Hard Disk Partition Managers

A variety of software tools are available which allow support staff to non-destructively manage users' hard disk partitions. We take a look at what's around.

By Phil Morris
Technical Writer

In a workstation or server support environment one of the most time-consuming jobs can be the process of partition resizing and/or conversion. For servers especially, system downtime must be kept to a minimum, so a tool that will speed up this process is to be welcomed. In the relatively early days of the PC the only way to manage partitions was by use of the FDISK program as supplied with MS-DOS. Unfortunately this was (and still is) extremely limited in functionality - partition resizing for example was impossible without first destroying the existing partition(s), so necessitating the backup of any required data beforehand followed by a full restore.

Partitions could be added using any remaining drive space but, depending on where the space was on the hard drive, the size of the new partition might be limited or it might have been necessary to make a few small partitions instead of the required single large one.

With the advent of commercial partition management software, such limitations are a thing of the past and the support technician has far more flexibility in what can be achieved in terms of partition resizing, deletion, movement, conversion of one file system or partition type to another, merging of data between two partitions and so on. Arguably the most well-known partition manager is PartitionMagic from PowerQuest but others also exist, such as Partition Commander from V Communications.

In this article I will list the main features of these two, plus comment on any particular strengths or weaknesses. These two packages are also complemented by other expanded packages (such as ServerMagic and System Commander 2000) and the main features of these will also get a mention. I will also briefly list (but not review) some of the other less well-known partition managers.

FDISK

Despite the limitations listed above, FDISK is still the default disk partitioning software used by many technicians. It is worth noting at this point that FDISK is stored as a .COM file for MS-DOS 3.3x and earlier, and as a .EXE file for MS-DOS 4.x and later. Besides those functions available from the FDISK menu there are also some hidden command-line switches. The /MBR (MS-DOS 6.x and above) switch recreates the Master Boot Record for DOS (useful if the boot record is suspect or damaged, but use with caution).

The /CMBR x switch (where x is a hard drive number) will recreate the MBR on a specified hard drive. A switch of x/PRI:500 would create a Primary partition of 500 MB on drive x, while x/EXT:500 will create an Extended partition of 500 MB on drive x. The x/LOG:200 will create a Logical partition 200 MB in size in the Extended partition on drive x, while /PARTN will save the partition table to the file PARTSAV.FIL. The /Q switch stops the system from automatically rebooting after the use of FDISK, while /STATUS shows the status of the hard drive(s) and /ACTOK speeds up the partition creation by preventing the default hard drive integrity check (this is not recommended unless it is certain that the hard drive is free of errors). The /FPRMT switch prevents the prompt for FAT32 support from appearing (for operating systems that support it) but it also allows drives smaller than 512 MB to use FAT32. This should only be used with caution and definitely not from within a DOS box (for example ,from within Windows 3.x/9x/ME) - reboot the PC first to the MS-DOS prompt.

Update 154:September 2001
Page 3

PC Support *Advisor*
www.pcsupportadvisor.com

File: R1173.1
Review:Software

FDISK Scripts

In order to speed up the creation and deletion of supported partition types, sizes etc it is possible to create an FDISK script file. A file called FDISK.SCR is edited with the commands listed as they would be entered from within the FDISK program, for example, the number 4 would be typed into the file if the partition information was to be displayed. If FDISK was being used interactively then, after entering the number, the Enter key would normally be pressed on the keyboard, so to simulate this in the script file Ctrl-P and Ctrl-M must be pressed, so leaving the music symbol within the file. To simulate the use of the Escape key use Ctrl-P and then press Escape. All the commands must be on one line. To execute the script, type FDISK FDISK.SCR. For those who wish to experiment with FDISK with zero risk of doing any damage, a simulation of FDISK is available on the Web - see the Resources section below for details.

To avoid problems caused by viruses or errors, it is possible to use one of the many programs available to save (and restore when required) the partition table data to a floppy disk. This data can also be stored on an available network resource or another hard drive. Various commercial PC software tools (such as PartitionMagic) incorporate this functionality plus there are some free standalone programs available to download from the Web.
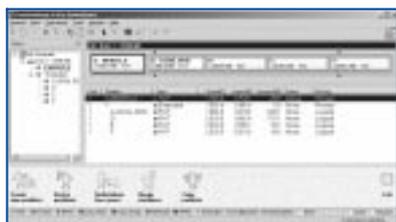
PartitionMagic

PartitionMagic 6.0, from PowerQuest, runs under all the more recent Windows operating systems, namely Windows 95/98/ME, NT4.0 (with Service Pack 4) and Windows 2000 Professional. If rescue disks are created then it can also be run from DOS, Windows 3.x, OS/2 or Linux. It exists in three main forms - the standard version (which this review will concentrate on), a Pro version and a Server version. The additional features of the latter two will be briefly covered later.

