

# **Drive Backup™ 9.0 Personal**

## **User Manual**

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# Introduction

Paragon Drive Backup™ 9.0 is an integrated set of powerful tools that is specially designed to establish a reliable and effective data protection system. Thanks to a highly intelligent program engine, which functionality covers all the latest achievements in the field of data and system security, you can now guarantee safety of your information even in case of a virus attack, a power outage or a hardware malfunction. The key features of the product are listed [in the special chapter](#).

In this manual you will find the answers to many of the technical questions, which might arise while using the program.

## What's New in Drive Backup 9.0

- **[Support of the File backup](#)**. You can now back up only information you really need, thus saving time and the backup storage space. Besides by making incremental images to this kind of backup you can easily keep it updated.
- **[File backup to a sector image](#)**. It is a unique technology on the market so far that bridges two principally different approaches of the data backup: the file-based backup and the sector-based backup. With its help you can now create a sector-based backup of your system to get it back on track in minutes in case of a virus attack or a hardware malfunction and then just make file-based incremental images to the previously created sector-based backup to keep updated only information that is critical for you. Thus you will considerably save your system resources.
- **[Adaptive Restore](#)**. It is a special technology that enables to successfully recover Windows 2000/XP/Vista or 2003/2008 Server to a different hardware configuration. If you need to replace failed hardware and cannot find an exact match for your original system specifications, this feature will help you out. Besides you can even restore a backup image of your real system to a virtual one and vice versa.
- **[Support of the Windows Installer MSI package](#)**. It is the latest engine for the installation, maintenance and removal of software on Windows-based operating systems. With its help you can now install the product remotely or in the silent mode, make use of powerful deployment capabilities, etc.
- **[Improved 64-bit support](#)**. You don't need to reboot your computer from the Recovery CD every time an operation cannot be accomplished under 64-bit Windows any more. The program will automatically reboot to a special mode to complete the operation.
- **[Support of GUID Partition Table \(GPT\)](#)**. It is the next generation of a hard disk partitioning scheme developed to lift restrictions of the old MBR. GPT disks are now supported by Windows Vista, Server 2008, Mac OS X and Linux.
- **[Support of the latest Linux kernel](#)**. It offers support of a wider range of hardware configurations, including the brand new Intel ICH9 chipset.
- **[Integration of the Linux/DOS recovery media directly to the installation package](#)**. You can now burn it with the Recovery Media Builder any time you want. Besides it will also be used as a bootable part of any bootable backup image created with the program.
- **[Linux/DOS recovery environment on a USB flash drive](#)**. With the help of the Recovery Media Builder you can now create Linux/DOS bootable media on a USB flash drive that may later be used for maintenance or recovery purposes.
- **[Dual boot Backup Capsule](#)**. Now you've got the choice to launch the Linux or PTS DOS recovery environment every time you start up the computer. With its help you will be able to run utilities under Linux or PTS DOS, and that way to get access to your hard disk for maintenance or recovery purposes.
- **[A context sensitive hint system](#)** for all functions of the program. You can now get a detailed description to any setting, control, or field of the program just by clicking the hint button and then the object you need.

- ❑ **Automatic data exclusion.** An advanced system of filters will help you automate the process of building up contents of the future backup image, by excluding irrelevant data such as movies, music, etc.
- ❑ **Support of Blu-ray discs.** You can now burn backup images to high capacity Blu-ray discs. A single layer Blu-ray can store 25 GB, more than five times the capacity of a single layer DVD.

## Product Components

In order to cope with different tasks, the product contains several components:

- ❑ **Windows based set of utilities** is the crucial part of the product. With the help of an easy to use launcher you may find and run tasks of any complexity in the field of data and system protection, hard disk partitioning and cloning, etc.
- ❑ **Linux/DOS based Recovery CD** is a multi-platform bootable media that enables to run utilities under Linux or PTS DOS, and that way to get access to your hard disk for maintenance or recovery purposes. Both platforms have their strong sides, for instance Linux can boast support of FireWire (i.e. IEEE1394) or USB devices. It enables to burn CD/DVD disks. However there can be some difficulties with detecting new hardware. DOS in its turn has no problems of that kind but is limited in features. The Linux/DOS Recovery CD requires no installation and can be of great help when the system fails to boot. Besides it offers a Windows XP like environment.

## Features Overview

This chapter dwells upon key benefits and technical highlights of the product.

### Key Features

Let us list some of the key features:

#### User Friendly Fault Minimizing Interface

- ❑ **Graphical representation of the data** to gain a better understanding.
- ❑ **A handy launcher** to easily find and run the required tasks.
- ❑ **Comprehensive wizards** to simplify even the most complex operations.
- ❑ **A context sensitive hint system** for all functions of the program.
- ❑ **Previewing the resulting layout of hard disks before actually executing operations** (so-called *virtual operations*).

#### Backup Facilities

- ❑ **Archive Database** to help the user easily manage backup images (get properties, add, delete, mount, etc.).



- ❑ **Support of all present day techniques to store backup images:**
  - *Backup to local mounted/unmounted (without drive letter assigned) partitions;*
  - *Backup to a special secured place on the hard disk called the Backup Capsule* that has an independent system layout (e.g. a separate partition) and will stay operable should the active file

system be damaged. To avoid an accidental removing or unauthorized access of the backup data, this partition is hidden and thus cannot be mounted in the operating system;

- *Backup to external media* (CD/DVD) to guarantee a high level of data protection as long as the backup media is kept secure;

- *Backup to a network drive* to stand a better chance of success in case of a hard disk failure.

- **Sector backup** to save not only all on-disk information but also the system service structures. It is ideal for making a backup image of an entire hard disk or system partitions to guarantee the operating system's working capability.

- **Differential backup to a sector image** to only archive changes since the last full sector-based image, thus considerably saving the backup storage space. To restore this kind of backup you will require a full image and one of its differentials.

- **File backup** to save information you really need. If you only care about safety of your e-mail database or particular documents and are not willing to waste the backup storage space, this very feature will suit you at most. Besides an advanced system of filters will help you automate the process of building up contents of the future backup image.

- **Incremental backup to a file image** to only archive changes since the last full or incremental file-based image. An incremental image is smaller and takes less time to create, but you will require the initial full image and all of its incrementals to restore the latest point of this kind of backup.

- **File backup to a sector image**. It is a unique technology on the market so far that bridges two principally different approaches of the data backup: the file-based backup and the disk imaging backup. With its help you can now create a sector-based backup of your system to get it back on track in minutes in case of a virus attack or a hardware malfunction and then just make file-based incremental images to the previously created sector-based backup to keep updated only information that is critical for you. Thus you will considerably save your system resources.

- **Bootable Backup Capsule** to get the choice to launch the Linux or PTS DOS recovery environment every time you start up the computer. With its help you will be able to run utilities under Linux or PTS DOS, and that way to get access to your hard disk for maintenance or recovery purposes.



This feature is only available for the Windows installation of the program.

## Restore Facilities

- **Restore an entire disk, separate partitions** or **only files you need** from the previously created backup image.
- **Restore with Shrink** to restore a backup image to a free block of smaller size taking into account only the amount of actual data of the image.
- **Adaptive Restore** to successfully recover Windows 2000/XP/Vista or 2003/2008 Server to a different hardware configuration. If you need to replace failed hardware and cannot find an exact match for your original system specifications, this feature will help you out. Besides you can even restore a backup image of your real system to a virtual one and vice versa.

## Partition/Hard Disk Management Facilities

- **Basic functions for initializing, partitioning and formatting hard disks** ([create](#), [format](#), [delete](#)). Instead of the standard Windows disk tools, the program supports all popular file systems.
- **Mount a partition (assign a drive letter)** of any file system type to make it available for your operating system.
- **Modify file system parameters** (make active/inactive, hide/unhide, change serial number, partition ID, volume label, etc.).

## Automatization Facilities

- ❑ **[Task scheduling](#)** to automate routine operations. It can be particularly effective when you have to repeat a sequence of actions on a regular basis.



Scheduling is only available for the Windows installation of the program.

## Auxiliary Facilities

- ❑ **[File Transfer Wizard](#)** to make such operations as transferring of files/directories or burning of them to CD/DVD as easy and convenient as possible. Providing access to Paragon backups as regular folders, it may also help to replace corrupted data from a previously created image in case of an operating system failure.
- ❑ **[Recovery Media Builder](#)** to create a Linux/DOS bootable media, which can later be used to boot and recover your computer in case of an operating system failure. Moreover, with its help you can save data from partitions of your hard disk directly to compact discs or burn ISO-images. The utility supports various formats of laser discs: CD-R/RW, DVD-R/RW, DVD+R/RW, DVD-R, DVD+R double layer, Blu-ray and can handle multi-session burning.
- ❑ **[Network Configuration Wizard](#)** to establish a network connection under Linux either to save a backup of a partition/hard disk or just several files on a network computer or retrieve a previously made backup from a network computer for recovery purposes.

## Supported Technologies

Along with using innovative technologies from outside, Paragon has developed a number of its own original technologies that make its products unique and attractive for customers:

- ❑ **Paragon Hot Backup™** technology to back up locked partitions and hard disks under Windows NT+ family operating systems providing both high operating efficiency as well as low hardware requirements.
- ❑ **Paragon Adaptive Restore™** technology to successfully recover Windows Vista or 2008 Server to a different hardware configuration.
- ❑ **Paragon Power Shield™** technology to provide data consistency in case of a hardware malfunction, power outages or an operating system failure.
- ❑ **Paragon UFSD™** technology to browse partitions of any file system including hidden and unmounted, modify and copy files and folders, etc.
- ❑ **Paragon Hot Resize™** technology to enlarge NTFS partitions (system, locked) without rebooting Windows and interrupting its work.
- ❑ **Paragon Restore with Shrink™** technology to restore a backup image to a free block of smaller size taking into account only the amount of actual data of the image.
- ❑ **Paragon Smart Partition™** technology to securely perform hard disk partitioning operations of any complexity.
- ❑ **Paragon BTE™** technology to set tasks for execution in the Windows blue screen mode, thus saving from the need to use a bootable media when modifying system partitions.
- ❑ **Paragon Shutdown After Apply™** technology to set the computer to automatically switch off on the successful accomplishment of any operation.
- ❑ **Microsoft Dynamic Disk** (simple, spanned, striped, mirrored, RAID-5) to offer more management flexibility without the partition limitation of basic disks. Dynamic storage can be particularly beneficial for large-scale businesses when dealing with many physical hard disks involving complex setup.

## Supported File Systems

Paragon Drive Backup 9.0 provides support of major file systems presented on the market today:

- Full read/write access to FAT16/FAT32 partitions.
- Full read/write access to NTFS (Basic and all five types of Dynamic Disks) under Windows 95/98/ME, Linux and PTS DOS. Compressed NTFS files are also supported.
- Full read/write access to Ext2FS/Ext3FS partitions under all versions of Windows, DOS 5.0 and later.
- Basic partitioning operations (*create, format, delete*) for Linux Swap.

## Supported Media

- Support of both MBR and GPT hard disks (up to 1,5 TB tested)
- IDE, SCSI and SATA hard disks
- CD-R, CD-RW, DVD-R, DVD+R, DVD-RW, DVD+RW, DVD-R, DVD+R double layer and also Blu-ray discs
- FireWire (i.e. IEEE1394), USB 1.0, USB 2.0 hard disks, ZIP® and Jazz® disks
- PC card storage devices (MBR and GPT flash memory, etc.)

## Getting Started

In this chapter you will find all the information necessary to get the product ready to use.

## Distribution

Paragon Drive Backup 9.0 is distributed in two ways:

- [Boxed package](#) from Paragon Technology GmbH and resellers
- [Downloadable package over the Internet](#) at the company's web-site

### Distributive CD

The boxed package includes a distributive CD that is in fact a bootable Linux/DOS Recovery CD with auto-run of the Windows installation, thus it can be used as a ready-made solution (see [Booting from the Linux/DOS Recovery CD](#)). But if you're going to run the Windows components, you need to install them first (see [Installing the Program under Windows](#)).

If you want to download an update/upgrade of the product, it will be in form of the downloadable installation package as described in [Online Distribution](#)).

### Online Distribution

Drive Backup 9.0 purchased over the Internet will be in form of an MSI package. After installing the product you can launch the Recovery Media Builder to burn the Linux/DOS Recovery CD.

### Registration

Paragon Technology GmbH provides a wide range of online services through its web-service - KB (Knowledge Base):

- ❑ Registration of new users;
- ❑ Registration of purchased products for registered users;
- ❑ Available around-the-clock downloading center, where registered users can get product updates/upgrades as well as all the necessary documentation;
- ❑ Downloadable free demo versions and open documentation for all users.

To enter the Knowledge Base, please visit the web-site: <http://kb.paragon-software.com/>.



**It is recommended to use Internet Explorer 5+ or any compatible browser.**

## To Register as a New User

To register as a new user, simply do the following:

1. **Run the Internet browser and visit the page:** <http://kb.paragon-software.com/>;
2. **Select Registration** in the menu;
3. On the renewed page, **select your country and language**;
4. **Fill out the registration form**.



**The most important field in the form is an E-mail address, as it serves as a login to enter the system. Besides your access password will be sent to this address as well.**

## To Register a New Product

If you are a registered user and would like to register Drive Backup 9.0, simply do the following:

1. Click **Login** in the menu;
2. On the *Login* page, in the *User Name* field, **enter an E-mail**, which you have used for registration;
3. In the *Password* field **enter the password** you received with registration confirmation. Click the *Submit* button;
4. If the user name and password are valid, you will enter the system;
5. In the opened menu click the **Product Registration** item to see a list of all registered products with a new registration form;
6. Select **Paragon Drive Backup 9.0** from the list of products;
7. **Type in your product serial number** in the *Serial Number* field. Click the *Submit* button.

