SOFTWARE GUIDE

Creating RAID 50 Volumes

How to combine 2 or more MegaRAID SATA adapters into 1 OS RAID 50 volume

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This document describes the creation of RAID 50 volumes with LSI Logic Corporation's MegaRAID Serial ATA 150-4 and 150-6 adapters and will remain the official reference source for all revisions/releases of these products until rescinded by an update.

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Chapter 1
Introduction

This chapter describes creating a RAID 50 volume with MegaRAID SATA 150-4 and 150-6 adapters and connected storage devices in Windows environments. The following topics are included:

1.1 Overview

RAID 50 volumes allow you to utilize multiple logical drives and combine them to create one large RAID array at the operating system level. There are several types of RAID arrays including simple, spanned, striped, mirrored, and RAID5.

Utilizing multiple LSI Logic MegaRAID Serial ATA 150-4 or 150-6 adapters, you can scale your storage needs to meet the demands of today’s data growth. Striping two logical drives at the operating system level, RAID 50, into a single array can provide you with a speed and fault tolerance advantage.

1.2 RAID 50 Volume Creation Overview

This user guide will provide the instructions on how to create RAID 50 volumes with Windows 2000. Utilizing LSI Logic’s unique implementation of multiple SATA controllers doubles your data protection, data throughput, and increases overall performance.

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1.3 Related Publications

MegaRAID SATA 150 Storage Adapters User's Guide

Document Number DB15-000272-01

This document explains how to install your MegaRAID SATA 150 storage adapter into the host system. It also provides the electrical and physical specifications, jumper definitions, and connector locations for the storage adapter.

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Chapter 2
Creating a RAID 50 Volume with Windows 2000

This chapter describes how to create a RAID 50 volume with Windows 2000 operating systems, and includes these topics:

2.1 What is RAID 50 and How Does it Work?

This procedure describes how to create a striped RAID 50 volume using two RAID 5 logical drives and two or more MegaRAID SATA 150-4 or 150-6 adapters with multiple disk drives connected to each adapter. To gain the full advantage of our MegaRAID adapters, use 4 drives on the 150-4 or 6 drives on the 150-6 adapter. Then create your striped RAID 50 volume.

RAID 50 provides the features of both RAID 0 and RAID 5. RAID 50 includes both parity and disk striping across multiple drives.Data is “striped” across multiple drive groups (super drive group). For data redundancy, drives are encoded with rotated XOR redundancy.

RAID 50 is best implemented on two RAID 5 disk arrays with data striped across both disk arrays. RAID 50 breaks up data into smaller blocks, and then stripes the blocks of data to each RAID 5 raid set. The size of each block is determined by the stripe size parameter, which is set during the creation of the RAID set. RAID 50 can sustain a drive failure while maintaining data integrity if each failed disk is in a different RAID 5 array.

- **Benefits:** RAID 50 provides increased write performance, improved data protection, and faster rebuild even in the event of a drive failure. During a degraded mode with this setup, performance remains high overall because the other RAID 5 array is functioning fully.

