Configuring the RAID Array 7000 for Dual Controller Operation With NetWare 4

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Introduction

This application note describes how to load the Adaptec AIC7870.DSK driver in Netware 4 to take advantage of the RAID Array 7000 Dual-Controller functionality. To configure the dual-controller RAID Array 7000, refer to your Getting Started, HSZ70 Solutions Software V7.1 for Novell Netware Installation Guide, AA-R8JUC-TE. To take full advantage of the dual controller features of the RAID Array 7000, Adaptec driver AIC7870.DSK Version d4.10 S41 must be loaded in STARTUP.NCF with the following switches:

Load AIC7870.DSK lun_enable=ff multlun_targets=ff io_timeout=30 io_retries=10

The dual-controller failover capability must have the io-timeout and the io_retries values set. This value depends on the number and size of storagesets configured. If you are using a single controller RAID Array 7000, you do not need these two switches. The recommended values are io_timeout=30 io_retries=10. The io_timeout variable is a counter that is used to detect and retry/abort I/O requests that have either come back with an error or haven't come back at all (i.e. lost or not completed for some reason). Approximately every two seconds, the driver calls a timer routine that decrements the io_timeout counter of all I/O requests. When it reaches 0, the I/O request is either retried or aborted (depending on the io_retries variable). Therefore, io_timeout * 2 is approximately the number of seconds the driver waits before retrying or aborting a given I/O command. Its primary purpose is to prevent the system from hanging while waiting for lost I/O requests.

The io_retries is a counter for how many times to retry a command before aborting it. Every time the io_timeout counter reaches 0, io_retries is decremented and the I/O request is retried. When io_retries reaches 0, the driver reports an error to the OS (i.e. the request is aborted). Note that if the request is retried, its io_timeout counter is reset to the user-specified value. Thus, if we had a time-out of 30 seconds and a retry count of 10, we could potentially wait five minutes before reporting the request's status back to the OS.

Mapping NetWare Partitions with Device ID’s

The lun_enable and multlun_targets switches must be set for Netware to see multiple luns configured on the RAID Array 7000. If you do not use multiple LUNs, you do not need to enable these two switches.

<table>
<thead>
<tr>
<th>lun_enable</th>
<th>LUN scan enable mask on all targets</th>
<th>Hexadecimal</th>
<th>1 (Scan LUN 0 only)</th>
</tr>
</thead>
</table>
multilun_targets =  Bitmask that enables LUNs on selected targets
                  Hexadecimal     FFFF (LUNs on all targets)

**Bit Mask Options**

Use the example in the following table to aid in calculating bit mask options hex values. Each SCSI device ID 0-7 (or 0-15 for wide host adapters) is enabled by a “1” in its corresponding bit position. In this example, lun_enable = 05 enables scanning for LUNs 0 and 2 on all targets.

<table>
<thead>
<tr>
<th>SCSI ID</th>
<th>Bit Position</th>
<th>Binary</th>
<th>Hex Conversion</th>
</tr>
</thead>
<tbody>
<tr>
<td>15 14 13 12 11 10 09 08 07 06 05 04 03 02 01 00</td>
<td></td>
<td>0 0 0 0 0 0 0 0 0 0 0 0 0 1 0 0</td>
<td></td>
</tr>
<tr>
<td>Binary</td>
<td>Hex Conversion</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

The RAID Array 7000 is capable of using up to eight SCSI ID’s (0–5, 8, 9). ID’s 6 and 7 are reserved. Each SCSI ID can have up to eight LUNs. If you use the SHOW THIS command from the CLI, you will see the SCSI ID’s enabled for your controller.

HSZ> SHO THIS

**Controller:**

HSZ70 ZG64900263 Firmware V71Z–0, Hardware H01
Configured for dual–redundancy with ZG64900241
In dual–redundant configuration:
  Device Port SCSI address = 7
  Time = NOT SET

**Host Port:**

SCSI target(s): (0, 1, 2, 3, 4, 5)
Preferred target(s): (0, 1, 2)
TRANSFER_RATE_REQUESTED=20MHZ
Host Functionality Mode = A
Allocation class: 0
Command Console LUN is disabled

HSZ> sho device

<table>
<thead>
<tr>
<th>Name</th>
<th>Type</th>
<th>Port</th>
<th>Targ</th>
<th>LUN</th>
<th>Used By</th>
</tr>
</thead>
<tbody>
<tr>
<td>DISK60100</td>
<td>disk</td>
<td>6</td>
<td>1</td>
<td>0</td>
<td>D506</td>
</tr>
<tr>
<td>DISK60200</td>
<td>disk</td>
<td>6</td>
<td>2</td>
<td>0</td>
<td>D507</td>
</tr>
</tbody>
</table>

When you create your NetWare partitions the disk options will show the devices as:
56. Device #48 DEC HSZ70 (5D020605)
57. Device #49 DEC HSZ70 (5D020705)

Device #49 DEC HSZ70 (5D020705) breaks down as:
5D 02 07 05
adapter device ID, adapter number, LUN number, SCSI ID

This is the same device (as seen from the CLI):

DISK60200 disk 6 2 0 D507

In this case, D5 is the SCSI ID and the 07 is the LUN.