That is all. You will receive a confirmation by E-mail.

## How to Download Updates/Upgrades

Downloading of updates/upgrades can be fulfilled in the following way:

1. **Enter the Paragon Software web-service**;
2. In the menu click the **Download Update** to see what updates are available for you;
3. **Select the desired update** and click the *Download* button.

## Contacting Paragon Technology GmbH

If you have any questions about the company products, please do not hesitate to contact Paragon Technology GmbH.

Service	Contact
Visit Paragon GmbH web site	<a href="http://www.paragon-software.com">www.paragon-software.com</a>
Registration & updates web-service	<a href="http://kb.paragon-software.com">kb.paragon-software.com</a>
Knowledge Base & Technical Support	<a href="http://kb.paragon-software.com">kb.paragon-software.com</a>
Pre-sale information	<a href="mailto:sales@paragon-software.com">sales@paragon-software.com</a>

## System Requirements

### Windows based set of utilities

To use the Windows utilities, you should install them first. But before that, make sure your computer meets the following minimum system requirements:

- Operating systems: Windows 98/NT/2000/XP/Vista and XP SP2/Vista 64-bit
- Internet Explorer 5.0 or higher
- Intel Pentium CPU or its equivalent, with 300 MHz processor clock speed
- 128 MB of RAM
- Hard disk drive with 100 MB of available space
- SVGA video adapter and monitor
- Mouse

### Linux/DOS based Recovery CD

To use the Paragon Linux/DOS Recovery CD on your computer (it doesn't matter what operating system is installed), make sure that it meets the following minimum system requirements:

- IBM AT compatible computer with i486 or higher CPU
- 256 MB of RAM
- SVGA-compatible monitor
- Mouse (recommended)
- On-board BIOS supports *booting from CD first*

There may be additional requirements if you want to use advanced features:

- Network card is required to send partition/hard disk backups to a network computer or to retrieve previously made backups
- Recordable CD/DVD drive is needed to burn data to compact disks
- To save copy or backup of a hard disk or partition, removable USB disks can be used. The program supports USB Drives 1.0, 2.0.

## Installing the Program under Windows

As we have already mentioned only Windows components of the product require installation. So to install Paragon Drive Backup 9.0 under Windows, please do the following:

### 1. Run Setup Application

Click on the *DriveBackup.MSI* file. This application will guide you through the process of the program installation. The setup utility is compiled with the **InstallShield SDK**, hence it contains the standard user interface and set of installation steps.



**In case there is some previous version of the program installed on the computer, the program will offer the user to uninstall it first.**

## 2. Starting Setup

The Welcome page informs that the application is being installed. Click the *Next* button to continue.

## 3. Confirm License Agreement

The License Agreement page displays the Paragon License Agreement. Read the agreement and then select the appropriate option to accept. If you do not agree with any conditions stated there, the installation process will be interrupted. By clicking the *Print* button, the License Agreement may also be printed out.

## 4. Provide Customer Information

On the Customer Information page you are to provide the standard information, i.e. a user name and an organization. Besides you need to decide whether to make the program available for all users of this computer (if several) or only for the current one.

## 5. Select an Installation Folder

The Destination Folder page allows you to choose a folder where the program will be installed. By default, the installation folder will be created as:

**C:\Program Files\Paragon Software\Paragon Drive Backup 9.0.** To select another folder, click the *Change...* button.

After you have selected the required folder, click the *Next* button to continue.



**Do not install the program on network drives. Do not use Terminal Server sessions to install and run the program. In both cases, the program functionality will be limited**

## 6. Confirm Installation

On the Ready to Install the Program page click the *Install* button to start the installation or the *Back* button to return to any of the previous pages and modify the installation settings.

## 7. Copying Files

The Copying Files page shows the overall progress of the installation. Click the *Cancel* button to abort the setup.

## 8. Finishing the Installation

The Final page reports the end of the setup process. Click the *Finish* button to complete the wizard.



**To accomplish online backup/copy of locked partitions/hard disks the program uses a kernel mode *hotcore driver*, thus the system reboot is required to complete the installation procedure.**

# Starting the Program under Windows

To start Paragon Drive Backup 9.0 under Windows, please click the Windows **Start** button and then select **Programs > Paragon Software > Paragon Software Drive Backup™**.



**The program provides wide opportunities in the field of hard disk structure modification, so just to be on the safe side, please make a backup of your data before carrying out any operation.**

The first component that will be displayed is called the *Launcher*. In general it enables to run wizards and utilities, to specify program settings, to visualize the operating environment and the hard disk configuration, to launch the help system or to go to the program's home page.



**To know more on the subject, please consult the [Windows Components](#) chapter.**

## Booting from the Linux/DOS Recovery CD

The Linux/DOS Recovery CD can be used to boot your computer into Linux or PTS DOS to get access to your hard disk for maintenance or recovery purposes. On the disk you can also find the PTS DOS safe mode, which may help in a number of non-standard situations such as interfering hardware settings or serious problems on the hardware level. In this case, only basic files and drivers (such as hard disk drivers, a monitor driver, and a keyboard driver) will be loaded.

### Startup Procedure

To start working with the Linux/DOS Recovery CD, please take the following steps:

1. Insert the Linux/DOS Recovery CD into a CD/DVD drive;
2. Reboot the computer;
3. Launch a boot mode you need (**Normal, Safe, Low-Graphics Safe**) in the [Boot menu](#).



**By default the *Normal Mode* will be automatically initiated after a 10 second idle period.**

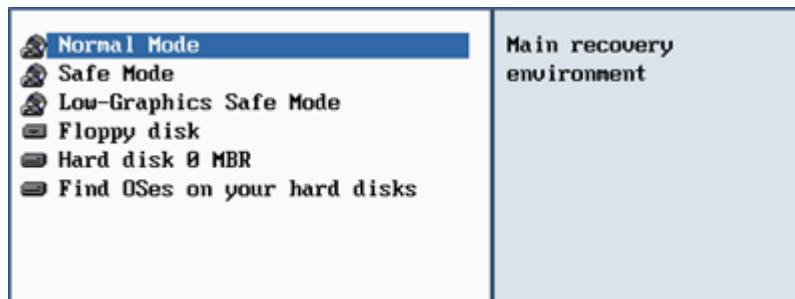
4. Click on the required operation to start. Hints on the selected at the moment item will help you make the right choice;
5. Consult the help system by pressing **ALT+F1** to know more on the subject.



**To automatically boot from the Recovery CD make sure the on-board BIOS is set up to *boot from CD first*.**

### Boot Menu

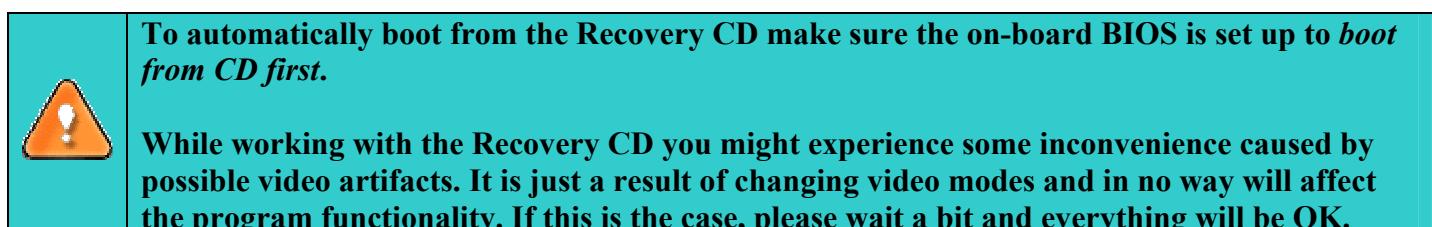
After you have inserted the Recovery CD into a CD/DVD drive and restarted the computer, the Boot menu appears.



The Boot menu contains the following commands:

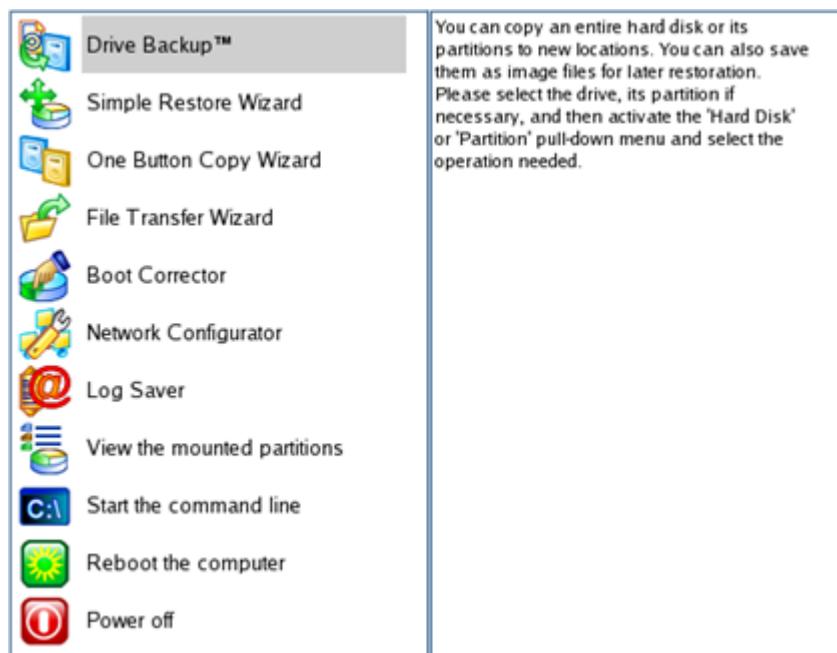
- **Normal Mode.** Boot into the Linux normal mode. This mode uses the full set of drivers (recommended).
- **Safe Mode.** Boot into the PTS DOS mode. This mode can be used as an alternative of the Linux normal mode if it fails to work properly.
- **Low-Graphics Safe mode.** Boot into the PTS DOS safe mode. In this case, only the minimal set of drivers will be included, like hard disk, monitor, and keyboard drivers. This mode has simple graphics and a simple menu.
- **Floppy Disk.** Reboot the computer from a system floppy disk.
- **Hard Disk 0.** Boot from the primary hard disk.
- **Find OS(s) on your hard disks.** The program will scan hard disks of your computer to find any bootable operating system.

To move within the menu, please use the arrow keys of the computer keyboard.



## Normal Mode

When the Normal mode is selected, the Linux launch menu appears:



- **Drive Backup** (enables to copy and back up separate partitions or entire hard disks, carry out basic partitioning operations, etc.);
- **Simple Restore Wizard** (allows restoring hard disks and partitions);
- **One Button Copy Wizard** (helps to carry out such a technically complicated operation as cloning of hard disks just by pressing one button);
- **File Transfer Wizard** (allows coping files/folders to another disk or a partition as well as recording them to CD/DVD);
- **Boot Corrector** (helps to correct the Windows System Registry without Windows being loaded);

- Network Configurator** (enables to establish a network connection under Linux);



If you are going to use network resources, first launch the Network Configuration Wizard to establish a network connection.

- Log Saver** (helps to collect and send the necessary log files to the Technical Support)
- View the mounted partitions** (the list of all mounted partitions will be displayed);



Linux/DOS Recovery CD assigns drive letters to partitions the way it is done in DOS, i.e. one after another, primary partitions at first. Thus mounted partitions may have different drive letters from Windows.

- Command Line** (allows experienced users to execute any operation);
- Reboot the computer;**
- Power off the computer.**

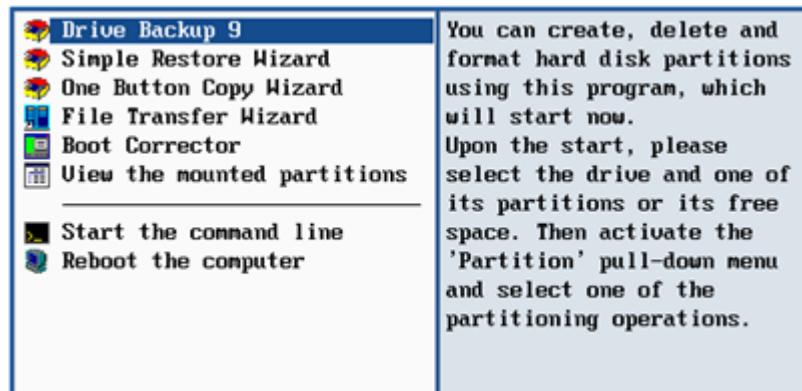
To move within the menu, please use the arrow keys of the computer keyboard.

### Safe Mode

When the Safe mode is selected, the PTS DOS launch menu appears. It has nearly the same functionality as for the Normal mode except the *Network Configurator* and *Log Saver* commands. Besides due to certain limitations of the PTS DOS environment, there is no possibility to burn CD/DVD disks.

### Low Graphics Safe Mode

When the Low Graphics mode is selected, the PTS DOS launch menu appears. It has the same functionality and looks similar to the Safe mode but graphically simpler.



## Basic Concepts

This chapter explains terms and ideas that show how the program works. To understand these helps to obtain a general notion of the operation performance and makes it easier for the user to operate the program.

## System and Data Protection

The data protection issue is a growing cause of worrying for more and more people today. Indeed, it is hardly to find a person who will be particularly happy when all precious information on the hard disk is irreversible lost as a result of its malfunction. So how this tragedy can be prevented?

