

# Active@ Partition Recovery

## User Guide

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# Overview

What Happened to my Data?

When partition (volume, drive, etc...) is deleted from a hard drive, two systems are notified:

1. The partition record in the Partition Table (which is a part of MBR) is removed.
2. Space where partition was located is labeled as 'unoccupied'. The data itself is not removed.

In the event of an accidental partition deletion we strongly recommend that you perform the recovery operation as soon as possible. If any new partition is created instead on the same space and some information is written there, there is a chance that the writing process may allocate some data in this 'unoccupied space' thus damaging you data located on the partition deleted previously.

Welcome to Active@ Partition Recovery

Active@ Partition Recovery is a powerful software utility, designed to restore accidentally deleted partitions and partitions being damaged by virus or any other cause. Active@ Partition Recovery can be installed on and run from USB disk or bootable CD/DVD, so that the risk of overwriting your data is minimized.

Active@ Partition Recovery will help you to restore partitions residing on hard drives formatted in any of the following file systems:

- Microsoft NTFS / NTFS5 / NTFS+EFS
- Microsoft FAT12 / FAT16 / FAT32 / exFAT
- Apple HFS+
- Linux Ext2 / Ext3 / Ext4 & BtrFS
- Unix UFS

It works under all Windows family operating systems:

- Windows XP
- Windows Vista
- Windows Server 2003, 2008, 2008 R2, 2012
- Windows 7 & 8
- Windows PE (embedded Windows recovery environment loaded from CD-ROM or USB disk)

Active@ Partition Recovery supports:

- IDE, SATA, SSD, SCSI hard drives, External USBs, Floppy and USB Flash Media, Memory Cards
- Large-sized drives (more than 2 TB)
- Detection and recovery of deleted or damaged partitions
- Saving scan results to the storage and opening them later on
- Deleted partitions filtering
- Correcting BOOT.INI if needed to keep the system bootable
- Fixing damaged MBR and Deleting invalid partitions
- Automatic and Manual correction of Volume Boot Sectors
- Disk Image creation for further data recovery purposes
- Integration with a Disk Viewer/Editor - to be able to inspect raw disk/partition/file data

### New in version 11

- Added "LastChance" recovery method for detecting and restoring files by their signatures
- Files detected by signatures can be renamed and organized in folders before recovery occurs
- Added Linux BtrFS file system recovery
- Added option of recovery only volume's files and folders, in addition to sector-by-sector copy
- New Ultimate package now includes Linux-based bootable Active@ LiveCD, being able to boot all the latest x86 & x64 UEFI secure boot systems

### New in version 10

- Added 64-bit executable to perform faster on x64 platforms
- Improved scanning and recovery algorithms
- Open Disk Image (including third party disk images) and recover all files and folders to another disk

### New in version 9.0

- New Look and Feel: light color scheme by default
- Copy all data at once from damaged disk to another physical disk (USB, HDD, MemoryCard...)
- Improved integrated Disk Editor (HexViewer), including Linux & Unix iNode & SuperBlock templates
- Fixed minor bugs and improved scanning and recovery algorithms

### New in version 8.0

- Support for recovery from FreeBSD UNIX UFS and Linux Ext4fs file systems
- Added an integrated Disk Editor (HEX Viewer) component being able to inspect disks and files on a low level (raw sectors)
- Flexible application style: can be changed from Dark to Light color schemas
- Convenient 'Go Back' and 'Go Up' navigation buttons and key combinations added
- Improvements in recovery kernel: faster scans, more files and partitions can be detected...

The free evaluation version can scan drives, detect deleted partitions and inspect files and folders there, however to recover them you need to purchase a registration key.

# Using QuickScan to detect partitions just deleted

QuickScan searches for partitions being just deleted. Before you can recover partition, you must scan unallocated space to detect the drive being deleted.

There are two methods for scanning: QuickScan and SuperScan.



QuickScan is a fast and basic scan. Partitions that have just been deleted most likely will be detected using this method (if no other partition has been created in unallocated space).



SuperScan is a much slower and thorough scan. It processes the whole hard drive surface detecting all possible deleted data. After running QuickScan, if you haven't found proper partition, try SuperScan.

To run QuickScan, open Active@ Partition Recovery and do one of the following:

- Just click QuickScan toolbar button. It will scan ALL unallocated areas on ALL hard disk drives (and removable devices).
- In the Local System Devices list, select the Unallocated Space under the particular Hard Disk Drive or USB Disk and click QuickScan toolbar button or right-click the Unallocated Space and select QuickScan from the context menu.

Disk scanning starts. To stop the scanning process for any reason, click Cancel button.

You can tell the state of your partitions by the color of the icons:



Grey icon shows an existing partition

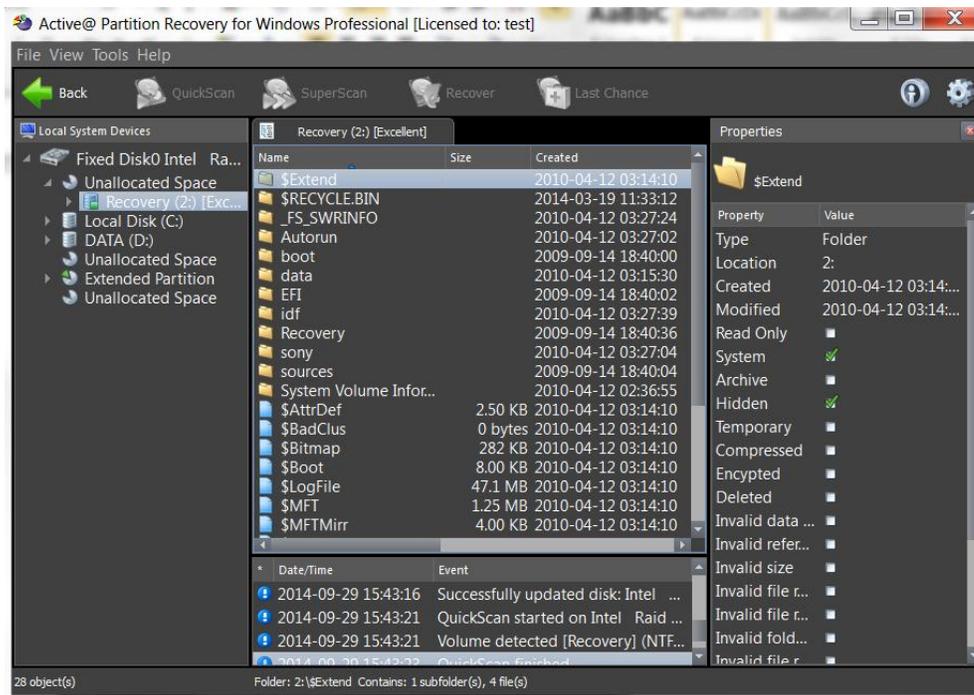


Grey icon with Green box shows a deleted partition that can be recovered



Grey icon with Red box shows a deleted partition that can be recovered, however this partition might have been formatted before deletion or has some other damage.

After you complete the drive scan, to locate your deleted partitions, just look under Unallocated Space nodes. If new partitions having blue and lime icons  appear there - inspect them (click on icon) and verify their content browsing the files and folders.



You can inspect the content of the file by selecting the file and clicking Preview toolbar button, or executing Preview command from the context menu, or by pressing Alt + P key combination.

If you satisfied with results, proceed with a partition recovery (click Recover toolbar button).

## Using SuperScan to analyze deleted and severely damaged volumes

Use SuperScan when trying to recover a partition or logical drive that you know has been deleted or damaged and cannot be detected by QuickScan.

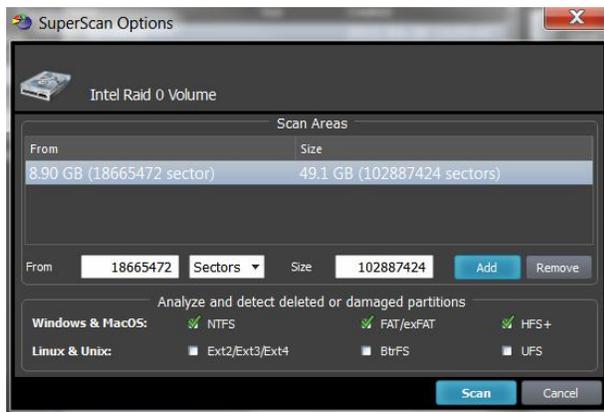
Another reason to use SuperScan is when the volume has been quick-formatted, or disk's surface has been heavily overwritten by other data, so you are not able to find your deleted data using QuickScan.

SuperScan processes the whole surface of the physical device searching for all possible logical drives and partitions, whether they are live, damaged or deleted. If a partition cannot be found, SuperScan keeps searching. SuperScan reads each disk sector and looks for not only the boot sector, but also tries to reconstruct the drive structure, based on residual clues to the drive's system structures that remain on the disk surface. This is a very slow process and it usually gives much more results than QuickScan.

