"HARD DRIVE SURGERY" TO RESOLVE BAD CLUSTERS FOR A HARD DRIVE

HIGH-LEVEL EXECUTIVE SUMMARY

Your failed hard drive is still spinning. It does not make any funny-sounding noises. However, it still does not work right: you cannot add new NTFS partitions to it or you cannot format existing existing NTFS partitions. You can probably still get it working by doing a little "hard drivesurgery" with Windows "Disk Management" to "block out" the bad parts of your hard drive. Once you do this, you can probably extend the useful life of your failed hard drive.

MORE DETAILED DESCRIPTION

At some point in the life of any hard drive, it will start developing bad sectors in its low level format. If you get enough of these bad sectors, the high-level NTFS format of your hard drive will develop bad clusters and "Windows" will fail in its job of keeping track of the bad clusters. The end result is that some portions of the hard drive cannot be formatted by "Windows".
If you attempt to format the entire hard drive as a single NTFS partition, the portions of the hard drive that cannot be formatted will prevent the entire hard drive from being formatted. Your older hard drive was originally "initialized" with a "Master Boot Record" which allows you to create up to 4 primary partitions on it.

You can use a trial-and-error process of creating two or more primary partitions of different sizes on your hard drive to determine where the bad, unusable sections of the hard drive are located. Once your determine what sections are bad, you can create unused primary partitions and purposely NOT format them. The net result of this exercise is that you will end up with a smaller usable hard drive but with a

usable hard drive. This net result is that you perform surgery on your hard drive to block out bad sections in order to extend the useful life of your hard drive.

The process of blocking out bad sections to make an old hard drive useful is similar to the process of surgeons using various surgical techniques to remove malignant tumors from cancer patients. We will refer to this technique as our "drive surgery technique"!

AN ACTUAL EXAMPLE OF THE SUCCESSFUL USE OF THE "DRIVE SURGERY TECHNIQUE"

On April 16, 2012, members of the Tucson Computer Society's "Windows 8 / Hardware Special Interest Group" successfully used this technique to repair the hard drive of a laptop computer that belonged to local not-for-profit origanization:

We started by removing the failed hard 2 1/2-in. 233-Gigabyte hard drive from the laptop computer, since multiple attempts to use a failed hard drive to boot up a computer only causes more errors on the hard drive.

We installed the failed hard drive into a USB 2 "KingWin" hard drive enclosure.

DATA RECOVERY USING "PARTED MAGIC" LINUX

We used a VMware Player virtual machine that booted up with a "Parted Magic" LiveCD to copy about 99 percent of the data files and folders to a known-good external USB hard drive. The procedure for using "PC Man File Manger" to recover data files from within "Parted Magic" Linux is described in
http://aztcs.org/meeting_notes/winhardsig/harddrives/repairing/050-HDdatarecovery.pdf

DISK "ERROR CHECKING" WITH MULTIPLE VERSIONS OF "WINDOWS.."

We attempted to run disk "Error Checking" with virtual machines running "Windows XP", "Windows Vista", "Windows 7", and "Windows 8 Consumer Preview".
All of these runs of "Error Checking" found lots of hard drive errors:

None of these versions of "Windows.." were able to stabilize the hard drive to the point that it could be formatted with the NTFS file system.

REPAIRS ATTEMPTED WITH "SPINRITE 6"