Over the years I have used assorted versions of PartitionMagic and have always liked its GUI - everything is neatly and logically laid out, with colour coding used to represent different types of partitions and file systems. At the top of the screen is the Toolbar which provides convenient shortcuts to the available partition Operations (see later for a listing of these). Below that is the Partition Map which shows the hard drive(s) with their colour coded partition information, while further down is the Partition List which contains a more detailed breakdown of the partitions within the drive(s).

The Wizard buttons are next - these provide convenient shortcuts to the wizards, namely Create new partition, Resize partitions, Redistribute free space, Merge partitions and Copy partition. At the bottom of the PartitionMagic window is a colour key showing the colour representations for the supported file systems: FAT, FAT32, NTFS, Linux Ext2, Linux Swap, NetWare, HPFS, Extended, Unallocated, Unformatted, Other, Used and Unused. To the left of the Partition Map and Partition List is a feature that is new to version 6 - a tree view of the hard drives and partition types. Some of these views can be toggled on or off via the View menu.

A partition is adjusted by either right clicking one of its views (from the Map, List or Tree views) or selecting it then choosing an action from the Operations menu. Depending on the state and type of the partition, the following operations may or may not be available: Resize/Move, Copy, Create, Delete, Undelete (only FAT, FAT32 and NTFS partitions), Label, Format, Convert, Merge, Split, Info, Check for Errors, Windows CheckDisk. The Advanced option gives you Change Drive Letter, Bad Sector Retest, Hide Partition, Resize Root, Set Active and Resize Clusters. See Figure 1 for a view of a sample main window.

Resizing In Action

It is beyond the scope of this article to detail every possible feature of this program, but I will give a brief example of a common task, namely resizing a partition. Because the GUI is so easy to use this is a simple operation that involves selecting the drive then selecting Resize/Move (either from the Toolbar, Operations menu or right mouse click). This will bring up a graphical colour coded representation of the selected partition (Figure 2) where the partition can be easily resized by dragging the far left and right edges of the colour bar. Resizing can also be carried out by

Figure 1 - Main PartitionMagic 6 window.

Update 154:September 2001
Page 4

PC Support *Advisor*
www.pcsupportadvisor.com

File: R1173.2
Review:Software

typing the required information into the provided fields or scrolling through various values - the program will not allow the drive to be set to an incorrect or invalid size. Clicking on OK will cause the main window to be updated to show the resized partition.

At this stage no changes have been made to the hard disk itself. Instead two more buttons will have appeared at the bottom right of the window - Apply Changes and Undo Last. The action of the latter is obvious and the Apply button does what the name suggests, therefore the changes are made to the hard drive. As part of the Apply procedure the PC will be rebooted and the partitions resized as specified but this will be carried out prior to completely loading the OS. The reboot is rigorously enforced by the program and is necessary for most PartitionMagic operations - it would be impossible if not catastrophic to carry out some operations while the operating system was running - at the very least data loss could occur or the system could be rendered unbootable. This is where the rescue boot disks would come into their own, as they would allow the partition to be repaired (or resized, moved back to its original location etc) so hopefully enabling the system to function again.

Matters Of Size

Cluster sizes can greatly affect the storage capacity of a hard drive depending on the size of files it contains. For example, if many small files of only a few KB each are stored on the drive and a large cluster size of 64 KB is used then a lot of disk capacity can be wasted. This is illustrated nicely by the Resize Clusters operation (see Figure 3). Caution should be exercised when selecting different cluster sizes, for example the 64 KB cluster size should only be used with Windows NT or Windows 2000 and a 2-4 GB hard disk drive. Another time to exercise caution is when converting a file system from one type to another - for example, FAT32 partitions cannot be accessed by older versions of MS-DOS and Windows NT, while NTFS partitions can by default only be accessed by NT and Windows 2000. Converting a file system to an unsupported type will render that partition inaccessible via certain operating systems, so maybe necessitating the use of the Rescue Disks to recover the situation.