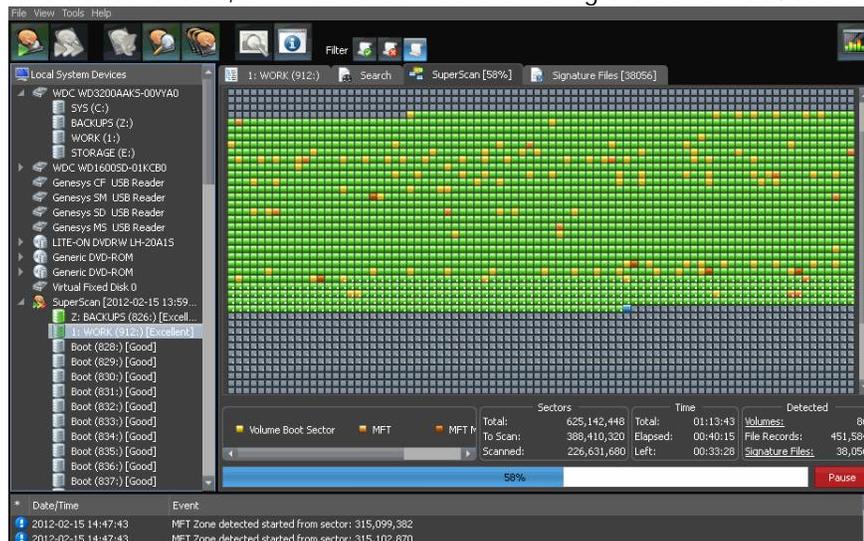
To run SuperScan:

1. In the Local System Devices list, select a physical device, or a volume that contains your data. It may be a Fixed Disk, USB external or Removable Disk, Memory Card, and even Floppy Disk.
2. To open the SuperScan Options dialog box, do one of the following:

- In the toolbar, click SuperScan 
- Right-click the physical device node and choose SuperScan from the context menu
- Execute SuperScan command from Tools menu



3. Fields From and Size contain currently selected object's geometry in sectors. You can switch geometry display to other units (Bytes, MB and GB) using drop down combo box. If you click Scan now - this area will be scanned by default
4. To select disk's area manually, type the starting sector number in the From field and the number of sectors in the Size field. If you need several areas to be scanned, define area parameters and click Add button, then type other area parameters and click Add again
5. In the Analyze and detect deleted or damaged partitions area, select the check boxes next to the partition types that you want to look for. Clear the check boxes next to the partitions that you do not want to look for. If you select all partition types, the scanning takes a longer time, however you may find more recoverable partitions
6. Click Scan or press Enter to start SuperScan process
7. The statistics and progress bar appear underneath the scanning area. To stop the SuperScan at any time, click Pause red button at bottom, or choose Pause SuperScan from the context menu. If SuperScan has been paused, you may resume it by clicking Resume button at bottom or by choosing Resume SuperScan from the context menu. If you have saved paused SuperScan results, its state being saved as well, so you can resume SuperScan later on, after loading SuperScan results - even after re-boot, or on another machine having the same HDD/USB disk attached



8. For each SuperScan process a new virtual folder named SuperScan [YYYY-MM-DD HH:MM:SS] has been added to the Local System Devices list. The contents of this folder displayed in the tree (left panel) as well as in the Volumes tab (right panel). You may treat SuperScan virtual folder and its contents the same way that you treat other device nodes in the list.

## Inspecting SuperScan results

SuperScan can be a long process. You can check the estimated run time displayed on the status panel at bottom of the Scanning Area. You can wait until SuperScan finishes, or you can inspect and manage found partitions (volumes) "on-the-fly":

- Click the volume in the tree (left panel) to highlight the volume position in the Scanning Area (right panel)
- Right-click the volume and choose Properties from the context menu - to check volume integrity and attributes being detected
- Double-click the volume, or choose QuickScan from the context menu - to scan the volume, browse its folders, view files and so on
- You can preview files from the found volume while SuperScan is still in progress

You can inspect the content of the file by selecting the file and clicking Preview toolbar button, or executing Preview command from the context menu, or by pressing Alt + P key combination.

### Important

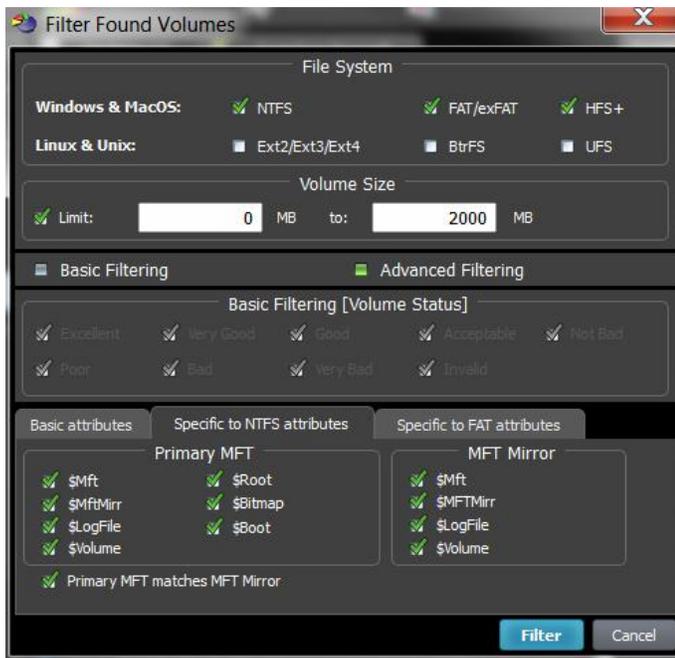
After you complete a SuperScan, you may find hundreds of partitions. Volumes having different locations and size, may have been created and then deleted at different times on the device being scanned. If you have virtual VMware workstation profiles (from VMware, Inc.) or VirtualPC profiles (from Microsoft Corp.), these files also contain partition information. Moreover, if remaining system areas of damaged disk structures not enough to define all necessary partition parameters, SuperScan uses complex algorithms to project the most probable parameters and instead of one partition could create 10-20 partitions having different sizes, offsets, cluster size and so on. This does not mean that SuperScan creates a lot of garbage. This means that among these projected partitions most likely will be the one you've lost, and most likely you'll be able to find and recover your data. So, if you cannot find your data on the volumes having Excellent or Good recovery status, it is still recommended that you wait until SuperScan finishes and then inspect all found volumes once again.

## Filtering SuperScan results

To reduce the amount of work, you may use a filter so that you are working with a smaller set of data. After the SuperScan, all detected volumes are displayed. When you change the settings in the filter dialog box, you can display only selected types of volumes.

To filter SuperScan results:

1. After running SuperScan, select the virtual folder with the name SuperScan [date time stamp]
2. Right-click the node. From the context menu choose Filter... The Filter Found Volumes dialog box appears



3. To select the types of file systems to display, in the File Systems area, clear the check box beside the types that you do not want to display. Only the selected types of file systems data will be displayed
4. To display only those partitions within a specified size limit, in the Volume Size area, indicate the minimum and maximum sized partitions in Megabytes (MB). Only those partitions within the specified range will be displayed
5. To use basic filtering parameters, click Basic Filtering. To select displayed partitions based on partition status, in the Basic Filtering [Volume Status] area, clear the check box next to each partition status number that you do not want to display. Only the selected status ratings will be displayed
6. To use advanced filtering parameters, click Advanced Filtering and use the bottom section:
  - o To restrict displayed results for found boot sector's attributes (file system-independent), in the Basic Attributes area, select the check box beside all the types of data that you want to display
  - o To restrict displayed results for NTFS-specific parameters, in the Specific to NTFS attributes area, select the check box beside all the types of data that you want to display
  - o To restrict displayed results for FAT-specific parameters, in the Specific to FAT attributes area, select the check box beside all the types of data that you want to display
7. Click Filter to set up a filter for all volumes found by SuperScan

## Storing and loading SuperScan results

Depending on the size of the drive that you are scanning, it can take a long time to scan partitions. On large or damaged drives, it can take hours. If you have to exit Active@ Partition Recovery for any reason, it would take a long time to scan the partition again. So that you don't lose the information that you have scanned, you may save the SuperScan results to a file. When you open Active@ Partition Recovery, opening the saved results file takes much less time.

If you decide to stop the SuperScan process, it is easy to continue scanning from the point that you stopped. After SuperScan has stopped, you may save the SuperScan virtual folder results, exit and re-start the application, open SuperScan results and resume SuperScan from the last point. To continue scanning, select the SuperScan virtual folder and click Resume button on the right of the progress bar.

