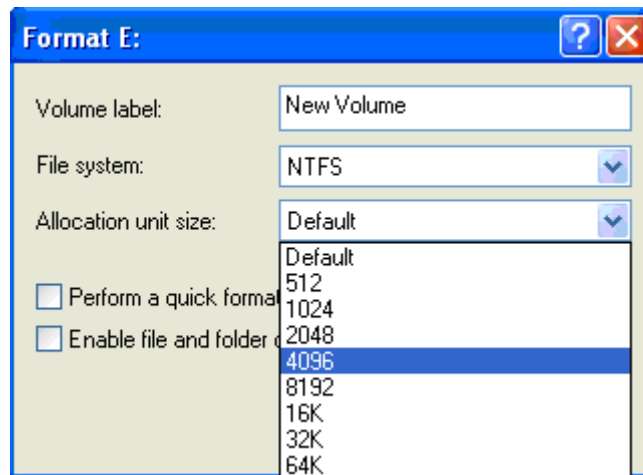


Change cluster size to better manage hard drive space

All file systems that Windows XP uses to organize the hard disk are based on cluster (allocation unit) size, which represents the smallest amount of disk space that can be allocated to hold a file. The smaller the cluster size, the more efficiently your disk stores information.

If you do not specify a cluster size for [formatting](#), Windows XP Disk Management bases the cluster size on the size of the volume. Windows XP uses default values if you format a volume as NTFS by either of the following methods:

- By using the **format command** from the command line without specifying a cluster size.
- By **formatting a volume in Disk Management** without changing the Allocation Unit Size from Default in the Format dialog box.



The following table shows the **default cluster size for NTFS** when Windows XP uses formatting.

Drive size (logical volume)	Cluster size	Sectors
512 MB or less	512 bytes	1
513 MB - 1,024 MB (1 GB)	1,024 bytes (1 KB)	2
1,025 MB - 2,048 MB (2 GB)	2,048 bytes (2 KB)	4
2,049 MB and larger	4,096 bytes (4 KB)	8

The maximum default cluster size under Windows XP is 4 kilobytes (KB) because NTFS file compression is not possible on drives with a larger allocation size. The Format utility never uses clusters that are larger than 4 KB unless you specifically override that

default either by using the **/A:** option for command-line formatting or by specifying a larger cluster size in the **Format** dialog box in Disk Management.

If you use the Convert utility to convert a volume from **FAT** to NTFS, Windows always uses a 512-byte cluster size. FAT structures are aligned on 512-byte boundaries; a larger cluster size does not allow conversion. Note also that in Microsoft Windows NT 4.0 and earlier, when a partition is formatted under Windows Setup, the partition is first formatted as **FAT** and then converted to NTFS. Therefore the cluster size is always 512 bytes when a partition is formatted in Setup. (This information does not apply to Microsoft Windows 2000 Setup or Windows XP Setup, which both format the partition according to your choice of a file system.)

Default cluster size for FAT file system. These sizes apply to any operating system that supports **FAT**:

Drive size (logical volume)	FAT type	Sectors	Cluster size
15 MB or less	12-bit	8	4 KB
16 MB - 127 MB	16-bit	4	2 KB
128 MB - 255 MB	16-bit	8	4 KB
256 MB - 511 MB	16-bit	16	8 KB
512 MB - 1,023 MB	16-bit	32	16 KB
1,024 MB - 2,048 MB	16-bit	64	32 KB
2,048 MB - 4,096 MB	16-bit	128	64 KB
*4,096 MB - 8,192 MB	16-bit	256	128 KB Windows NT 4.0 only
*8,192 MB - 16384 MB	16-bit	512	256 KB Windows NT 4.0 only

To support FAT partitions that are greater than 4 GB using 128- or 256-KB clusters, the drives must use sectors that are greater than 512 bytes.

Note: On very small FAT partitions, a 12-bit FAT is used instead of a 16-bit FAT. The FAT file system supports only 512-byte sectors, so both the sectors per cluster and the cluster size are fixed.