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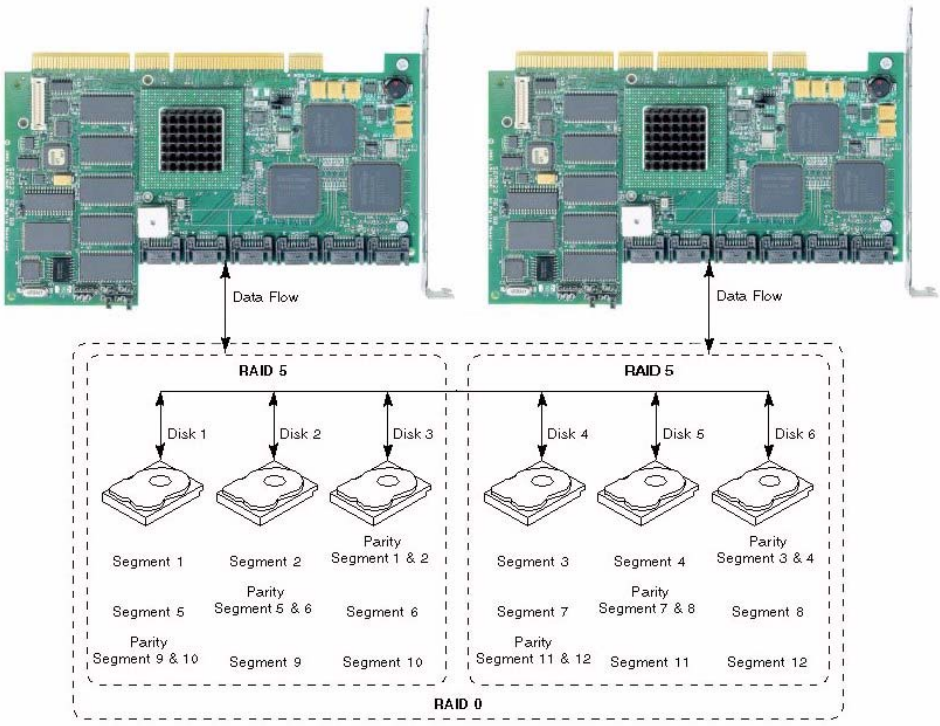
- **Uses:** RAID 50 works best when used with data that requires high reliability, high request rates, and high data transfer and medium to large capacity.
- **Drives:** MegaRAID SATA 150-4 = 4 drives, MegaRAID SATA 150-6 = 6 drives
- **Fault Tolerance:** Yes

2.2 Creating a RAID 50 Volume with 2 SATA RAID Adapters

In this example, we have configured the system using two LSI Logic MegaRAID SATA 150-6 adapters with three 80GB SATA drives connected to each adapter. On both adapters, we have created a RAID 5 volume. Ideally, the three 80GB drives would yield a 160GB logical drive, however, in this example with partitioning and other factors, the drive actually yields 149GB.

Figure 2.1 RAID 50 Configuration



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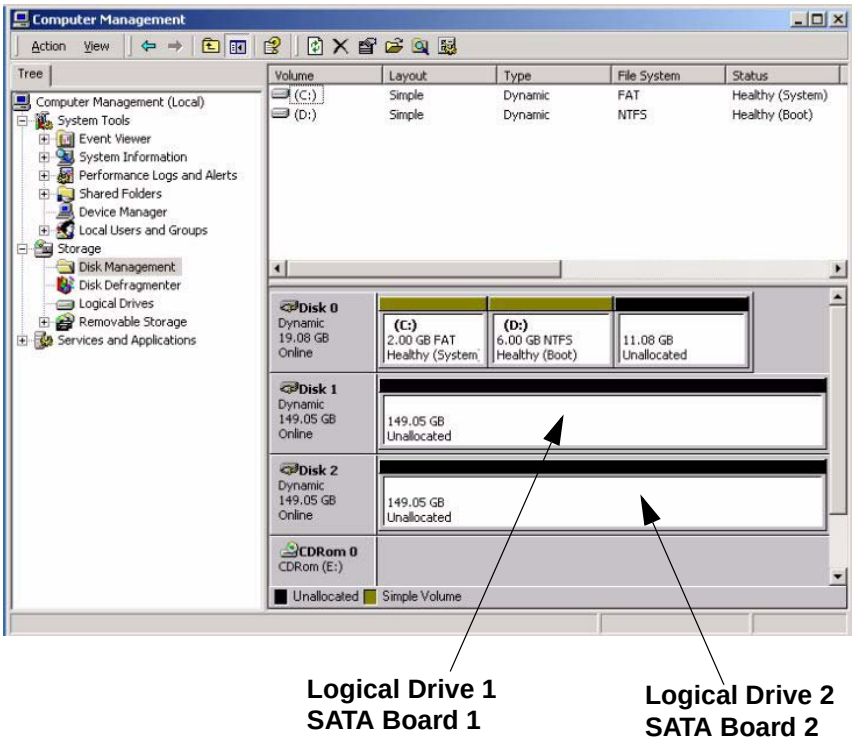
1. From your computer Desktop, right-click the **My Computer** icon and select **Manage**.

Figure 2.2 Select My Computer Manage

The Computer Management window opens.