Supplementary Tools

Various additional tools are provided with PartitionMagic. Boot Disk Builder creates a Remote Agent Boot Disk to enable the remote copying, creation, moving and checking of partitions between two PCs, but is for use only with PartitionMagic Pro. DriveMapper remaps drive letters in registry and .INI files and is used if a partition

Figure 3 - The PartitionMagic 6 Resize Clusters operation.
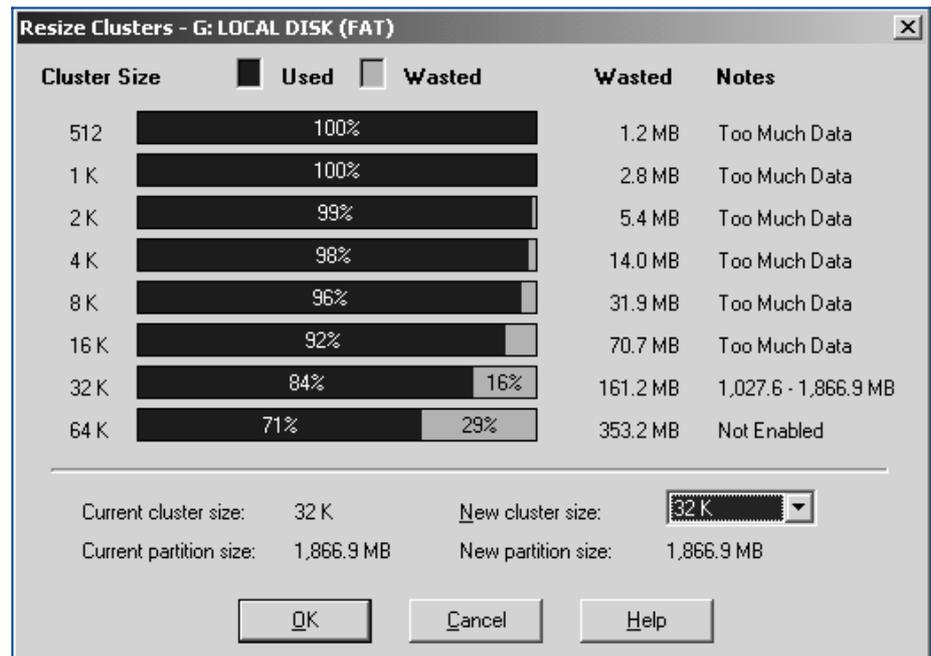

*Figure 2 - The PartitionMagic 6
Move/Resize Partition window.*

Update 154:September 2001
Page 5

PC Support Advisor
www.pcsupportadvisor.com

File: R1173.3
Review:Software

has had a change of drive letter or if two partitions have been merged. PartitionInfo gives additional information on the partition structure of the hard disk drive(s) in the PC, while PQBoot enables the user to select which partition to boot from. Finally, BootMagic allows multiple operating systems to be installed on the same PC, all easily selectable via a menu on boot up.

PartitionMagic Pro

PartitionMagic Pro is PowerQuest's enterprise version of PartitionMagic 6. Besides the features of the latter product there is also support for the new across-the-wire feature, which gives the ability to remotely copy, move, delete and create partitions via a TCP/IP connection to another machine using a remote agent. There is a new script facility for automating partition-related tasks, and a shred facility overwrites data on a selected partition so making it much harder to recover the old data. The shred facility is especially useful for those times when a PC is scrapped and any potentially sensitive data needs to be securely erased.

ServerMagic

PowerQuest also produces a program called ServerMagic. On the face of it, this is effectively Partition Magic but designed exclusively for servers. It does though incorporate additional functionality, such as support for volume sets, migration of data from one server to another while retaining file permissions, scripting (namely recording of mouse actions and keyboard input for future playback), partition shredding, RAID support and, via the inclusion of PowerQuest's Server Image, the ability to copy the whole partition to other media such as a CD-R, another hard drive, network devices and removable media (a process that is also possible via Norton's Ghost software). A NetWare product is available as is a product that caters for both Windows NT4 and Windows 2000 servers.