We ran "Spinrite 6" on the hard drive and "Spinrite 6" locked up after a minute or two without completing its attempted repairs:
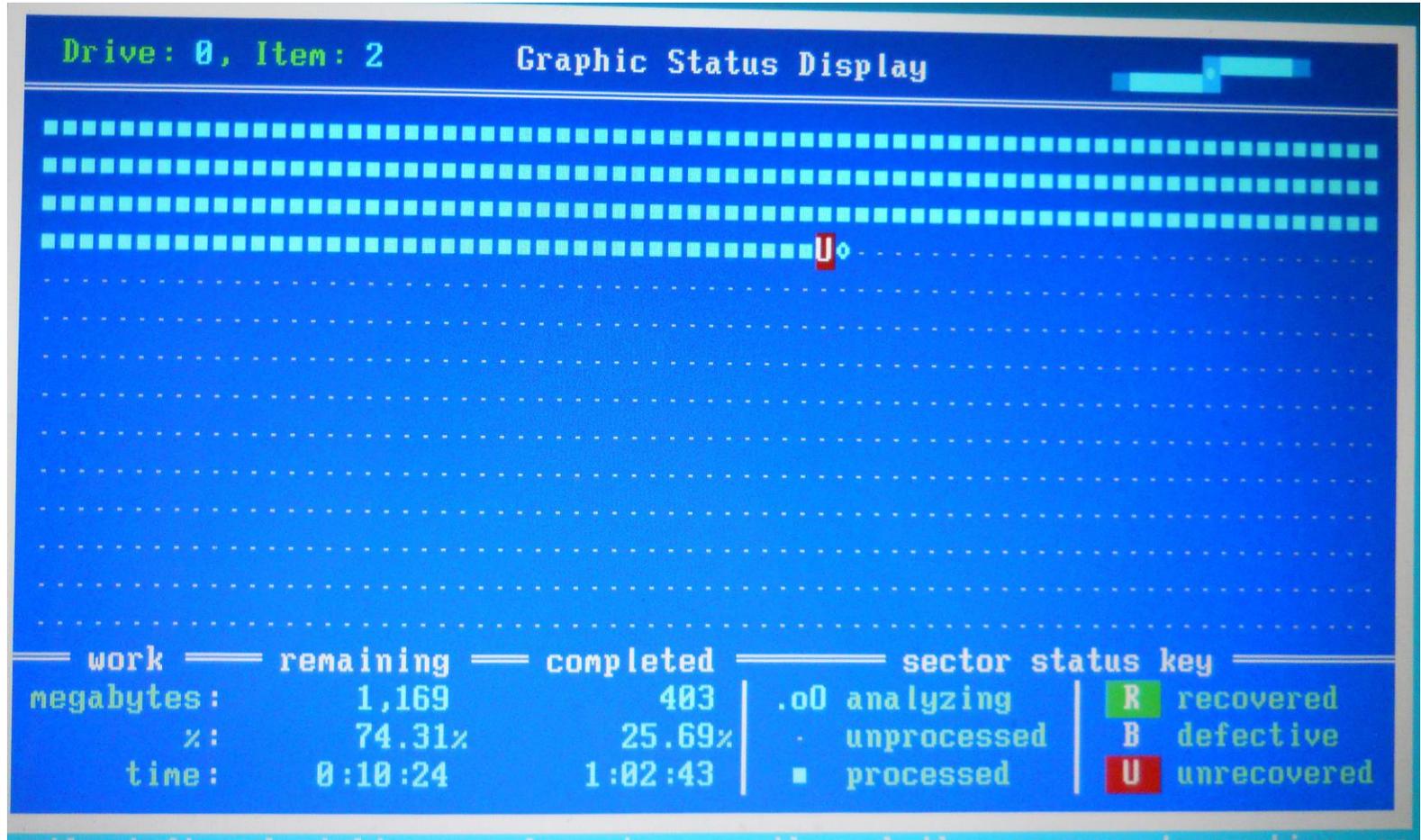
ORIGINAL PARTITIONING OF THE HARD DRIVE

The hard drive had two partitions on it:
A 2-Gigabyte Toshiba-proprietary partition with restore data for restoring the computer to "Day 1".
A 233-Gigabyte NTFS partition where "Windows Vista Home Premium 64-bit".

Using virtual machines we were unable to access the 2-Gigabyte Toshiba-proprietary partition with:
"Partition Editor" of "Parted Magic 6" Linux,
"Disk Management" of "Windows XP",
"Disk Management" of "Windows Vista",
"Disk Management" of "Windows 7",
and
"Disk Management" of "Windows 8".

Using virtual machines we were unable to re-format the 233-Gigabyte NTFS partition with:
"Partition Editor" of "Parted Magic 6" Linux,
"Disk Management" of "Windows XP",
"Disk Management" of "Windows Vista",
"Disk Management" of "Windows 7",
and
"Disk Management" of "Windows 8".

At this point, we used "Partition Editor" of "Parted Magic" Linux to delete the original two primary partitions on the hard drive.

