ETERNUS
Disk storage systems

Server Connection Guide
(Fibre Channel)

for Oracle Solaris

Driver Settings for Brocade Fibre Channel Cards
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ETERNUS Disk storage systems Server Connection Guide 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 and using Brocade Fibre Channel cards 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
• ETERNUS Disk storage systems Server Connection Guide (Fibre Channel) for Oracle Solaris

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.

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The Contents and Structure of this Manual

This document is composed of the following four chapters and an appendix.

• Chapter 1 Workflow
  This describes the workflow required to establish a connection between a server with Brocade Fibre Channel cards and an ETERNUS Disk storage system.

• Chapter 2 Installing the Fibre Channel Card Driver
  This describes how to install the Fibre Channel card driver.

• Chapter 3 Setting Up the Server
  This describes how to set up the server for different connection topologies.

• Chapter 4 Logical Unit Recognition
  This describes how to make the server recognize the ETERNUS Disk storage system LUNs (logical units).

An appendix contains the various management tables that are used in "Chapter 3 Setting Up the Server".
Safe Use of this Product

Using this manual

This manual contains important information to ensure the safe use of this product. Be sure to thoroughly read and understand its contents before using the product. After reading, store this manual in a safe place for future reference.

FUJITSU has made every effort to ensure the safety of the users and other personnel, and to prevent property damage. When using this product, carefully follow the instructions described in this manual.

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Naming Conventions

Product names

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 in 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 .................................................................................. 6

Chapter 2  Installing the Fibre Channel Card Driver ................................ 8

Chapter 3  Setting Up the Server ............................................................... 9
  3.1  Creating a WWN Instance Management Table for the Server ................. 9
  3.2  Setting Up Brocade Fibre Channel Cards .............................................. 12
  3.3  Setting the Configuration File (/etc/system) .......................................... 14

Chapter 4  Logical Unit Recognition ....................................................... 15

Appendix A  Management Table Template ............................................. 17
  A.1  WWN Instance Management Table for the Server ............................... 17
Chapter 1 Workflow

This manual is used when performing the setup procedure described in "Installing the Driver and Setting Up the Server" and "Logical Unit Recognition" of the "ETERNUS Disk storage systems Server Connection Guide (Fibre Channel) for Oracle Solaris".

Workflow

1. Fiber Channel Card Driver Installation
   Install the driver. Download the proper driver from the Brocade web-site as required.
   - "Chapter 2 Installing the Fibre Channel Card Driver" (page 8)
   - Used for driver installation
     • Driver (downloaded from the Brocade web-site)

2. Management Table Creation (Various)
   Enter the necessary information in the "WWN Instance Management Table for the Server".
   - "Chapter 3 Setting Up the Server" (page 9)
   - "Appendix A Management Table Template" (page 17)

3. Fiber Channel Card Driver Setup
   Set the driver parameters by editing the configuration file.
   - "Chapter 3 Setting Up the Server" (page 9)
Logical Unit (LUN) Recognition
Make the server recognize the ETERNUS Disk storage system logical units.

Refer to “Chapter 4 Logical Unit Recognition” (page 15)

After completing all the required procedures in this manual, proceed to "Setting the Multipaths" in "ETERNUS Disk storage systems Server Connection Guide (Fibre Channel) for Oracle Solaris".
Install the Fibre Channel card driver.
Download and install the driver from the Brocade web-site.
Refer to the following Brocade web-site for instructions on how to install the driver.

http://www.brocade.com/products/all/adapters/index.page
Chapter 3  Setting Up the Server

The server setup will vary according to how the ETERNUS Disk storage systems and server are to be connected. Only Fabric connections are supported.

The Fibre Channel card instance name, target WWN, and target ID information are necessary. Check each item and enter them in the list. Edit the configuration file according to those information and make settings.

Refer to the following to set.

- "3.1 Creating a WWN Instance Management Table for the Server" (page 9)
- "3.2 Setting Up Brocade Fibre Channel Cards" (page 12)
- "3.3 Setting the Configuration File (/etc/system)" (page 14)

3.1 Creating a WWN Instance Management Table for the Server

Determine the following information for each Fibre Channel card installed in the server and enter it into a copy of the "WWN instance management table for the server" (provided in "Appendix A Management Table Template" (page 17)).

