

WHITE PAPER

April 1998

Compaq Computer
Corporation

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Order and Configuration Guide for Compaq ProLiant Cluster Series S Model 100

The Compaq ProLiant Cluster Series S Model 100 is a two-node, high-availability cluster solution for customers who want to continue using Compaq mainstream servers and ProLiant Storage options that are SCSI-based technology. These clusters are integrated at Compaq and certified with Microsoft in specific hardware configurations.

The Compaq ProLiant Cluster Series S Model 100 uses leading industry-standard Compaq ProLiant Servers, ProLiant Storage Systems, SMART-2 Array Controllers, Recovery Server Option, and a ProLiant Cluster/S100 Kit containing integrated software and documentation to provide a high-availability cluster for applications and data in a business-critical environment.

This document describes the steps involved in ordering and configuring the components of your Compaq ProLiant Cluster Series S Model 100. It also contains information and diagrams that will assist you in determining storage subsystem requirements for your Compaq ProLiant Cluster/S100.

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Order and Configuration Guide for Compaq ProLiant Cluster Series S Model 100

First Edition (April 1998)

ECG029/0498

INTRODUCTION

The Compaq ProLiant Cluster Series S Model 100 is a two-node, high-availability cluster solution for customers who want to continue using Compaq mainstream servers and ProLiant Storage options that are SCSI-based technology. These clusters are integrated at Compaq and certified with Microsoft in specific hardware configurations.

The first servers to be certified in like-node configurations with various storage and SMART-2 Array Controllers include the ProLiant 850R, ProLiant 1600, ProLiant 2500, ProLiant 3000, ProLiant 4500, ProLiant 5000, ProLiant 5500, ProLiant 6500, and ProLiant 7000.

Beyond the initial release, additional servers in unlike-server pairs will be certified with various ProLiant Storage Systems. A list of these configurations will be updated and maintained on the Compaq website at <http://www.compaq.com>.

In the interest of preserving customer investment in Compaq servers and ProLiant Storage Systems, Compaq has moved forward to provide the Compaq ProLiant Cluster /S100.