## To save SuperScan results

1. In the Local System Devices list, select the SuperScan virtual folder and do one of the following:
  - o Right-click the device node. From the context menu click Save Scan Results...
  - o From the File menu, choose Save Scan Results...
2. In the Save Scan Results dialog box, type a path or browse to a folder where the scan results file is to be stored
3. Click Save

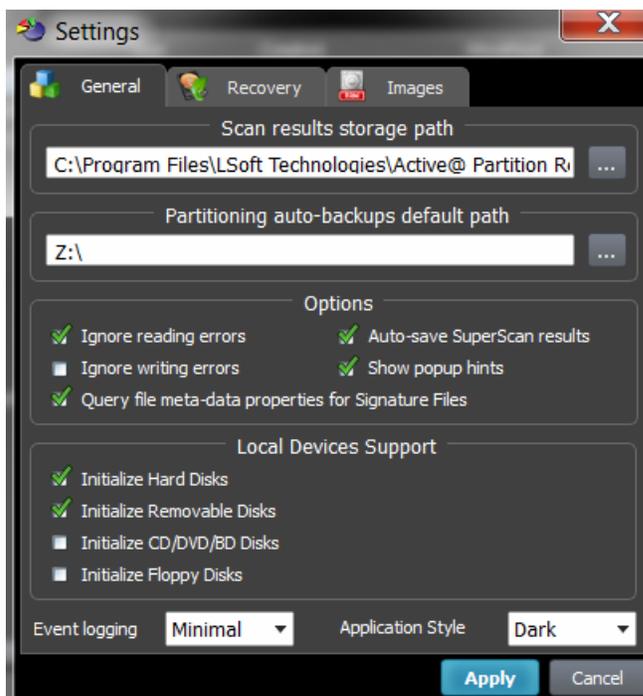
## To open SuperScan results

1. From the File menu click Open Scan Results...
2. In the Open Scan Results dialog box, browse to the file where you saved the scan results file
3. Click Open
4. In the Matched Devices dialog box confirm the device name (HDD/USB name) to apply SuperScan results for.

 Note: Several devices might have the same name, for example, similar disks usually used in RAID arrays. In this case the order they appear in Matched Devices dialog matches the order devices appear in Local System Devices list. You may inspect your disks in Local System Devices list to know for sure which device to choose.

### Important

SuperScan results can be saved automatically. You can configure this option and storage path in General tab of product Settings.



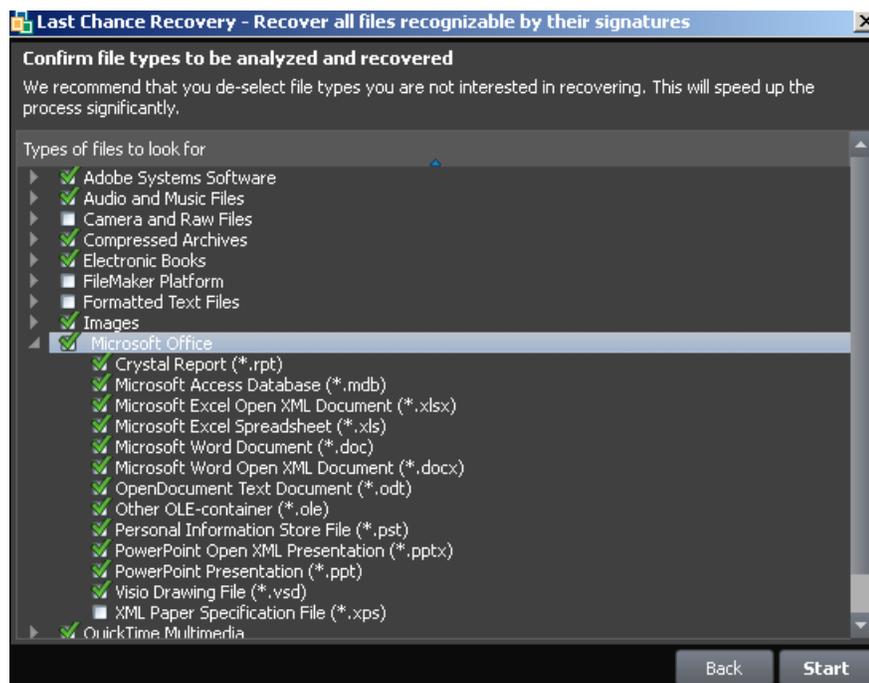
# Using LastChance - recovery by file signatures

This recovery method is helpful when primary recovery methods (QuickScan and SuperScan) haven't detected deleted or damaged partitions you are looking for. Advanced LastChance recovery method allows to detect and to recover files by their specific signatures on severely damaged volumes. Supported 117 standard file signatures, including Music, Photos, Camera Raw Images, eBooks, Office Documents and more. LastChance recovery is the only option when partition recovery was unsuccessful due to serious damage to the partitions data. Built-in file Organizer allows to rename and to organize files (detected by signatures) in a proper directories structure.

This recovery method tries to detect all un-fragmented files based on their standard signatures. In most cases we will be able to detect and properly recover the contents of lost files. However we won't be able to detect the file system attributes (eg. original filename, creation date, modification date etc). Detected and recovered files will be grouped by file extension only, and will have abstract file names. The File Organizing feature will help you to group your files into folders based on extended file attributes (available for some file types). For example, songs may be grouped by artist and or album, and photo images may be grouped by camera and the date the photo was taken.

## To use LastChance recovery method:

1. Launch an Active@ Partition Recovery and click LastChance toolbar button, or click LastChance from Tools menu
2. Select the disks you wish to analyze, or de-select disks you are not interested in, and click Next
3. Confirm file signatures to be analyzed and de-select file types you are not interested in recovering (this will speed up the process significantly)



4. Click Start button and wait until the scan process completes

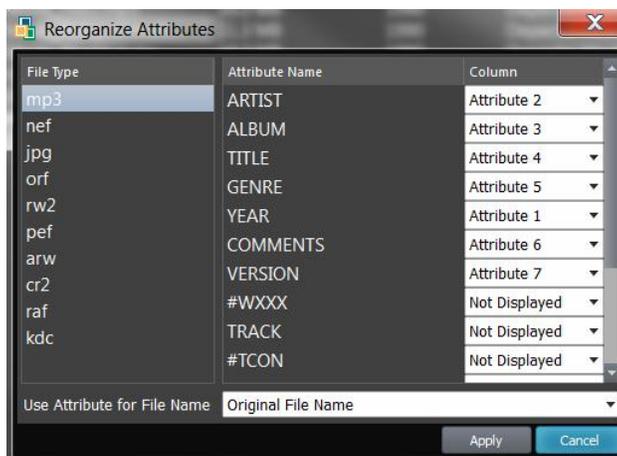
- Review found by signatures files, Preview file content to make sure files are recoverable and it's what you need
- If needed, re-organize found files in folders by specific attributes using File Organizer
- Select file groups or particular files to be recovered and click Recover toolbar button to recover them all at once

## To organize and recover files detected by signatures:

- Select SuperScan node in the tree view on the left and Signature Files tab in the list view on the right
- Expand general groups (Music, Documents) and specific sub-types (MP3, XLS,...) to inspect what is detected:

Name	Size	Count	Attr #1	Attr #2	Attr #3	Attr #4	Attr #5
<b>Music &amp; Audio Files</b>	<b>1.97 GB</b>	<b>309</b>					
<b>mp3</b>	<b>1.97 GB</b>	<b>309</b>	<b>ARTIST</b>	<b>ALBUM</b>	<b>TITLE</b>	<b>VERSION</b>	<b>YEAR</b>
- _c6e658e4e56dc01-db5__Conte...	1.04 MB		nt-Length- 1...	nge- bytes 2...	- _c6e658e4...		2101
Waiting In Walthamstow.mp3	9.90 MB		The Cranber...	Roses	Waiting In ...	3	2012
Tomorrow.mp3	9.03 MB		The Cranber...	Roses	Tomorrow	3	2012
So Good.mp3	8.94 MB		The Cranber...	Roses	So Good	3	2012
Show Me.mp3	7.89 MB		The Cranber...	Roses	Show Me	3	2012
Schizophrenic Playboy.mp3	8.41 MB		The Cranber...	Roses	Schizophren...	3	2012
Roses.mp3	8.47 MB		The Cranber...	Roses	Roses	3	2012
Raining In My Heart.mp3	7.94 MB		The Cranber...	Roses	Raining In ...	3	2012
Losing My Mind.mp3	8.41 MB		The Cranber...	Roses	Losing My ...	3	2012
Fire & Soul.mp3	10.4 MB		The Cranber...	Roses	Fire & Soul	3	2012
Conduct.mp3	11.9 MB		The Cranber...	Roses	Conduct	3	2012
Astral Projection.mp3	10.9 MB		The Cranber...	Roses	Astral Proje...	3	2012
You.mp3	8.18 MB		The Pretty R...	Light Me Up	You	3	2010
Since You're Gone.mp3	6.23 MB		The Pretty R...	Light Me Up	Since You're ...	3	2010
Nothing Left To Love.mp3	9.66 MB		The Pretty R...	Light Me Up	Nothing Lef...	2	2010