### File Backup versus Sector Backup

Since the advent of the computer age people were in the search of ways to guarantee data safety. As a result we've got now two principal approaches: the *file-based backup* and the *sector-based backup*. The main difference between the two lies in the way data is treated.

A sector-based backup operates with an image (or a snapshot) of the whole disk system or its separate partitions. It not only includes the contents of all user-made files, but additionally contains the exact structure of directories, information about file allocation, file attributes and other related data. Thus it enables to successfully process system or encrypted partitions of any file system type, no matter what kind of information they contain.

In contrast, a file-based backup takes into account a file system structure and only functions on a file or folder level. So it is very efficient when archiving separate files or folders, but in no way will help you back up a system partition.

You should understand pretty well that each of the two approaches is only good when properly chosen. In the comparison table below you can see when this or that approach will suit you at most.

Sector-Based Backup	File-Based Backup
Merits	
It does not depend on a particular file system. Thus it can successfully process system or encrypted partitions of any file system type, no matter what kind of information they contain.	Functioning on a file/folder level, it is ideal for archiving separate files or folders.
It can create an exact image of a partition, including its service data. Thus it is ideal for a backup/restore of a system partition or a fast deployment to a bunch of identical computers.	It enables to automatically build up contents of the future backup image by using an advanced system of filters.
	It allows archiving data of the same volume with different backup policies.
	It is easy and efficient when creating backup chains.
Demerits	
Resulted backup images may contain a lot of redundant data.	It depends on a file system structure, so you won't be able to process unknown file systems.
It is ineffective when trying to maintain a backup chain, especially when little amount of data is being changed.	It cannot be used to back up a system partition.
	It is much slower when processing large amount of data.

## Backup Types

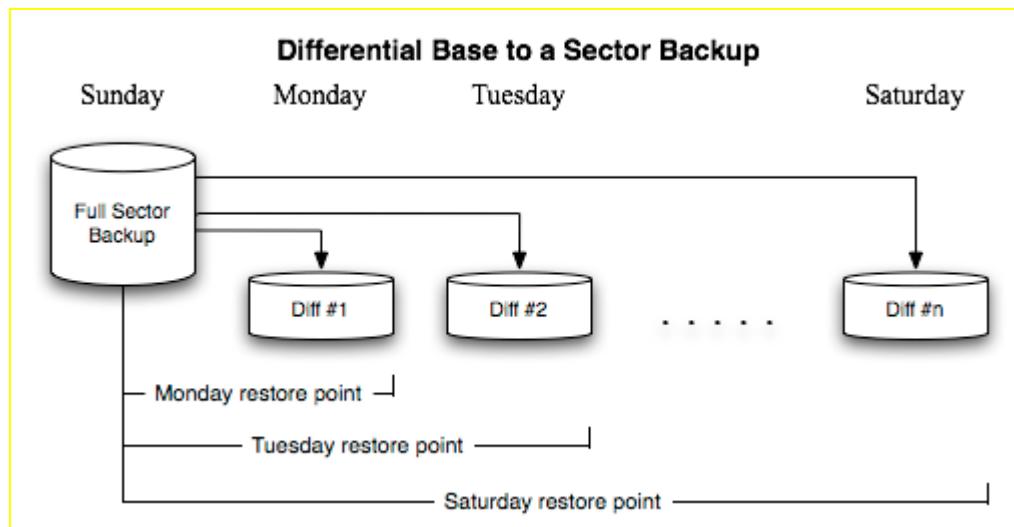
At the present moment the market is offering various types of backup imaging to meet the needs of any user. Besides supporting them all, our program offers a unique backup type, called *File Increment to a Sector Backup*.

### Full and Differential Sector Backups

A full sector-based backup image includes all contents of a partition or a hard disk at the moment of its creation. If you roll back your system to the initial state on a regular basis, that's exactly what you're looking for. But if you want to have multiple backup archives of the same partition reflecting certain time

stamps, unchanged data will inevitable be duplicated in all archives and take additional space on backup media. To tackle this issue there has been developed a supplementary technique called *Differential Sector Backup*.

A differential archive only contains data changed since the time of creating a full archive, which forms a base (or a parental image) in this case, thus considerably saving your system resources. It is realized by the exact bit-wise comparison of the previous partition's data (saved in the parental image) with the current data (that is actually the partition itself). To restore this kind of backup you will require a full image and one of its differentials, what is very convenient.

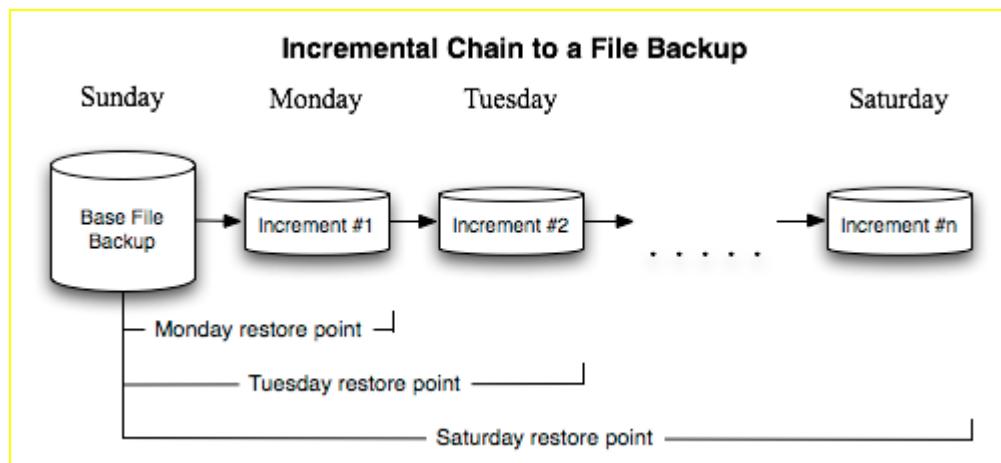


This function is only available for single primary and logical partitions.

### Full and Incremental File Backups

A full file-based archive only contains files and folders. It is really efficient when backing up an e-mail database or particular documents, as no redundant data is processed. But if you care about maintaining a files history, you can benefit from one more supplementary technique called *Incremental File Backup*.

An incremental archive only contains data changed since the time of creating a full or incremental file-based archive. It is smaller and takes less time to create, but you will require the initial full image and all of its incrementals to restore the latest point of this kind of backup.



## File Increment to a Sector Backup

*File Increment to a Sector Backup* is a unique technology on the market so far that bridges two principally different approaches of the data backup: the file-based backup and the sector-based backup. With its help you can now create a sector-based backup of your system to get it back on track in minutes in case of a virus attack or a hardware malfunction and then just make file-based incremental images to the previously created sector-based backup to keep updated only information that is critical for you. Thus you will considerably save your system resources.

## Backup Storage

Our program supports all present day techniques of storing backup images. Let's take a closer look at them all to understand what kind of storage is able to provide better security:

- You can place a backup image to a local mounted or unmounted (without drive letter assigned) partition. Despite the fact that it is the most convenient way, try not to use it. You can delete your backup just by accident or lose it as a result of a hardware malfunction, or a virus attack;
- You can place a backup image to a special secured place on the hard disk called the Backup Capsule that has an independent system layout (e.g. a separate partition) and will stay operable should the active file system be damaged. To avoid an accidental removing or unauthorized access of the backup data, this partition is hidden and thus cannot be mounted in the operating system. However it won't help you in case of a hardware malfunction.
- You can place a backup image to external media (CD/DVD) to guarantee a high level of data protection as long as the backup media is kept secure;
- Finally you can place a backup image to a network drive to stand a better chance of success in case of a hard disk failure. Moreover, by storing it on a special-purpose server you may be pretty sure nothing will happen to it;

## Adaptive Restore

Adaptive Restore is a special technology that enables to successfully recover Windows 2000/XP/Server 2003 as well as Windows Vista/Server 2008 to a different hardware configuration. As you probably know, Windows family operating systems are pretty much sensible to any hardware replacement, especially when you need to replace your motherboard - actually Windows will most likely fail to boot as a result of this operation.

With our technology you can now make your Windows bootable on some other computer or even a virtual machine. You can either use a previously made backup of your system to restore to a different hardware configuration or just fix your Windows installation with the Linux/DOS recovery environment (you can find the appropriate options in the main program or Boot Corrector). Anyway by activating one additional option, the program will automatically detect what kind of Windows it's dealing with as work algorithms for Windows 2000/XP/Server 2003 and Windows Vista/Server 2008 differ.

### Adaptive Restore for Windows 2000/XP/Server 2003

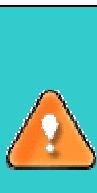
It actually implies two operations:

- **Providing the ability to change the Windows kernel settings** to the most suitable for your new configuration. The program will automatically add all available Windows HAL and kernels to the boot menu (the boot.ini file) to choose the required platform in case your system fails to boot (Uniprocessor, Multiprocessor, or Old legacy PC without ACPI). You can later remove them from the menu either under Windows or with Boot Corrector.



If you've got a 64-bit operating system, no options will be added to the boot menu.

- **Automatic replacement of the boot critical drivers** (HDD controller, PS/2 and USB mouse and keyboard) to the default Windows drivers to provide the maximum level of compatibility. Once your Windows starts up, it will initiate reconfiguration of all Plug'n'Play devices, so we do recommend you to provide the latest drivers for your motherboard and processor at this step, as it can considerably improve the overall performance of your system.



The current version of the program does not enable to add any 3<sup>rd</sup> party driver during the operation, which may lead to boot problems (relevant for SCSI and Serial ATA controllers mostly). In some cases however you can tackle the problem by switching the required device to the standard ATA compatible mode in BIOS (e.g. the Intel ICH8 controller can be set in the IDE mode, not AHCI). Moreover if you're going to upgrade your motherboard to one of the same manufacturer, just update the driver before the operation to guarantee successful startup of your system later.

## Adaptive Restore for Windows Vista/Server 2008

It is based on the fact that these operating systems do not delete their distributive driver repositories after the setup, but simply make them inactive in the Windows Registry. So thanks to our technology these driver repositories can be made available during the restore procedure to let Windows Vista or 2008 Server automatically find and install any lacking driver with no action from your side required, what is very convenient.

However you might face a situation when no driver has been found in the driver repository. So in this case you will have to provide an exact location of the required drivers or insert the Windows distributive CD/DVD, besides it is expected extra system restarts. Anyway your system will most likely be operable once again.

## Adaptive Restore Application

Let's consider a number of situations when the Adaptive Restore feature can help you out:

- If you need to upgrade to newer hardware while keeping all your programs and settings intact;
- If you need to replace failed hardware and cannot find an exact match for your original system specifications;
- If you need to do a system testing to deploy a system backup image to a virtual machine or vice versa.



This feature is only available for the Linux/DOS or WinPE recovery media at the moment.

## Paragon Hot Processing & Volume Shadow Copy Service

### Offline versus Online Data Processing

In the course of time there have been developed various methods of data processing. Despite different work concept, all of them can be divided into two principal groups: *offline (cold)* and *online (hot)* data processing techniques.

As the name infers, *offline data processing* can only be accomplished when the data is in consistent state (the operating system and all the applications are completely shut down). Actually it is the most preferable

way of image creation or data cloning, since software can obtain an exclusive right to process data that guarantees high level of operating efficiency. However, the *offline data processing* is absolutely out of question when dealing with 24/7 production environments.

In contrast, *online data processing* enables to create a consistent snapshot even as the data is currently modified. It is particularly useful for systems with high availability requirements, but it won't be accomplished until all active transactions are complete. The point is to provide a coherent state of all open files and databases involved in a process, taking into account that applications may still keep writing to disks. As a result an online data processing cannot boast high operating speed.

Our program supports both offline and online methods of data processing. As far as online method is concerned it offers its own hot processing algorithm together with the possibility to use snapshot technologies provided by the Microsoft VSS framework.

## Paragon Hot Processing Technology

Paragon Hot Processing is an online copy/backup technology for Windows NT+ family operating systems. Developed back in 2001, nowadays it is integrated with all copy/backup solutions offered by the company.

Paragon Hot Processing is not exactly a snapshot technology, though it has much in common with it. During an online copy/backup, the program uses the kernel mode driver *HOTCORE.SYS* to intercept and control disk write activity of applications and the operating system. The *hotcore driver* as an integral part of the program is installed during the setup procedure (that's why the system reboot is required to complete the setup procedure). For the most part the driver is in the idle mode until it is activated with the program. While in this mode it bypasses any calls having no effect on the overall system performance, but a few kilobytes of the system memory.

Paragon Hot Processing technology offers copy/backup of locked partitions and hard disks under Windows NT+ family operating systems providing both high operating efficiency as well as low hardware requirements.



**It is not recommended to use Paragon Hot Processing with active SQL Server, Exchange or Oracle databases since the backup image contents may be corrupted.**

## Volume Shadow Copy Service

Microsoft *Volume Shadow Copy Service* (VSS) is designed to provide the copy/backup infrastructure for the Microsoft Windows XP/Vista/Server 2003/2008 operating systems. It offers a reliable mechanism to create consistent point-in-time copies of data known as shadow copies. Developed by Microsoft in close cooperation with the leading copy/backup solution vendors on the market, it is based on a snapshot technology concept.

Initiated by a VSS aware copy/backup utility, VSS creates snapshots for the selected volumes and represents them as virtual read-only devices, called *volume shadow copies*. Once the shadow copies are created, the copy/backup utility starts processing the data while applications keep writing to original volumes.

