

Creating a Backup of System Partitions Using WinHex

The hex editor WinHex is not only a versatile tool to edit binary data or to repair corrupt partitions, you may also use WinHex to backup or clone whole partitions or hard disks - quite easily.

- Start WinHex
- Choose Disk Editor
- Choose Physical Media -> Hard disk a
- Choose Access-Button -> Partition b -> Make Disk Backup...

That's it !!! - You need no calculations of sectors, WinHex will do it. No input of complicated commands is necessary.

1. Preconditions for Backup System Partitions

- There are at least **two** versions of Windows NT, Windows 2000, Windows XP or Windows 98/ME necessary on **different** partitions on the hard disk. The installations may also reside on several hard disks.
- Do **not** create a backup of the **currently running system** -- the result will be inconsistent. Create only backups of inactive system installations, which must reside on partitions, where no write access is possible during the backup.
- The same conditions are valid for the **restoring** of the partition!

2. Properties

- No DOS-Diskette or DOS-Partition necessary.
- The file system of the partition, you want to backup, is uninteresting. The partition is read sector by sector, bypassing the file system. Unknown file systems (like Linux) or corrupted file systems, which are still working, cause no problems. - You receive an exact copy.
- Make sure, that there is no write access to that partition, you want to backup. The best way (with Windows NT/2000/XP): **Remove the drive letter with the Disk Manager**, if possible.
- The Disk Manager of Windows 2000 marks the boot partition (the active partition) as "System", the system partition as "Boot", see in the example below (3.1).
- Temporary directories or a pagefile of the currently running system must not reside on the partition to backup.
- Incompatible boot loader, which modify the partition table, may restrict the direct access to the partitions and should not be used.
- For restoring the partition (the inactive!), you can double click the backup file on the hard disk, CD, ...
- If you create a backup before installing a new or "critical" program, you can "deinstall" it completely: Restore this system partition!

3. Example for Creating a Backup

Example: 37 GB Hard disk, Disk 0:

- Partition 1: primary, 2 GB, NTFS (Windows NT)
- Partition 2: primary, 2 GB, NTFS (Windows NT)
- Partition 3: primary, 2 GB, NTFS (Windows 2000)

- Partition 4: extended

The job is to create a backup of partition 2 (Windows NT).
To do this, start Windows NT, Partition 1 or Windows 2000, Partition 3.
Start WinHex:

1. Choose Disk Editor
2. Choose Physical Media -> Hard disk 0
3. Choose Access-Button -> Partition 2 -> Make Disk Backup...
4. Choose Directory, Filename, Options

That's all.

In detail ? - ok:

3.1. Information

Have a look to your disk configuration and analyze, what you want to do!
Starting the Disk Manager of Windows 2000, you see the following partitions:

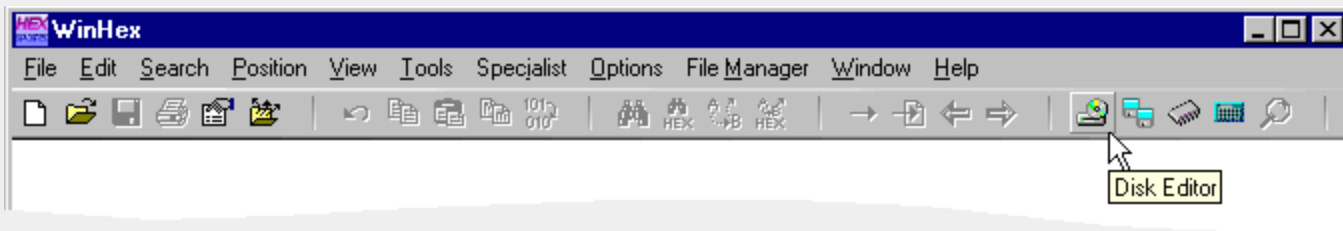
Disk	Partition	Type	Size	Health	Drive Letter
Disk 0 Basic 37,30 GB Online	1	Primary Partition	2,01 GB NTFS	Healthy (Syst)	
	2	Primary Partition	2,01 GB NTFS	Healthy	
	3	Primary Partition	2,01 GB NTFS	Healthy (Boot)	(C:)
	4	Unallocated	1,82 GB	Unallocated	
	5	Primary Partition	10,00 GB NTFS	Healthy	(D:)
Disk 1 Basic 38,33 GB Online	6	Primary Partition	14,00 GB NTFS	Healthy	(G:)
	7	Primary Partition	5,45 GB NTFS	Healthy	(E:)
	8	Primary Partition	20,07 GB NTFS	Healthy	(M:)
Disk 3 Basic 115,03 GB Online	9	Primary Partition	2,61 GB	Healthy	
	10	Primary Partition	2,61 GB	Healthy	
	11	Primary Partition	2,61 GB	Healthy	
	12	Primary Partition	107,19 GB NTFS	Healthy	(K:)
CDRom 0					