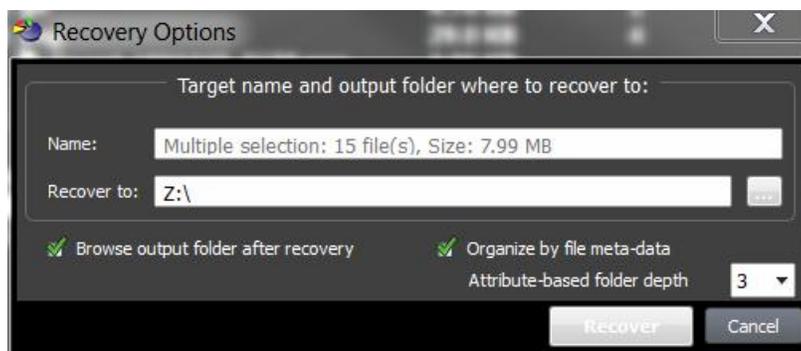
- If file detected by signatures has some extended attributes, like AUTHOR, CREATED, TITLE, etc., these attributes will be displayed on the right. By default the only 5 first detected file attributes being displayed. To display more attributes, use Show Attributes drop down list
- By default files are not sorted and displayed in the order of detection. To group files by attributes, click the column you want to sort on. If Subsequent Column Sorting option is turned ON, files are grouped & sorted on all columns followed the column you clicked. This could be convenient, for example, if you want to group music by Artist and then by Album
- If you want to hide some attributes or change display order, click Organizer button on the toolbar to open Signature Files Organizer. Dialog appears and you can change the attribute for the particular file type (MP3, XLS, ...) to be displayed in the particular column on the screen. For example, default column order for music is Artist, Album, Title, Genre, Year,... To group MP3 first by Year, then by Artist, then by Album, change column order this way:



... and you will see:

Name	Size	Count	Attr #1	Attr #2	Attr #3	Attr #4
Music and Videos	42.8 MB	5				
mp3	42.8 MB	5	YEAR	ARTIST	ALBUM	TITLE
Depeche Mode_Halo.mp3	10.3 MB		1990	Depeche Mode	Violator	Halo
Depeche Mode_Policy of truth...	11.3 MB		1990	Depeche Mode	Violator	Policy of truth
Depeche Mode_World in my ...	10.2 MB		1990	Depeche Mode	Violator	World in my ...
Depeche mode_Never Let Me ...	10.0 MB		2006	Depeche Mode	The Best of D...	Never Let Me...
Found_21611_1062920.mp3	1.01 MB		2008	Dido	Safe Trip Home	Look No Furt...

- To recover files detected by Signatures, select the particular file or group of files, or even all signature files and click Recover button. On Recovery Options dialog use Organize by file meta-data option to group files in folders based on attributes (meta-data):



- Use Attribute-based folder depth parameter to organize recovered files in a specified number of sub-folders. For example, for the MP3 files default columns are Artist, Album, Title and default folder depth is 2. When you recover MP3s using default parameters, your music files will be organized first by Artist, then by Album, so all album songs will be in one folder. If you reorganize columns display like in example above (Year, Artist, Album,...) and specify folder depth 3, after recovery you'll have music grouped in folders first by Year, then by Artist, then by Album.

# Restoring a Deleted or Corrupted Partition detected by QuickScan or SuperScan

There are two basic approaches for restoring all volume data:

1. Physical recovery of the boot sector and partition table (in-place recovery)
2. Copy all data to a new safe location (to another attached or external physical disk)

First option (in-place recovery) works best when the partition/volume was just deleted, or the data and the file system on deleted/re-created/re-formatted partition have not been severely damaged (overwritten). In this case the recovery process is very fast, and you'll be able to access your files using Windows Explorer (or any other program) immediately after recovery. However, if some data overwriting occurred, or damage to the file system took place, Windows might not recognize the recovered volume (a drive with an assigned letter does not appear), or you may get messages like "Drive is not accessible". In this case you should try the second option: copy all existing data from the corrupted volume to a new physical disk.

There are other scenarios when you do not want to recover your data in-place. You just want to restore all live (non-deleted) volume data (files and folders) to another media in a single operation. Possible scenarios when this is applicable:

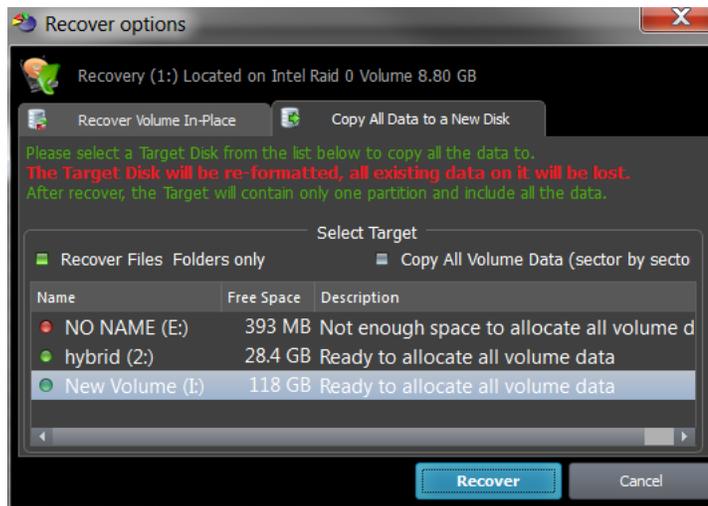
- USB Flash or Camera Memory Card is damaged or formatted
- Hard Disk has some physical damage (unreadable or bad sectors)
- Volume boot sector is damaged by virus or power surge and volume becomes unreadable
- Partition or volume has been formatted accidentally
- RAID Disk Array crashed and needs to be re-built

## Copying All Volume Data to another Location

This approach is the safest way to get all your data backed up to a new safe place (storage), however this is also the slowest way. You keep your original damaged disk (all data on it remain untouched), and just copy all your valuable information to a dedicated attached HDD/SDD, external USB Disk or USB Flash Card. The copy process itself could take a long time, especially in cases where you have terabytes of data (videos or photo archives).

To Copy All Volume Data to a New Disk:

1. In Active@ Partition Recovery, use QuickScan or SuperScan to detect a deleted or damaged partition, verify its content, and select the partition node
2. To open the Recovery Options dialog box, use one of the following methods:
  - Click Recover on the toolbar
  - Right-click the volume, and then choose Recover from the context menu
  - Execute Recover command from Tools menu
  - Press Ctrl+R key combination
3. Make sure Copy All Data to a New Disk tab is active:



4. Select a recovery method:

- Recover Files & Folders only – copies all safe files and folders from the partition being recovered to a new target disk. Original data structure (location of files and directories in folder's tree) and file's attributes (creation date, read-only flag, etc..) have been duplicated as well. Advantage of this method is that copied files are guaranteed to be readable (accessible) on a new target. Disadvantage is that system areas, meta-data and deleted data are not copied, so future data recovery of damaged file system is not possible on a new target.
- Copy All Volume Data (sector by sector copy) – copies all occupied sectors on the volume as it is specified in file system's allocation bitmap. This means than all system areas (like MFT records, or FAT tables) have been duplicated as well, and along with safe files and folders you can recover files being marked as deleted as well, so future data recovery is possible even from the new disk (target). This can be considered as a significant advantage. Disadvantage is that if some system areas (for example MFT, or boot sector) on the found partition are damaged, target disk will have exactly the same damaged data, and when accessing the new volume, or files on it, you can get error messages, like "access denied".

5. Select a designated disk (having enough storage space) to copy all of your data to (target). A list box displays all available disks in the system, excluding physical disks where the currently running operating system is installed. You can plug-in more disks (or remove some of them them) and the software should detect and display them here immediately. Make sure you select a proper target disk, as before the data copying occurs it will be formatted (all existing data, if any, will be lost).

6. Click Recover and wait while all volume data is copied to the new destination

After completion Windows Explorer should be launched and you can access and inspect your data at the new location.

◆ Important

Copy All Data to a New Disk command re-formats the target disk, destroying all data on it, before all data being copied to. Be careful and select a proper target disk, which doesn't contain anything important!

## Restoring a deleted/damaged volume in-place

This approach is the fastest way to return your volume "back to life" in the place where it resided originally. However this could be a dangerous and non-guaranteed method. Recovery of partition information, volume boot sector and partition table usually takes only a couple seconds. However, you need to be absolutely sure that you recover a proper volume, and recovery is successful only when file system itself has not been damaged previously.

This way works best when you just deleted a volume, realized the problem, and immediately started the recovery process. In this case not many data overwrite operations occurred within the Windows environment, so most of your data structures would not have been damaged.

