HP Netserver LP 1000r with NetRAID-2M (HP Surestore DS2100)

Windows® 2000 Advanced Server
Cluster Configuration Guide

Introduction

This document defines the server cluster configurations supported by Hewlett-Packard for interconnection of two HP Netserver LP 1000r servers and one or two HP Surestore Disk Storage 2100 disk drive enclosure(s), with Microsoft® Cluster Server software. These configurations provide high server cluster availability and minimize single points of failure (SPOFs). A configuration certified and supported by both Hewlett-Packard and Microsoft® is included, but any cluster configuration that conforms to the guidelines of this document will be supported by Hewlett-Packard. Deviations from the supported configurations can result in an inoperative cluster, an operating cluster with degraded performance, or hidden SPOFs. Therefore, deviations are not supported. For revision/update information on this document, refer to Versions on page 9.

Cluster Configuration Elements

This section identifies the hardware components, system software, network interfaces, and power distribution arrangement required to build an operational server cluster supported by Hewlett-Packard. The various server cluster elements are listed below, and their associated configuration data is detailed in separate tables and illustrations that follow.

- Server configuration
- Shared storage configuration
- Microsoft® and HP certified server configuration
- Intra-cluster (heartbeat) LAN configuration
- Client LAN configuration
- SCSI cabling and power distribution configuration
- Special notes and warnings

Server Configuration

Parameter	Specification
Server	
Type	HP Netserver LP 1000r
Number of nodes	Two Each node must be the same server type, but nodes may differ in their CPU clock speeds and cache sizes, and amounts of main memory.
Clock speed	1.26 GHz This certification covers any CPU speed within 500 MHz of the certified rate.
Number of CPUs	Two
BIOS	For CPU clock speeds up to 1 GHz, version range 4.06.12 RA to 4.06.19 RA For CPU clock speeds of 1.26 GHz, version 4.06.03 RO or later
CPU cache	Any size

Server Configuration

Parameter	Specification
RAM	256 MB, minimum. Must be HP.
Number of power supplies	One
I/O slots	PCI slot 1
Default boot order	IDE CD-ROM, FDD, embedded SCSI, PCI slot 1
Local Storage	
Controller	Embedded SCSI
Driver	For embedded SCSI, sym_u3.sys, version 5.07.00, or later (driver obtained from Navigator CD-ROM, version L.20.00, or later)
Physical drive location	Server internal drive bays, or HP external drive cabinet (e.g., HP Rack Storage/12)
Disk drives	Must be HP
SCSI bus	Any HP cables that meet SCSI specifications, and any SCSI bus speed
SCSI IDs	Any
System software	
Navigator CD-ROM	Version M.04.00, or later
Operating system Service pack	Microsoft Windows® 2000 Advanced Server Latest service pack version
Power distribution	
Layout	Redundant power distribution units (PDUs) are recommended. See power cabling diagram on page 8.

Shared Storage Configuration

Parameter	Specification
Controller	
Model	HP NetRAID-2M Controller, Model P3411A, or P3475A
Number of controllers	One
BIOS	Disabled
Firmware	Version H.01.08 (firmware obtained from Navigator CD-ROM, version M.04.00)
Driver	Mraid2k.sys, version 5.20 (driver obtained from Navigator CD-ROM, version M.04.00)
NetRAID Assistant	Version B.01.04 (software obtained from Navigator CD-ROM, version M.04.00)
SCSI ID	6, 7
Channels	Only a channel 0 connection is supported. Use of channel 1 can cause cluster failure.
RAID levels	1, 5, 10, 50
Logical disks	One per RAID array Eight, maximum, per cluster

