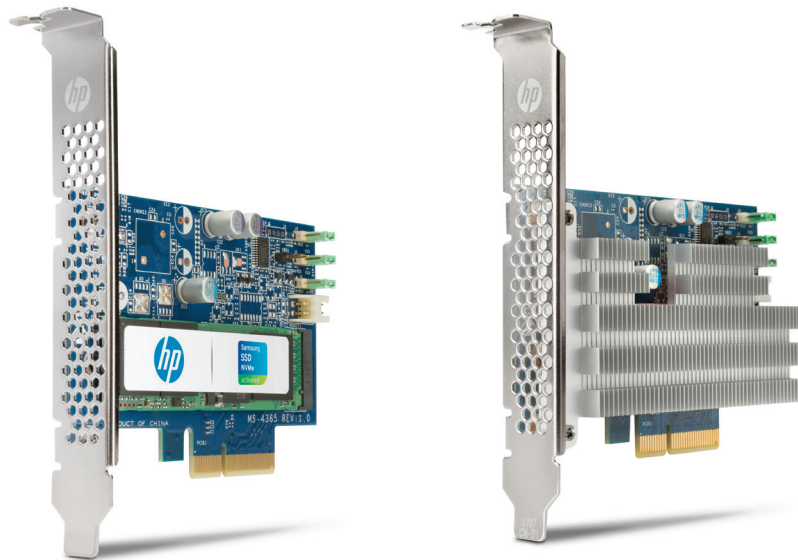# Configuring RAID with HP Z Turbo Drives

HP Workstations

This document describes how to set up RAID on your HP Z Workstation, and the advantages of using a RAID configuration with HP Z Turbo Drives. These advantages include greater performance or greater reliability. The HP Z Turbo Drive G2 products were used to create this document, but any HP Z Turbo Drive can use this same process to create a RAID configuration.

Before you begin

To view QuickSpecs and determine the compatibility of this product with your HP Z Workstation, see hp.com/go/productbulletin.

If installing the HP Z Turbo Drive for the first time, check the installation guide and verify that the BIOS revision is greater than or equal to the minimum BIOS revision.

Install the HP Z Turbo Drive(s) following the directions in the installation guide. Make sure to install the appropriate drivers as found on the hp.com/support website. The workstation model can be found on the front of the system chassis.

Benefits of HP Z Turbo Drives using software RAID configurations

HP Z Turbo Drives use the built-in capabilities of the operating system (OS) to support a RAID configuration (also known as a software RAID). In order for the RAID volume to be correctly managed, the system must first boot to the OS. As such, the HP Z Turbo Drive family currently only supports data RAID configurations. Use of HP Z Turbo Drives in an OS RAID or Boot RAID configuration is not supported. This limitation applies to all PCIe connected SSD components today.

Configuring the HP Z Turbo Drives into a RAID 1 (mirror) will provide data redundancy for those customers concerned about data loss, but provides no performance improvement. Configuring the HP Z Turbo Drives into a RAID 0 (striped volume) provides additional performance that scales as shown below.

Figure 1. Software RAID 0 performance

HP Z Turbo Drive G2 RAID 0 performance

Number of drives in RAID 0 configuration
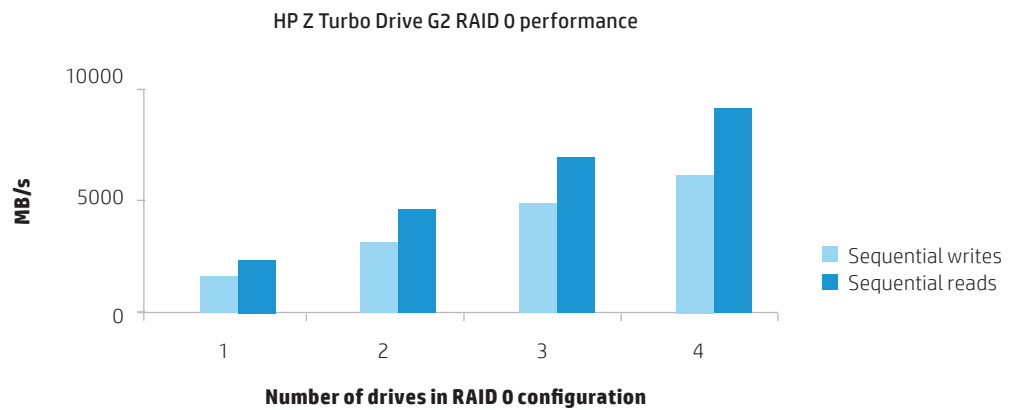
## Configuring RAID with HP Z Turbo Drives using Microsoft Windows