On Volumes, having cluster size more than 4 KB compression is not supported

➤ Why change cluster size?

Cluster is an allocation unit. If you create file 1 byte in size, at least one cluster should be allocated on FAT file system. On NTFS if file is small enough, it can be stored in MFT record itself without using additional clusters. When file grows beyond the cluster boundary, another cluster is allocated. It means that the bigger the cluster size, the more disk space is wasted.

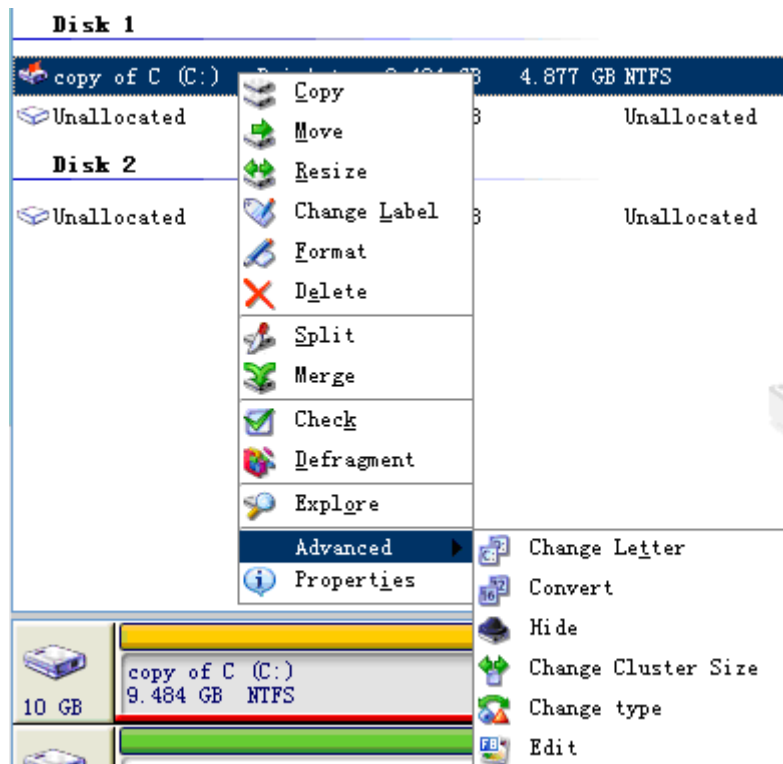
However, when you format the partition manually, you can specify cluster size 512 bytes, 1 KB, 2 KB, 4 KB, 8 KB, 16 KB, 32 KB, 64 KB in the format dialog box or as a parameter to the command line FORMAT utility.

➤ **How to determine proper cluster size?**

The simplest (but rough) way is to divide number of files on the drive by total disk usage in kilobytes. Another idea is to estimate the approximate data size in advance before formatting the hard drive. If you are going to store multimedia stuff that is usually huge in size, make cluster bigger to increase a performance. If you plan to store small web pages or text documents, make cluster size smaller not to lose a lot of disk space. Think!

➤ **How to change cluster size without data losing?**

If you want to change the cluster size of an existing partition, what would you do, by formatting again? No, files would be lost after formatting the partition, then is there a way to change cluster size without data loss or reformatting? The answer is yes. By partitioning software, you can easily complete this job.



Cluster Size

Changing the cluster size on FAT, FAT32 and NTFS partitions. Reducing the cluster size may help you reclaim wasted space on your hard disk.