Legend: Unallocated Primary Partition Extended Partition Logical Drive

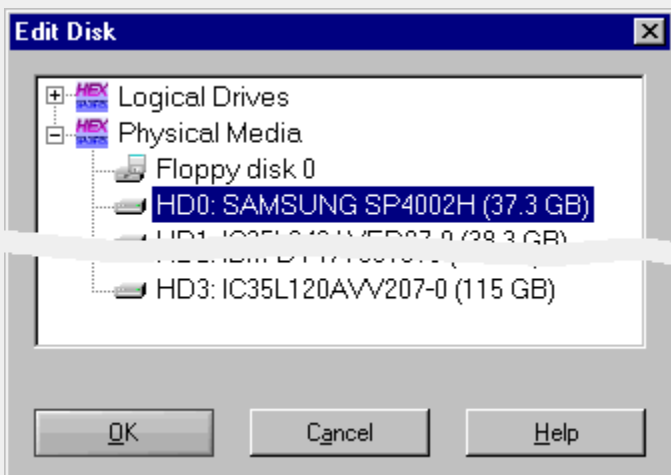
Partition 2 of Disk 0 has no drive letter, is not "mounted".

3.2. Backup

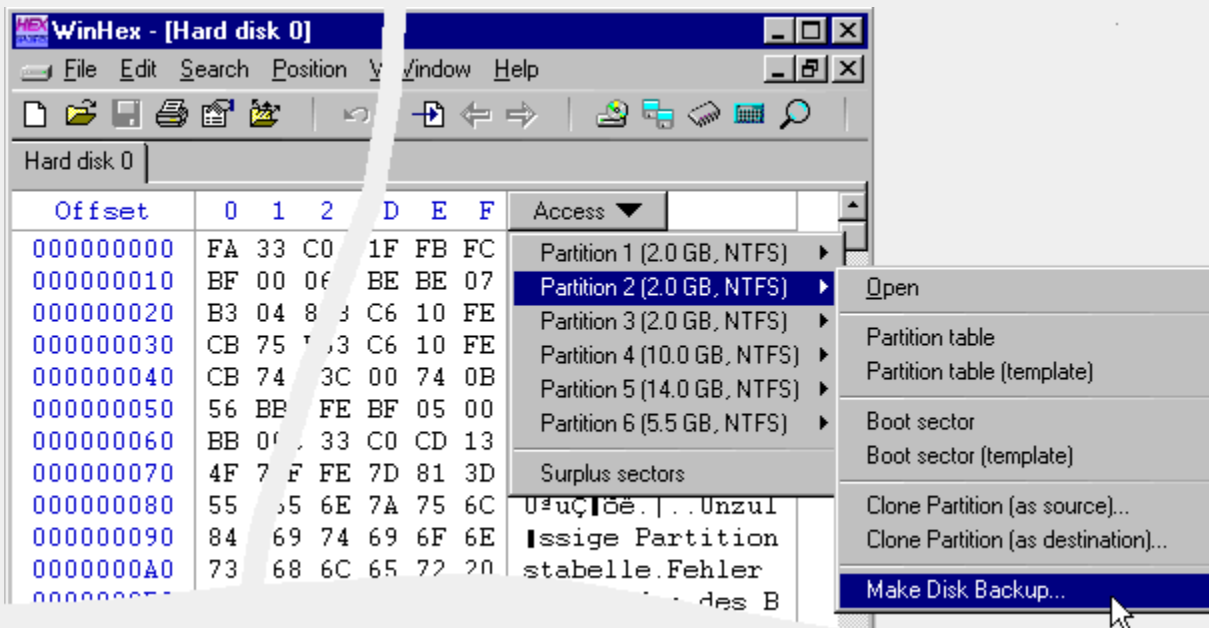
3.2.1. Start WinHex, click on Disk Editor