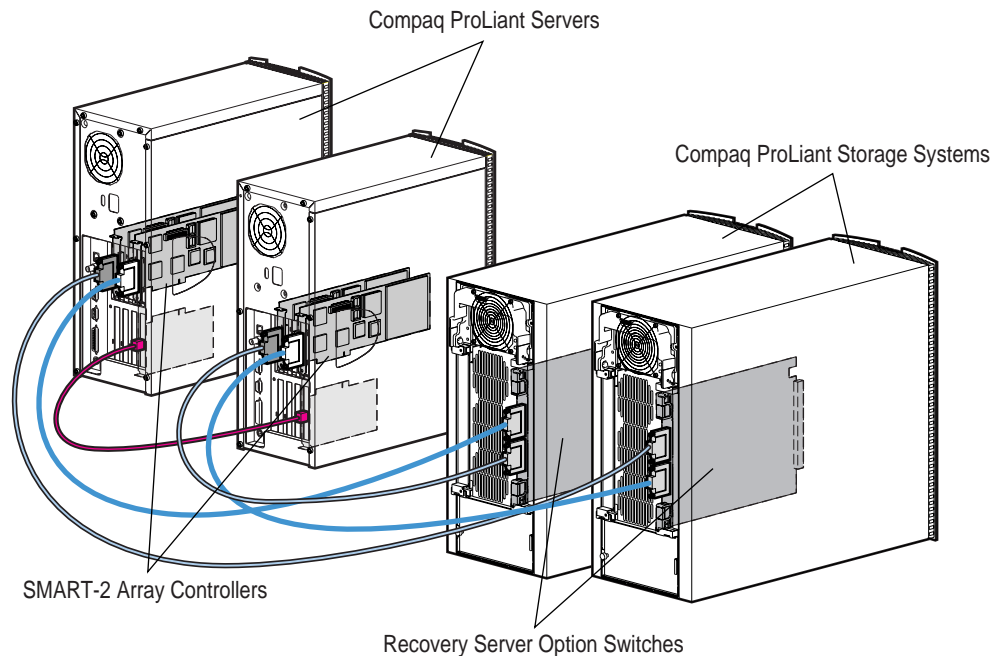


Figure 1. ProLiant Cluster Series S Model 100

The Compaq ProLiant Cluster/S100 Kit provides maximum flexibility in the configuration of a cluster from new and existing Compaq ProLiant Servers and Compaq ProLiant Storage Systems. All components are standard, off-the-shelf items. The Cluster/S100 Kit contains the required software and documentation to allow these off-the-shelf items to be clustered.

This document provides basic information for ordering and configuring your Compaq ProLiant Cluster/S100; it is not intended to replace the user guide that is shipped as part of the cluster kit. Use other available documentation when determining options of individual servers and storage systems, as they provide a greater level of detail for each individual system.

CLUSTER COMPONENTS

Compaq ProLiant Cluster/S100 Kit (340673-B21)

- 12' Ethernet Crossover Cable
- ProLiant Cluster/S100 Software
- *Compaq ProLiant Cluster Series S Model 100 User Guide*
- *Microsoft IIS 3.0 Service Failover Using MSCS (TechNote)*
- *Microsoft IIS 3.0 Resource Failover Using MSCS (TechNote)*
- *Microsoft File and Print Service Failover Using MSCS (TechNote)*

Compaq ProLiant Servers with Options

Compaq ProLiant Storage Systems with Options (SCSI)

Recovery Server Option (Required)

Server-to-Server Dedicated Heartbeat Interconnect

Microsoft Cluster Server Software

Microsoft Cluster Server (MSCS) is included in Microsoft Windows NT Server 4.0/Enterprise Edition, which is to be ordered directly from Microsoft or a Microsoft Reseller. It is not available through Compaq, even though it is identified as a key component of the cluster.

Related Documentation:

- Product Bulletins
- Server Quick Specs
- Storage and Options Quick Specs
- *MSCS Installation Manual*

ORDERING A CLUSTER USING COMPAQ PROLIANT CLUSTER/S100 KIT

Follow the process outlined in Figure 2 to order components for a Compaq ProLiant Cluster Series S Model 100. See the following pages for detailed information related to each step.