- Physical slot name
- WWN
- Number of the target controller connected to the Fibre Channel card
- Instance name
- Physical path name

WWN Instance Management Table for the Server

<table>
<thead>
<tr>
<th>Physical slot name</th>
<th>WWN</th>
<th>Controller name</th>
<th>Instance name</th>
<th>Physical path name</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Procedure

1  Check the instance names.

"bfa + instance number" is the format used to represent Fibre Channel card instance names.
Chapter 3  Setting Up the Server

3.1  Creating a WWN Instance Management Table for the Server

The instance number that corresponds to the physical path in which the Fibre Channel card is installed is stored in the `/etc/path_to_inst` file at Fibre Channel card driver installation. Extract the necessary lines using the "grep" command.

```
# grep "bfa" /etc/path_to_inst
```

**Example**

```
# grep "bfa" /etc/path_to_inst
"/pci@7c0/pci@0/pci@8/bfa@0" 0 "bfa"
"/pci@7c0/pci@0/pci@8/bfa@0,1" 1 "bfa"
```

**Physical path name**  **Instance number**

2  Enter the results in "Instance name" and "Physical path name" columns of the "WWN instance management table for the server".

**Example**

<table>
<thead>
<tr>
<th>Physical slot name</th>
<th>WWN</th>
<th>Controller name</th>
<th>Instance name</th>
<th>Physical path name</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>bfa0</td>
<td>/pci@7c0/pci@0/pci@8/bfa@0</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>bfa1</td>
<td>/pci@7c0/pci@0/pci@8/bfa@0,1</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

3  Enter the slot number of the Fibre Channel card installed in the server in the "Physical slot number" field of the "WWN instance management table for the server".

Use the `/usr/platform/`uname -i`/sbin/prtdiag -v` command to check the installed Fibre Channel card slot number.

**Example: Excerpt from `/usr/platform/SUNW,SPARC-Enterprise-T5220/sbin/prtdiag -v` output**

```
# /usr/platform/SUNW,SPARC-Enterprise-T5220/sbin/prtdiag -v
------------------------ IO Configuration ------------------------
Location   Type   Slot  Path                       Name             Model
(IOBD/PCIEX)
------------------------ IO Configuration ------------------------
IOBD/PCIE1  PCIE  1   /pci@7c0/pci@0/pci@8/bfa@0     bfa-pciex1657,13 Brocade-8+  
IOBD/PCIE2  PCIE  2   /pci@7c0/pci@0/pci@8/bfa@0,1   bfa-pciex1657,13 Brocade-8+  

<table>
<thead>
<tr>
<th>Physical slot name</th>
<th>WWN</th>
<th>Controller number</th>
<th>Instance name</th>
<th>Physical path name</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>bfa0</td>
<td>PCIE1</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>bfa1</td>
<td>PCIE2</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
```

4  Check the WWN for the Fibre Channel card.

4-1  Use the following command to check the display order of the Fibre Channel card physical path names.

```
# prtpicl -v -c scsi-fcp | grep devfs-path
```

**Example**

```
# prtpicl -v -c scsi-fcp | grep devfs-path
:devfs-path     /pci@7c0/pci@0/pci@8/bfa@0
:devfs-path     /pci@7c0/pci@0/pci@8/bfa@0,1
```
4-2 Use the following command to check the WWN of the Fibre Channel card that corresponds to the physical path name. The result is displayed in the same order as shown in Step 4-1.

```
# prtpicl -v -c scsi-fcp | grep port-wwn
```

Example

```
# prtpicl -v -c scsi-fcp | grep port-wwn
:bfa0-port-wwn 10:00:00:05:1e:e7:45:7b
:bfa1-port-wwn 10:00:00:05:1e:e7:45:7c
```