Unlike Paragon Hot Processing the VSS technology provides a unique possibility to make a synchronous snapshot of multiple volumes. This very feature can be particularly beneficial when backing up active SQL Server 2003, Exchange 2003 or Oracle databases located on multiple volumes the way it is recommended by Microsoft to improve the level of database performance and reliability, thus providing 100-percent data consistency.



To use VSS it is necessary to have a mounted 300 MB+ NTFS partition.

## GPT versus MBR

GUID Partition Table (GPT) is the next generation of a hard disk partitioning scheme developed to lift restrictions of the old MBR. Being a part of the Extensible Firmware Interface (EFI) standard proposed by Intel to replace the outdated PC BIOS, it offers a number of crucial benefits:

- Up to 128 primary partitions for the Windows implementation (only 4 in MBR);
- The maximum allowed partition size is 18 exabytes (only 2 terabytes in MBR);
- More reliable thanks to replication and cyclic redundancy check (CRC) protection of the partition table;
- A well defined and fully self-identifying partition format (data critical to the platform operation is located in partitions, but not in un-partitioned or hidden sectors as this is the case with MBR).

Please note, that the current version of the product provides a limited support of GPT disks:

- Backup of a separate partition or entire hard disk;
- Restore of a partition archive to any location, even to a block of smaller size taking into account only the amount of actual data of the image (restore with shrink);
- Restore of a hard disk archive to its original location or a larger disk without the resize function;
- Create partition;
- Format partition;
- Delete partition;
- Check file system integrity;
- Test surface;
- View/Edit sectors.

Besides, you won't be able to see a drive letter assigned to a GPT disk in the program's interface.

## 64-bit Support

The bulk of software today is written for a 32-bit processor. It can meet the requirements of almost any end user. However that is not the case when dealing with servers processing large amounts of data with complex calculations of very large numbers. That is where 64-bit architecture comes into play.

It can boast improved scalability for business applications that enables to support more customer databases and more simultaneous users on each server. Besides a 64-bit kernel can access more system resources, such as memory allocation per user. A 64-bit processor can handle over 4 billion times more memory addresses than a 32-bit processor. With these resources, even a very large database can be cached in memory.

Although many business applications run without problems on 32-bit systems, others have grown so complex that they use up the 4 GB memory limitation of a 32-bit address space. With this large amount of data, fewer memory resources are available to meet memory needs. On a 64-bit server, most queries are able to perform in the buffers available to the database.

Some 32-bit applications make the transition to the 64-bit environment seamlessly others do not. For instance, system-level utilities and programs that provide direct hardware access are likely to fail. Our program offers a full-fledged support of the 64-bit architecture providing fault-tolerant work for such system dependent modules as *Hot Processing*.

## Drive Partitioning

As you probably know a hard drive is to be split into one or more partitions, since it cannot hold data until it is carved up and space is set aside for an operating system. Until recently most PCs used to have just one partition, which filled the entire hard disk and contained an OS. The situation has changed however, thanks to new cost-effective high capacity hard drives, thus opening up numerous possibilities for PC users, such as editing video, archiving music, backing up CD images, etc. Huge increase in space is great, but it poses a number of problems, most important of which are effective data organization and speed.

Large drives are always going to take longer to search than smaller volumes, and an operating system is going to have its work cut out both finding and organizing files. It is for this reason that many people decide to invest in multiple hard drives, but there is an easy solution – drive partitioning. Partitioning lets you divide a single physical drive into a number of logical drives, each of which servers as a container with its own drive letter and volume label, thus enabling the operating system to process data more efficiently. Besides partitioning makes it possible to organize data so that it is easy to find and manage. You can set aside, for instance, 40 GB of a 160 GB hard drive for the OS, 70 GB for storing video and another 50 GB for your favorite music collections to provide transparent data storage.

It is also worth mentioning to that with a hard drive properly partitioned, such routine operations as files de-fragmentation or consistency check will not be that annoying and time-consuming any more.

By detaching the OS from the rest of the data you can tackle one more crucial issue – in case of a system malfunction, you can get the system back on track in minutes by recovering it from a backup image located on the other partition of the hard drive.

But that is not all drive partitioning may be used for. If you are willing to play games in Windows while browsing the Internet in Linux, 100-percent sure that no virus will attack your PC, drive partitioning is a necessity. In order to run several OSs on a single hard drive you are to create a corresponding number of partitions to effectively delineate the boundaries of each OS.

## Scheduling

The automation of operations is particularly effective when you have to repeat a sequence of actions on a regular basis. For example, developing a specific project on a day-to-day basis and having to make a backup every evening so as not to lose the valuable data, you will really appreciate, when this kind of routine operations will be carried out automatically without your participation.

Another aspect of any automation process is that it allows an optimization of your computer's work-load. This is especially important when operations require a considerable amount of computer resources – processor time, memory and more. A number of tasks, which can decrease the performance, can be run during the night or whenever the computer has the least work-load to perform.

The program has a special tool for scheduling. You can set out a timetable for any operation and it will start at a specified time without interrupting your current activity.

## Windows Components

In the given section you can find all the information necessary to successfully work with the Windows version of the product.

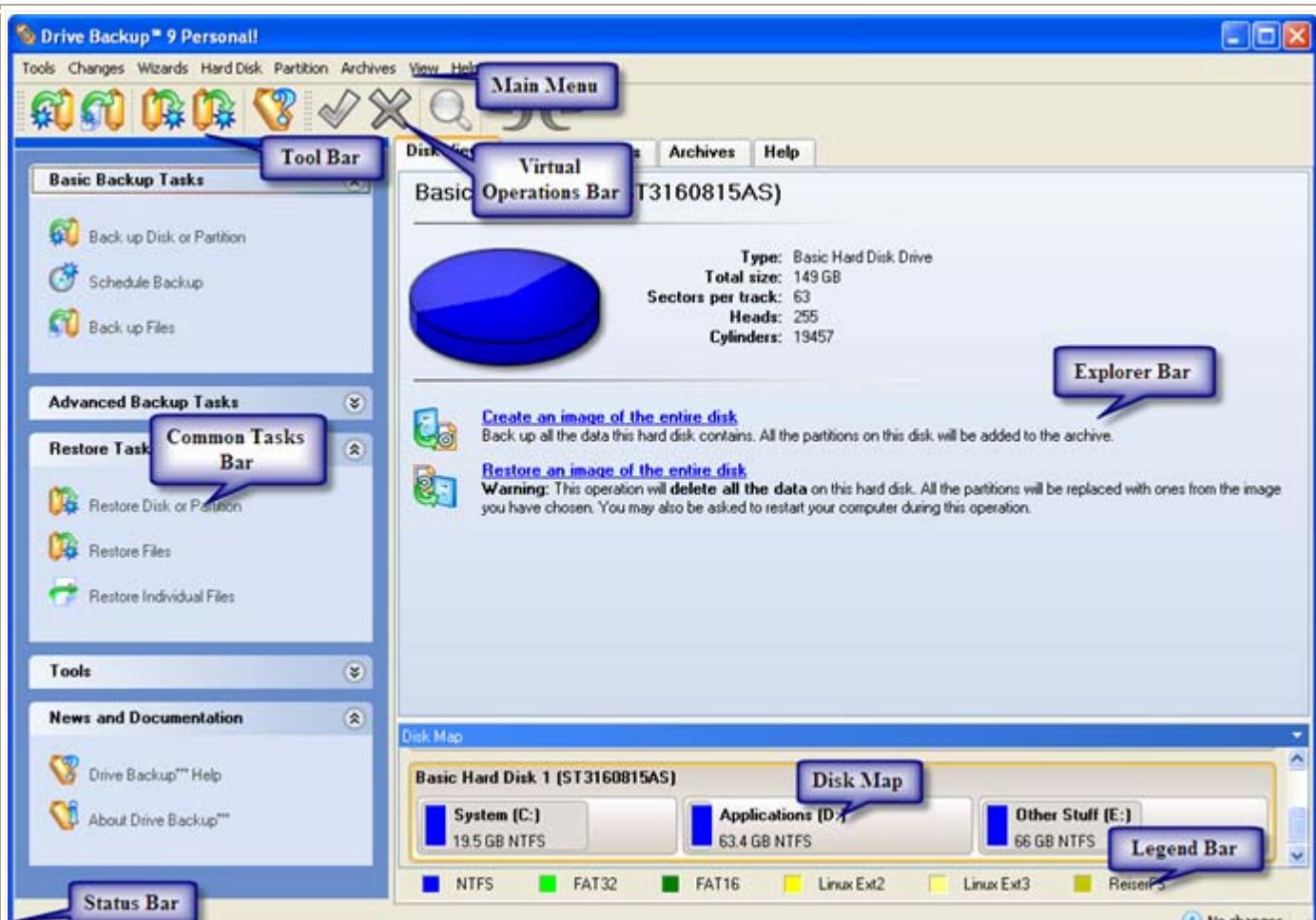
## Interface Overview

This chapter introduces the graphical interface of the program. The design of the interface precludes any mistake being made on the part of the user. Most operations are performed through the system of wizards. Buttons and menus are accompanied by easy understandable icons. Nevertheless, any problems that might occur while managing the program can be tackled by reading this very chapter.

## General Layout

When you start the program, the first component that is displayed is called the *Launcher*. It enables to run wizards and dialogs, to specify program settings, to visualize the operating environment and the hard disk configuration.

The Launcher's window can be conditionally subdivided into several sections that differ in their purpose and functionality:



1. [Main Menu](#)
2. [Tool Bar](#)
3. [Virtual Operations Bar](#)
4. [Common Tasks Bar](#)
5. [Explorer Bar](#)
6. [Disk Map](#)
7. [Legend Bar](#)
8. [Status Bar](#)

A number of panels offer similar functionality with a synchronized layout. The program enables to conceal some of them to simplify the interface management.

All panels are separated by vertical and horizontal expandable sliders, allowing the user to customize the screen layout.

## Main Menu

The Main Menu provides access to the entire functionality of the program. The available functions are as listed below:

MENU ITEM	FUNCTIONALITY
<b>Tools</b>	
<a href="#">Save to Scheduler...</a>	Schedule pending operations
<a href="#">Send Log Files</a>	Compress and send the log to the Paragon Support Team
<a href="#">View Logs...</a>	View logs on the carried out operations
<a href="#">Recovery Media Builder...</a>	Restore the system even when the current operating system cannot boot anymore
<a href="#">Check Recovery Disks...</a>	Verify the recovery media for integrity and ability to boot from
<a href="#">File Transfer Wizard...</a>	Transfer data from any media
<a href="#">Settings...</a>	Edit the general settings of the program
Exit	Exit the program
<b>Changes</b>	
Undo "the last virtual operation"	Cancel the last virtual operation on the List of Pending Operations
Redo "the last virtual operation"	Cancel the last undo virtual operation on the List of Pending Operations
<a href="#">View Changes...</a>	Display the List of Pending Operations
<a href="#">Apply Changes</a>	Launch the real execution of virtual operations
<a href="#">Discard All Changes</a>	Cancel all virtual operations on the List of Pending Operations
<a href="#">Reload Disk Info</a>	Refresh the current information about disks
<b>Wizards</b>	
<a href="#">Back up Disk or Partition...</a>	Create a sector-based archive of an entire hard disk or separate partitions
<a href="#">Restore Disk or Partition...</a>	Restore an entire hard disk or separate partitions from the backup image
<a href="#">Schedule Backup...</a>	Set a timetable for a disk or partition backup
<a href="#">Differential Backup...</a>	Create a differential to a partition backup
<a href="#">Create File Complement...</a>	Create an increment to a full partition backup
<a href="#">Backup Files...</a>	Create a file-based archive of your files and folders
<a href="#">Restore Files...</a>	Restore files from the backup image
<a href="#">Create a File Increment...</a>	Create an increment to a file backup
<a href="#">Manage Backup Capsule...</a>	Create and manage the backup capsule
<a href="#">Check Archive Integrity...</a>	Perform integrity check for the required backup image
<b>Hard Disk</b>	
<a href="#">Update MBR</a>	Update MBR (Master Boot Record) of the selected hard disk

<a href="#">Change Primary Slots...</a>	Modify the primary partitions enumeration for the selected hard disk
<a href="#">Properties...</a>	Get in-depth information on the properties of selected hard disk
<b>Partition</b>	
<a href="#">Create Partition...</a>	Create a partition
<a href="#">Format Partition...</a>	Format a partition
<a href="#">Delete Partition...</a>	Delete a partition
<a href="#">Assign Drive Letter...</a>	Assign drive letter to the selected partition
<a href="#">Remove Drive Letter...</a>	Remove drive letter for the selected partition
<a href="#">Hide Partition...</a>	Make the selected partition unavailable for the operating system
<a href="#">Unhide Partition...</a>	Make the selected partition available for the operating system
<a href="#">Mark Partition as Active</a>	Make the selected partition bootable by default
<a href="#">Mark Partition as Inactive</a>	Make the selected partition non-bootable by default
<a href="#">Change Volume Label...</a>	Change volume label of the selected partition
<a href="#">Change Serial Number...</a>	Change serial number of the selected partition
<a href="#">Change Partition ID...</a>	Change identifier of the selected partition
<a href="#">Test Surface...</a>	Test surface of the selected partition/block of free space
<a href="#">Check File System Integrity...</a>	Check the selected partition for possible file system errors
<a href="#">Properties...</a>	Get in-depth information on the properties of selected partition
<b>View</b>	
Layouts	Manage the Launcher layout with several predefined profiles
Toolbar	Manage the Tool Bar representation: show / hide standard and navigation buttons, text labels and large icons.
Status Bar	Display the Status Bar
Common Tasks Bar	Display the Common Tasks Bar
Disk Map Legend	Display the Disk Map legend
Disk Map Location	Select whether the Disk Map will be located on the top of the main window or at the bottom
<b>Help</b>	
Help	Open the Help system (you can also do it by pressing F1)
About	Open the dialog with information about the program



The Main Menu contents available at the moment may vary depending on the selected object.