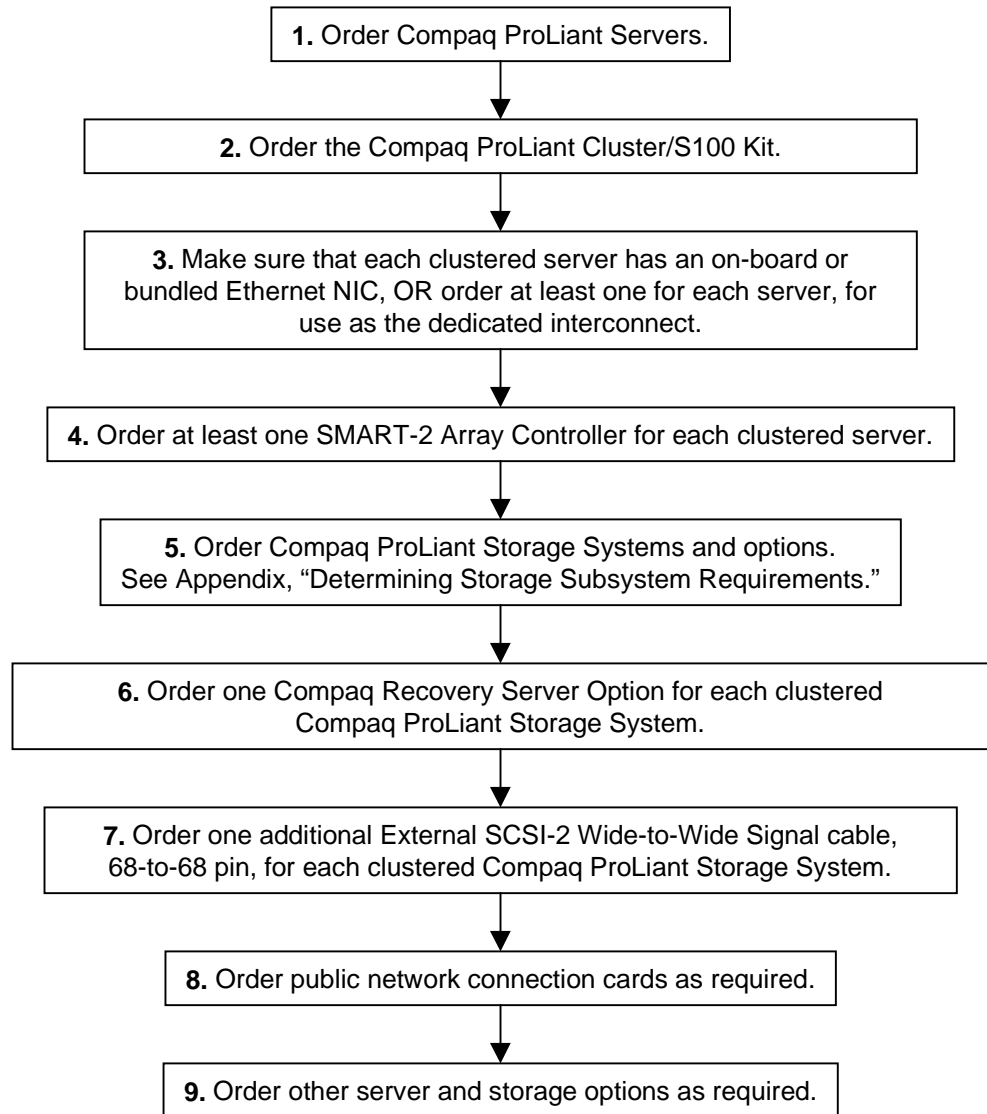


Figure 2. Ordering process for Compaq ProLiant Cluster/S100

1. Order Compaq ProLiant server(s).

- a) See the Compaq website at <http://www.compaq.com> for the complete listing of certified server and storage combinations.
- b) The Certified Listing contains the high-level server identification. All models of a specified server are supported. For example, PL2500 includes rack and tower and various clock speed models.
- c) Both new and existing servers can be used in a Compaq ProLiant Cluster configuration.
- d) If mixing server models in a cluster, make sure that either server can satisfy the application workload.
- e) Make sure that your server has enough PCI/EISA slots to satisfy the cluster interconnect, public network interconnect, and shared storage requirements.

2. Order the Compaq ProLiant Cluster/S100 Kit (340673-B21).

- a) One cluster kit per cluster is required.
- b) The kit includes the Ethernet crossover cable, S100 software, and documentation.
- c) Microsoft Cluster Server software is required and is NOT included. Microsoft Windows NT Server 4.0/Enterprise Edition operating system includes MSCS and must be ordered from an authorized Microsoft reseller (one license for each server in the cluster).

3. Make sure that each ordered server has an on-board, or bundled, Ethernet network interface card (NIC). If not, order at least one NIC for each clustered server, for use as the dedicated “private” heartbeat interconnect.

- a) Compaq strongly recommends the use of a private network connection between cluster nodes. An Ethernet crossover cable is included in the Compaq ProLiant Cluster/S100 Kit for this purpose.
- b) Multiple dedicated interconnect paths can be used for redundancy; order extra Ethernet cards as required.
- c) Redundant Network Interface Cards (NICs) are supported in Compaq ProLiant Cluster/S100 configurations.
- d) For cluster interconnect scenarios and recommendations, refer to Compaq White Paper ECG051/1297, *Increasing Availability of Cluster Communications in a Windows NT Cluster* (available from the Compaq website at <http://www.compaq.com>).

IMPORTANT: Review the “Determining Storage Subsystem Requirements” section on page 9 before proceeding to step 4.

4. Order at least one SMART-2 Array Controller for each clustered server.

IMPORTANT: Review “Determining Storage Subsystem Requirements” on page 9 before ordering SMART-2 Array Controllers.