Once the HP Z Turbo Drives are installed in the system and the system has been rebooted, launch **Disk Management**.

• For Windows 7 systems, click **Start**, right-click on **Computer**, select **Manage**, select **Disk Management**.

• For Windows 8 and later systems, hit the **Windows+X** keys on the keyboard, select **Disk Management**.

If the HP Z Turbo Drives are new, you will be asked to initialise the drives.

• Choose either **Master Boot Record** (MBR) or **GUID Partition Table** (GPT).

  – You can use MBR or GPT for arrays smaller than 2.2 TB (e.g. the array size for two 512 GB drives in a RAID 0 is equal to 1 TB; the array size for two 512 GB drives in a RAID 1 is equal to 512 GB).

  – GPT must be used for arrays larger than 2.2 TB (e.g. the array size for four 1 TB drives in a RAID 0 is equal to 4 TB).

• Click **OK**.

Figure 2. Initialise disk
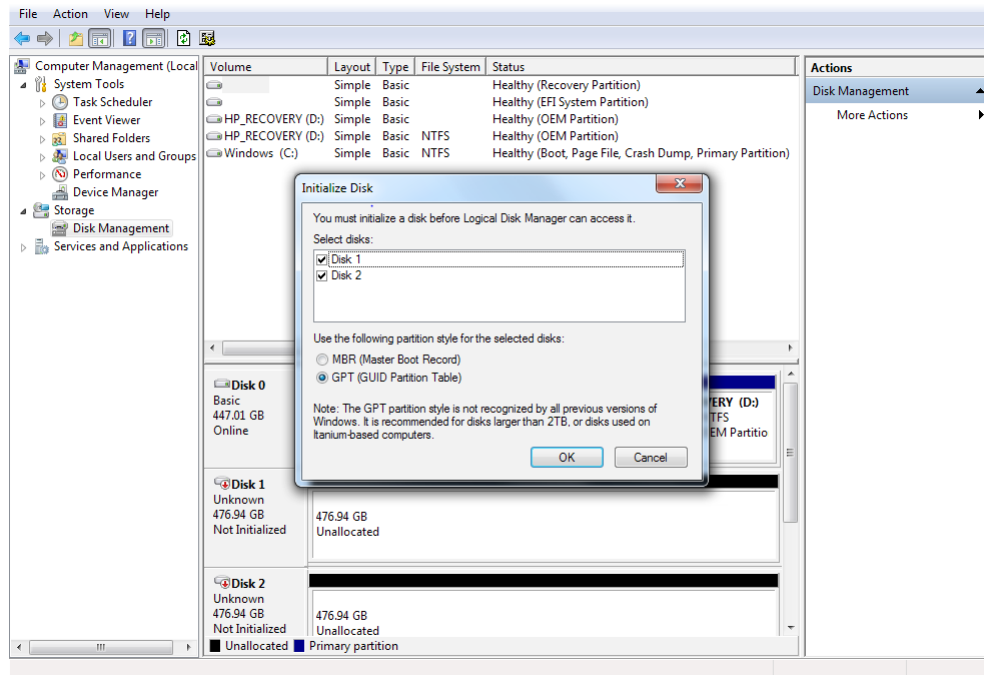

The drives are now initialised but unallocated.