Figure 2.3 Disk Management



2. Click the **Disk Management** folder. After clicking the folder, the right lower pane will display all of the disks on your system.

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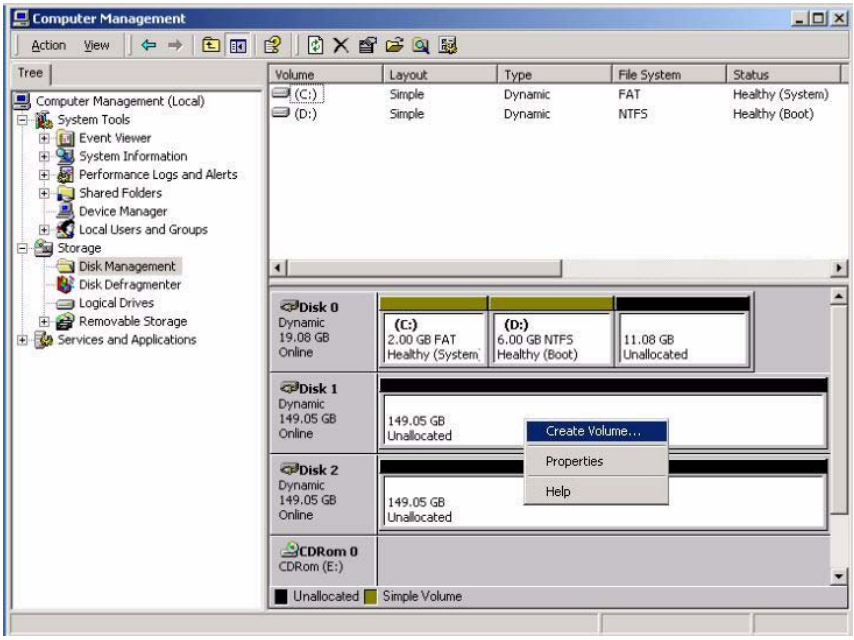
3. Right-click unallocated space on one of the disks that you want to create the RAID 50 striped volume, select **Create Volume**.

Note: If your disks are in basic mode, right-click the disk and change to dynamic mode.

Figure 2.4 Create Volume Wizard



The Create Volume Wizard opens.

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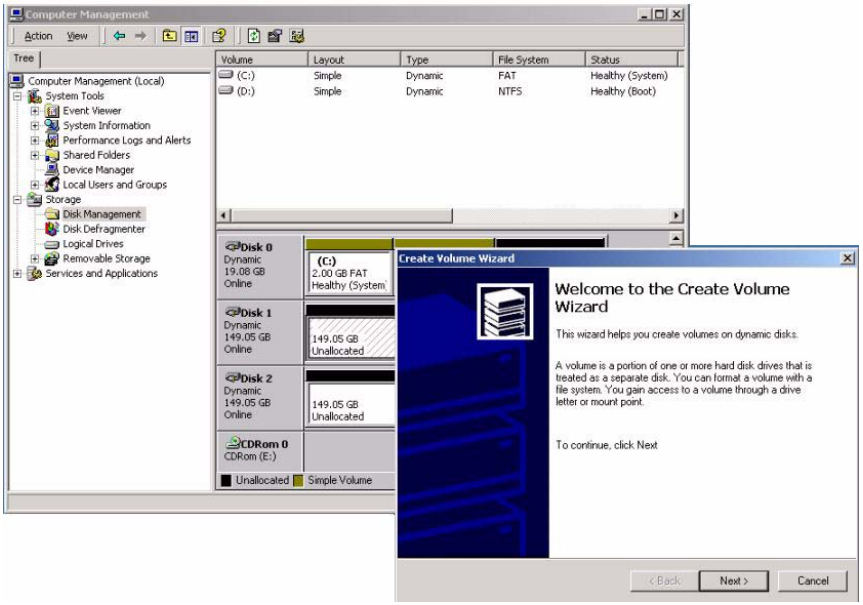
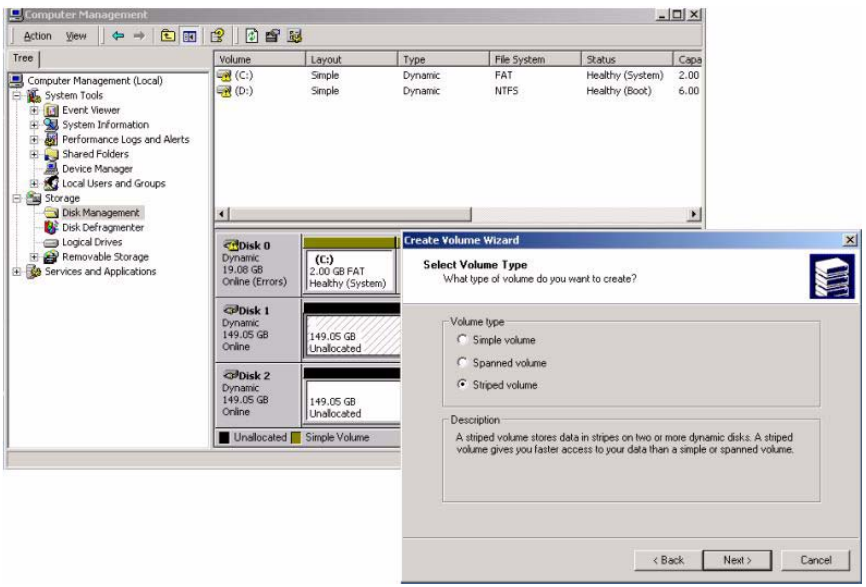
Figure 2.5 Create Volume Wizard