- a) Only Compaq ProLiant Storage Systems (SCSI) can be used as shared storage in a Compaq ProLiant Cluster/S100 configuration.
- b) SCSI Raid Disk Array Controllers: (Firmware 1.94 or later)
- c) 194753-001 Compaq SMART-2P Array Controller, 2 Channel PCI
- d) 194771-001 Compaq SMART -2E Array Controller, 2 channel EISA
- e) 295242-B21 Compaq SMART -2DH Array Controller, 2 channel PCI
- f) 242776-B21 Compaq SMART -2SL Array Controller, 1 channel PCI
- g) Multiple ProLiant Storage Systems can be configured in a cluster. This is dependent upon the number of slots available in the clustered server.
- h) Controller-to-Storage System connection made with Wide-to-Wide SCSI cable P/N 212057-002 (6 ft.) or -003 (12 ft.). (Spare part numbers 189635-002, -003)

5. Order your ProLiant Storage Systems and options.

IMPORTANT: Review “Determining Storage Subsystem Requirements” on page 9 before ordering ProLiant Storage Systems and options.

- a) ProLiant Storage System Model 1: 197100, 197150, 189600, 189640
Note: ProLiant Storage System Models 146700 and 146750 are not supported.
- b) ProLiant Storage System Model F1: 272800, 272900.
- c) ProLiant Storage System Model F2 is not supported.
- d) ProLiant Storage System Model U1: 304100, 304110.
- e) ProLiant Storage System Model U2 is not supported.
- f) Standard options for ProLiant Storage System Models 1, F1, and U1 are supported.
- g) Order Disks.
- h) A redundant power supply is recommended for greater component redundancy. ProLiant Storage System Power Supply 224206-001 is supported on 272900, 272800, 304100, and 304110.

6. Order one Compaq Recovery Server Option for each clustered ProLiant Storage System.

- a) Order 213817-001 for Compaq ProLiant Storage Model 1.
- b) Order 304117-B21 for Compaq ProLiant Storage System F1.
- c) Order 304117-B21 for Compaq ProLiant Storage System U1.

7. Order one additional External SCSI-2 Wide-to-Wide Signal cable, 68-to-68-pin, for each clustered ProLiant Storage System.

- a) Controller-to-Storage System connection made with Wide-to-Wide SCSI cable P/N 212057-002 (6 ft.) or -003 (12 ft.). (Spare part numbers 189635-002, -003)

8. Order public network connection cards as required.

- a) Compaq ProLiant Clusters use IP failover to enable failover of applications from one node to another. Client interconnects must support TCP/IP to allow for seamless reconnect to applications after failover.
- b) Public network connections can be set up within MSCS to enable both client and heartbeat traffic. This is a good way to achieve redundancy when coupled with the dedicated interconnect.

9. Order other server and storage options as required.

All server and storage options are supported in the ProLiant Cluster/S100, with the exception of the Compaq ProLiant Cluster/F100 Kit, Duplex option for F1 and U1 (304116-B21, 272830-001), and Fibre Channel Storage Systems and Options.

APPENDIX

Determining Storage Subsystem Requirements

Several factors must be considered when determining the ProLiant Storage System and SMART-2 Controller requirements for a Compaq ProLiant Cluster/S100 configuration. The following diagrams and descriptions will help you determine your specific configuration to ensure that you order the appropriate components.

ProLiant Storage Systems

The first factor you must decide is the total amount of switched storage that will be contained in a single ProLiant Storage System. This will determine the type of SMART-2 Controller(s) you will need.

Remember that when using the ProLiant Cluster/S100, all storage attached to a single SMART-2 Controller is managed as a single cluster disk entity, regardless of how the disk volumes or partitions are configured. For example, if a SMART-2 Controller is attached to two ProLiant Storage Systems, all disks contained therein would act as a single cluster disk resource. If a failover occurred, both ProLiant Storage Systems would fail over to the other server.