Cluster Size:	Useful Space (%):	Wasted:	Allowable Partition Size:
512 bytes	100%	0 bytes	4.558 GB - 9.997 GB
1 KB	100%	0 bytes	4.558 GB - 9.997 GB
2 KB	100%	0 bytes	4.558 GB - 9.997 GB
4 KB	100%	0 bytes	4.558 GB - 9.997 GB
8 KB	100%	0 bytes	4.612 GB - 9.997 GB
16 KB	98%	89.01 MB	4.726 GB - 9.997 GB
32 KB	93%	355.9 MB	4.987 GB - 9.997 GB
64 KB	84%	868 MB	5.485 GB - 9.997 GB

Current cluster size: 4 KB New cluster size: 4 KB
Current partition size: 9.484 GB New partition size: 9.484 GB

OK Cancel Help

Note: This software doesn't compatible with Windows 7

Partition Manager

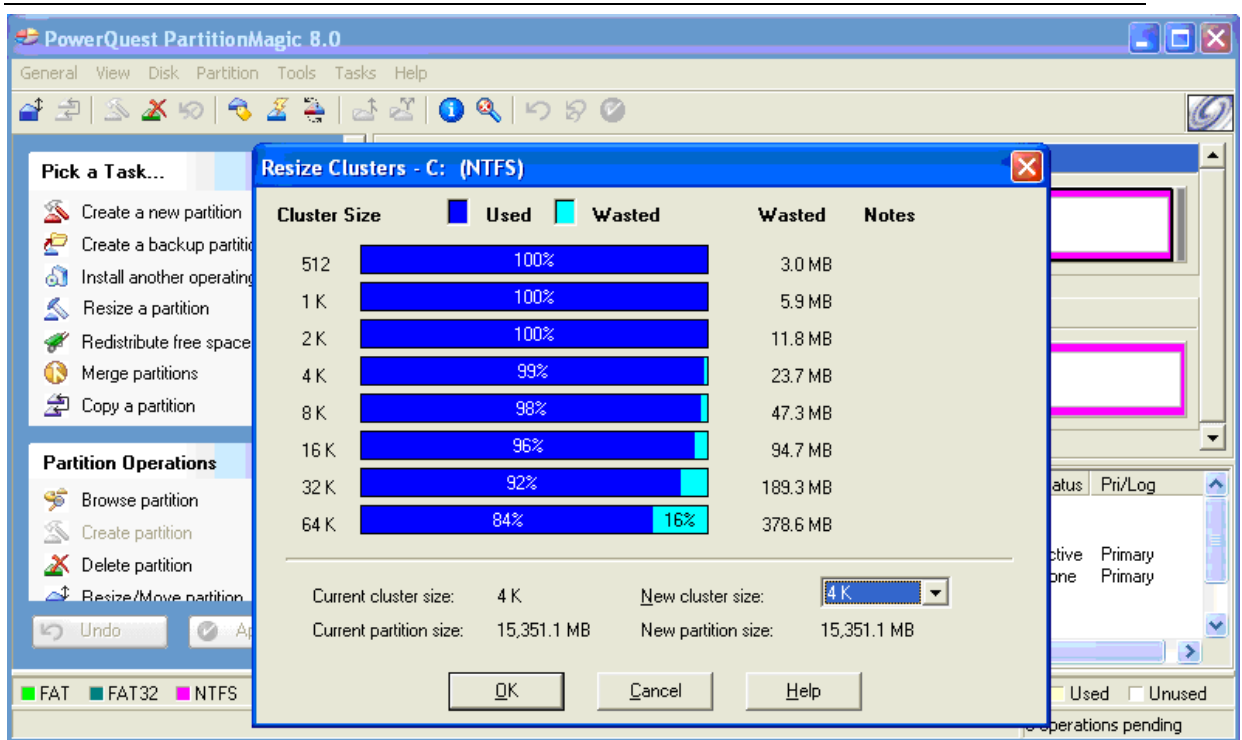
Are you sure you want to change cluster size for partition (C:)?

Current cluster size is 8 sectors, 4 KB (4,096 Bytes).
Smaller clusters may provide more effective usage of disk space.

Please enter new cluster size in sectors: 8

1
2
4
8
16
32
64
128

No



Note: This software doesn't compatible with Windows Vista/Server 2008/ Windows 7 and is no longer for selling.

With this partitioning software, you can easily change cluster size without data losing or reformatting.

About www.hdd-tool.com

www.hdd-tool.com is personal blog website, which specialized in hard disk tools and how to solve hard disk problem, system problem.