In case if you formatted the disk and installed a new OS, or copied some files to a newly formatted partition, you may still try this approach. However, chances that some critical file system data structures have not been damaged are low, and most likely Windows would not be able to access a logical disk after recovery and you will see something like: "Volume is not accessible or damaged" and "Do you want to format the volume?", and you'll need to delete this invalid partition and try another approach.

To evaluate your chances for successful physical recovery (in-place recovery), take a look at the icon besides the found volume. You can distinguish deleted partitions from existing ones by the icons:

 Grey icon shows an existing partition or drive visible in Windows Explorer

 Green icon shows live drive in SuperScan results (having a letter assigned)

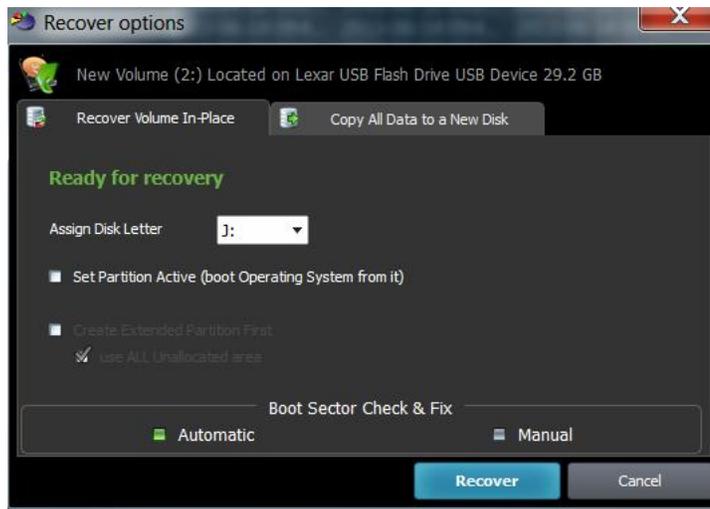
 Grey icon with green mark shows a deleted partition with an excellent integrity status. This means the chances for successful in-place recovery are good

 Grey icon with brown mark shows a deleted partition with an acceptable integrity status. This means that there is some chance for successful in-place recovery

 Grey icon with red mark shows a deleted partition with Poor integrity status. However this partition might have been formatted before deletion or has some other damage, so there are minimal chances of successful volume recovery in-place

To restore a deleted partition:

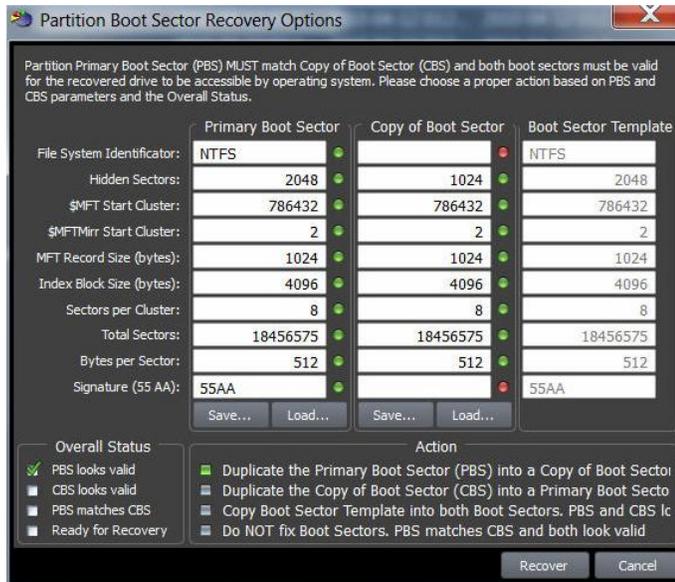
1. In Active@ Partition Recovery, use QuickScan or SuperScan to detect deleted partition, verify its content and select the deleted partition node.
2. To open the Recovery Options dialog box, use one of the following methods:
  - o Click Recover on the toolbar 
  - o Right-click the file, and then choose Recover from the context menu
  - o Execute Recover command from Tools menu
  - o Press Ctrl+R key combination
3. Make sure Recover Volume in-Place tab is active:



4. To assign a partition to be recovered non-default disk letter, you may choose one of available letters from the drop-down box
5. To mark a partition to be recovered as an Active , you may check the related check box. Be careful! If you mark as an Active a partition that does not have system files on it for the booting process - your computer might not boot properly. So mark it as an Active only when you sure 100% percent that partition being recovered had an Active status before deletion
6. In some cases partition being recovered seems to be not a Primary type, but the Logical Disk in the Extended partition. In this case Create Extended Partition First options will be available, if no Extended partition exists on the disk. Keep it turned on if you want to create Extended partition container first, then to place your recovered partition inside. If option use ALL Unallocated area is turned off - Extended partition (container) will have the same size as partition being recovered, otherwise Extended partition (container) would occupy all unallocated space on the disk
7. You have an option to execute either Automatic or Manual recovery to check and fix the Volume Boot Sector. If you are not familiar with disk low-level structures, use Automatic mode. If you know a lot about sectors, clusters, FAT, MFT, etc.. you can choose Manual mode to check the parameters manually and to select the most appropriate action
8. Click Recover

After the recovery process is complete, a confirmation message pops up. Make sure that the results are correct by verifying the contents of the recovered partition in the Windows Explorer. Recovered partition should appear there after you refresh its content.

## Manual mode for Volume Boot Sector Recovery



If you've chosen Manual mode for the Boot Sector Check & Fix, dialog like above appears.

You can:

- Verify the parameters of the Primary and Copy of Boot Sector located on the disk. Parameters that look like invalid are marked with a red mark. Boot Sector Template column is formed programmatically and contains the most appropriate parameters for the partition found
- Save to the file raw Primary Boot Sector or Copy of Boot Sector to be able to analyze these raw values in Hex Editor or third party software, or restore them back if recovery is unsuccessful
- Load from the file raw Primary Boot Sector or Copy of Boot Sector to restore them back after unsuccessful recovery
- See the Overall Status of Partition Boot Sectors (their validity and match)
- Choose an Action to execute for the Boot Sectors while partition recovery:
  1. Duplicate Primary Boot Sector into a Copy of Boot Sector - if you are sure that Primary Boot Sector is valid, but Copy is not
  2. Duplicate Copy of Boot Sector into a Primary Boot Sector - if you are sure that Copy of Boot Sector is valid, but Primary is not
  3. Copy Boot Sector Template into both Boot Sectors - if both Primary and Copy of Boot Sector look invalid
  4. Do NOT fix Boot Sectors - if both Boot Sectors look valid and match each other and the Boot Sector Template values.

In the example above, even you are not a specialist - you can notice that Copy of Boot Sector contains some garbage (i.e. damaged), the red marks appear next to the fields, so the most appropriate action is to Duplicate Primary Boot Sector into a Copy of Boot Sector.

#### ◆ Important

Recover Deleted Partition command for the hardware device has been automatically logged to the partitioning backup file, and you can always rollback you changes later on.

 Note

Recover Deleted Partition function is available in commercial (purchased) version only.

# Rollback, Backup and Restore Disk Partitioning Info

Disk Partitioning Information is an MBR, Partition Table and Volume Boot Sectors for each existing partition on the disk.

You might ask, "Why should I backup Partitioning Info?"

Here is the answer: If you something goes wrong while attempting to recover the partition (for example you recovered wrong partition), you will be able to restore original partitioning structure for the drive being repaired.

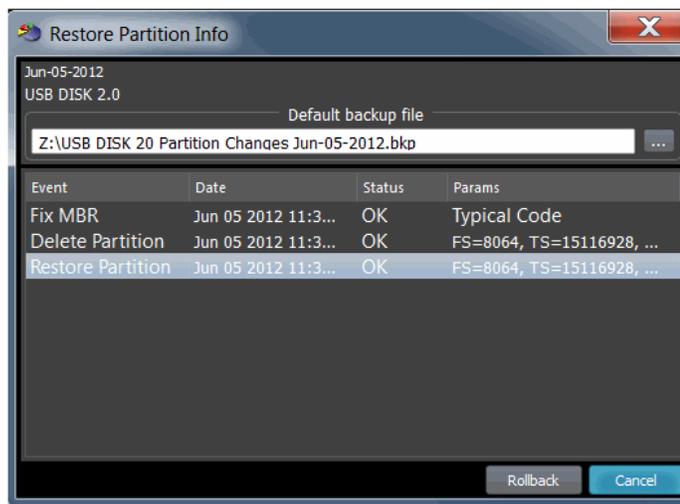
## Automatic Partitioning Backups

When you are trying to resolve your partitioning problem, you usually execute such commands of Active@ Partition Recovery as Fix MBR, Fix Boot Sector, Delete Invalid Partition and Recover partition. Every command execution has been automatically logged the partitioning backup file. If something goes wrong (you recovered not a proper partition, you accidentally removed a valid partition...) you always have a chance to rollback your last changes to the system.

Backups are stored for each physical device at the location Partitioning auto-backups default path in Settings.