Shared Storage Configuration

Parameter	Specification
Configuration options	Termination disabled by physical jumper setting -- Cover J3 pins 2-3. See jumper diagram on page 5. Cluster mode on Cache write policy to Write thru
Enclosure	
Disk drives	Any HP drive supported by storage enclosure. Any combination of HP disk models is allowed in an array, on a SCSI channel, or in a cluster.
Number of cabinets	One or two per cluster
Model	HP Surestore DS2100 A5676A
Disk SCSI IDs	SCSI ID switch B or C
SCSI ID Switch Settings	When daisy-chaining two DS2100 enclosures, each must have a different switch setting. Set one DS2100 to switch B, and the other to switch C. In single DS2100 clusters, set the switch to either B or C. B – 8,10,12,14 C – 9,11,13,15
Cables	
SCSI	C7541A (Quantity = two, required) – 2 Meter in-line terminated cable (to connect NetRAID-2M to DS2100) C2978B (Quantity = one needed only when configuring two DS2100s in the cluster) - 0.5 meter LVD cable See SCSI cabling diagrams starting on page 6.
Power distribution	
Layout	Redundant power distribution units (PDUs) are recommended. See power cabling diagram on page 8.

Microsoft® and HP Certified Server Configuration

Parameter	Specification
Server	
I/O card slot	PCI slot 1, NetRAID-2M shared storage controller
Network interfaces	Embedded NICs for both intra-cluster (heartbeat) and client LANs
Boot device	Embedded SCSI

Intra-Cluster (Heartbeat) LAN Configuration

Parameter	Specification
Network	
Connection	HP D5954A crossover cable, or equivalent. The intra-cluster LAN may only be used for cluster node communication. It may not be used for client communication.
NIC	
Quantity	One

Intra-Cluster (Heartbeat) LAN Configuration

Parameter	Specification
Model	Embedded NIC – LAN A
Driver	Hptxnt5.sys, version 4.02.27, or later (driver obtained from Navigator CD-ROM L.20.00, or later)

Client LAN Configuration

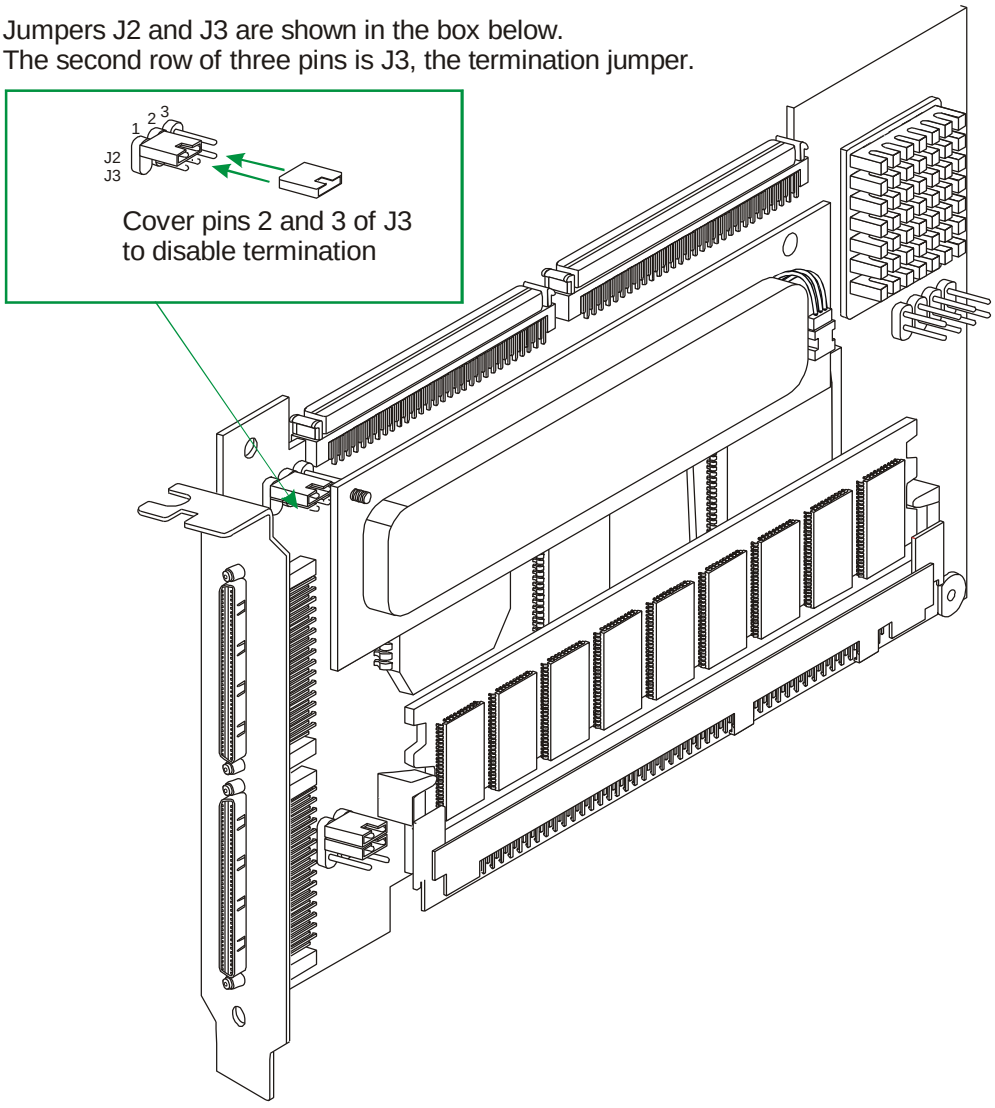
Parameter	Specification
Network	
Connection	Any LAN
NIC	
Quantity	One
Model	Embedded NIC – LAN B
Driver	Hptxnt5.sys, version 4.02.27, or later (driver obtained from Navigator CD-ROM L.20.00, or later)