When the ProLiant Storage Systems are attached to a single SMART-2 Controller, it is not possible to split the cluster ownership and control of the individual ProLiant Storage Systems across two servers – at any given time, both ProLiant Storage Systems will be controlled by a single server. Also, it is not possible to use one channel of a SMART-2 Controller for switchable cluster drives, and the other channel on the same controller for non-switchable local drives. Each individual SMART-2 Controller must be dedicated entirely to either switchable cluster drives or to non-switchable local drives.

The next step is to decide how many ProLiant Storage Systems (either one or two) will be required to satisfy your switchable disk storage requirements for each separately manageable cluster group in your configuration.

ProLiant Storage Systems can hold up to seven (7) drives, and should also be configured for hardware fault tolerance through the Compaq Array Configuration Utility (e.g. RAID 1 or RAID 5). When two ProLiant Storage Systems are attached to a single SMART-2/P, SMART-2/E, or SMART-2DH Controller, the RAID volumes may span across the two ProLiant Storage Systems. For example, using two ProLiant Storage Systems, each with seven drives, you could configure a single RAID 5 volume consisting of all 14 drives. (SMART-2SL Controllers support a single ProLiant Storage System.)

In addition to the type and number of SMART-2 Controllers and ProLiant Storage Systems, there are several other configuration notes you should keep in mind when determining which components you will need:

- Order one Recovery Server Option Kit for each ProLiant Storage System that will be used for switchable cluster drives. This kit contains the SCSI switch that allows you to connect the ProLiant Storage System to both servers in the cluster. Make sure to order the appropriate version of the Recovery Server Option Kit for your particular ProLiant Storage System.
- Order one External SCSI-2 Wide-to-Wide Signal Cable, 68- to 68-pin, for each ProLiant Storage System that will be used for switchable cluster drives. ProLiant Storage Systems ship with one SCSI cable. However, since the ProLiant Storage System will be connected to two servers, an additional cable is needed (for a total of two SCSI cables per ProLiant Storage System. These come in two lengths: 12 ft. (part number 212057-003) and 6 ft. (part number 212057-002).

SMART-2 Controllers

After you have determined how many ProLiant Storage Systems are required for each switchable cluster group, you can decide the type and number of SMART-2 Controllers you will need. The SMART-2SL Controller supports a single ProLiant Storage System (and therefore only seven drives). The SMART-2/P, SMART-2/E, or SMART-2DH Controllers support up to two ProLiant Storage Systems (and up to 14 drives).

After you have determined the type of SMART-2 Controller to use, determine how many of each controller are required to support your failover model.

Note that SMART-2 Controller pairs connected to the same ProLiant Storage System(s) must be identical types. For example, two SMART-2SL Controllers, one in each server, may be connected to a single ProLiant Storage System. However, using a controller pair of a SMART-2SL Controller in one server and a SMART-2/P Controller in the other server, connected to the same ProLiant Storage System, is not supported.

There are two basic configurations. In an asymmetric configuration, only one of the servers accesses the ProLiant Storage Systems, and the other server acts as a backup. In a symmetric configuration, each server accesses a separate ProLiant Storage System and acts as a backup to the other server.

Use Figures 3 through 6 to help identify your configuration. You will be able to determine the following:

- The number of ProLiant Storage Systems per controller
- The specific type of SMART-2 Controllers
- The number of each type of SMART-2 Controller

Configuration A: Active/Passive, One ProLiant Storage System

Figure 3 shows a single ProLiant Storage System, which is normally owned and accessed via Node 1. Since only one ProLiant Storage System is being accessed, a single SMART-2SL Controller is used in each server.