"DRIVE SURGERY TECHNIQUE" MAKES THE DRIVE USABLE

Using "Disk Management" in a "Windows XP" virtual machine, we experimented with dividing the drive into two primary partitions:
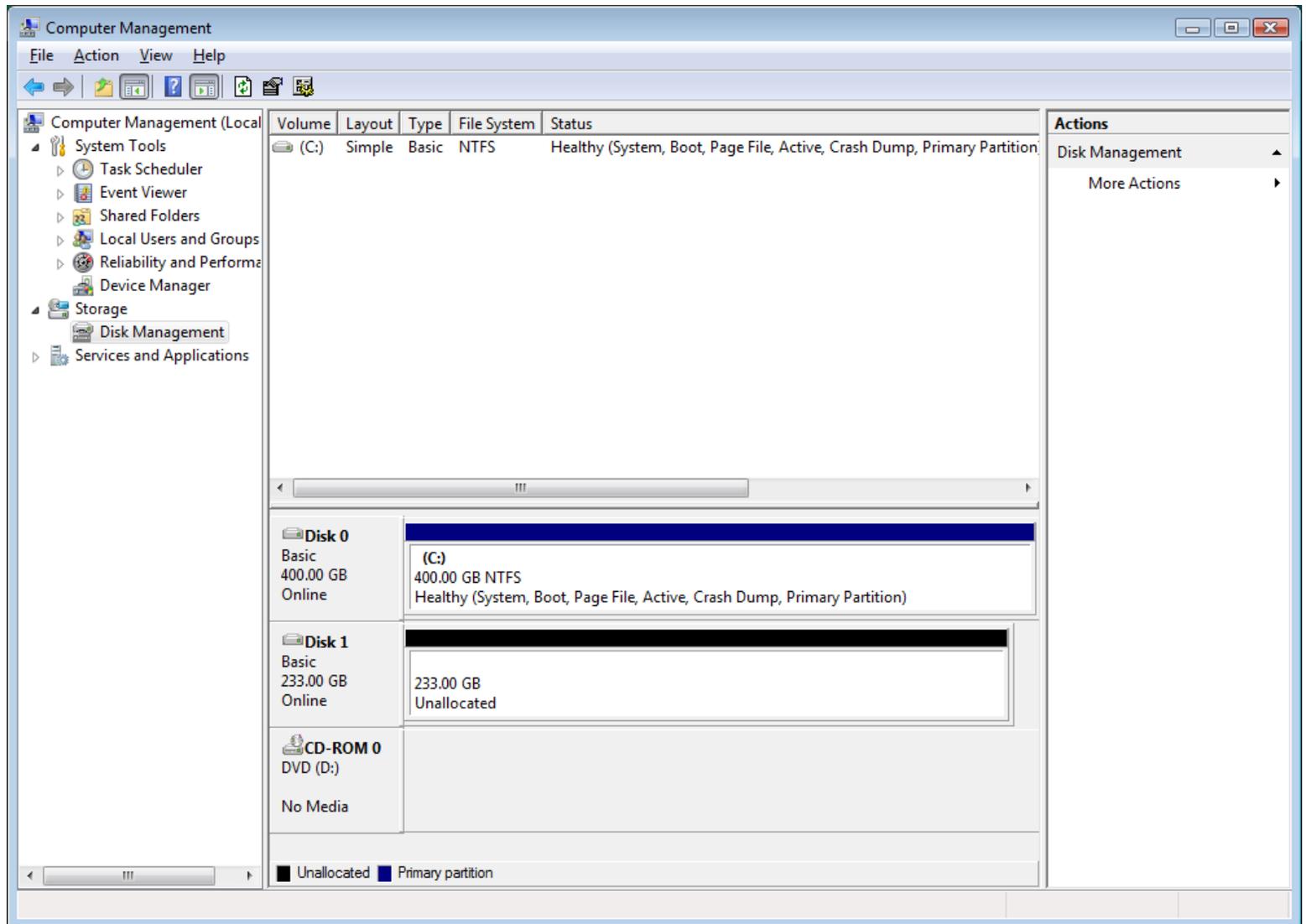
We experimented with different partition sizes.