4. Click **Next**. The Select Volume Type window opens.

Figure 2.6 Select Volume Type



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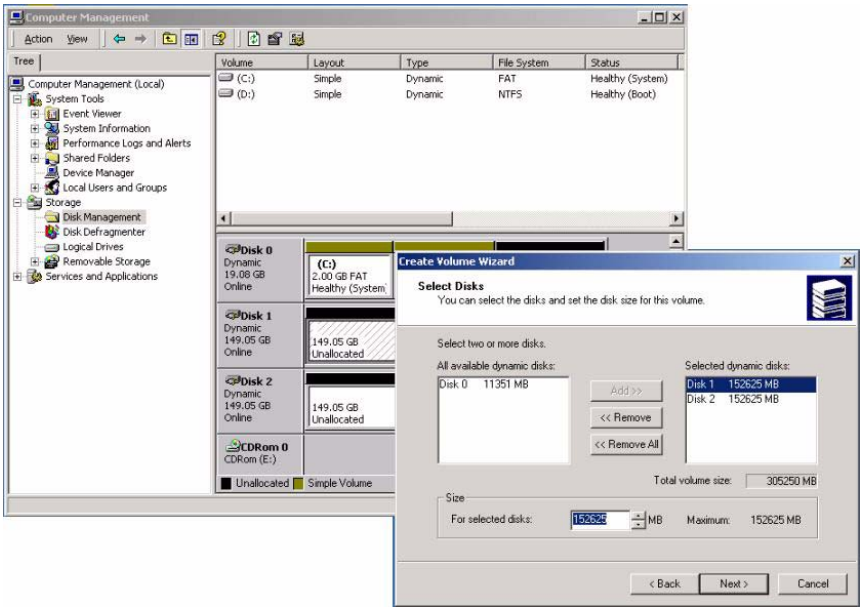
5. Select Striped volume, this will enable you to use the capacity of all disks connected to your SATA adapter. In this example, we are demonstrating 6 drives connected to two MegaRAID 150-6 adapters. However, you can scale up to 6 drives on each adapter (or 4 drives on each 150-4 adapter).

   You also have the opportunity to select different array types including (options vary depending on the version of Windows you are running):

   - ◊ RAID 5 volume: Data and parity striped across three or more disks.
   - ◊ Simple volume: Single or multiple linked regions on one disk. Contains no fault tolerance, but can be mirrored.
   - ◊ Striped volume: Data striped evenly on two or more disks. Contains no fault tolerance and cannot be mirrored.
   - ◊ Mirrored volume: Data duplicated on two disks.
   - ◊ Spanned volume: Data is spanned across multiple disks or parts of multiple disks. No fault tolerance or mirroring.