## Tool Bar

The Toolbar provides fast access to the most frequently used operations:

BUTTON	FUNCTIONALITY
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	Back up a hard disk or partition
	Back up files
	Restore a disk or partition
	Restore files
	Open the Help system

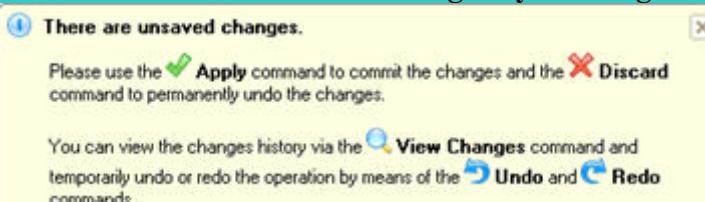
## Virtual Operations Bar

The program supports previewing the resulting layout of hard disks before actually executing operations (so-called virtual mode of execution). In fact, when the [virtual mode is enabled](#), the program does not accomplish operations immediately, but places them on the List of Pending Operations for later execution.

The Virtual Operations Bar enables to manage pending operations.

BUTTON	FUNCTIONALITY
	Cancel the last virtual operation on the List of Pending Operations
	Cancel the last undo virtual operation on the List of Pending Operations
	Display the List of Pending Operations
	Launch the real execution of virtual operations
	Cancel all virtual operations on the List of Pending Operations

**Virtual mode is an effective way of protection from any troubles, since no operations will be executed until clicking the *Apply* button for confirmation, thus giving a second chance to weigh all pros and cons of this or that particular operation. The program politely reminds the user that there are unsaved changes by showing the following window:**



## Common Tasks Bar

The Common Tasks Bar is located on the left side of the main window. It is intended for easy access to the program's wizards.

The bar contains several tabs named [Basic Backup Tasks](#), [Advanced Backup Tasks](#), [Restore Tasks](#), [Copy Tasks](#), [Tools](#) and [News and Documentation](#). Each of these contains a separate button bar which can be folded by clicking it.

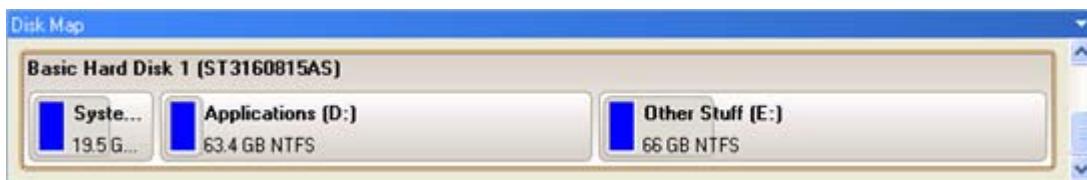
<b>Basic Backup Tasks</b>	
 Back up Disks or Partition	Starting the Sector Backup Wizard to create an archive of a hard disk or separate partitions.
 Schedule Backup	Starting the Sector Backup Wizard with the preset scheduling option.
 Back up Files	Starting the File Backup Wizard to create an archive of particular files and folders.
<b>Advanced Backup Tasks</b>	
 Differential Partition Backup	Starting the Differential Backup Wizard to create a differential to a partition backup.
 Incremental File Backup	Starting the Incremental Backup Wizard to create an increment to a file or partition backup.
<b>Restore Tasks</b>	
 Restore Disks or Partition	Starting the Restore Wizard to restore a hard disk or partition to restore an entire hard disk or separate partitions from the backup image.
 Restore Files	Starting the Restore Wizard to restore files or folders from the backup image.
 Restore Individual Files	Starting the File Transfer Wizard to retrieve data from the program's backup images.
<b>Tools</b>	
 Manage Backup Capsule	Starting the Manage Backup Capsule Wizard to create, resize or delete the backup capsule.
 Recovery Media Builder	Starting the Recovery Media Wizard to create a Linux/DOS bootable media which can be used to get access to your hard disk for maintenance or recovery purposes.
 Check Recovery Discs...	Starting the Check Recovery Disk Wizard to verify recovery media for integrity and ability to boot from.
 Check Archive Integrity	Starting the Check Archive Integrity Wizard to verify backup archives for consistency.
 Transfer Files	Starting the File Transfer Wizard to transfer data from any media. Besides it provides access to Paragon backups as regular folders to browse through their contents or copy required files.
<b>News and Documentation</b>	

 Drive Backup™ Help	Launching the help system (you can also do it by pressing F1).
 About Drive Backup™	Opening the page which contains information about the program. This page will be displayed in the Explorer Bar.

## Disk Map

The Disk Map is displayed in the [Explorer Bar](#) when the *Disk View* tab is selected. It is located either at the top or at the bottom of the window, depending on the state of the *Disk Map Location* option (Main Menu: *View > Disk Map Location*).

As the name infers, the Disk Map displays the layout of physical and logical disks. Physical disks are represented with rectangle bars that contain small-sized bars. These small-sized bars represent logical disks. Their color depends on the file system of the appropriate partition.



Large-sized bars display the following information about physical disks:

- Manufacturer,
- Model.

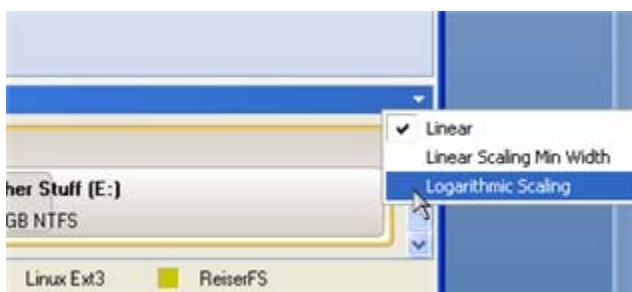
Small-sized bars display the following information about logical disks:

- Serial number,
- Drive letter,
- Total size,
- File system.

Furthermore, it is possible to estimate the used disk space by looking at the size of the bar's shaded area. The program offers to choose from several types of the disk layout scaling. It's done especially to increase the program usability. For instance, if you've got a high capacity hard drive containing both very large (more than 100 GB) and rather small (less than 10 GB) partitions, you can select the logarithmic type to make all partitions readable, otherwise (selecting the linear type) you won't be able to see small partitions at all, but thin strips. On the other hand, if the proportional disk layout is critical for you, the linear type is exactly what you need.

Nevertheless there's a compromise solution – linear scaling with the minimal limit to small partitions. So if a partition is too small it will remain readable.

Just click on the arrow icon on the top right side of the Disk Map to select the desired scaling type.



Disk Map is synchronized with the [Explorer Bar](#). Thus by selecting a disk on the Disk Map, the Explorer Bar will automatically display detailed information on it.



**The user can click a large-sized bar to display information about the appropriate physical disk in the Explorer Bar. A click on a small-sized bar will lead to displaying information about the appropriate logical disk.**

## Explorer Bar

The Explorer Bar is located in the center of the main window which emphasizes its importance. The bar displays reference information including:

- The help system;
- General information on the product including its name, version and a list of helpful links;
- Detailed information about disks selected on the [Disk Map](#);
- List of scheduled operations;
- List of archives

According to these categories the Explorer Bar has several tabs:

- Disk View**, which offers the user the following options:
  - *Properties* to [view detailed information](#) on the selected partition/hard disk in the bright graphical form.
- Scheduled Tasks**, which gives the user the possibility of [browsing and editing scheduled operations](#) and the program scripts.
- Archives**, which enables to manage the [Archive Database](#).
- Help**, which contains the program help and general information on the product.

You can access the desired information by clicking on the appropriate tab.

The Explorer Bar is a fully-functional embedded HTML browser, which offers the possibility to address, for example, the company's website to look through important technical notes or download the latest updates without having to close the program.

The program help is also HTML-oriented. You can read it and follow external links from to get additional information.



To easily navigate through browsed pages, the program provides the following functionality:

BUTTON	FUNCTIONALITY
	Return to the previously browsed page
	Open the next browsed page
	Stop loading the current page
	Refresh the contents of the current page

## Legend Bar

The Legend Bar explains the color scheme used for disk and partition presentation. You can hide (or show) the bar with the appropriate Main Menu item: *View > Disk Map Legend*. When it is activated it can be found at the bottom of the *Explorer Bar*.

The program distinguishes between the following types of known file systems:

- FAT16/32,
- NTFS,
- Linux Ext2/3,
- Linux ReiserFS.

## Status Bar

This is the bottom part of the main window. The Status Bar displays menu hints, for each item the cursor points to.

The user can hide (or show) the bar with the appropriate Main Menu item: *View > Status Bar*.

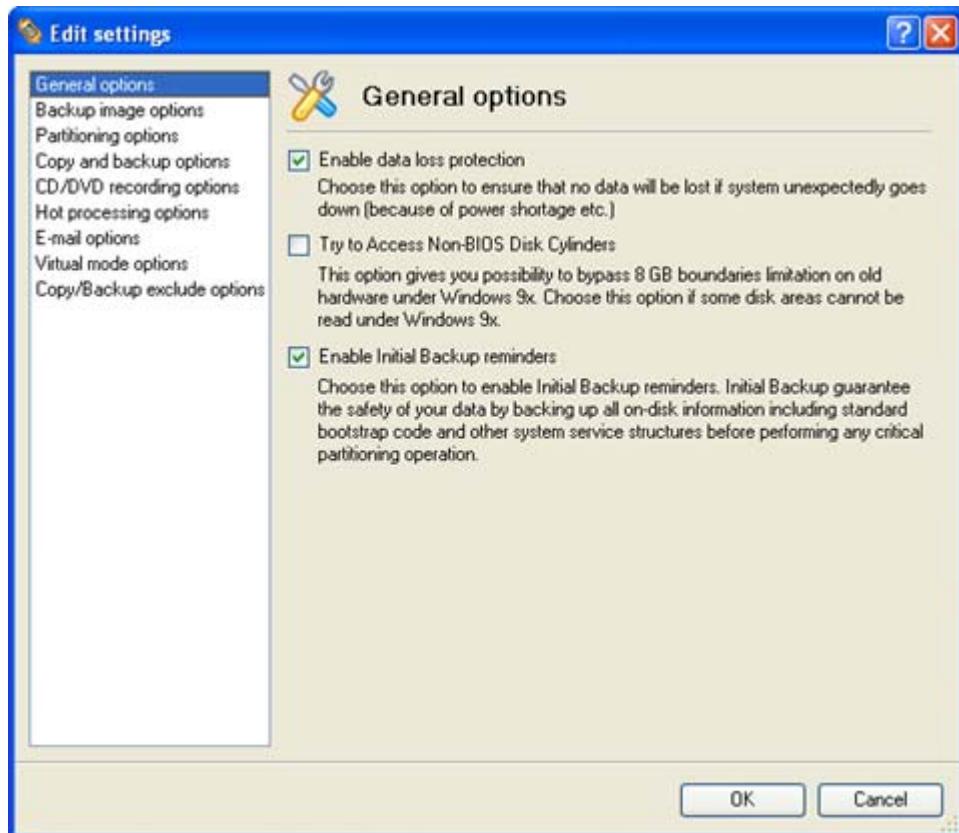
## Settings Overview

The Settings dialog is available from the Main Menu: *Tools > Settings*. All the settings are grouped into several sections, which functions are described in the following paragraphs. The list of sections is placed on the left side of the dialog. By selecting a section from the list, you can open a set of options.



To get a detailed description to any setting, control, or field of the program just click the hint button and then the object you need.

### General Options



This section contains a set of general options that will be taken into account during any operation carried out with the program:

- ❑ **Enable data loss protection.** Mark the checkbox to make the program work in the *fail-safe* mode (also referred to as the *data-loss protection* mode), which ensures reliability for operations by maintaining a special journal. In case of a hardware malfunction, power outage or an OS failure happened in the middle of a data-sensitive operation (resize, move, merge, redistribute, change cluster size, etc.), the program will ask to insert the bootable Recovery CD and automatically complete the interrupted operation, thus reviving the corrupted partition.