After each re-partition of the hard drive into two primary partitions, we used "Disk Management" in our "Windows XP" machine to attempt to format the two primary partitions with NTFS.

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When the first partition was 10-Gigabytes and the second partition was 233-Gigabytes, we were unable to format either partition.

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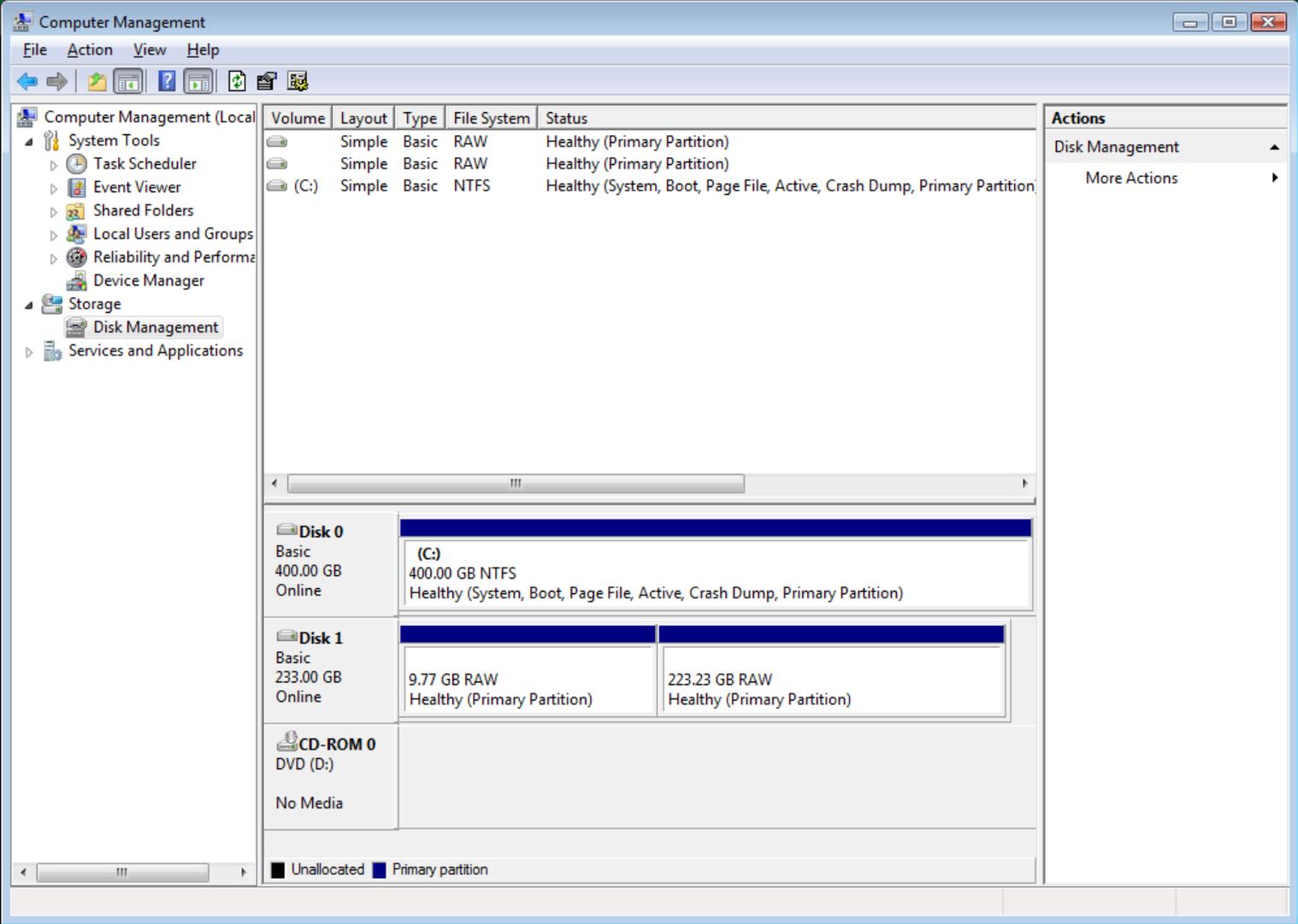
When the first partition was 15-Gigabytes and the second partition was 218-Gigabytes, we were unable to format either partition.