Special Notes and Warnings

Disk Drive LEDs There is no hardware support in the DS2100 for disk drive failure detection or indication by disk drive LEDs (Light Emitting Diodes). A failed drive cannot be identified by an LED signal. Only disk spin-up and data access activity is indicated by a green flashing light on a disk drive LED.

Disconnected SCSI cables SCSI cables must not be disconnected while both server nodes are up. Cluster failover may not occur upon a SCSI cable being disconnected at a live node. Only disconnect a SCSI cable from a server that is powered off. Also, do not disconnect a SCSI cable interconnecting two DS2100 enclosures on a live cluster because cluster failures may result from the SCSI bus not being terminated.

NetRAID-2M channels When connecting the NetRAID-2M SCSI cables to the DS2100, only use NetRAID-2M channel 0. Cluster failure could result and there is a potential for data loss from connections to channel 1 and so channel 1 connections are not supported.



Setting Jumper J3 on the NetRAID-2M Controller to Disable Termination

NOTES:

1. To connect server to DS2100 --
   C7541A - 2 Meter ILT cable

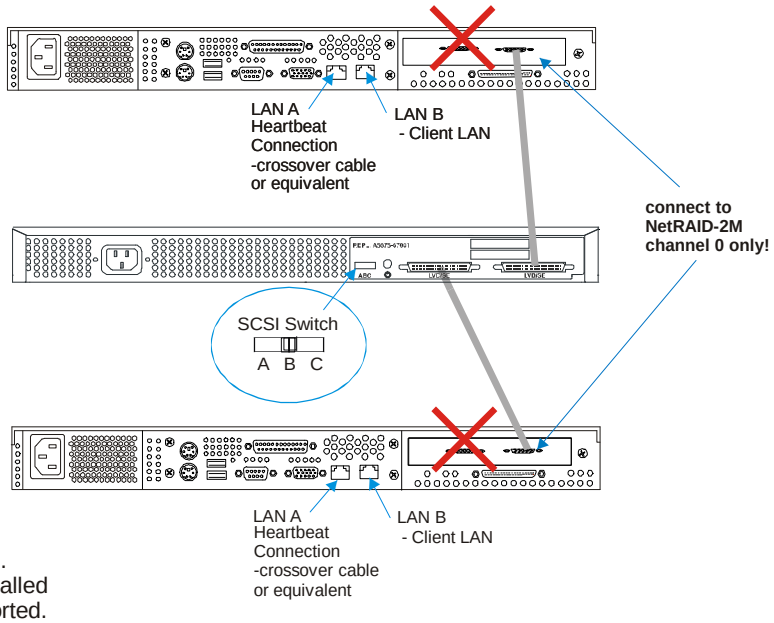
2. This diagram shows using one DS2100. You can use from one to two storage cabinets per cluster. The next figure shows two DS2100s in a cluster.