**It is strongly recommended to enable this option.**

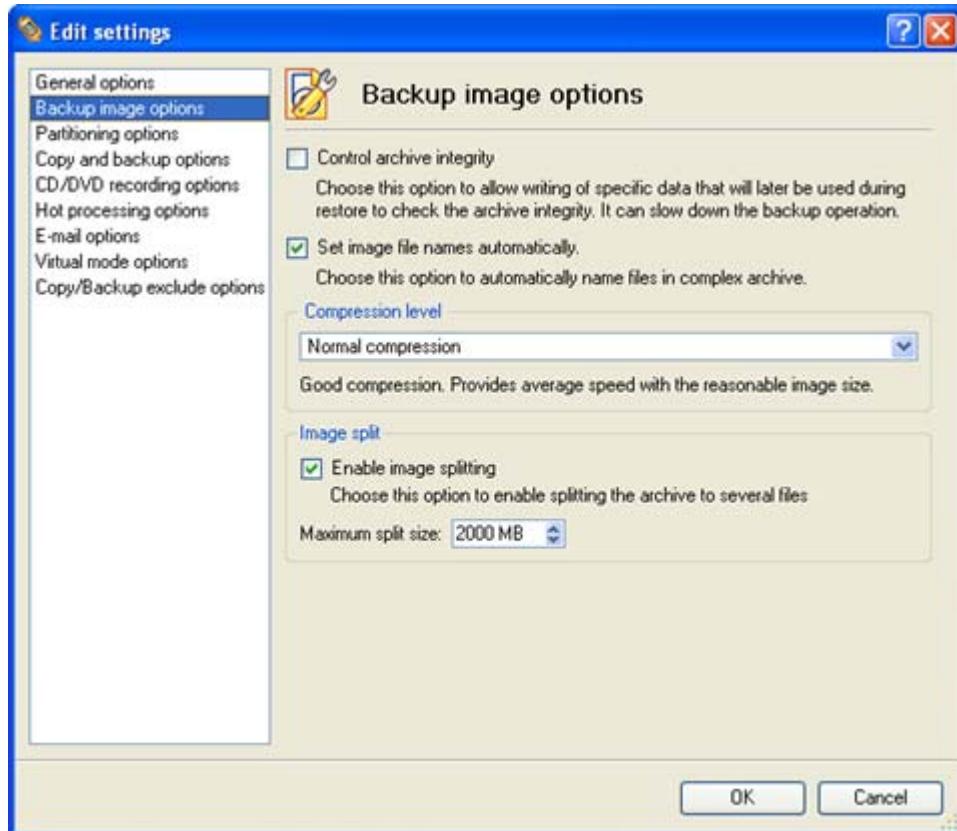
- ❑ **Try to access non-BIOS disk cylinders.** While working under Windows 9x you've noticed that your hard disk capacity is limited to 8GB, mark the checkbox to perform a special procedure of detecting its real capacity, but not using the value returned by the BIOS of your motherboard.



This option is only relevant for Windows 95, 98, ME.

- **Enable Initial Backup reminders.** If this option is marked, the program will automatically offer to make a backup before accomplishing any critical partitioning operation, thus minimizing the risk of data loss.

## Backup Image Options



This section contains a set of options that will be taken into account during backup/restore operations:

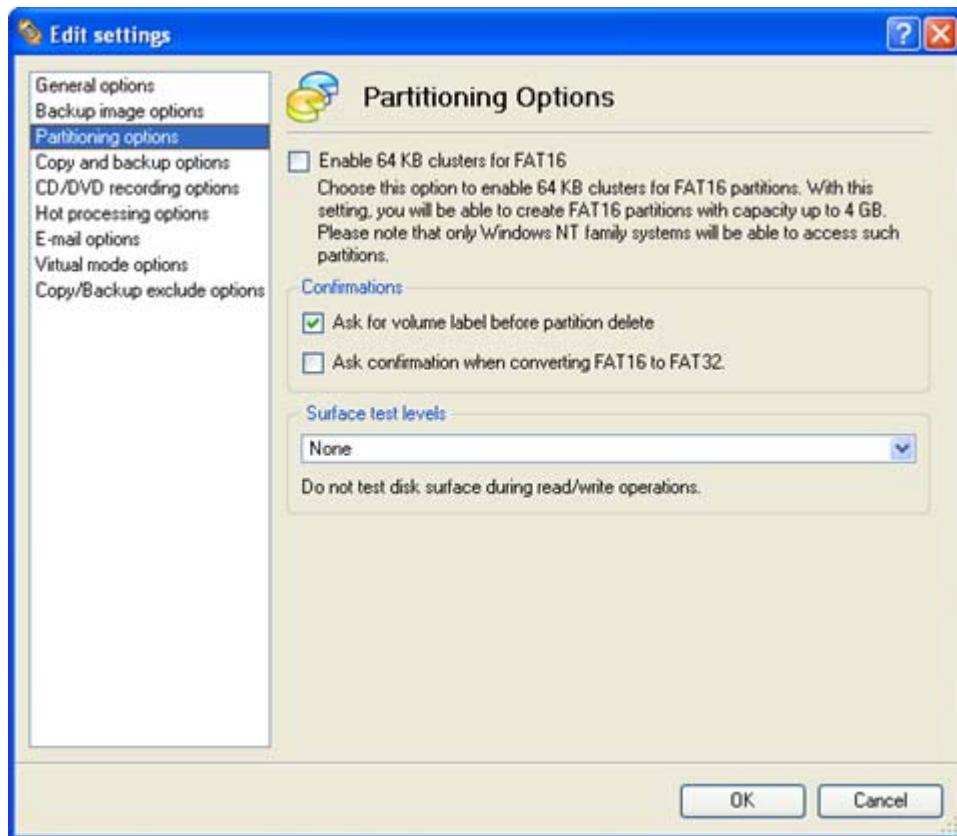
- **Control archive integrity.** Mark the checkbox to guarantee that all backup images created with the program are 100 percent flawless. If you decided not to control the archive integrity, the backup operation would take about 3-5% less time.
- **Set image file names automatically.** Mark the checkbox to make the program automatically set a file name for every volume of a complex backup image. Otherwise you will need to do it manually during the backup operation.
- **Compression level.** From the pull-down list you can select the desired compression level for backup images that will be used by default.
- **Enable image splitting.** Mark the checkbox to automatically split every backup image to volumes of a particular size.



**Splitting images enables to tackle problems caused by a maximum file size limitation of some file systems.**

- **Maximum split size.** With the spinner control you can specify a maximum size for backup volumes.

## Partitioning Options



This section contains a set of options that will be taken into account during partitioning operations:

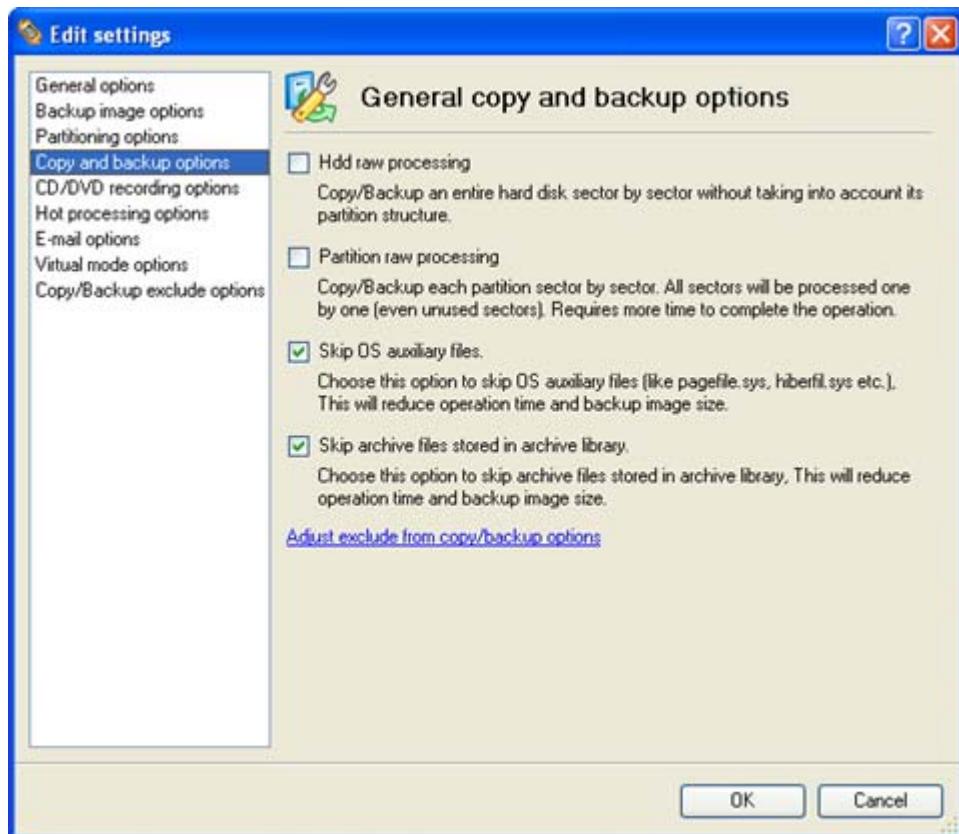
- Enable 64 KB cluster size for FAT16.** Mark the checkbox to enable 64KB clusters for FAT16 partitions. Thus you will be able to create FAT16 partitions up to 4GB in size



**Due to the maximum cluster size of 32KB for Windows 95/98/ME or MS DOS, FAT16 partitions larger than 2GB are not reliably accessible under these operating systems.**

- Request confirmation before partition deletion.** Mark the checkbox to activate an additional security mechanism. Thus when going to delete a partition you will be automatically requested to enter its label.
- Request confirmation when converting FAT16 to FAT32.** Mark the checkbox to automatically request confirmation before converting FAT16 to FAT32. There are a number of situations when this kind of conversion is the only way out to accomplish the operation. For instance, you are going to migrate your system to a larger hard disk with the proportional resize of existing partitions, what is very convenient. As a result you can get original FAT16 partitions go beyond the 4GB limit. Thus without conversion to FAT32, this operation will in no way be possible to accomplish. The same goes for any copy hard disk/partition or restore hard disk/partition operation involving an extra upsizing.
- Surface test level.** Here you can define the surface check level to make the program find bad and non-stable sectors before any write operation and mark them unusable in the file system metadata.

## General Copy and Backup Options



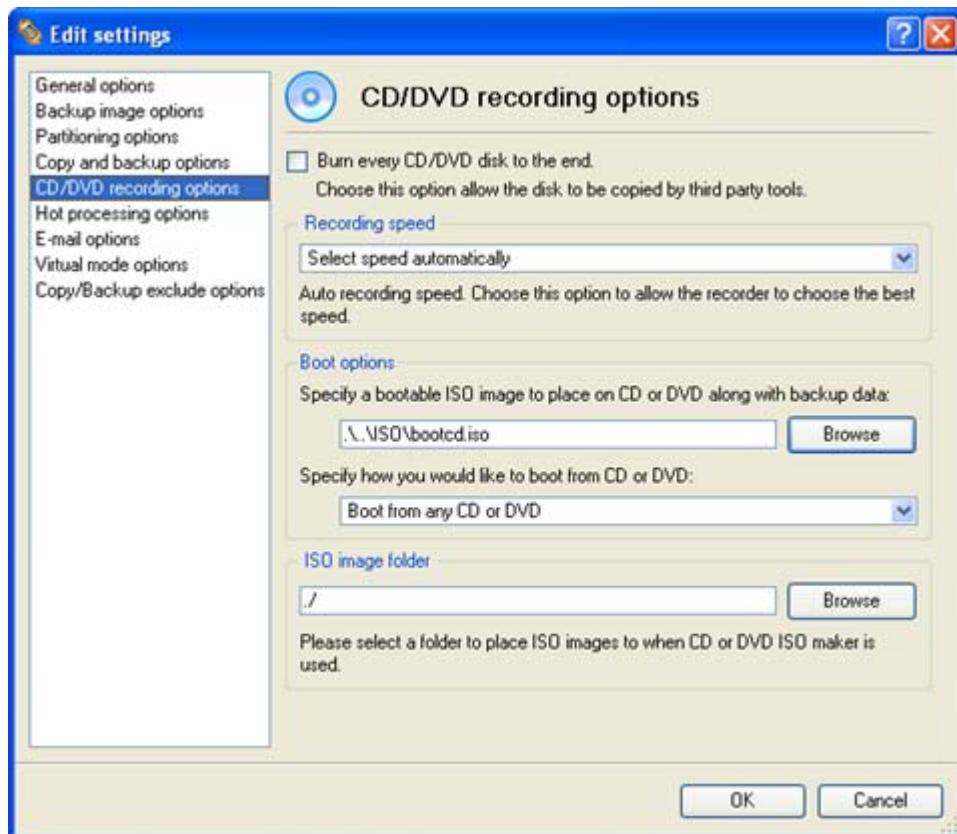
This section contains a set of options that will be taken into account during copy and backup operations:

- **HDD raw processing.** Mark the checkbox to copy/back up a hard disk in the *sector-by-sector* mode, thus ignoring its information structure (e.g. unallocated space or unused sectors of existing partitions will be processed as well). This can help to avoid problems with hidden data created by certain applications or the system administrator. However, it will take more time to accomplish the operation.
- **Partition raw processing.** Mark the checkbox to copy a partition in the sector-by-sector mode to successfully process unknown file systems. However it is not recommended to enable this option when working with supported file systems as it takes more time to accomplish the operation.
- **Skip OS auxiliary files.** Mark the checkbox to skip OS auxiliary files (like pagefile.sys, hiberfil.sys, etc.), thus reducing the operation time and the resulted size of the backup image.



By clicking the link at the bottom of the window you can jump to the [Copy/Backup Exclude Options](#).