PartitionMagic Summary

The assorted PartitionMagic programs make up a very useful and technician friendly suite of partition manipulation tools. However, nothing is perfect and as with many windows applications there are horror stories on the Internet about corrupted hard drives, lost data and the like. These are not always the fault of PartitionMagic - trouble can occur due to unforeseen circumstances such as power or other hardware failure in the middle of the repartitioning process, plus it is arguable that no program is 100% bug free. PowerQuest does recommend backing up your hard drives before using the program - I can only echo this advice. Overall, the range is an excellent, feature rich set of programs.
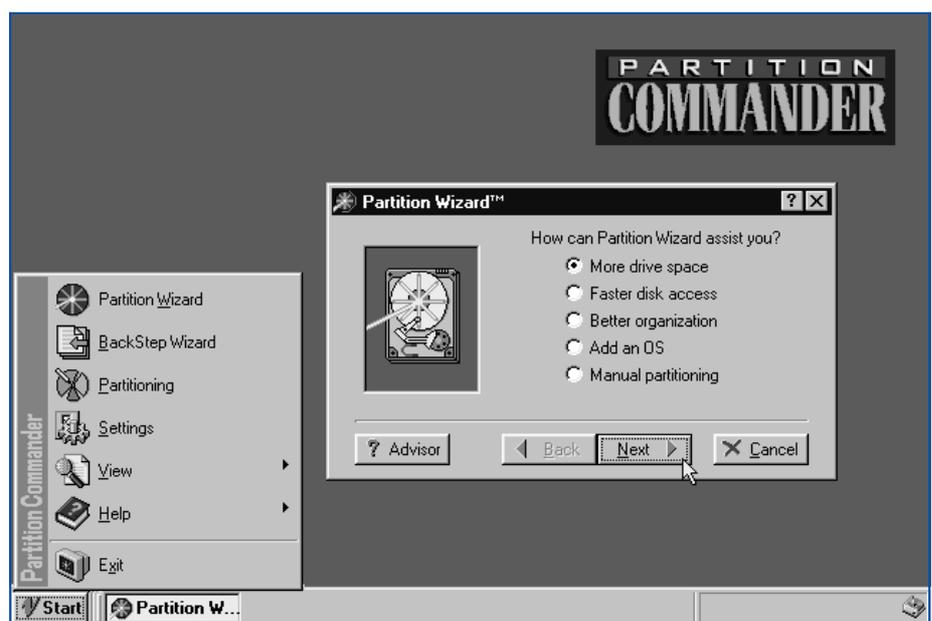
Alternatives

Some other partition managers are also available, some of which are shareware, some commercial - one apparently well thought of but relatively unknown program is BootIt Next Generation (NG) by Terabyte Unlimited - this combines partition management with a multi boot manager. It is only available to purchase online and can be delivered via email or post (on 3½" or 5¼" floppy disks). A 30 day trial version is also available. Symantec have a program called Partition-It which doesn't appear to have been updated for some time as it claims to be designed for Windows 3.1 and Windows 95 - its Select-It boot manager does though support the booting of DOS, Unix, Windows 3.1, Windows 95 and Windows NT. Ranish Partition Manager is a free partition management program which allows low level manual partitioning, it also incorporates an Advanced Boot Manager. Germany-based Paragon Software also has a package called PartitionManager. For links to these programs please see the Web Resources section of this article.

Figure 4 - Partition Commander 6 Partition Wizard.

Update 154:September 2001
Page 6

PC Support *Advisor*
www.pcsupportadvisor.com

File: R1173.4
Review:Software

Partition Commander

Windows 2000 Pro is my current operating system of choice and the first hurdle I came across with Partition Commander 6, from V Communications, was that it is a DOS program which doesn't even provide an interface that runs under Windows (except for the purposes of the first section of the installation). Installation then failed due to the additional hardware security in Windows 2000 (and by default Windows NT) as the installation tries to access the Master Boot Record. To be fair, Partition-Magic 6 doesn't exactly "run" under Windows 2000 (or any other Windows OS) - what you are presented with is a Windows GUI that allows you to set up the required changes, which are then applied as part of the reboot process. Such a useful facility would be welcome within Partition Commander 6, at the very least as a selectable option.