Figure 3. Initialised but unallocated drives
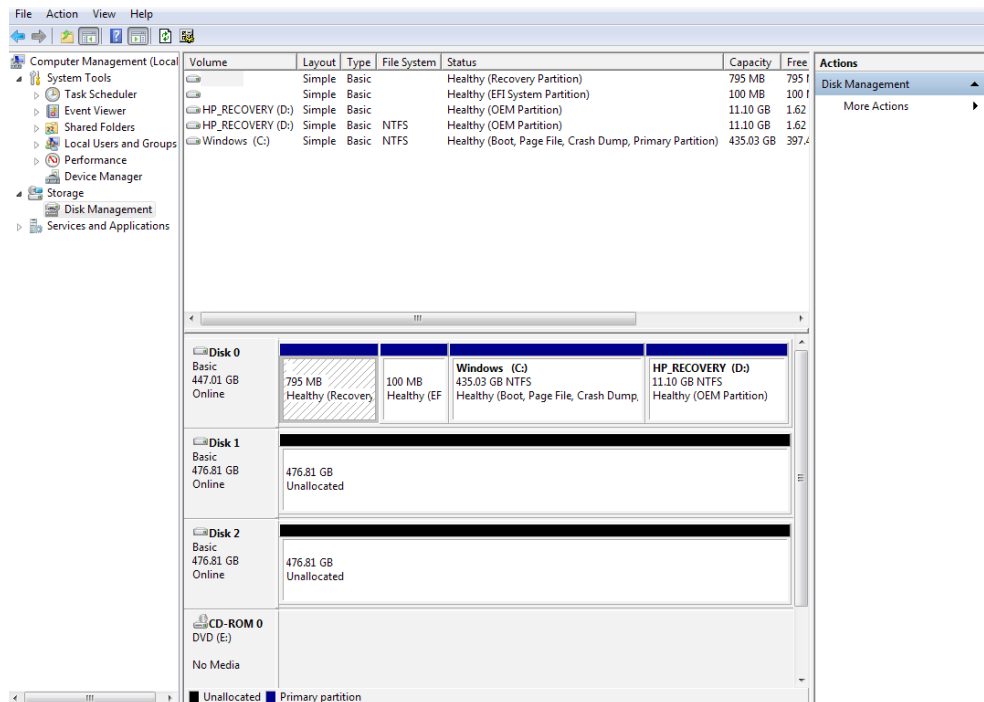
Mouse over one of the unallocated HP Z Turbo Drives and right-click. A menu will appear to configure a software RAID. The software RAID modes are defined as follows:

- **Simple volume:** No RAID, single drive.

- **Spanned volume:** A single partition that includes multiple drives. Files are not deliberately broken up among the drives. A spanned volume does not include any performance or redundancy advantages.

- **Striped volume (RAID 0):** Data and files are deliberately broken up across multiple disks in an attempt to improve read and write performance. The resulting RAID volume size is the sum of the individual drives included in the configuration.

- **Mirrored volume (RAID 1):** Data is replicated between drives, providing data redundancy but no performance advantage. The RAID volume size equals the size of the smallest drive in the array.

- **RAID 5 volume:** A RAID 5 does not replicate data between multiple drives and is more efficient at storing the redundancy information necessary to restore the RAID when a drive fails. Instead of replicating all data to a second drive, it creates a smaller parity partition to allow data recovery. RAID 5 is not available on Windows 7 or Windows 10.