5 Add the results in the "WWN instance management table for the server".

```
Physical slot name  
PCIE1 100000051ee7457b  
PCIE2 100000051ee7457c  
```

```
Controller name  
bfa0  
bfa1  
```

```
Instance name  
/pci@7c0/pci@0/pci@8/bfa@0  
/pci@7c0/pci@0/pci@8/bfa@0,1  
```

```
Physical path name  
/pci@7c0/pci@0/pci@8/bfa@0/fp@0,0:fc  
/pci@7c0/pci@0/pci@8/bfa@0,1/fp@0,0:fc  
```

6 Check the controller number of the target connected to the Fibre Channel card.

6-1 Use the following command to check the controller number of the target connected to the Fibre Channel card. The controller number corresponds to the physical path displayed in Step 4-1.

```
# cfgadm -v
```

Example

```
<table>
<thead>
<tr>
<th>Ap_Id</th>
<th>Receptacle</th>
<th>Occupant</th>
<th>Condition</th>
<th>Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>When</td>
<td>Type</td>
<td>Busy</td>
<td>phys_ID</td>
<td></td>
</tr>
<tr>
<td>c2</td>
<td>connected</td>
<td>configured</td>
<td>unknown</td>
<td></td>
</tr>
<tr>
<td>unavailable</td>
<td>fc-fabric</td>
<td>n</td>
<td>/devices/pci@7c0/pci@0/pci@8/bfa@0/fp@0,0:fc</td>
<td></td>
</tr>
<tr>
<td>c3</td>
<td>connected</td>
<td>configured</td>
<td>unknown</td>
<td></td>
</tr>
<tr>
<td>unavailable</td>
<td>fc-fabric</td>
<td>n</td>
<td>/devices/pci@7c0/pci@0/pci@8/bfa@0,1/fp@0,0:fc</td>
<td></td>
</tr>
</tbody>
</table>
```

7 Add the results in the "WWN instance management table for the server".

```
Physical slot name  
PCIE1 100000051ee7457b  
PCIE2 100000051ee7457c  
```

```
Controller name  
C2  
C3  
```

```
Instance name  
bfa0  
bfa1  
```

```
Physical path name  
/pci@7c0/pci@0/pci@8/bfa@0  
/pci@7c0/pci@0/pci@8/bfa@0,1  
```

End of procedure

This completes the "WWN instance management table for the server".
3.2 Setting Up Brocade Fibre Channel Cards

Brocade Command line Utility (BCU) is bundled with the Brocade Fibre Channel card driver. Use the "bcu" command to check the port ID and to set the port speed, topology, and frame data size.

- **Port ID**
  Use the information obtained in "3.1 Creating a WWN Instance Management Table for the Server" (page 9) to check the port ID.

  Port ID check command

  ```
  bcu port --list
  ```

- **Port speed**
  Specify the port speed value according to the table below.

  "bcu" command format

  ```
  bcu port --speed <port_id> [ 1|2|4|8|10|auto]
  ```

<table>
<thead>
<tr>
<th>Fibre Channel card transfer speed</th>
<th>Fibre Channel switch transfer speed</th>
</tr>
</thead>
<tbody>
<tr>
<td>8Gbps</td>
<td>8Gbps 4Gbps 2Gbps</td>
</tr>
<tr>
<td>4Gbps</td>
<td>4Gbps 4Gbps 2Gbps</td>
</tr>
</tbody>
</table>

- **Topology**
  Set the topology value to "p2p".

  "bcu" command format

  ```
  bcu port --topology <port_id> [auto | p2p]
  ```

- **Frame data size**
  Set the frame data size value to "2048".

  "bcu" command format

  ```
  bcu port --dfsize <port_id> [<dfsize>]
  ```
The following procedure shows an example for setting the port speed, topology, and frame data size.

**Procedure**

1. **Check the "port_id" of the target port.**
   ```
   # bcu port --list
   
   Port#  Type  PWWN/MAC                  FC Addr/ Media  State       Spd  
   Eth dev
   1/0    fc    10:00:00:05:1e:e7:45:7b   010400   sw     Linkup  8G  
   1/1    fc    10:00:00:05:1e:e7:45:7c   010500   sw     Linkup  8G
   
   Check the port ID
   ```

   The port ID checked here is used to set the port speed, topology, and frame data size.