If Windows 2000 or NT are installed on the PC then one of the two ways to run Partition Commander 6 is via the provided boot floppy (or rather a copy of it, just to be on the safe side). If a FAT partition is used on the hard drive then a DOS disk (with appropriate DOS CD-ROM device drivers) can be used instead to boot the PC and install Partition Commander, but it will be necessary to boot to a DOS prompt whenever you want to run the program. I would recommend running the program from a copy of the provided boot floppy if you have Windows 2000 or NT installed. After booting the PC into Windows 95 the installation was easily accomplished. If running the program from a Windows (95/98/Me) GUI the PC will reboot into command-line mode where the main program will be automatically run - what you are first presented with is a partial simulation of the Windows GUI that we have all become familiar with since Windows 95 was introduced, complete with Start button.

The Partition Wizard starts by default on the first run of the program and asks if you require more drive space, faster disk access, better organisation, to add an OS, or require manual partitioning (Figure 4 shows both the Start Menu and the Partition Wizard). Selecting anything other than manual partitioning will then bring up more menus and hand-hold the operator through the relevant process so making the relevant operation very easy.

Many PC technicians will probably prefer a more hands-on approach, so manual partitioning will likely be selected. This brings up a screen displaying a graphical cylindrical representation of the selected hard drive in the PC, colour coded for partition type (see Figure 5). Here you will find pretty much every useful function that is available in PartitionMagic 6, such as converting one file system to another, deleting file systems, display of partition information and so on.

"System Commander 2000, also from V Communications, is Partition Commander 6 with more advanced, fully customisable boot management facilities."
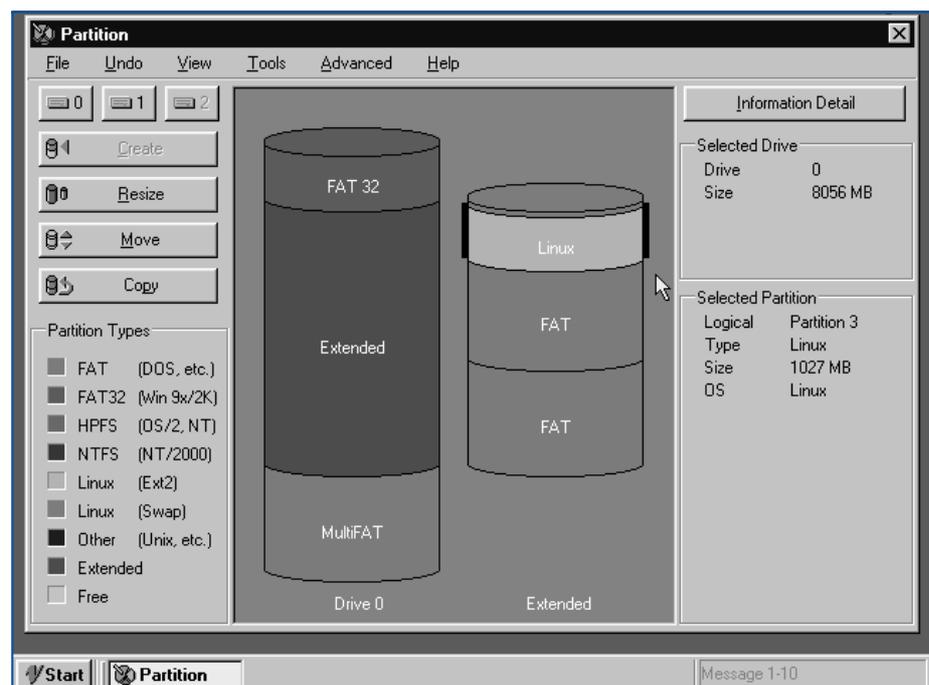
Figure 5 - Partition Commander 6, Manual Partition manipulation.

PC Support *Advisor*
www.pcsupportadvisor.com

Partition Commander 6 has its own boot management program called System Commander Personal Edition (SCPE) which is based on V Communications' System Commander (see below for more details on that package). When installed, SCPE saves a copy of the old MBR (for uninstall purposes) and then installs its own. Assuming that multiple operating systems are installed on the PC, on booting it is then possible to select which one to boot from. A Backstep Wizard is also provided, which allows operations to be undone, however as with PartitionMagic it is not possible to undo certain operations (such as a deleted partition) if for example a new partition has been created or an existing partition copied to the previously occupied area. This backstepping is possible because all manual operations are logged and can also be viewed with this useful facility.