Figure 4. Disk Management screen and menu choices
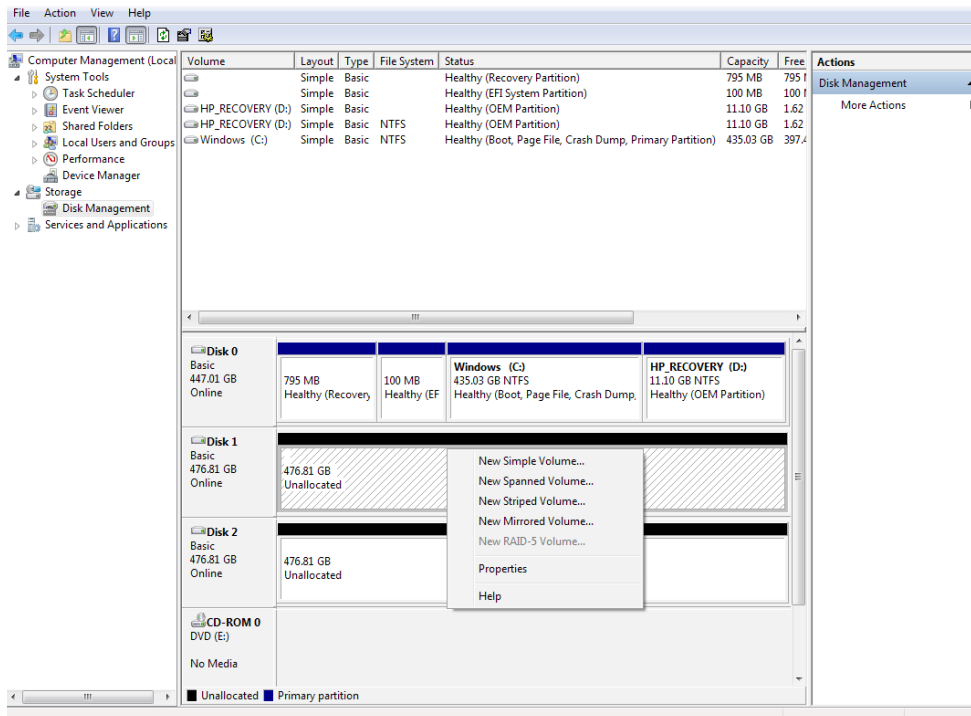
For this document, RAID 0 is selected using HP Z Turbo Drive G2s. Microsoft Windows provides a wizard to help complete the process.
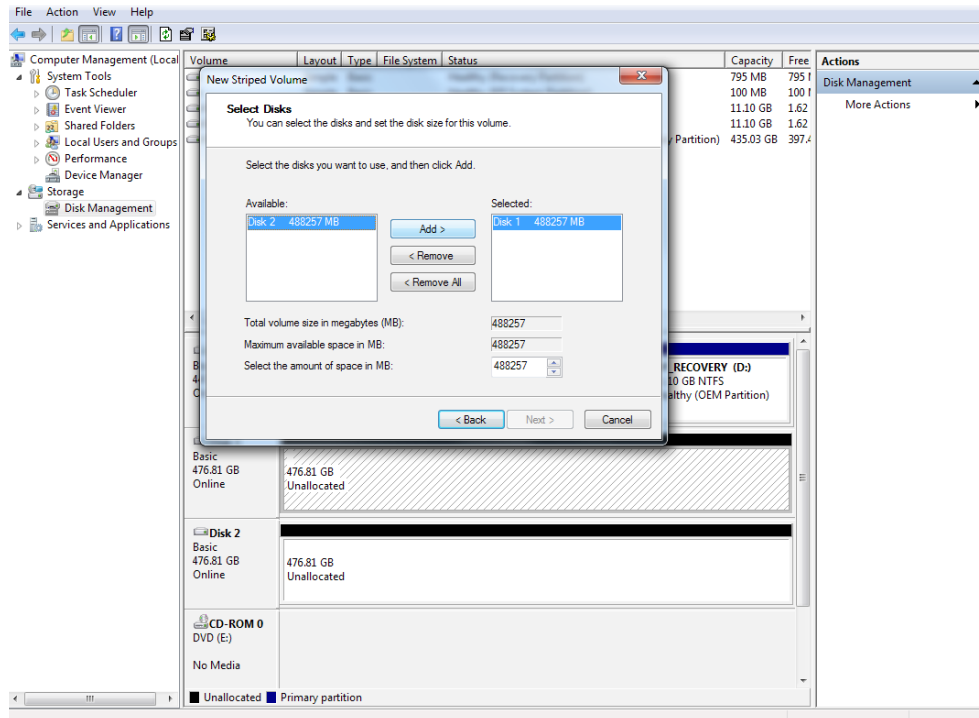
Figure 5. Microsoft Windows RAID Configuration Wizard
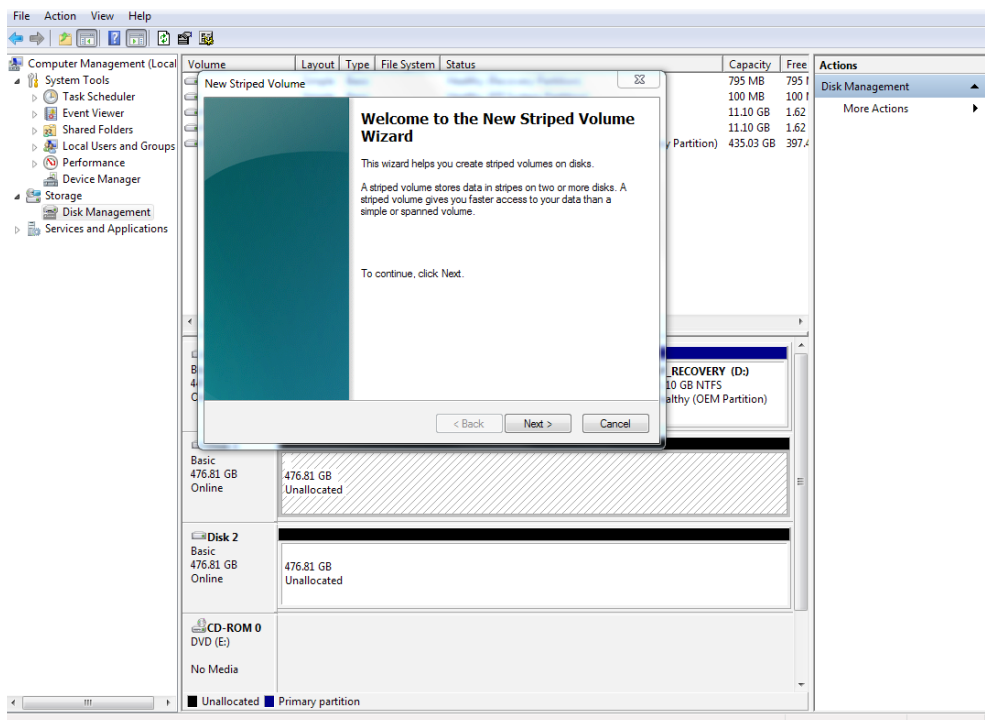
Click **Next**.