2. **Set the port speed to "8G".**
   ```
   # bcu port --speed 1/0 8
   Setting will be enforced after port --disable and --enable
   ```

3. **Set the topology to "p2p".**
   ```
   # bcu port --topology 1/0 p2p
   Setting will be enforced after port --disable and --enable
   ```

4. **Set the frame data size to "2048".**
   ```
   # bcu port --dfsize 1/0 2048
   Setting will be enforced after port --disable and --enable
   ```

5. **Execute the "port disable|enable" command to apply the port speed, topology, and frame data size settings.**
   ```
   # bcu port --disable 1/0
   port disabled
   # bcu port --enable 1/0
   port enabled
   ```

6. **Check the port speed, topology, and frame data size that have been set.**
   - **Port speed confirmation**
     ```
     # bcu port --speed 1/0
     Current port speed is: 8G
     Configured port speed is: 8G
     ```
   - **Topology confirmation**
     ```
     # bcu port --topology 1/0
     Current topology is: P2P
     Configured topology is: P2P
     ```
• Frame data size confirmation

```
# bcu port --dfsize 1/0
Port maximum receive data field size is 2048 -
```

To set multiple ports, repeat the above procedure for each port.

End of procedure

### 3.3 Setting the Configuration File (/etc/system)

#### Procedure

1. Edit the configuration file.
   
   Edit the configuration file (/etc/system) and specify the command queue depth. The appropriate "ssd_max_throttle" parameter value is determined by the ETERNUS Disk storage system model, as follows:

<table>
<thead>
<tr>
<th>ETERNUS Disk storage system</th>
<th>Command queue depth setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>ETERNUS2000</td>
<td>8</td>
</tr>
<tr>
<td>ETERNUS4000</td>
<td>20</td>
</tr>
<tr>
<td>ETERNUS8000</td>
<td>20</td>
</tr>
</tbody>
</table>

   Specify the command queue depth for the "ssd_max_throttle" parameter. Add the "ssd_max_throttle" parameter if it does not exist.

   **Example**

   ```
   set ssd:ssd_max_throttle = 20
   ```

2. After editing the configuration file, save it.

3. After the setting is complete, check the configuration file for incorrect settings.

4. Reboot the server.

   ```
   # /usr/sbin/shutdown -y -g0 -i6
   ```

   End of procedure
Set the server to recognize the ETERNUS Disk storage systems' logical units.

Execute the following commands to check the path of the ETERNUS Disk storage system to be connected.

**Procedure**

1. Execute the following command to confirm that the server can access the logical units.

   ```
   # cfgadm -a1
   
   # cfgadm -a1
   Ap_Id       Type     Receptacle  Occupant    Condition
   c2          fc-private connected configured unknown
   c2::500000e0d0400006 disk    connected configured unknown
   c3          fc-private connected configured unknown
   c3::500000e0d04000086 disk    connected configured unknown
   
   ETERNUS Disk storage system CA (WWN:500000e0d0400086) has been connected to the Fibre Channel card port with controller number “c3”.
   ```
2 Use the following command to confirm that the storage system and all the logical units have been correctly recognized.

```bash
# format
```

---

ETERNUS Disk storage system target ID=5000000E0D0400086, lun=0 and 1 are connected to physical path /pci@7c0/pci@0/pci@8/bfa@0,0 and c3500000E0D0400086d0 and c3500000E0D0400086d1 are assigned to each of these LUNs.

End of procedure
Appendix A Management Table Template

The following management table is required in "Chapter 3 Setting Up the Server" (page 9). Use it as required.

### A.1 WWN Instance Management Table for the Server

<table>
<thead>
<tr>
<th>Physical slot name</th>
<th>WWN</th>
<th>Controller number</th>
<th>Instance name</th>
<th>Physical path name</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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<td></td>
<td></td>
</tr>
</tbody>
</table>

This table should be filled in as required.
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Server Connection Guide (Fibre Channel) for Oracle Solaris
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