETERNUSmgr.

ETERNUS Disk storage systems’ setup can be performed independently of server setup. For details on how to perform these settings, refer to the "ETERNUS Disk storage systems Server Connection Guide (Fibre Channel) ETERNUS Disk Storage System Settings" and "ETERNUSmgr User Guide".
The following describes the required settings when connecting the server and the ETERNUS Disk storage systems using a Fibre Channel switch. Follow the procedures given in "ETERNUS Disk storage systems Server Connection Guide (Fibre Channel) Fibre Channel Switch Settings".
Chapter 7  Installing the Driver and Setting Up the Server

Install the Fibre Channel card driver and set up the server.

Refer to each "ETERNUS Disk storage systems Server Connection Guide (Fibre Channel) for Oracle Solaris Driver Settings" for detailed setting procedures.

- ETERNUS Disk storage systems Server Connection Guide (Fibre Channel) for Oracle Solaris
  - Driver Settings for Fujitsu Fibre Channel Cards
  - Driver Settings for Sun Fibre Channel Cards
  - Driver Settings for Emulex Fibre Channel Cards
  - Driver Settings for QLogic Fibre Channel Cards
  - Driver Settings for Brocade Fibre Channel Cards
Chapter 8  Recognizing the Logical Units

Refer to each "ETERNUS Disk storage systems Server Connection Guide (Fibre Channel) for Oracle Solaris Driver Settings" for detailed setting procedures.

- ETERNUS Disk storage systems Server Connection Guide (Fibre Channel) for Oracle Solaris
  - Driver Settings for Fujitsu Fibre Channel Cards
  - Driver Settings for Sun Fibre Channel Cards
  - Driver Settings for Emulex Fibre Channel Cards
  - Driver Settings for QLogic Fibre Channel Cards
  - Driver Settings for Brocade Fibre Channel Cards

**Caution**

Skip this chapter if using the ETERNUS Multipath Driver "grmpdautoconf" command, since logical units are automatically recognized.
Chapter 9  Setting the Multipaths

- Multipaths must be set up for multipath connection. Install the multipath software and set up the multipath connections as detailed in the applicable documentation.

Refer to the following documents to install and set up multipath connection.
- When using the ETERNUS Multipath Driver or GR Multipath Driver
  "ETERNUS Disk storage systems Server Connection Guide (Fibre Channel) for Oracle Solaris Multipath Driver Settings for ETERNUS Multipath Driver"

- When using the MPxIO Multipath Driver
  "ETERNUS Disk storage systems Server Connection Guide (Fibre Channel) for Oracle Solaris Multipath Driver Settings for MPxIO Multipath Driver"

- When using VxVM DMP without a multipath driver, install and set it up as detailed in its accompanying documentation and the "Server Support Matrix".
Chapter 10  Setting a File System

10.1  Creating a File System

The file system is created using exactly the same procedure as when creating a file system on a regular disk. In each case, a confirmation message will be displayed after the command is executed. Enter “y” in response to create the new file system.

- When using single-path connection with the sd driver or hddv driver
  Example command:
  
  ```
  # newfs /dev/rdsk/c4t16d0s0
  ```

- When using the ETERNUS Multipath Driver
  Example command:
  
  ```
  # newfs /dev/FJSVmplb/rdsk/mplb0s0
  ```

- When using single-path connection with the Sun Fibre Channel card or Brocade Fibre Channel card
  Example command:
  
  ```
  # newfs /dev/rdsk/c2t2050000B5D6A0109d4s0
  ```

- When using the MPxIO with the Sun Fibre Channel card or Brocade Fibre Channel card
  Example command:
  
  ```
  # newfs /dev/rdsk/c7t6000B5D0006A0000006A01090620000d0s0
  ```

- When using VxVM
  Example command:
  
  ```
  # newfs /dev/vx/rdsk/dg0/v0
  ```

- When using SVM
  Execute the following command.
  
  ```
  # newfs /dev/md/rdsk/d0
  ```
10.2 Setting Up Automatic Disk Mounting

The "/etc/vfstab" file can be edited so that the ETERNUS Disk storage systems' disks are mounted each time the system is booted in exactly the same way as for regular disks. The mount directories must be created beforehand.

For the following example, the "/mnt" mount directory should be created beforehand.

**Procedure**

1. **Backup "/etc/vfstab" file.**
   
   ```
   # cp /etc/vfstab /etc/vfstab.standard
   ```

2. **Open the "/etc/vfstab" file using a text editor.**

   ```
   #device  device  mount FS  fsck mount  mount
   #to mount to fsck point type pass at boot options
   fd - /dev/fd fd - no -
   /proc - /proc proc - no -
   /dev/dsk/c0t0d0s4 - - #wap - no -
   /dev/dsk/c0t0d0s0 /dev/rdsk/c0t0d0s0 / ufs 1 no -
   /dev/dsk/c0t0d0s6 /dev/rdsk/c0t0d0s6 /usr ufs 1 no -
   /dev/dsk/c0t0d0s3 /dev/rdsk/c0t0d0s3 /usr ufs 1 no -
   /dev/dsk/c0t0d0s7 /dev/rdsk/c0t0d0s7 /export/hone ufs 2 yes -
   /dev/dsk/c0t0d0s5 /dev/rdsk/c0t0d0s5 / opt ufs 2 yes -
   /dev/dsk/c0t0d0s1 /dev/rdsk/c0t0d0s1 /usr/openwin ufs 2 yes -
   swap - /tmp tmpfs - yes
   ```

   - **When using single-path connection with the sd driver or hddv driver**
   ```
   /dev/dsk/c4t16d0s0 /dev/rdsk/c4t16d0s0 /mnt ufs 2 yes -
   ```

   - **When using the ETERNUS Multipath Driver**
   ```
   /dev/FJ3Vmplb/dsk/mlb0s0 /dev/FJ3Vmplb/rdsk/mlb0s0 /mnt ufs 2 yes -
   ```

   - **When using single-path connection with the Sun Fibre Channel card or Brocade Fibre Channel card**
   ```
   /dev/dsk/c2t2050000B5D6A0109d4s0 /dev/rdsk/c2t2050000B5D6A0109d4s0
   /mnt ufs 2 yes -
   ```
When using the MPxIO with the Sun Fibre Channel card or Brocade Fibre Channel card

```
/dev/dsk/c7t6000b5d0006a000006a010900620000d0s0 /dev/rdsk/c7t6000b5d0006a000006a010900620000d0s0 /mnt ufs 2 yes -
```

End of procedure

Specify the parameters in the "/etc/vfstab" file as shown below.

- **device to mount**
  Specify the block device.

- **device to fsck**
  Specify the raw device.

- **mount point**
  Specify the mount directory.

- **FS type**
  Specify the file system type. Normally "ufs" should be specified.

- **fsck pass**
  Specify whether and with what priority "fsck" should be performed.

- **mount at boot**
  Specify whether or not to auto-mount the device when the system is booted.

- **mount options**
  Specify the mount options. Normally "." may be specified.
Chapter 11  SAN Boot

When using an ETERNUS Disk storage system LUN (Logical Unit) as the boot disk, check the "Server Support Matrix" for the server environment being used, as well as any SAN boot documentation (such as in a system installation guide) provided with the server.

When an ETERNUS Disk storage system LUN is to be used as a boot disk, it must be provided with sufficient capacity to install the OS.
ETERNUS Disk storage systems
Server Connection Guide (Fibre Channel) for Oracle Solaris

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