For those who have the relevant knowledge, Partition Commander also provides a raw sector editor that is available by executing the PCIN.EXE program. Finally, Partition Commander 6 will work on servers, unlike PartitionMagic 6 where such functionality is only included if ServerMagic is purchased.

System Commander 2000

In a nutshell, System Commander 2000, also from V Communications, is Partition Commander 6 with more advanced, fully customisable boot management facilities. On installation the program automatically detects which operating systems are installed and presents them to the user for selection on boot up. The MBR is backed up when System Commander 2000 is installed so the system can be restored to its original state if required, plus the OS Wizard is also integrated for easier installation of new operating systems.

If installing from Windows 95/98/Me a TrueDOS prompt is made available for selection from the menu, so even allowing Windows Me users access to the previously unavailable DOS prompt. This article is intended to be about partition managers so I won't delve any further into the boot management features of System Commander 2000, suffice to say that if multiple operating systems are to be installed on a PC (or many PCs) and Partition Commander 6 is already being considered, System Commander 2000 is a worthy alternative.

Choices

In terms of functionality, Partition Commander 6 is on a par with PartitionMagic 6 - some reports indicate that it is more powerful and stable and copes better with some partitions that PartitionMagic 6 chokes on, yet I have also read comments that suggest the complete opposite. I had no problems with either program. If you want a good, solid feature-rich program then it's difficult to choose between the two. Personally I prefer the ease of use of PartitionMagic 6, yet at first glance the in-depth Wizards suggest that Partition Commander 6 is aimed at the novice user. Further delving shows that it has far greater and more technician-oriented depths which equal those provided by PartitionMagic 6 and even surpass it in some areas (such as the Raw Partition Editor, which is certainly not for novices). Its manual interface also encourages more low level editing of the partition settings. Partition Commander 6 is also cheaper than PartitionMagic 6.

If only Partition Commander 6 had the integrated Windows GUI of PartitionMagic 6 and the ability to "run" under Windows (and install under Windows 2000 and NT) then that would be two real plus points. As things are I would find it very difficult to choose between the two and it would be useful to have both available in a PC support environment, especially when it is considered that Partition Commander 6 gives more low level control of some partition management operations.

Resources

FDISK
www.sta.si/~grk/razno/fdisk.tx
www.computerhope.com/
fdiskhlp.htm

MS KnowledgeBase
support.microsoft.com/
support/kb/articles/Q255/8/67.
ASP

Undocumented FDISK
www.jacobsen.sdn.dk/fdisk

FDISK info and batch files
www.robvanderwoude.com/
index.html

FDISK Simulation
www.computerhope.com/
sfdisk1.htm

PartitionMagic
www.powerquest.com

Partition Commander
www.v-com.com

BootIt
www.terabyteunlimited.com/
index.html

Partition-It
www.symantec.com

Ranish Partition Manager
www.users.intercom.com/~ranish/part/

PartitionManager
www.partition-manager.com

PCSA

Copyright ITP, 2001

Update 154:September 2001
Page 8

PC Support *Advisor*
www.pcsupportadvisor.com

File: R1173.6
Review:Software

New Reviews from [Tech Support Alert](http://www.techsupportalert.com)

[Anti-Trojan Software Reviews](http://www.techsupportalert.com)
A detailed review of six of the best anti trojan software programs. Two products were impressive with a clear gap between these and other contenders in their ability to detect and remove dangerous modern trojans.

[Inkjet Printer Cartridge Suppliers](http://www.techsupportalert.com)
Everyone gets inundated by hundreds of ads for inkjet printer cartridges, all claiming to be the cheapest or best. But which vendor do you believe? Our editors decided to put them to the test by anonymously buying printer cartridges and testing them in our office inkjet printers. Many suppliers disappointed but we came up with several web sites that offer good quality cheap inkjet cartridges with impressive customer service.

[Windows Backup Software](http://www.techsupportalert.com)
In this review we looked at 18 different backup software products for home or SOHO use. In the end we could only recommend six though only two were good enough to get our "Editor's Choice" award

[The 46 Best Freeware Programs](http://www.techsupportalert.com)
There are many free utilities that perform as well or better than expensive commercial products. Our Editor Ian Richards picks out his selection of the very best freeware programs and he comes up with some real gems.