To rollback partitioning changes:

1. Start Active@ Partition Recovery and select a physical device that you want to rollback changes for
2. From Tools menu click Rollback Partition Changes... command
3. Select a backup file, or confirm the backup file default location
4. Select a restore point to rollback to. If you executed several commands, these commands listed from top to bottom, and you can select a particular place to revert to
5. Click Rollback
6. Rollback process starts, you can check the results in log



◆ Important

To be able to rollback partitioning to the any particular restore point, we recommend you to use the only standard functions of Active@ Partition Recovery, and avoid using other tools, like Windows Disk Manager (to remove partitions, initialize disk, etc..)

To backup Disk Partitioning Info:

1. Start Active@ Partition Recovery and select a physical device (HDD, USB, MemoryCard...) that you want to create a backup for
2. From Tools menu click Backup Partitioning Info... command
3. Select a file name and location where to store backup
4. Click Save

To restore Disk Partitioning Info from the backup:

1. Start Active@ Partition Recovery and select a physical device that you want to restore backup for
2. From Tools menu click Restore Partitioning Info... command
3. Select a backup file
4. Click Open
5. Restoration process starts, you can check the results in log

◆ Important

Existing disk partitioning structure will be overwritten on the disk where you restore Disk Partitioning Info backup file to.

# Fix Damaged MBR and Delete Invalid Partition

## Fixing MBR

If partition table looks OK for the disk you are recovering (you see all volumes in the Explorer Tree), but your computer still does not boot from this disk, it is possible that Master Boot Record (MBR) is damaged by virus or overwritten. You can try to use Fix MBR command to replace existing MBR with the one from the set of templates (the typical one).

To fix damaged Master Boot Record (MBR):

1. Select the disk in you want to fix MBR for (place cursor on it)
2. In the main window, from the Tools menu, choose Fix MBR (Create Typical MBR)
3. In confirmation dialog make sure that a proper disk is selected for MBR fixing
4. Click Yes to confirm the command and wait while list of disks is being refreshed

## Deleting Invalid Partition

If you know for sure that partition on the disk is NOT valid (damaged, or created by mistake instead of deleted one, or recovered not properly) you can delete the existing partition first and then try to search for partitions being deleted previously.

This is also the only option when you found deleted partition using QuickScan or SuperScan, and you know for sure that it is valid, but you are unable to recover it due to overlapping with others existing partitions. You are to detect the invalid partition first, delete it and then to recover the only partition you are interested in.

To Delete Invalid Partition:

1. Verify that existing partition you want to delete is actually invalid partition (Windows Explorer is not displaying it properly, or unable to access it and suggests to format it, or displays a garbage instead of your files)
2. Select the partition to be deleted (place cursor on it)
3. In the main window, from the Tools menu, choose Delete Invalid Partition
4. In confirmation dialog make sure that a proper partition is selected for deletion
5. Click Yes to confirm the command and wait while list of disks is being refreshed

### Note

You can delete the only existing partition (Primary or Extended) and you cannot delete the System partition (Active one or having Windows installed) . If you need to delete the Extended partition, make sure that it is empty (no logical drives left in it). If logical drives exist in Extended partition, you are to delete them first, then to delete Extended partition itself.

### Important

Fix MBR and Delete Invalid Partition commands for the hardware device has been automatically logged to the partitioning backup file, and you can always rollback you changes later on.

 Note

Fix MBR function is available in commercial (purchased) version only.

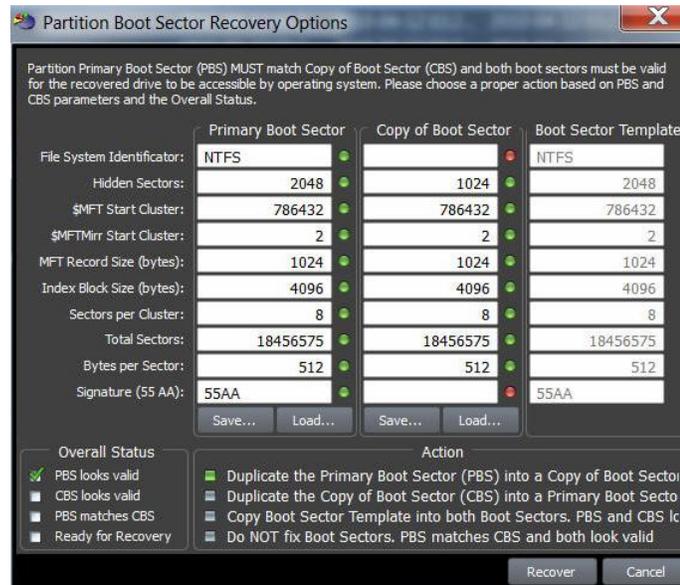
# Fix Damaged Partition Boot Sector

## Fixing Partition Boot Sector

If partition looks OK for the disk you are recovering (you see all volumes in the Explorer Tree), but Windows still does not recognize a volume, or says "Volume is inaccessible" , it is possible that Partition Boot Sector (or Copy of Boot Sector) is damaged by virus or overwritten. You can try to use Fix Boot Sector command to replace Primary Boot Sector with its Copy (or backward), or both of them from the set of templates (typical boot sector). The idea is the same as for the Manual Partition Recovery Mode.

To fix damaged Partition Boot Sector:

1. Select the volume (logical disk) you want to fix Boot Sector for (place cursor on it)
2. In the main window, from the Tools menu, choose Fix Boot Sector... or execute the same command from the context menu
3. In the dialog compare boot sector values, change them if needed, and select an action to execute
4. Click Recover to confirm the command and wait while list of disks is being refreshed



### Important

Fix Boot Sector command for the hardware device has been automatically logged to the partitioning backup file, and you can always rollback you changes later on.

### Note

Fix Boot Sector function is available in commercial (purchased) version only.

# Create a Disk Image

A Disk Image is a mirror copy of your entire logical drive or physical device stored as set of files. It may be a good idea to create a Disk Image for a drive, if you have enough space on another drive.

You might ask, "Why should I create a Disk Image on a drive that holds my data?"

Here is the answer: If you do something wrong while attempting to recover the partition, you will be able to recover all files and folders from the Disk Image that you have wisely created using Active@ Partition Recovery or other tools like [Active@ File Recovery](#).

Disk Image (Active@ Image format) consists of configuration file (with an extension .DIM) and set of file chunks having extensions .000, .001, .002 ... By default Active@ Partition Recovery tries to create one file (chunk) for the whole volume/device, however, in case if target location is FAT, it may not be possible due to file system limitations. In this particular case disk image split to several chunks and each file has a size of 2Gb. Chunks content can be RAW or RAW-Compressed, depending on settings.

To create a Disk Image:

1. Start Active@ Partition Recovery and select a drive or physical device that you want to create an image for.
2. To open the Create Disk Image dialog box, do one of the following:
  - o Select the Disk or Volume in Local System Devices list and choose Create Image from the File menu or press Ctrl+I key combination
  - o Right-click the selected item, and choose Create Image on the context menu
3. In the Save In drop-down list, select another physical device or to another logical drive
4. Browse to the folder where you want to save the Disk Image
5. To give the Disk Image file a different name, type one in the File Name field
6. Click Save

Watch the progress and wait while drive's contents are copied to the new location. You may cancel the process of image creation anytime by clicking Stop.

## Important

You must always create a Disk Image on a drive other than the source drive. Do not try to save a Disk Image of a drive onto itself.

# Open and Work with a Disk Image

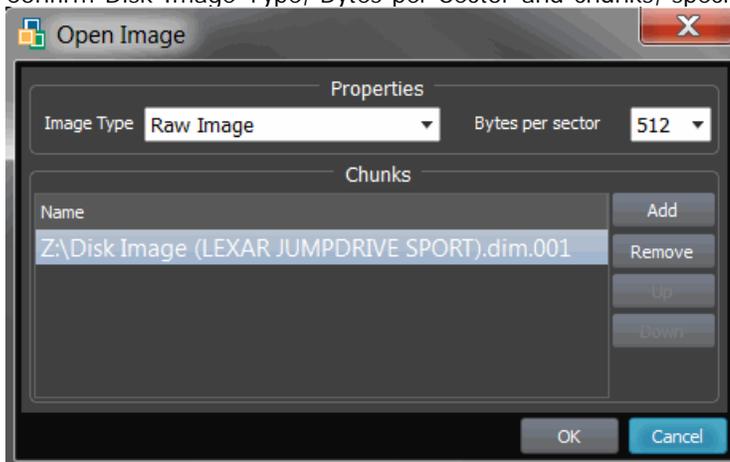
A Disk Image is a mirror copy of your entire [logical drive](#) or [physical device](#) stored as file or set of files. If you have enough space on another drive, it may be a good idea to create a Disk Image for a drive containing deleted files that you want to recover.