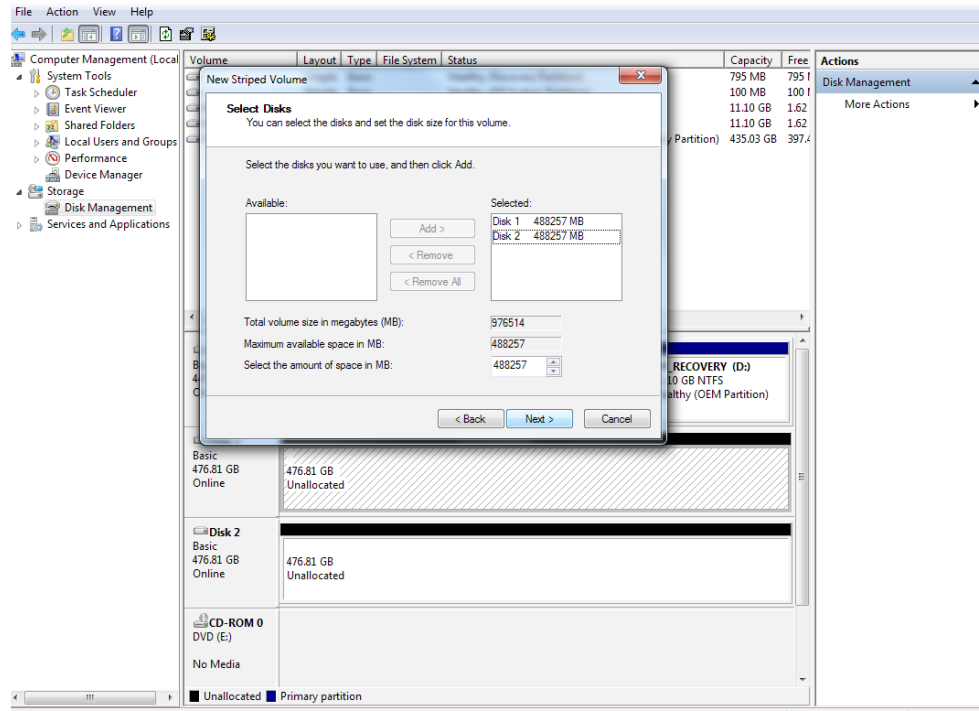Choose the other drives to be included in the RAID array. For each drive to be added to the array:

• Select the drive.

• Click **Add**.

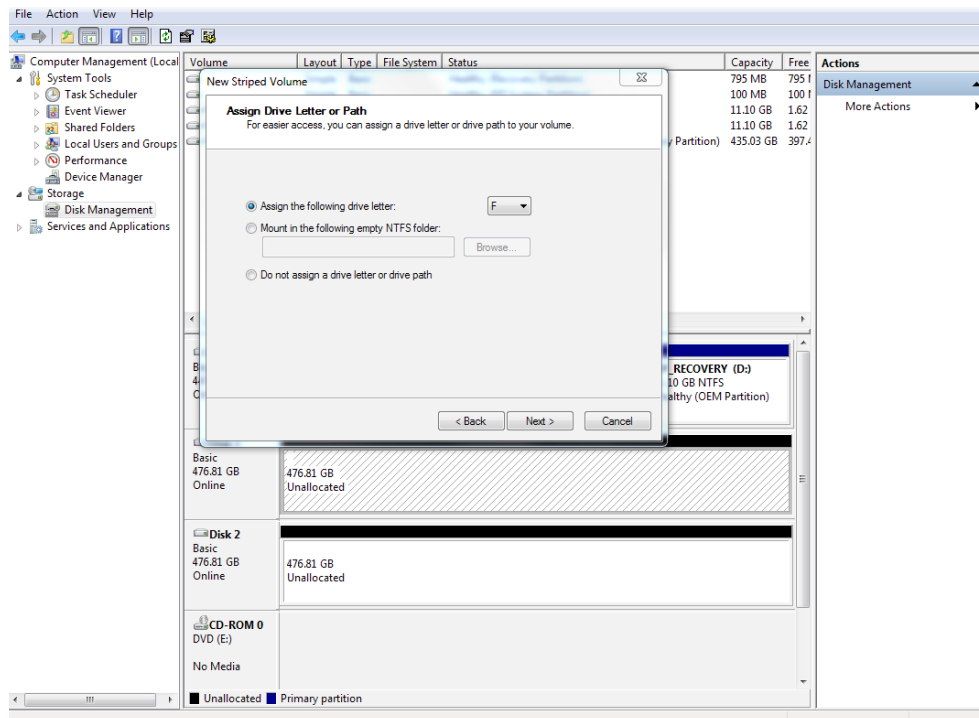**Figure 6.** Drive selection

Once all drives have been added, click **Next**.

Figure 7. Drive selection

Assign a drive letter for the resulting RAID volume. Notice that the RAID can be assigned to an empty NTFS folder. Choose the appropriate option, then click **Next**.