6. Click **Next**, the Create Volume window opens. All available disks will display, select Disk 1 and Disk 2.

Figure 2.7 Create a Volume



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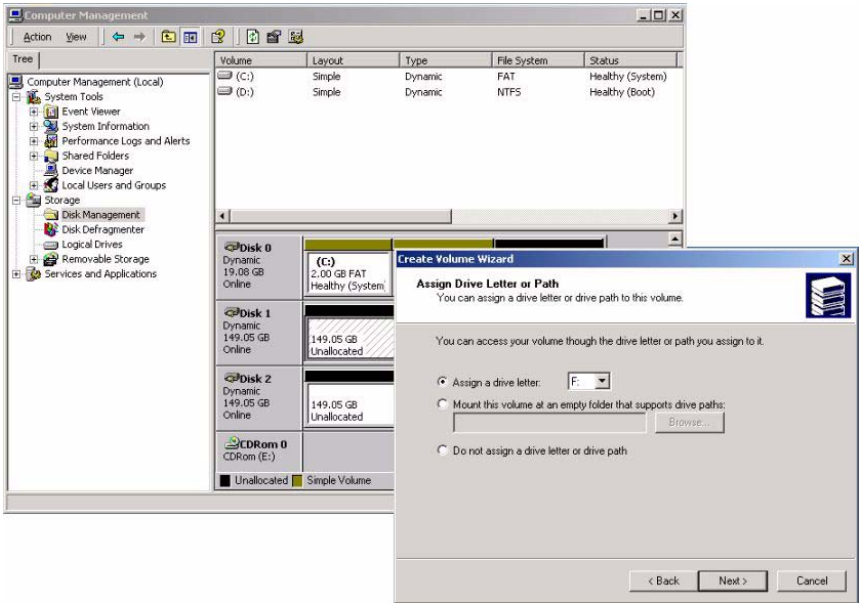
The Assign a Drive Letter or Path window opens.

Figure 2.8 Assign a Drive Letter or Path



7. Select the Assign a Drive Letter radio button. From the drop-down list select the desired drive letter. Click **Next** and the Format Volume window opens.

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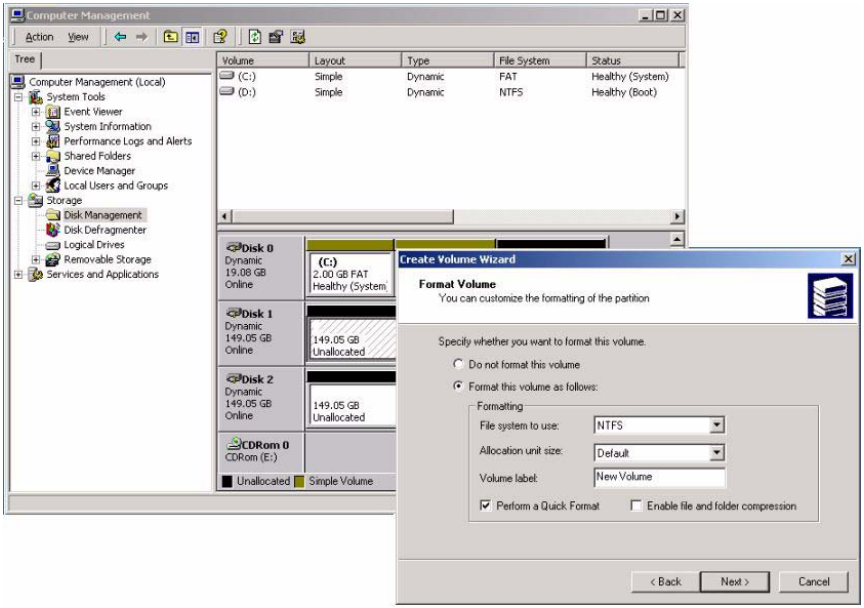
Figure 2.9 Formatting a Volume



8. You can modify the file system type, allocation size, and change the volume label here if needed. If not, Keep the default selections and click **Next**. The Completing the Create Volume window opens.