Active@ Partition Recovery can open:

- RAW and RAW-Compressed disk images (Active@ Image format: \*.DIM)
- RAW disk images created by third party software (WinHex, etc...)
- Disk Images (RAW format) composed from several chunks
- VMWARE (\*.vmdk) and VirtualPC (\*.vhd) Disk Images

To open a Disk Image:

1. Start Active@ Partition Recovery.
2. To invoke the Open Image dialog, do one of the following:
  - Press Ctrl+O key combination
  - In the File menu, choose Open Image...
3. Use drop-down listbox at bottom to specify disk image type: Active@ Image, Any RAW image, VMWare or VirtualPC disk image
4. Locate and select disk image file you want to open. Click Open
5. Confirm Disk Image Type, Bytes per Sector and chunks, specified in configuration file:



6. If there are no configuration file, you can add chunks and change their order manually, using buttons at the right side
7. Click OK to complete configuration and read disk image structures.

The opened disk image appears in the Local System Devices list.

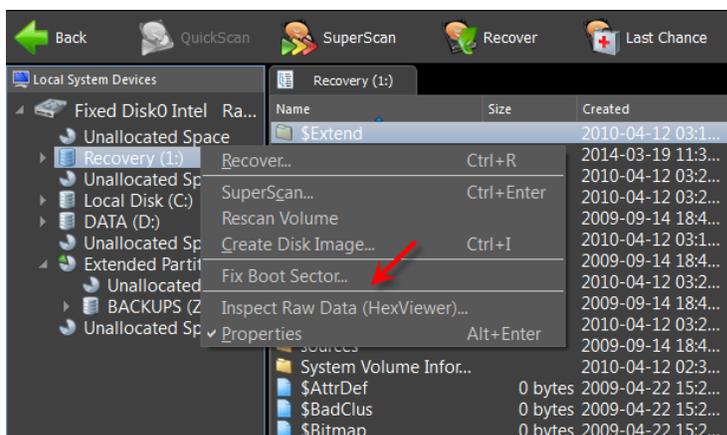
You may treat the opened Disk Image node and its content the same way that you treat other device nodes in the list. You may follow the same steps to perform SuperScan to detect deleted and damaged volumes, to Scan the volume, and then to Recover all files and folders to another location.

## Note

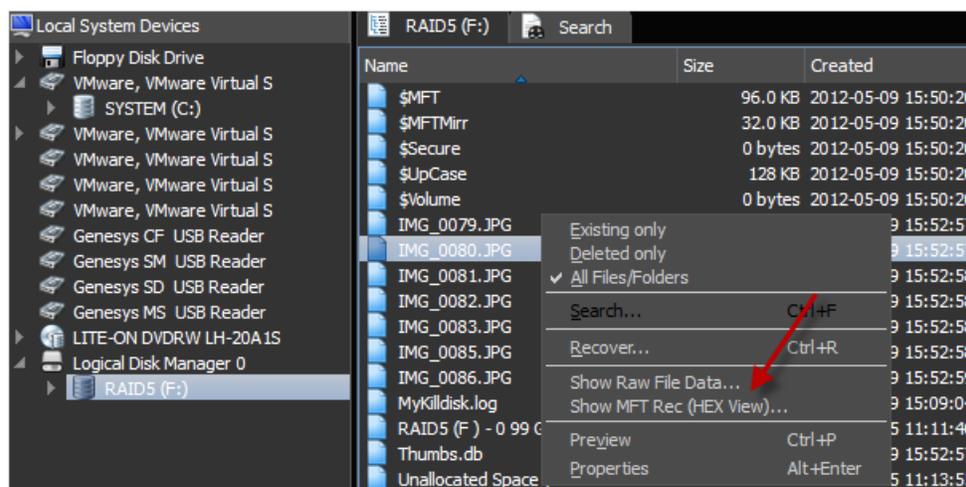
If you've created raw disk image using other third-party utilities (like copying sectors from WinHex) you are still able to open it! Just choose Any Raw Image disk image type in the Open File standard dialog and you will see all files on the disk. Select the required one.

# Inspect file headers and disk data (raw sectors) with integrated Disk Editor (Hex Viewer)

Advanced users and IT professionals may require inspecting raw disk structures before actual recovery occurs - to evaluate damage to the data and recovery chances. For these purposes Disk Editor (Hex Viewer) supplied as a separate application and is accessible from recovery panel. Launch it from the context menu for the object to be inspected (hard disk, volume, file data):



For NTFS volumes MFT records inspection is available, Disk Editor is launched and MFT record template is applied for binary data automatically:



## Active@ Disk Editor basics

Active@ Disk Editor uses a simple, low-level disk viewer which displays information in binary and text modes at the same time. You can use this view to analyze the contents of data storage structure elements such as:

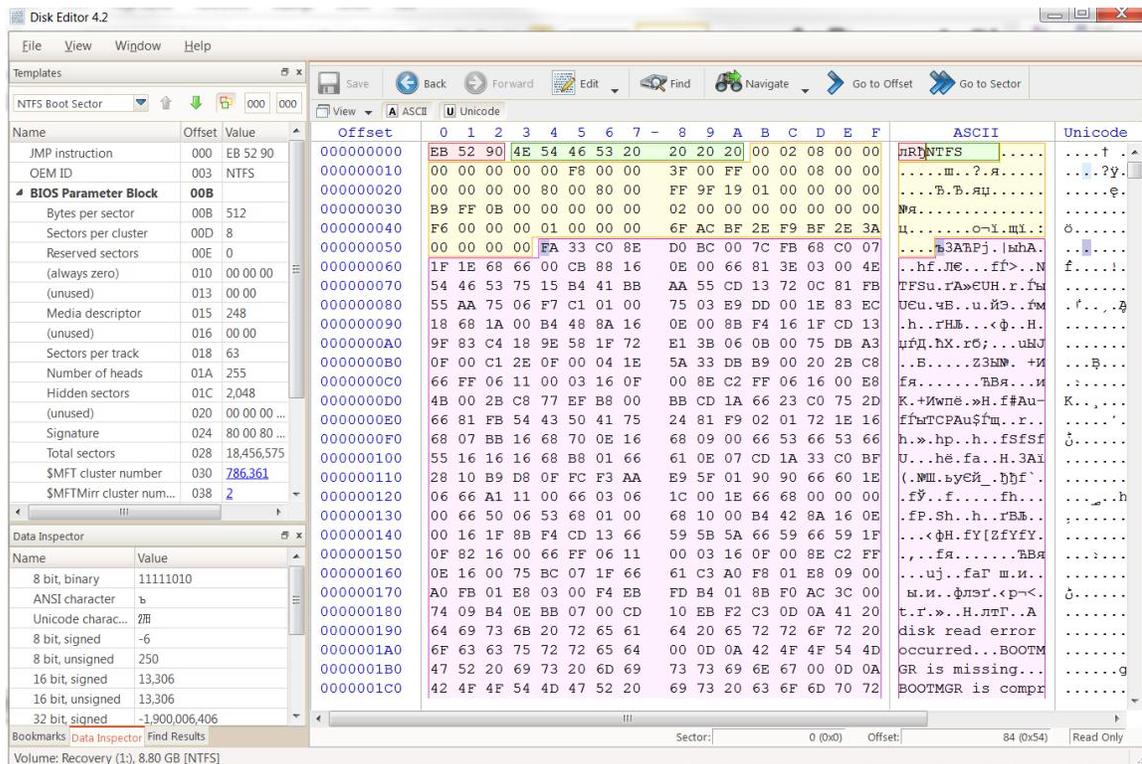
- Hard disk drives
- SSD & USB Disks
- Partitions & Volumes

- Files

Download the installation package and get full manual at: [www.disk-editor.org](http://www.disk-editor.org)

## The Main Features:

- Enhanced template view
- Detailed MFT record information
- Side-by-side Compare and Edit
- Fields coloring with data in tooltips
- Extensive exFAT support
- Fast navigation points
- Filling selection with a pattern
- Unicode support
- Quick Disk Info
- Bookmarks
- Data Inspector



# Recovery Tips

**DO NOT WRITE ANYTHING ONTO THE DRIVE CONTAINING YOUR IMPORTANT DATA THAT YOU HAVE JUST DELETED ACCIDENTALLY!**

In the event of an accidental partition deletion we strongly recommend that you perform the recovery operation as soon as possible. If any new partition is created instead on the same space and some information is written there, there is a chance that the writing process may allocate some data in this 'unoccupied space' thus damaging you data located on the partition deleted previously.

**BACKUP MBR AND PARTITION BOOT SECTORS BEFORE RECOVERY STARTS**

It will allow you to revert HDD back to the state it was before you started the recovery process in case if anything goes wrong, let's say you accidentally recover not a valid partition.