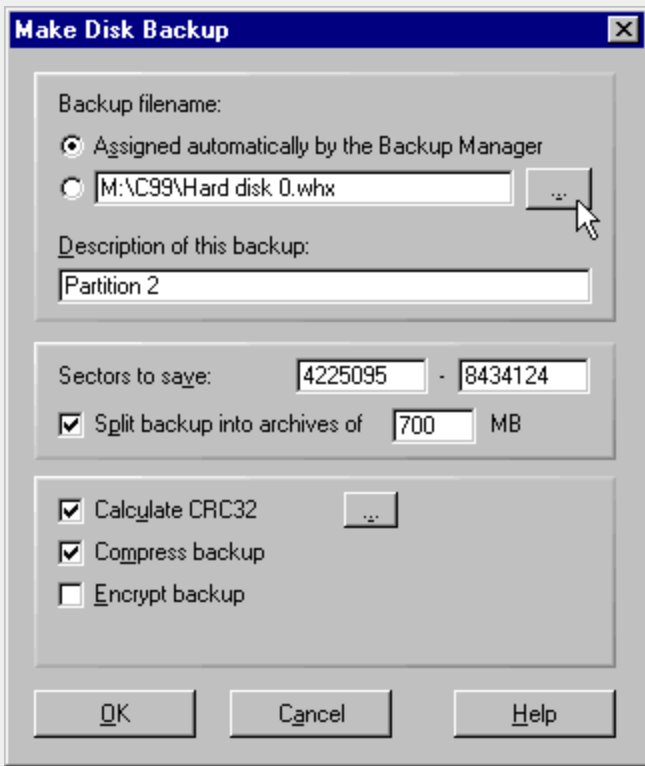
3.2.2. Choose Physical Media -> HD0 -> OK



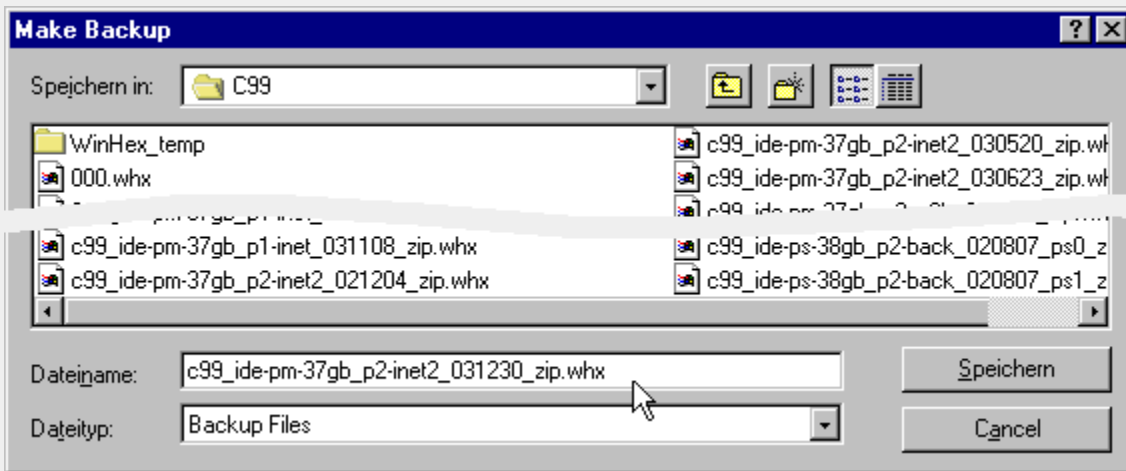
3.2.3. Choose Access -> Partition 2 -> Make Disk Backup...