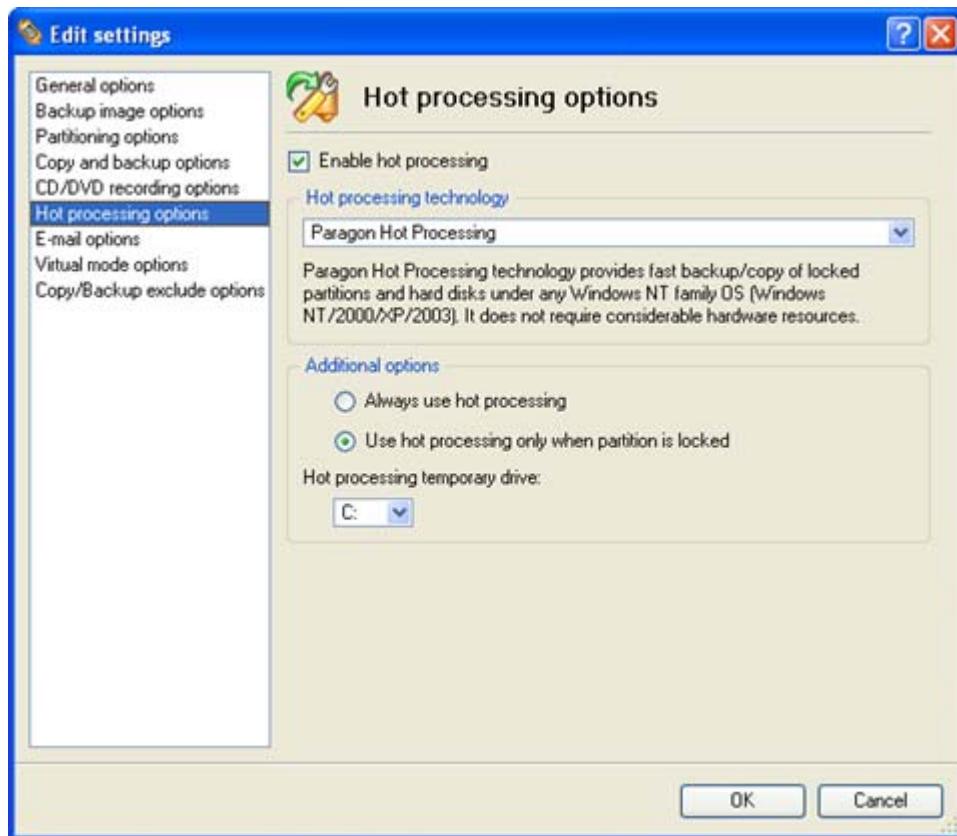
## CD/DVD Recording Options



This section contains a set of options that will be taken into account during CD/DVD burn operations:

- **Burn every CD/DVD to the end.** By default, the program does not create **ISO 9660 compliant** burning sessions, as it processes data on-the-fly and can only estimate the resulted session size. That's why no third party tool will get access to the recorded data. To tackle the issue, mark the checkbox to make the program create a standard **Disk-at-Once** session. It may slow down the burning process, as every CD/DVD will be recorded up to the end, no matter how much actual information to contain.
- **Recording speed.** The user may define how fast a CD/DVD will be recorded (*minimum, normal and maximum*). Besides there is an automatic mode when the program will set the most appropriate speed for every CD/DVD.
- **Bootable ISO image.** That's the image to be placed together with the backup data. By default, the program offers its own bootable ISO image, which contains a Linux/DOS recovery environment. However, the user is free to use any bootable ISO image.
- **CD/DVD boot capability.** The program enables to choose whether any recorded CD/DVD will be bootable, or only the first one for a session, or without that function at all.
- **Folder where the ISO image is to be placed.** When the user decides not to physically burn a CD/DVD, but create an ISO image file, this very folder will be used to contain these images.

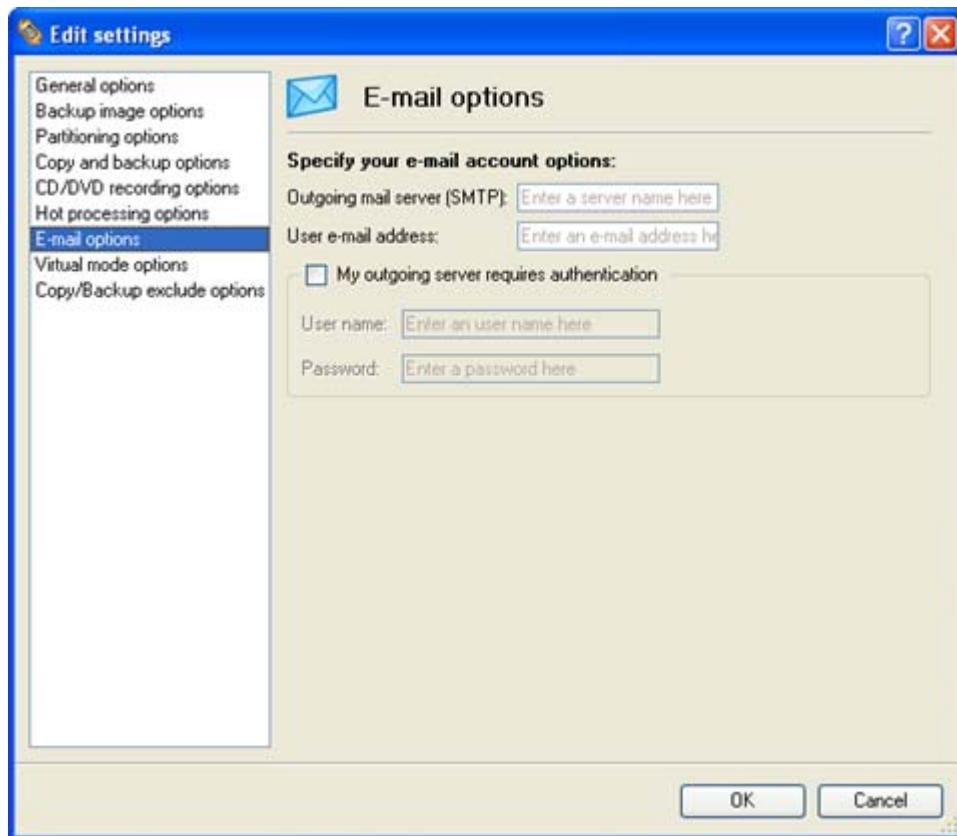
## Hot Processing Options



In this section you may configure the hot processing mode:

- **Enable hot processing.** Mark the checkbox to enable the so called *hot data processing* mode that is specially designed to process data without restarting your operating system.
- **Hot processing technology.** From the pull-down list you can select the required hot processing technology.
- **Always use hot processing.** Select the option to process partitions without making them locked. Thus you will be able to keep working with them as usual.
- **Use hot processing only when partition is locked.** Select the option to use the hot processing only when partitions are locked and cannot be processed without restarting the computer. Please keep in mind, that once you start any operation on a partition in this mode, it will automatically be locked by the program, thus you won't be able to keep working with it as usual.
- **Hot processing temporary drive.** Here you can select a disk drive that will be used to store the temporary hot backup data (by default – C:).

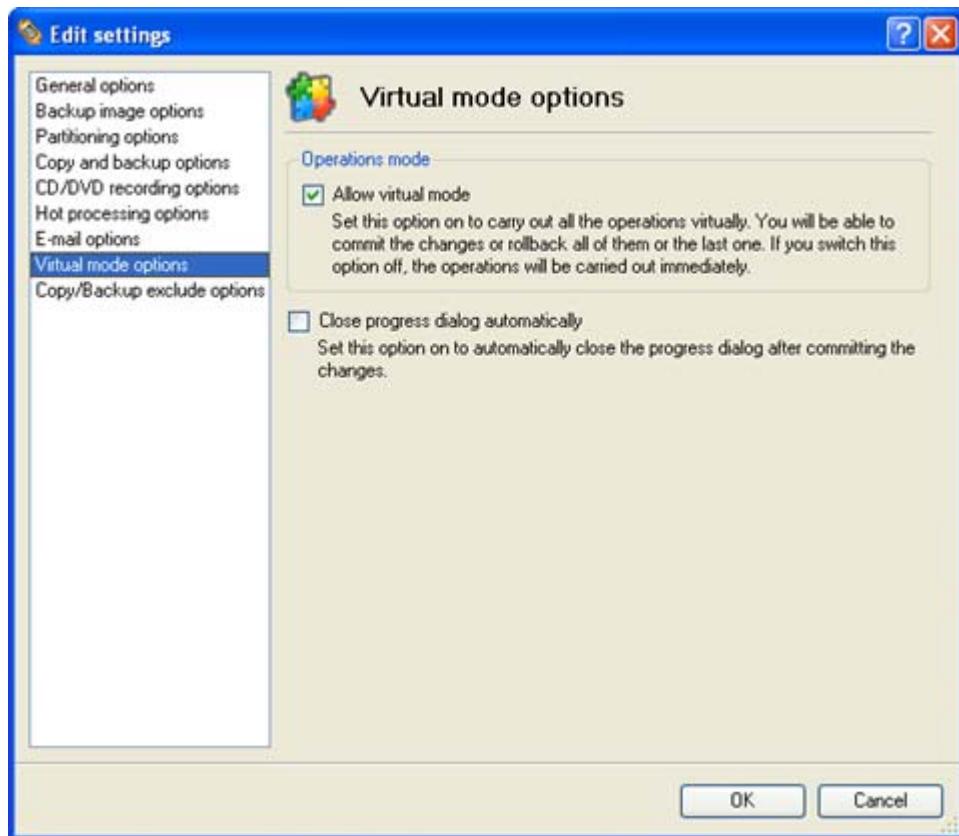
## E-Mail Options



This section contains a set of options that will be taken into account during the *Send log files* operation:

- **Outgoing mail server (SMTP).** To send messages by using the built-in mail client, it is necessary to have access to a computer running an SMTP (Simple Mail Transfer Protocol) server. All outgoing messages are first sent to the SMTP server, which in its turn delivers them to the required recipients. The address may be represented as a traditional Internet host name (e.g.: mail.com) or as an IP numeric address (e.g. xxx.xxx.xxx.xx).
- **User e-mail address.** Specify an e-mail address that has been assigned by the Internet Service Provider or organization's e-mail administrator.
- **My outgoing server requires authentication.** Activate the option to allow the program to make authentication on the server before sending messages.
  - **User name.** Enter the name that will be used to log in to the e-mail account.
  - **Password.** Enter the password that will be used to access the mail server.

## Virtual Mode Options



In this section you may configure the virtual mode:

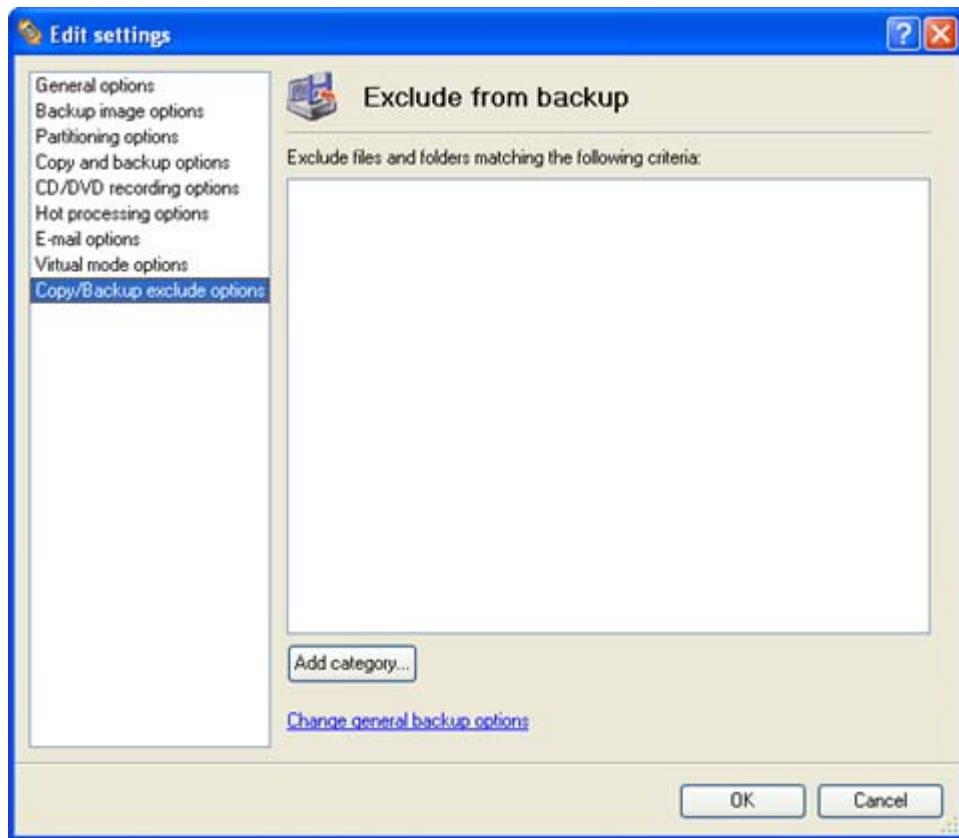
- **Allow virtual mode.** Mark the checkbox to enable the *virtual mode*. It is an effective way of protection from any troubles, since no operation will be executed until confirmation, thus giving you a second chance to weigh all pros and cons of this or that particular operation.



We strongly recommend you to enable this mode.

- **Close progress dialog automatically.** Mark the checkbox to automatically close the progress dialog after accomplishing operations.

## Copy/Backup Exclude Options



In this section the program enables to specify what data should be automatically ignored during copy and sector-based backup operations. You can filter certain files or folders either by the manual selection or by creating masks, what is more preferable. Thus you will be able to effectively manage contents of your backup images or partition/hard disk copies.

By default, there are no available filters. To create a filter, please click the *Add Category...* button.



In the opened dialog the program allows the user to define the following parameters:

- Name.** Give to the filter any name you like, but try to use an informative one;
- Filter.** Press the *Browse* button to select files or folders you would like to be excluded or specify a filter mask by using \* or ? wildcards;
- Description.** Add a short description to the filter not to miss it up later.

Click the *OK* button and you will get a new item on the list of filters. By marking/unmarking a checkbox opposite its name you can choose whether to use it or not.



**By clicking the link at the bottom of the window you can jump to the [General Copy and Backup Options](#).**

# Getting Information on Disks and Backup Images

The program provides some helpful tools to get information on the properties of disks and peculiarities of existing backup images.