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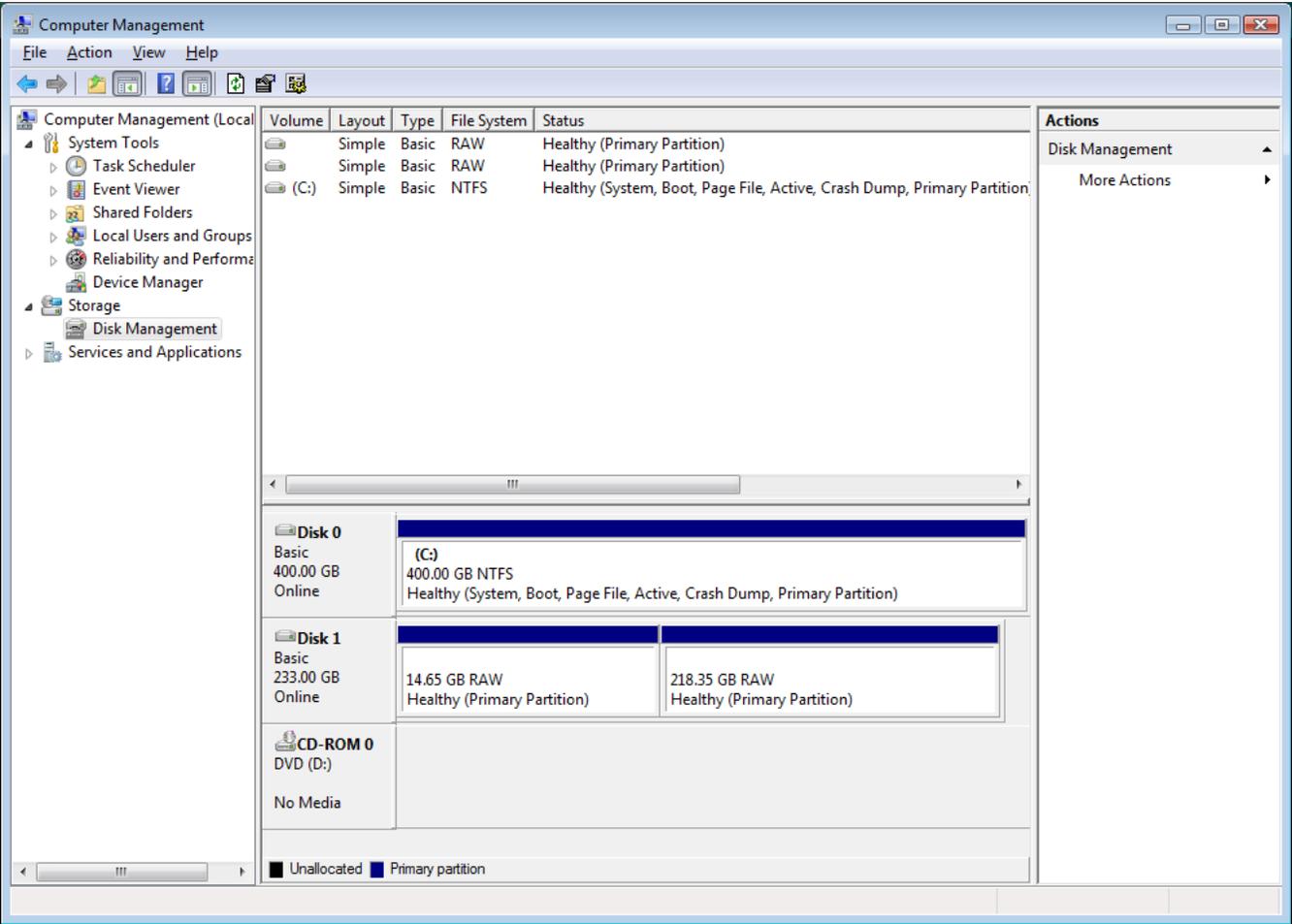
When the first partition was 20-Gigabytes and the second partition was 213-Gigabytes, we were unable to format either partition.