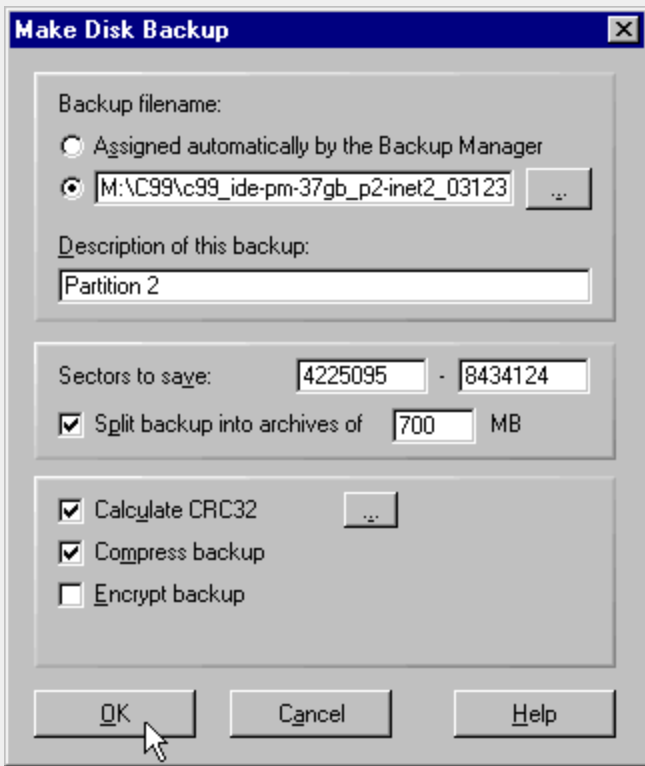
3.2.4. The sector fields are **automatically** filled. Choose directory and file name: Click on the button right beside the file name



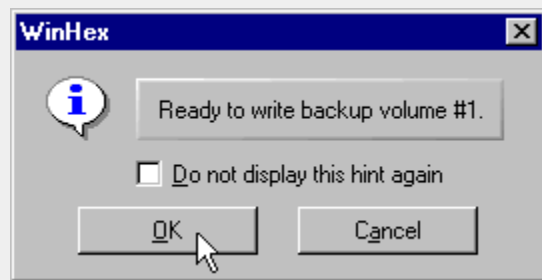
3.2.5. Choose a file name, for example. <Computername>_<Disk>_<Partition>_<Date>_<compressed>.whx:



3.2.6. The "Sectors to save" are automatically added, when you choose the partition (3.2.3.). For burning the backup to a CD later, you should activate "**Split** backup into archives of 650 or 700 MB". With "**Compress** backup", larger partitions may fit to one CD. But compression and decompression need CPU time. Depending on your CPU, the backup will take more time. Recommended: **Calculate CRC32 checksum**.

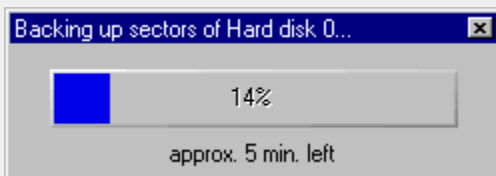


3.2.7. The splitted backups, created with a click on the OK button, are independent from each other and may be restored in any order. Restored in "normal" order, WinHex will ask for the next CD (and will update the "sectors to restore"-fields). The source disk and the source sectors are stored in the backup file(s), so there are no target sectors manually to calculate. In this example, the 2 GB partition was compressed to 499 MB, to one backup file. Compression rates of 2...3 are on an average. If the partition is more empty than filled, you receive higher rates, especially you initialize the free space with 0x00, before starting the backup.



(appears only, when "Split backup..." is activated)

3.2.8. Time for a cup of coffee.



3.2.9. The duration of the backup job is some minutes, it depends on the sustained transfer rate of the hard disk, the size of the partition, and - if compression is activated - the CPU.

In this example, we have a 3½" Hard disk from the year 2002/2003. In the outer sections, the transfer rate is up to 40 MByte/s. Newer disks will have more than 50 MB/s. One of this, disk 3, partition 4 (see 3.1.), was the target for the backup file

Duration of Backups	CRC 32	Split	Compression	Result File	Duration (min:sec)
Disk0, Partition 2 saved (2 GB) Processor: Athlon 1 GHz DMA: 66 MB/s WinHex 11.15	-	-	-	2 GB	2:15
	X	-	-	2 GB	2:44
	X	X	X	499 MB ¹	6:27
Backup saved on the same disk (D:)	X	-	-	2 GB	3:54 ²

¹ will vary. When deleting temporary files, deleting the pagefile (of the inactive partition), empty the recycle bin, and initializing the free space of the partition with 0x00, you will get higher compression rates.

² Use two different hard disks for source and target not only for security reasons (complete disk failure). With one disk, the heads are permanently moved from the reading to the writing position.

[4. Saving Important Sectors of a Hard Disk / Starting other operating systems](#)

[5. Optimizing](#)

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More information: [WinHex Knowledge Base](#)