3. Only connect channel 0 of the NetRAID-2M to the DS2100. Using channel 1 is not supported.

4. There are no 'left' or 'right' port requirements for cabling to the DS2100. Cables can be attached to either port.

5. Connect LAN ports A for the heartbeat cluster interconnect. Use ports B for the client LAN connection.

6. Here, the DS2100 SCSI ID switch is set to **B**. The following addresses will be assigned to installed disks: 8, 10, 12, and 14. Setting B or C is supported.



HP Netserver LP 1000r Cluster using one HP Surestore DS2100 Disk System

NOTES:

1. Color coding depicts the two different cable part types :

To connect server to DS2100 --

C7541A - 2 Meter ILT cable

To connect DS2100's together -

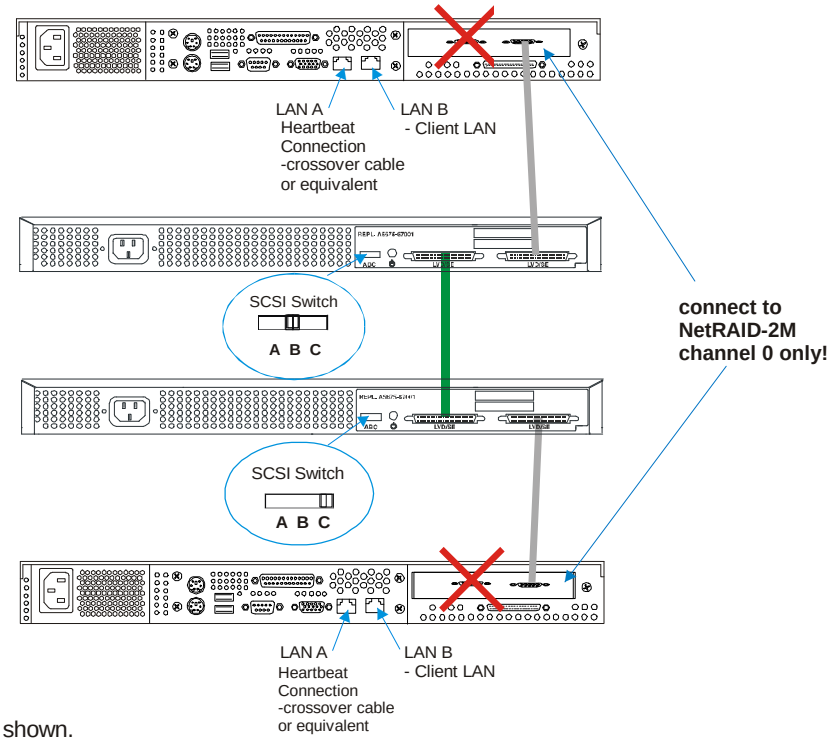
C 2978B - 0.5 Meter LVD cable

2. This diagram depicts using two DS2100's. You can use from one to two storage cabinets per cluster.