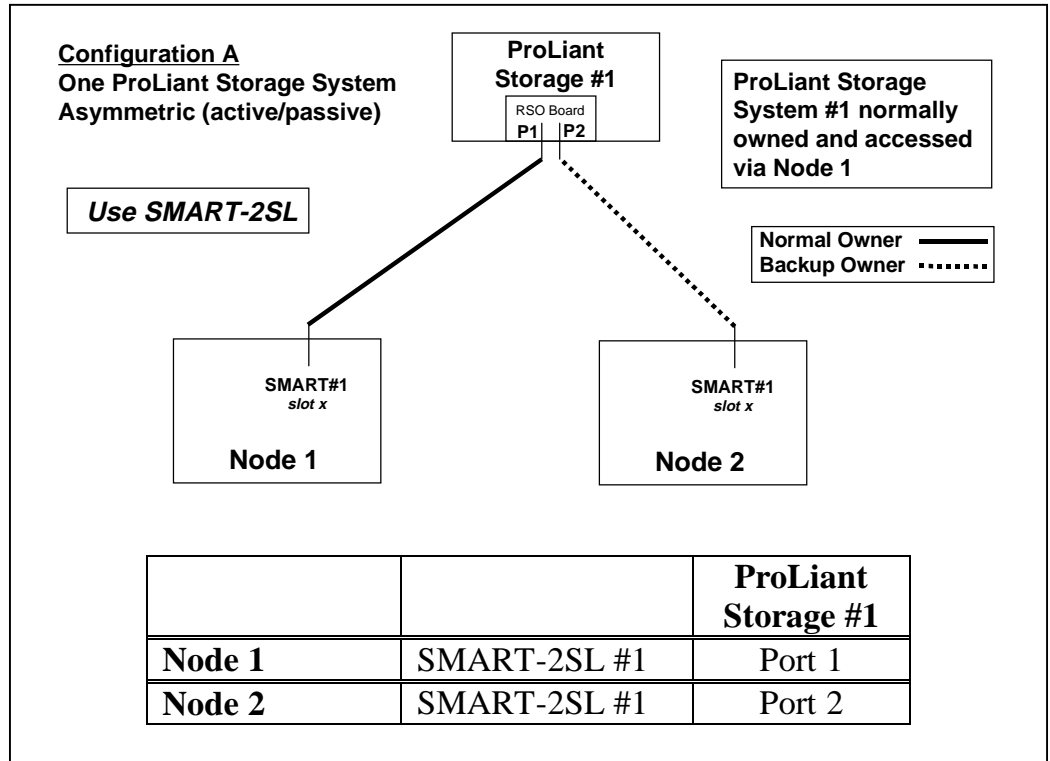


Figure 3. One ProLiant Storage System; asymmetric failover

Configuration B: Active/Passive, Two ProLiant Storage Systems

Figure 4 shows two ProLiant Storage Systems, which are normally owned and accessed via Node 1. Since two ProLiant Storage Systems are being accessed from a single server, a single SMART-2/P, SMART-2/E, or SMART-2DH Controller is used in each server.