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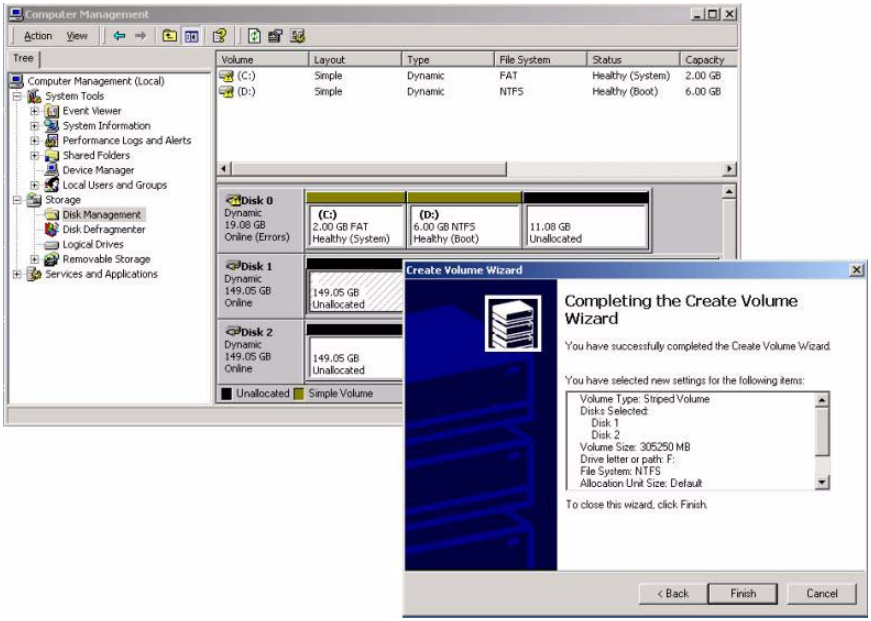
Figure 2.10 Verify Striped Volume Settings



9. Verify that the settings you have selected are correct and click **Finish**. The Computer Management window will reflect the changes you have made.

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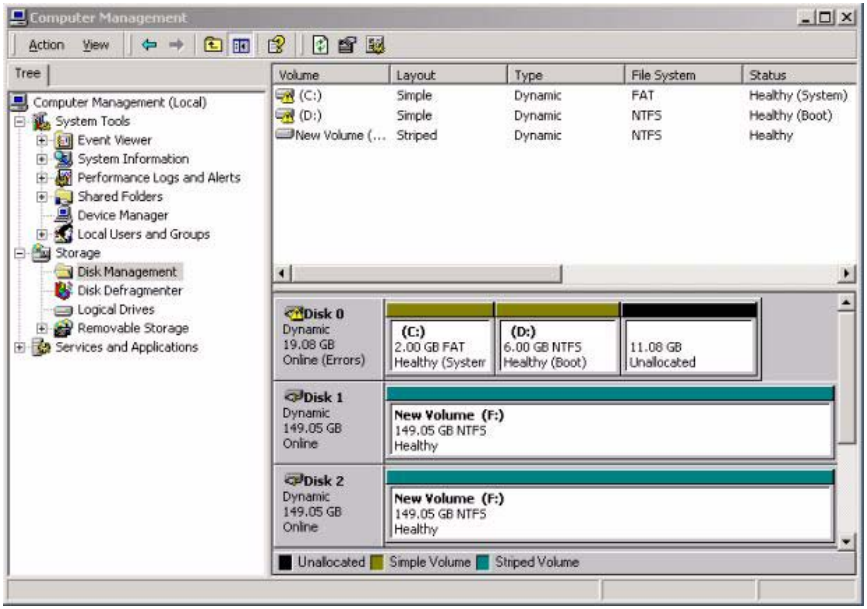
Figure 2.11 One Volume with Double Capacity



Verify that the system has striped the two volumes together as one big operating system volume.