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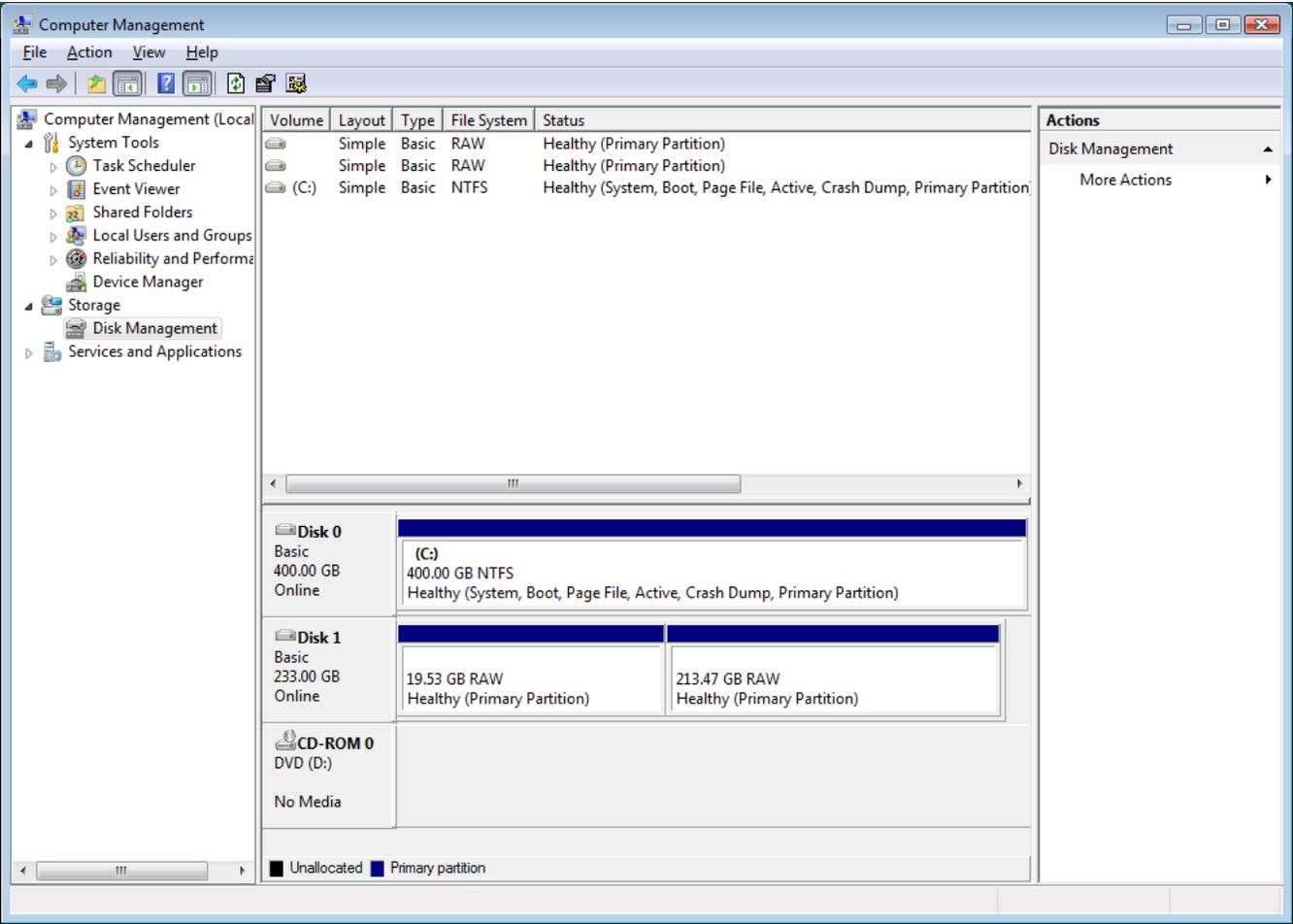
Finally, we re-partitioned the hard drive so that the first partition was 25-Gigabytes and the second partition was 208-Gigabytes:
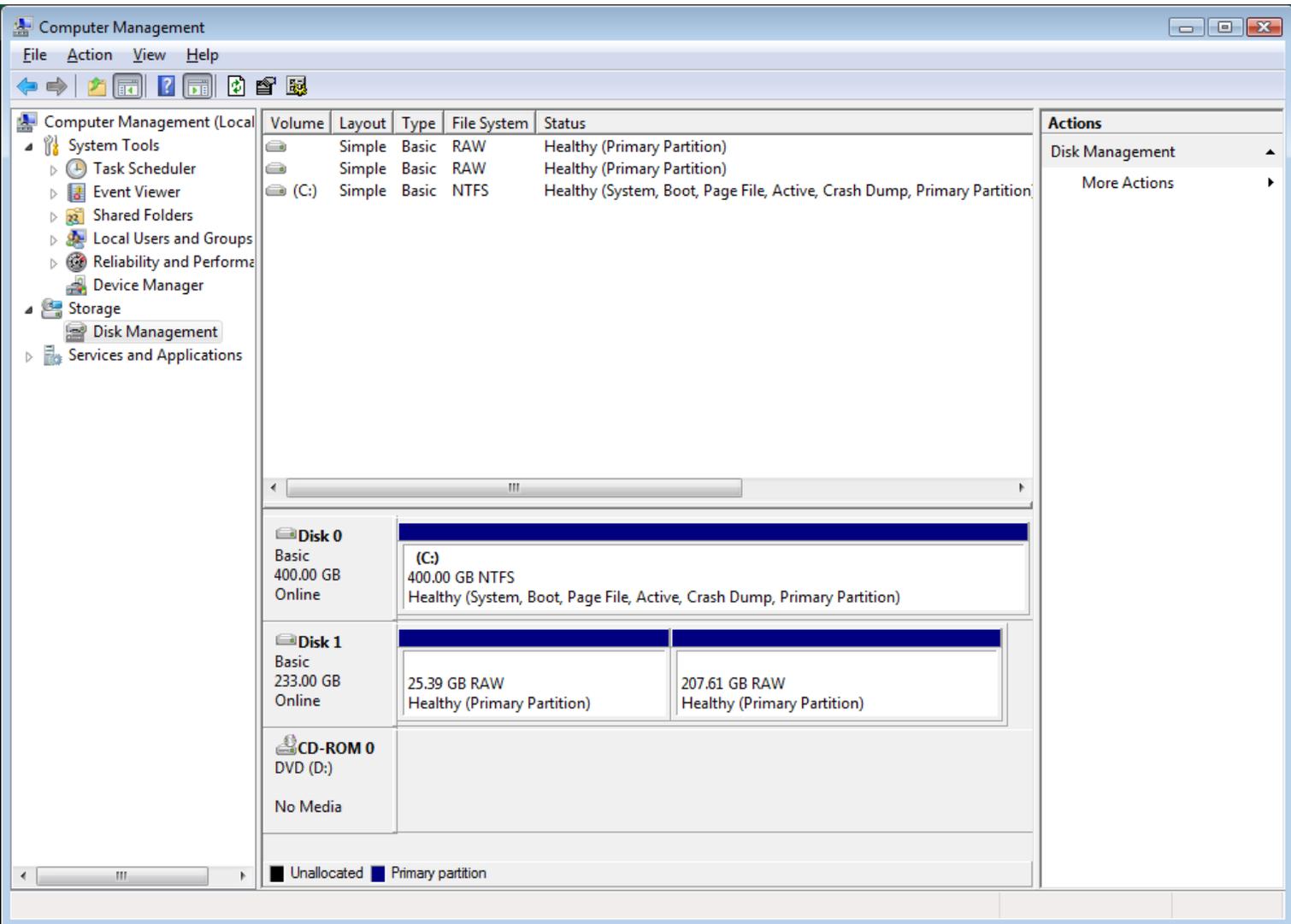
With a 25-Gigabyte partition and a 208-Gigabyte partition, we finally succeeded in isolating the defective section of the hard drive in the 25-Gigabyte partition:

We were unable to format the 25-Gigabyte partition, as expected.
We were able to format the 208-Gigabyte partition:
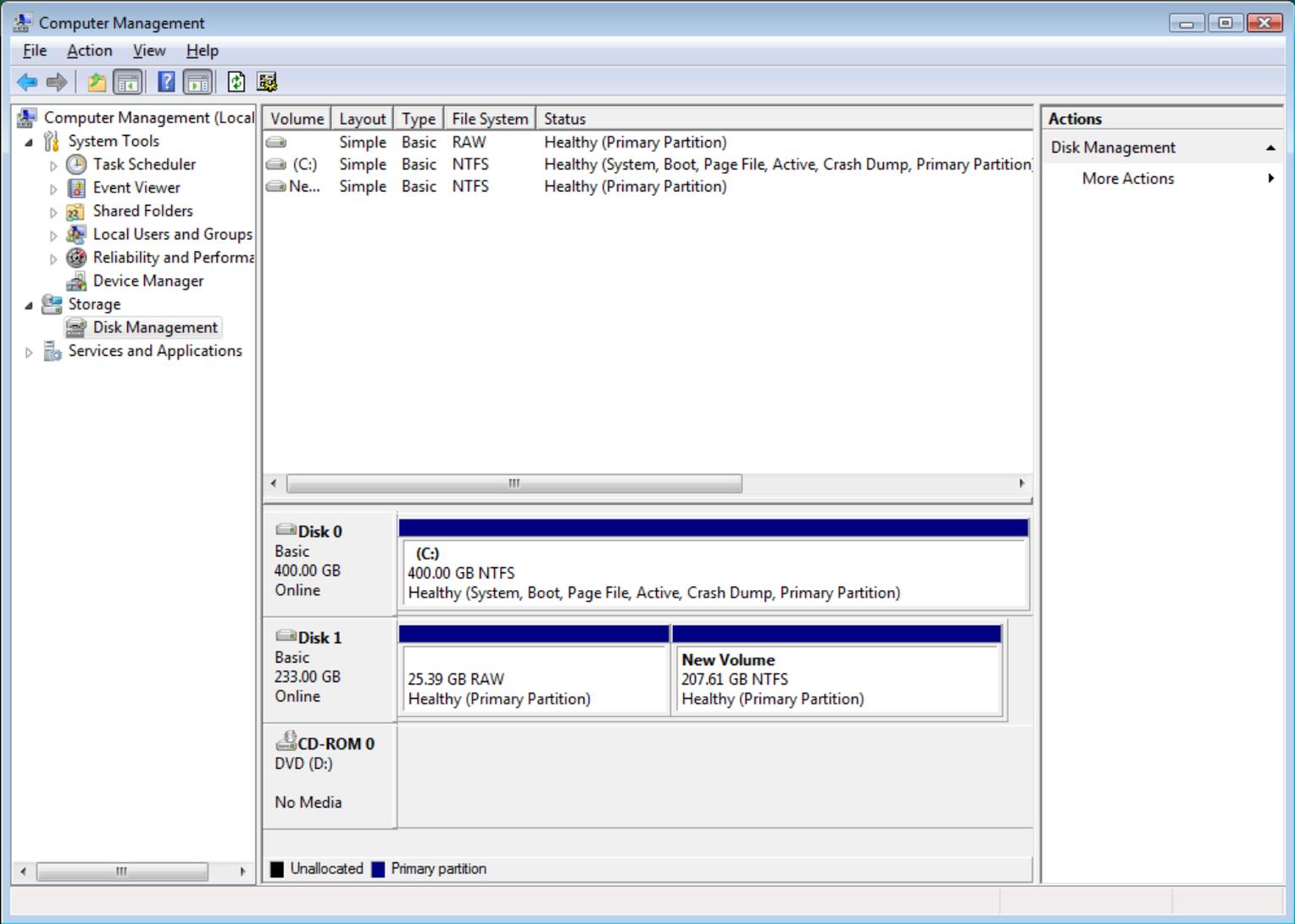
RE-INSTALLATION OF "WINDOWS" AND DATA FILES INTO THE REPAIRED HARD DRIVE

We re-installed the hard drive into the Toshiba laptop computer.

Using an installation media DVD, we re-installed "Windows Vista Home Premium" into the (second) new 208 Gigabyte partition.
We copied used the recovered data files and folders to the appropriate "user profile" location in the "Users" folder.