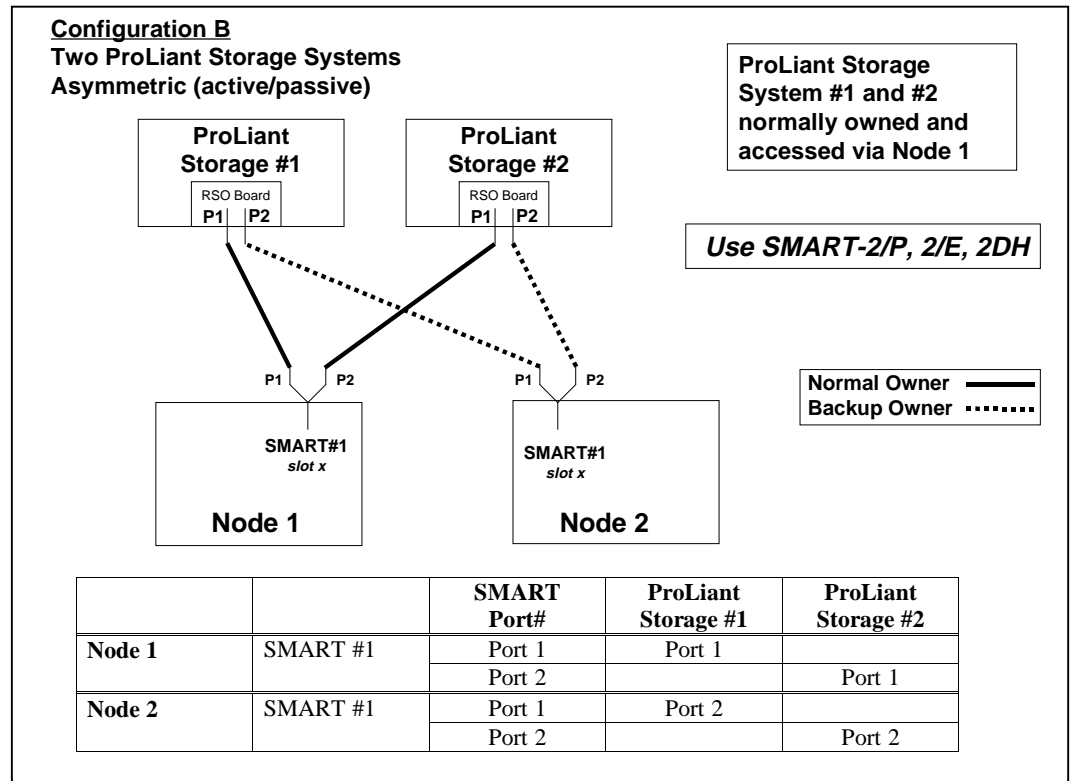


Figure 4. Two ProLiant Storage Systems; asymmetric failover

Configuration C: Active/Active, Two ProLiant Storage Systems

Figure 5 shows two separate ProLiant Storage Systems, each one normally owned and accessed by one of the servers. Since only one ProLiant Storage System is normally being accessed from each server, SMART-2SL Controllers are used. However, because this is a symmetric (two-way) failover configuration, two SMART-2SL Controllers are required in each server.