3. Only connect channel 0 of the NetRAID-2M to the DS2100. Using channel 1 is not supported.

4. There are no 'left' or 'right' port requirements for cabling to the DS2100. Cables can be attached to either port.

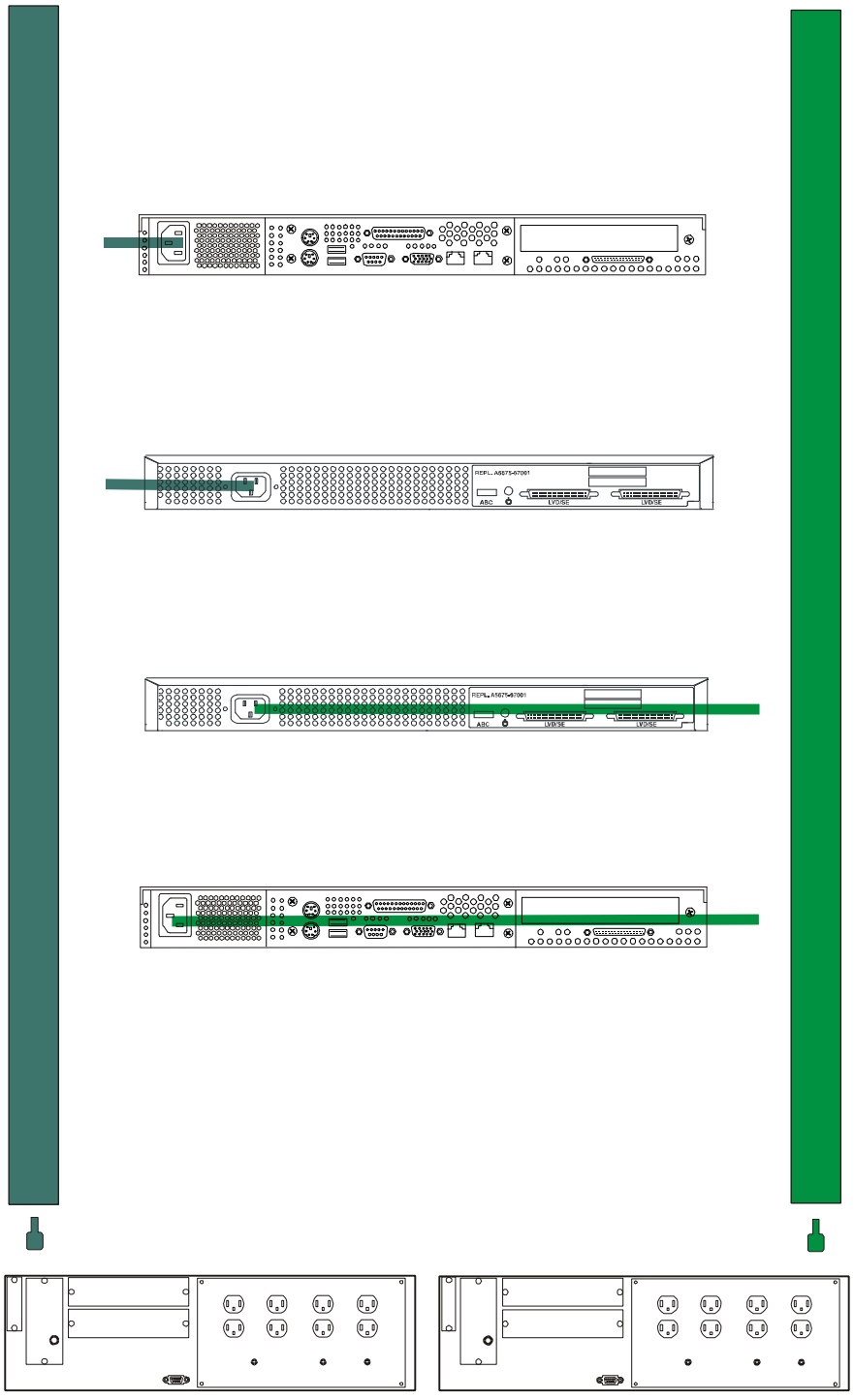
5. Connect LAN ports A for the heartbeat cluster interconnect. Use ports B for the client LAN connection.



6. Set the DS2100 SCSI ID switches as shown.
B - The following addresses will be assigned to installed disks in the top DS2100: 8, 10, 12, and 14.

C - The following addresses will be assigned to installed disks in the bottom DS2100: 9, 11, 13, and 15.

HP Netserver LP 1000r Cluster using two HP Surestore DS2100 Disk Systems



Power Cabling to Separate Power Circuits

Versions

15 November 2001	Corrected part number for daisy-chaining DS2100 enclosures.
7 November 2001	Added support for 1.26 GHz models.
2 October 2001	Initial release