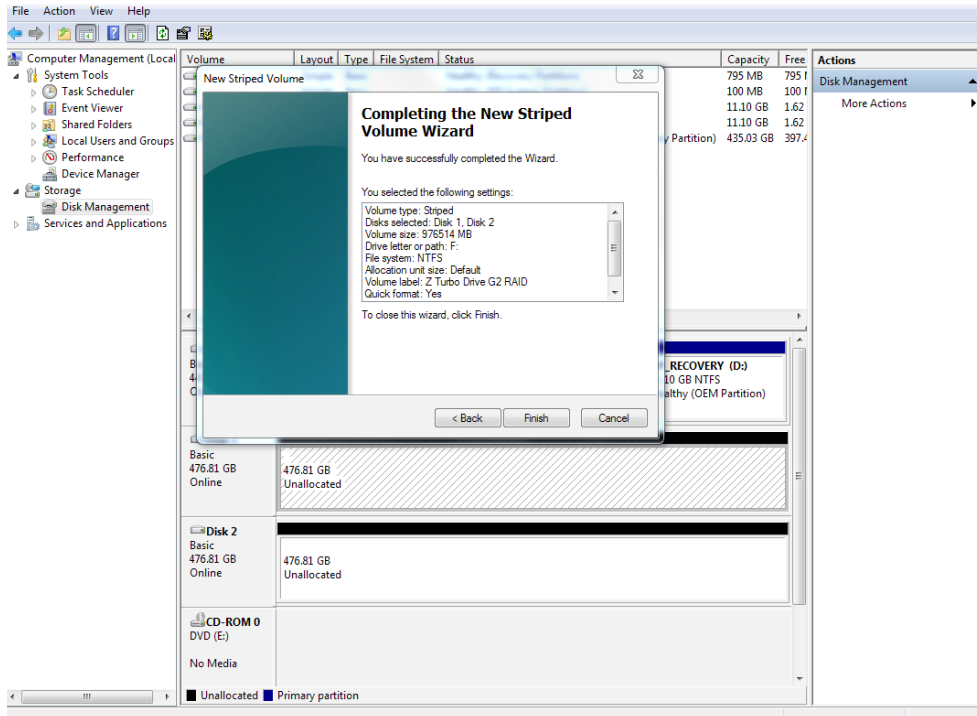**Figure 8.** Assigning a drive letter

The OS will now format the RAID volume. Select either the default stripe size, or choose an alternative size. Click **Next** to continue.
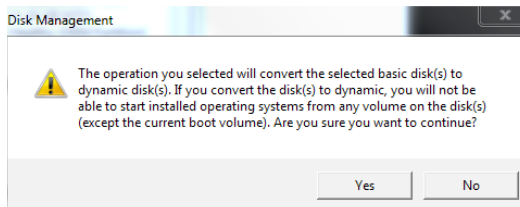
Figure 9. Stripe size
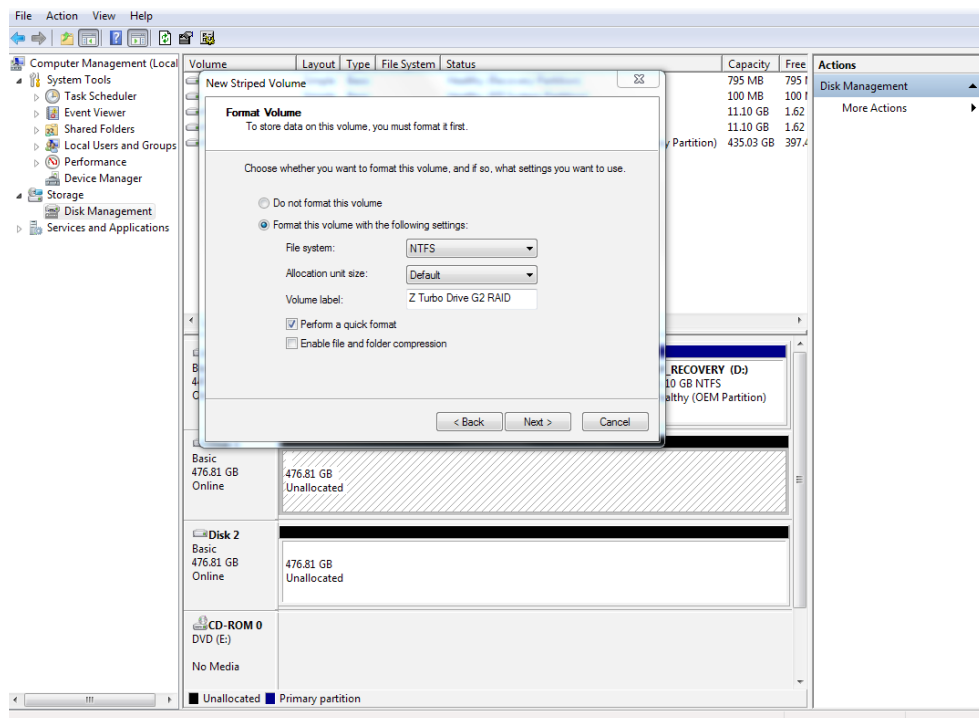
When the RAID configuration has completed, click **Finish**.