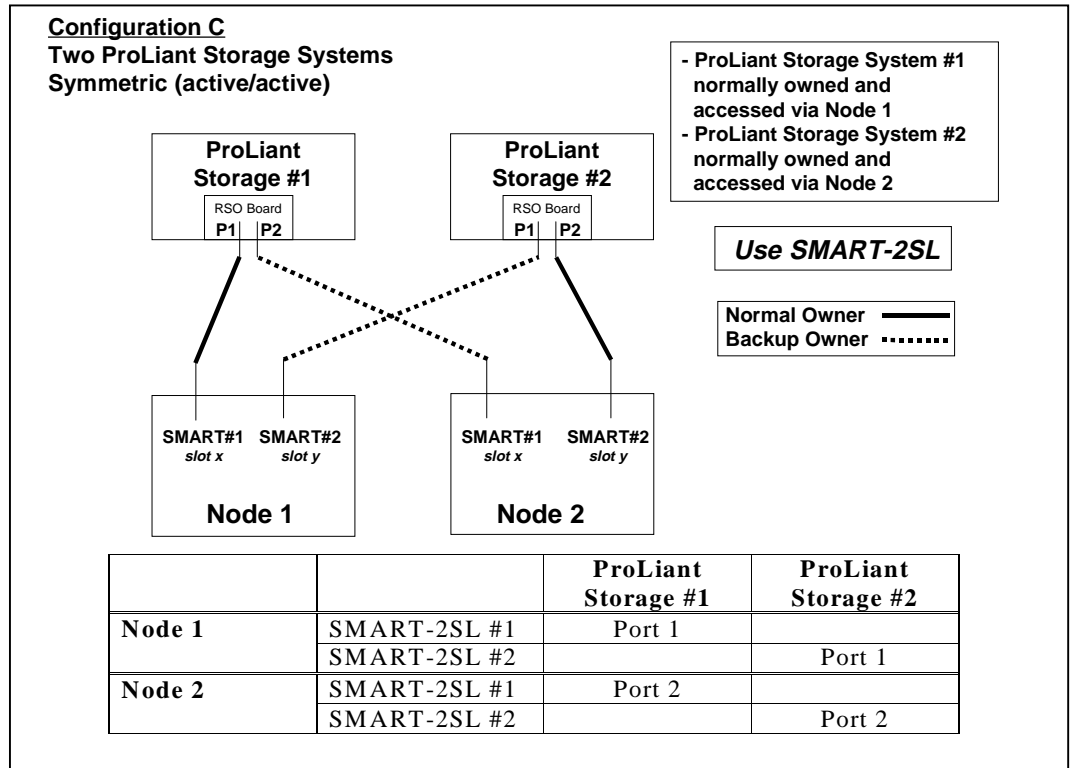


Figure 5. Two ProLiant Storage Systems; symmetric failover

Configuration D: Active/Active, Four ProLiant Storage Systems

Figure 6 shows four ProLiant Storage Systems, with a pair normally being owned and accessed by each one of the servers. Since two ProLiant Storage Systems are normally being accessed from each server, SMART-2/P, SMART-2/E, or SMART-2DH Controllers are used. However, because this is a symmetric (two-way) failover configuration, two SMART-2/P, SMART-2/E, or SMART-2DH Controllers are required in each server.

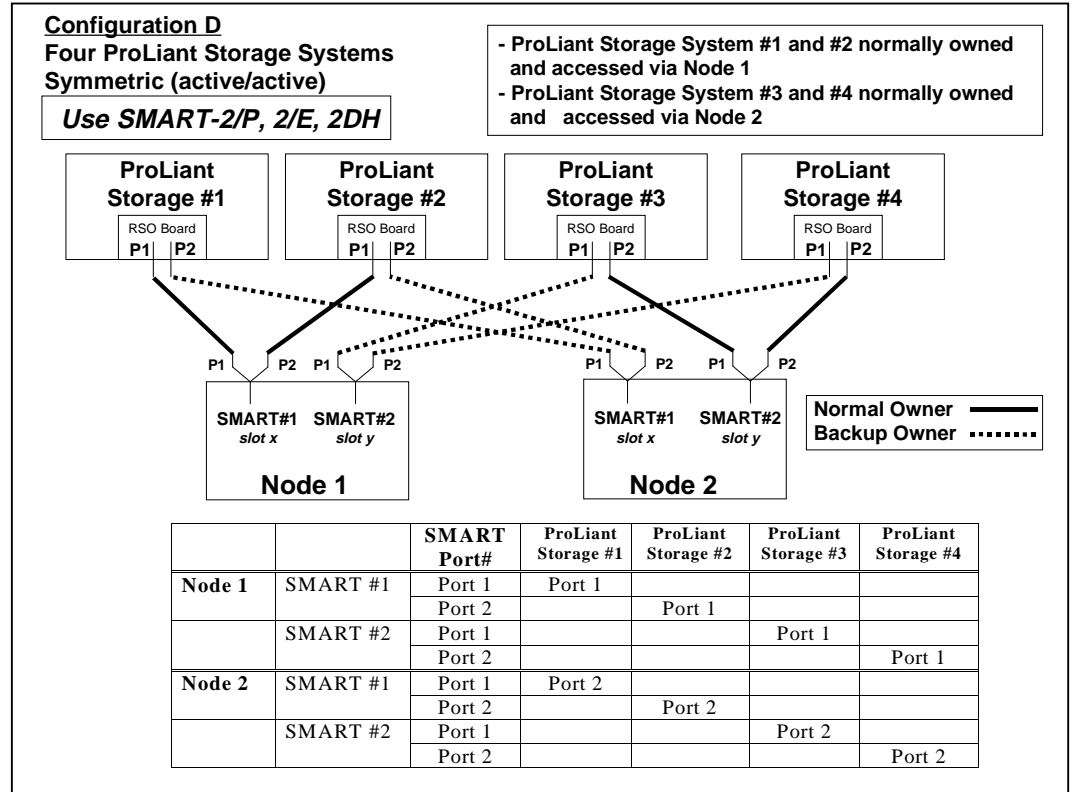


Figure 6. Four ProLiant Storage Systems; symmetric failover