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

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Application Note
EK–SMA22–AN. C01

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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 *HSZ70 Solutions Software V7.7 for Novell Netware – PCI Installation Guide, AA-R8JUE-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.

lun_enable =	LUN scan enable mask on all targets	Hexadecimal 0 - FF	1 (Scan LUN 0 only)

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multlun_targets =   Bitmask that enables   Hexadecimal   FFFF (LUNs on all targets)
                 LUNs on selected targets   0 - FFFF

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.

	Bit Position			
SCSI ID	15 14 13 12	11 10 09 08	07 06 05 04	03 02 01 00
Binary	0 0 0 0	0 0 0 0	0 0 0 0	0 1 0 1
Hex Conversion	0	0	0	5

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 ZG75104782 Firmware V77Z–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 = B
       Allocation class: 0
       Command Console LUN is disabled

       HSZ> sho device

Name	Type	Port	Targ	LUN	Used By
DISK60100	disk	6	1	0	D506
DISK60200	disk	6	2	0	D507
HSZ>					

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.