10. Go to the Windows Explorer and click the local disk that you just created.

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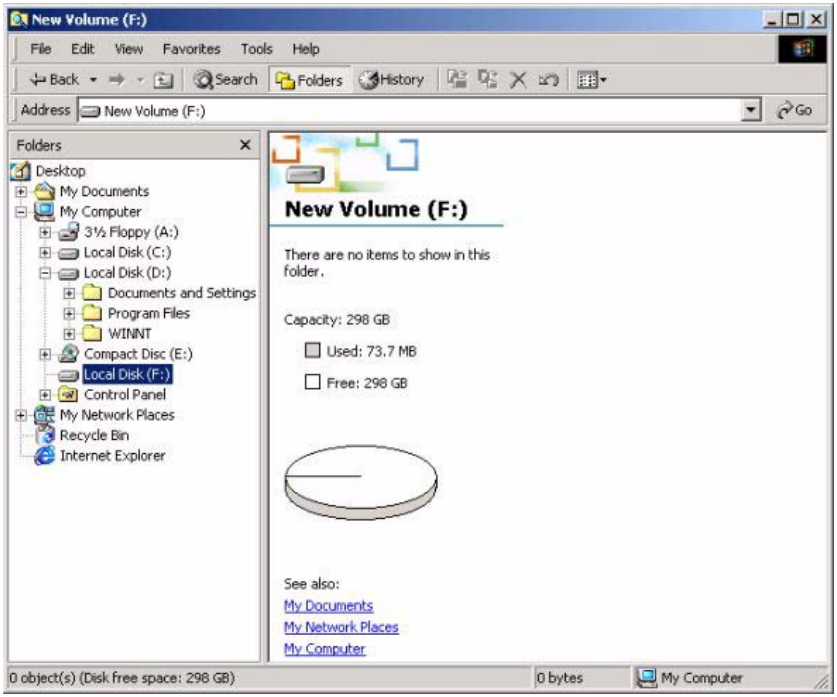
Figure 2.12 Operating System Volume



The operating system sees the double capacity as one striped volume.

11. Go to Power Console Plus to view the RAID 5 OS volume (see Figure 2.13). Select the volume that you just created. Click the Logical Drive Properties Icon or select **Logical Drive->Properties** from the menu bar. The Logical Drive Properties window opens.

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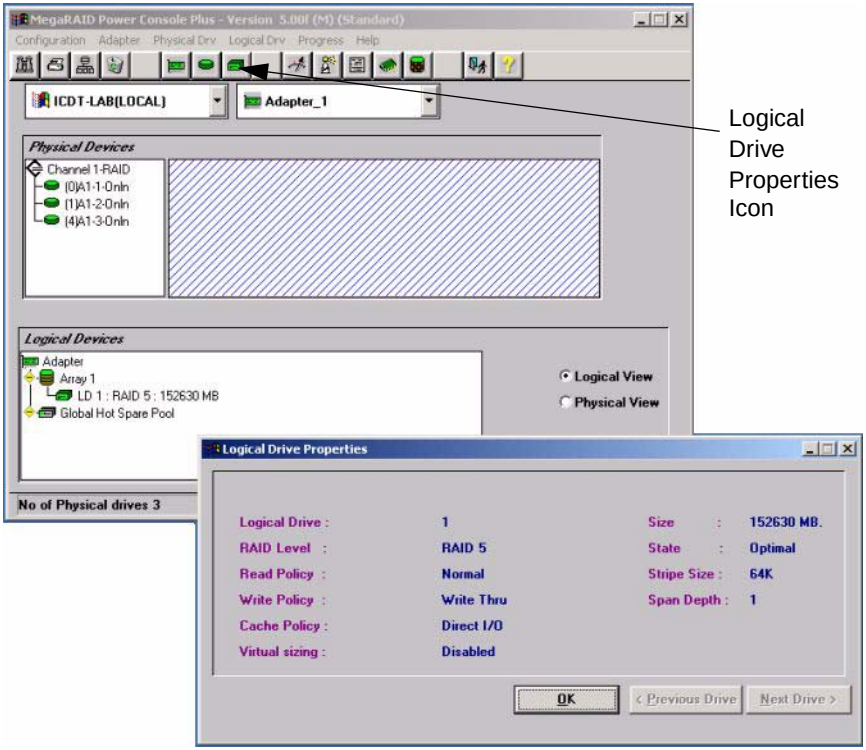
Figure 2.13 Power Console Plus RAID Volume



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