**CREATE DISK IMAGE IF YOU HAVE EXTRA HARD DRIVE, OR OTHER LOGICAL DRIVES ARE BIG ENOUGH!**

Disk Image is a mirror of your logical drive that is stored in one file. This can be useful when you want to backup the contents of the whole drive, and restore it or work with it later. Before you start recovering partitions, it may be a good idea to create a Disk Image for this drive, if you have enough space at another drive. Why? Because if you do something wrong while recovering, you still will be able to recover files and folders from the Disk Image that you have wisely created.

# Troubleshooting

The following scenarios are provided from help service offered to actual customers.

What problem are you having?

[I got Partition overlaps with other partition\(s\) error message while recovering. What does it mean and what can I do?](#)

Reason:

It means that the disk's space for the partition you are trying to recover is occupied by another existing partition(s). It also means that you are either trying to recover an improper partition, or, if you are 100% sure that it is your lost partition - the existing partition located underneath the Hard Drive device is invalid (for example, you deleted original partition and re-created a new one instead).

Actions:

1. Verify that the partition you are trying to recover is an original one and actually contains your data. If so, proceed to the step 2.
2. Verify that the existing partition(s) that overlaps with the one you are trying to recover is invalid. If so, you need to delete the existing invalid partition(s) using either the Computer Management console, or execute Delete Invalid Partition command from Tools menu.
3. Find and try to recover your original partition once again.

 Note:

Selecting, File -> Save Scan Results can save time and avoid having to re-scan the hard drive.

[I got No space in the partition table error message while recovering. What does it mean and what can I do?](#)

Reason:

It means that partition table is full and there is no space there to insert a recovered one. Standard partition table can contain only 4 partitions including one extended.

Actions:

1. Verify that partition you are trying to recover is an original one and actually contains your data. If so, proceed to the step 2.
2. Verify existing partition(s). Find out invalid one or not needed ones and delete them using either Computer Management panel, or execute Delete Invalid Partition command form Tools.
3. Find and try to recover your original partition once again.

[I got Unable to recover partition because detected file system is invalid! error message while recovering. What does it mean?](#)

It means that file system on the partition being recovered is not supported (i.e. Linux Ext2fs, etc...) or file

system itself is invalid. Partition Recovery is unable to recover such partitions.

[I got Partition is recovered however not possible to verify and refresh volumes warning. What does it mean?](#)

Reason:

It means that partition has been is written back to the partition table, but we are unable to verify the results. Windows does not let the software to refresh volumes.

It could also mean that drive letter cannot be assigned for some reason.

Action:

Try to reboot the machine and verify the results.

[I got Unable to recover the extended partition because another one already exists error. What does it mean?](#)

Reason:

It means that you are trying to restore Extended partition and another partition of type Extended already exists on the disk. Only one extended partition is allowed to reside on the disk.

Actions:

1. Verify that partition you are trying to recover is an original one and actually contains your data. If so, proceed to the step 2.
2. Verify existing Extended partition. If it is invalid or contains invalid drives, you can delete it using either Computer Management panel, or execute Delete Invalid Partition command form Tools menu.
3. Find and try to recover your original partition once again.

[I recovered the deleted partition, however Windows is unable to access it. Message Drive X: is inaccessible. Do you want to format it? appears. What does it mean and what should I do?](#)

Reason:

It means that underlying file system is damaged on the partition being restored. In spite the fact that partition recovery software corrected MBR, Partition Table and Boot Sectors - something else within file system is damaged (or overwritten) on the recovered drive, for example - MFT records on NTFS, Root or FAT areas on FAT. As long as disk integrity test is not passed, Windows displays such a message.

It could happen in case if you've recovered not a proper partition or in case if file system is actually damaged.

Actions:

1. Verify that partition you are trying to recover is an original one and actually contains your data. If several partitions has been detected - make sure that you have selected the proper one. If you realized that you've recovered not a proper one - delete it in Computer Management panel and try the recovery process once again. To delete not a properly recovered partition you can also execute Delete Invalid Partition command form Tools menu. You can also use [SuperScan](#) method to scan the whole disk's surface and detect all possible partition information. Then to filter

out the garbage and look for the proper partition in the list. If something else that looks like a valid data is found - delete not a properly recovered partition and try to recover the valid one.

2. In case if you 100% sure that you've recovered your partition and Windows is still unable to access it, the only option to save your data is to copy files and folders from the damaged partition to the another safe location. You can upgrade to and use Active@ File Recovery software to do it as well as any third party software. Active@ Partition Recovery Enterprise also contains Active@ File Recovery utility in its package. Before proceeding to the step 3, we strongly recommend you either to recover particular files and folders using any file recovery software, or Create Disk Image for the disk being recovered (to be able to recover files and folders later on from the raw disk image).
3. As a last chance is to execute Check Disk Windows command hoping that the Windows itself could repair damaged file system structures. Open Windows Explorer, go to Disk Properties, switch to Tools tab, and execute Check Now... command. We strongly recommend you to recover particular files and folders first, or create backup image for the disk being checked (to be able to recover files and folders from the image later on) before Check Disk starts. It often happens that Check Disk fixes file system structures, however part or all the user's data (files and folders) are lost. Recovered disk might look like just formatted.

# Frequently Asked Questions (FAQ)

[Does Active@ Partition Recovery work under Windows 2000 / XP / Vista?](#)

Yes, it does.

[Does Active@ Partition Recovery work under Windows 3.x](#)

No. Support of 16-bit operation systems like Windows 3.1 is not implemented.

[What is a Disk Image? Why is it needed?](#)

Disk Image is a mirror of your logical drive that is stored in one file. This can be useful when you want to backup the contents of the whole drive, and restore it or work with it later. Before you start recovering the deleted files, it may be a good idea to create a Disk Image for this drive, if you have enough space at another drive. Why? Because if you do something wrong while recovering the files (for example, recovering them onto the same drive could destroy their contents), you still will be able to recover these deleted files and folders from the Disk Image that you have wisely created.

# Glossary of Terms

## boot record

- See boot sector.

## boot sector

- The boot sector continues the process of loading the operating system into computer memory. It can be either the MBR (see MBR, below) or the partition boot sector (see partition boot sector, below).

## cluster

- A group of disk sectors that contain file data. It is the smallest allocation unit for storing a file. For example, if the file size is 100 bytes and the cluster size is 4096 bytes, the file system reserves one cluster, or 4096 bytes for file data.

## device node

- In the Local System Devices list, a physical device containing logical drives. The first physical device is named 80h.

## FAT

- File Allocation Table. An area that contains the records of every other file data and directory in a FAT-formatted hard disk drive. The operating system needs this information to access the files and define the data cluster's chain. There are FAT32, FAT16 and FAT versions.

## file

- A collection of data with a file name and file attributes, like size.. Almost all information stored in a computer must be in a file.

## folder

- An object that can contain a group of files. Folders are used to organize information. In DOS and UNIX, folders are called directories or root areas.

## HDD

- Hard disk drive.

## log file

- A file that lists all events that have occurred. For example, Active@ Partition Recovery writes a log file entry for every request made to the program and every event that happens as a result. You can see the log at the bottom of the main screen.

## logical drive

- A partition is a logical drive because it does not affect the physical hard disk other than the defined space that it occupies, yet it behaves like a separate disk drive.

#### MBR

- The Master Boot Record (MBR) is a small program that is executed when the computer is first turned on. Typically, the MBR can be found on the first sector of a disk. The MBR first reads the disk's partition table to determine which partition is used to load the operating system. The MBR then transfers control to this partition's "boot sector" to continue the process. Loading the operating system is called "booting" the computer.

#### MFT

- Master File Table. A file that contains the records of every other file and directory in an NTFS-formatted hard disk drive. The operating system needs this information to access the files.

#### NTFS

- NT File System. NTFS was created to provide a more reliable operating system, compared to the FAT file system.

#### partition

- A section of memory or hard disk isolated for a specific purpose. Each partition can behave like a separate disk drive.

#### partition boot sector

- On NTFS or FAT file systems, the partition boot sector is a small program that is executed when the operating system tries to access a particular partition. On personal computers, the Master Boot Record uses the partition boot sector on the system partition to determine file system type, cluster size, etc. and to load the operating system kernel files. Partition boot sector is the first sector of the partition.

#### partition status

- SuperScan gives each partition a rating depending on how likely it is to recover data on the partition. A status rating of 1 is very bad. A status rating of 8 is excellent.

#### physical device

- A piece of hardware that is attached to your computer by screws or wires. A hard disk drive is a physical device. It is also referred to as a physical drive.

#### root area (and root folder)

- An object that can contain a group of files in a FAT file system. In other words, a directory or folder. The root folder is the top-level folder that has no parent and can have children. A logical drive can have only one root folder. Its name is usually '.' (dot).

#### sector

- The smallest unit that can be accessed on a disk. Tracks are concentric circles around the disk and the sectors are segments within each circle.

volume

- A fixed amount of storage on a hard disk. A physical device may contain a number of volumes. It is also possible for a single volume to span a number of physical devices.