Figure 10. RAID configuration completion message

Click **Yes** to continue with the RAID configuration, or **No** to abort.

Figure 11. RAID configuration confirmation

When completed, Disk Management will show all the disks configured using RAID, based on the name of the volume and the assigned drive letter. Note that in Disk Management, the volumes shown in the top pane relates to the overall size of the RAID while the disks listed at the bottom display the size of the individual drives.
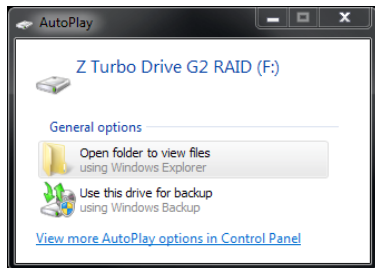
Figure 12. Disk Management with HP Z Turbo Drives in a RAID 0 configuration
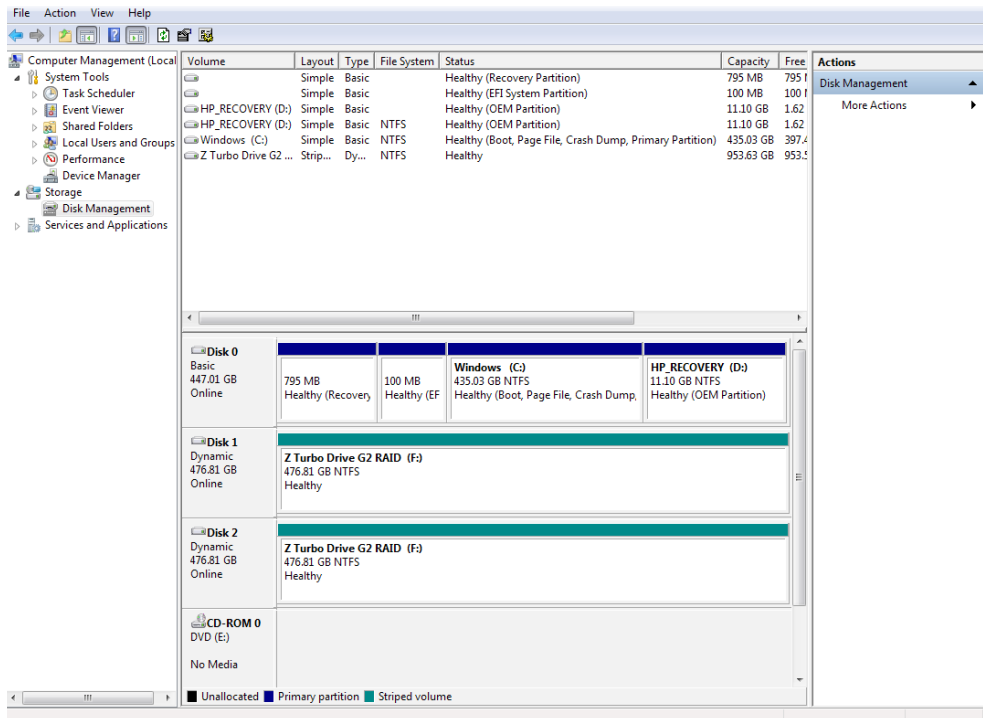
Note: On completion the OS will see a new drive and may generate an AutoPlay dialogue. Either select **Open folder to view files** or close the dialogue box.

Figure 13. AutoPlay dialogue box

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