## Viewing Disk Properties

The main tool to view in-depth information on the properties of hard disks is the [Disk Map](#). It represents the actual state of the computer's hard disks.

Generally the hard disks are represented on the map by rectangular bars, which also contain small-sized bars. The small-sized bars represent logical disks (partitions). When you select a large-sized bar, the [Explorer Bar](#) displays information about the disk in a bright, graphical form.

**Basic Hard Disk 1 (ST3160815AS)**

---



Type: Basic Hard Disk Drive  
Total size: 149 GB  
Sectors per track: 63  
Heads: 255  
Cylinders: 19457

---

 [Create an image of the entire disk](#)  
Back up all the data this hard disk contains. All the partitions on this disk will be added to the archive.

 [Restore an image of the entire disk](#)  
Warning: This operation will **delete all the data** on this hard disk. All the partitions will be replaced with ones from the image you have chosen. You may also be asked to restart your computer during this operation.

The model and serial number of the disk serve as the title of the browsed page. The disk layout is shown in form of a circular graph, where the color of a sector corresponds to a file system of an appropriate partition. On the right you may see a table, which contains the following information:

- Type of hard disk (basic or dynamic),
- Total size (in GB),
- Information on geometry of the disk (amount of sectors per track, heads and cylinders).

Below there is a list of available wizards. If you click a corresponding record the appropriate wizard will be started. All default values for the operation parameters will correspond to the disk's settings. The list of wizards contains a detailed description of tasks that can be performed by the wizard. This nullifies the possibility of selecting the wrong wizard.

## Applications (D:)



<b>Volume letter:</b> [D:]	<b>Serial number:</b> F48D3C80
<b>Volume label:</b> Application	<b>Partition ID:</b> 0x07 NTFS
<b>Type:</b> Primary	<b>NTFS version:</b> 3.01
<b>File system:</b> NTFS	<b>Total size:</b> 63.4 GB
<b>Root entries:</b> 52875	<b>Used space:</b> 6.2 GB
<b>Sectors per boot:</b> 8	<b>Free space:</b> 57.2 GB
<b>Sectors per cluster:</b> 8	<b>Activity:</b> No
	<b>Hidden state:</b> No

---

 [Create an image of the logical disk](#)  
Back up all the data this logical disk contains.

 [Restore the logical disk from an image](#)  
**Warning:** This operation will **delete all the data** on this logical disk and replace them from the image you have chosen. You may also be asked to restart your computer during this operation.

When you select a small-sized bar (i.e. corresponding to a logical disk) the [Explorer Bar](#) will display information on it as well. The page title will contain a drive letter, which is assigned to the disk. The disk layout graph will be colored in accordance with the volume ratio of the used space to the free space (the light colored sector). The table on the right will contain the following information:

- Volume label (if available),
- Type of the logical disk,
- File system (represented by the color of the graph and the selected bar),
- Total size, used space and free space (in GB or MB).

Below there is a list of wizards, which may be called for this disk. All default values of parameters will correspond to the disk settings.

## Viewing Image Properties

General information on backup archives can be obtained either with the help of the [Restore Wizard](#) or the [Archive Database](#):

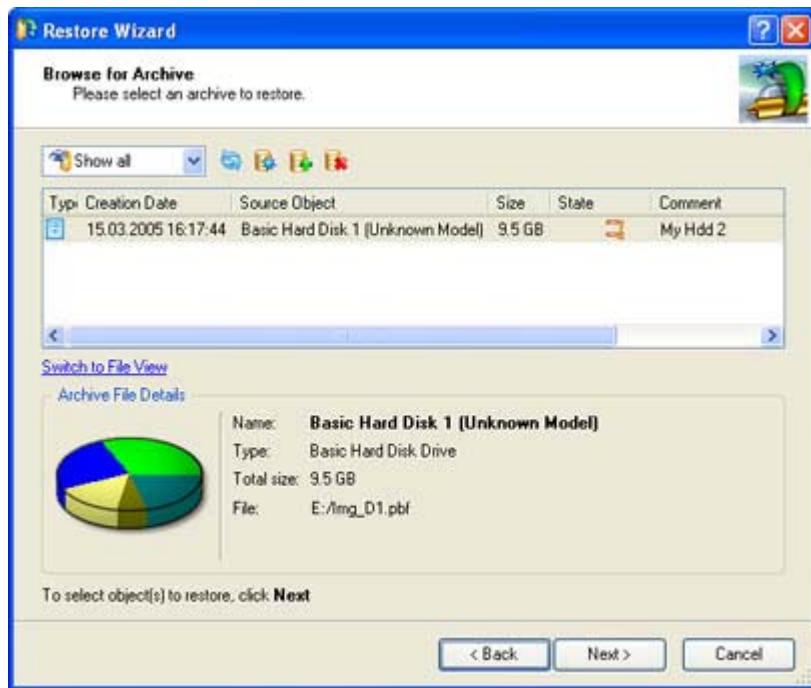
### Using the Restore Wizard

There are several ways to launch the Restore Wizard:

- In the Main menu: select Wizards > Restore a Disk or Partition...
- In Common Tasks bar: click the Restore a disk or partition item of the Wizards menu
- Select a logical disk and then click the Restore the disk from an image link on the Explorer Bar page.

At first, the wizard displays the Welcome page – simply click the *Next* button at the foot of the dialog window.

The next page refers to *Browse for Archive*. By clicking the *Switch to Archive List View* link, you can see a list of images contained in the [Archive Database](#) (if any).



To get a clear-cut picture on properties of the required image, just click on it and the section below will (i.e. *Archive File Details*) display a short description, including:

- Information on a type of the archive contents (whether it is sector-based or file-based),
- Whether the archive is compressed or not,
- Whether the archive is password protected or not,
- The date, when the archive was created.

In addition, there are some special graphical flags to indicate crucial properties:

FLAG	FUNCTIONALITY
	Disk archive
	Partition archive
	File archive
	MBR archive
	System archive
	Encrypted archive
	Compressed archive
	Complex archive
	Filtered archive
	Differential archive
	Incremental archive
	File increment to a partition archive

To easily manage images in the Archive Database, the program provides the following functionality:

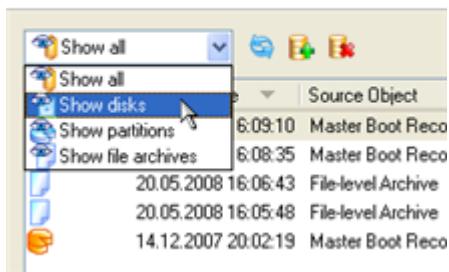
BUTTON	FUNCTIONALITY
--------	---------------

	Refresh the contents of the database
	Show only existing archives
	Add the selected archive to the database
	Delete the selected archive from the database

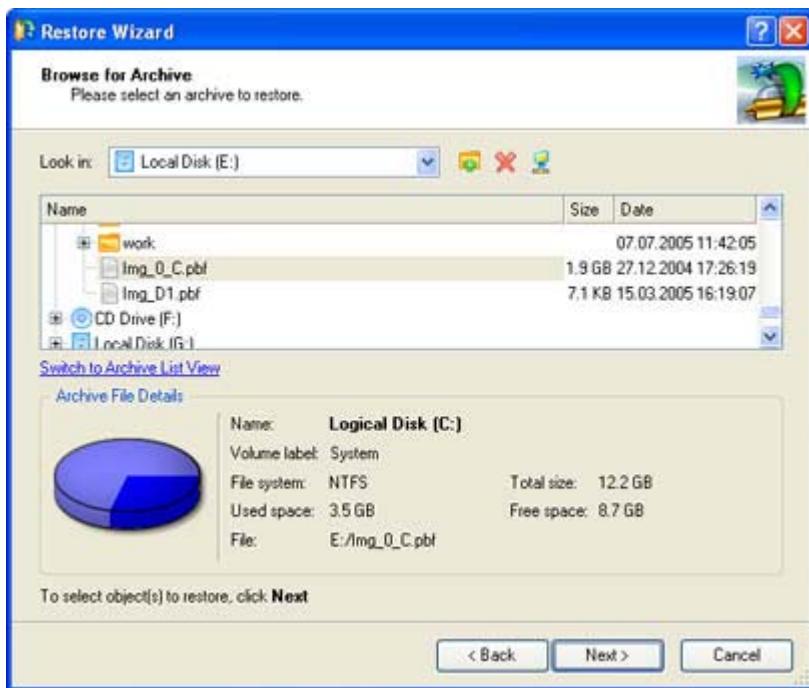
Besides you may filter backup archives to decide whether to show only file, partition or hard disk archives. To do that, please select the required filter in the left top corner of the page.

#### Browse for Archive

Please select an archive to restore.



By clicking the *Switch to File View* link, you can find the required image in the browser-like window.

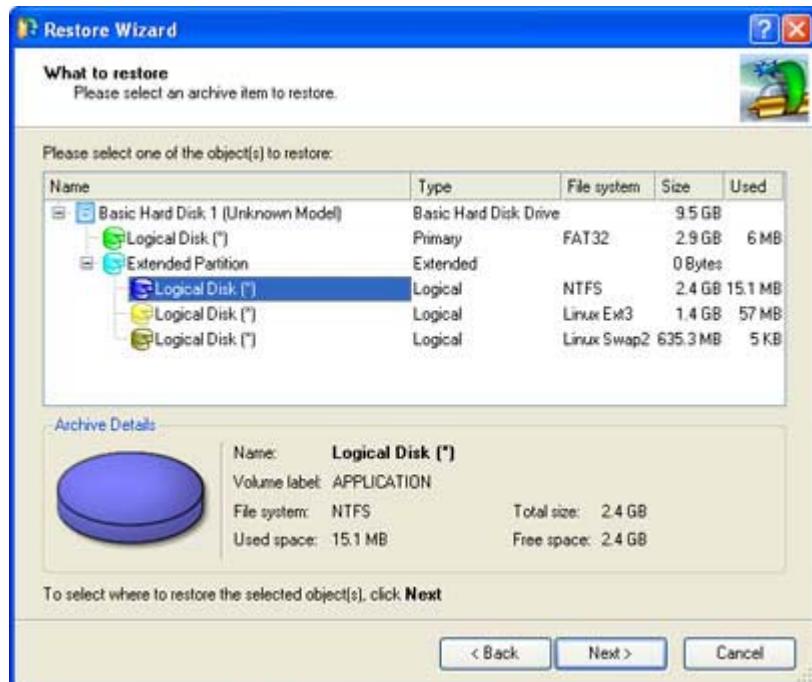


The section below (i.e. *Archive File Details*) displays a short description of the selected image, including:

- Information on a type of the archive contents (whether it is sector-based or file-based),
- Whether the archive is compressed or not,
- Whether the archive is password protected or not,
- The date, when the archive was created.

Moreover, on this page you've got the possibility to create new folders, delete existing files/folders or map network drives by clicking the appropriate buttons.

The next page (i.e. *What to restore*) displays detailed information about the contents of the archive.



If you want to restore the image contents, click the *Next* button. In order to cancel, click the *Cancel* button.

## Using the Archive Database

To open the Archive Database, click the appropriate tab in the [Explorer Bar](#). The database window can be conditionally subdivided into several sections that differ in their purpose and functionality:

The screenshot shows the 'Archive Database' window with the following sections:

- Explorer Bar:** Displays properties of the selected image (Basic Hard Disk 1). It includes a pie chart, source object size (9.5 GB), archive size (7.1 KB), location (E:/Img\_D1.pbf), creation date (15.03.2005 16:17), and flags (Compress).
- Volume Explorer:** Shows a list of files and folders within the archive, such as 'Img\_0\_C.p01', 'Img\_0\_C.pbf', etc.
- Archive List:** Displays a table of images contained in the archive. The table has columns: Type, Creation Date, Source Object, Size, Flags, Comment, and Mounted. It lists two entries: 'Basic Hard Disk 1 [Unknown Model]' and 'Logical Disk (C:)'.

Numbered callouts point to specific parts of the interface:

- 1 Points to the Explorer Bar.
- 2 Points to the Volume Explorer.
- 3 Points to the Archive List.

A sidebar at the bottom provides links for 'Restore Archive' and 'Check Archive Integrity'.

1. [Explorer Bar](#) that displays properties of the selected image.
2. Volume Explorer that enables to access the selected image as a regular folder to explore its contents or to retrieve certain files.
3. [Archive List](#) that displays a list of images contained in the Archive Database (if any). Besides the program provides all the necessary

functionality to manage backup images in the database ([add](#), [delete](#), [mount](#), [refresh](#), etc.)



All panels offer a synchronized layout and are separated by vertical and horizontal expandable sliders, allowing the user to customize the screen layout.

## Data Backup and Rescue

In this chapter you will find all the information necessary to establish a reliable data protection system.

### Creating Backup Images

We have already mentioned that the most prevalent way to protect valuable data is to create backup copies (*backup images* in terms of the program) of it. Depending on a type of information you need to protect and the way this information should be processed, the program offers a number of handy backup wizards.

#### Wizard Work Algorithm

To make your job with the program as easy and convenient as possible, all backup wizards share similar work algorithm. So let us just take as an example the *Sector Backup Wizard* to describe it in detail.

By going through steps of the wizard, you configure all the necessary settings to launch the backup operation. To minimize the possibility of making any mistake, the wizard provides auxiliary information on every single option. Moreover you can get an in-depth description to any setting, control, or field of the wizard just by clicking the hint button and then the object you need.

#### Startup

There are several ways to start the *Sector Backup Wizard*:

- In the Main Menu: select *Wizards > Back up a Disk or Partition...*
- On the Common Tasks Bar: click the *Back up a Disk or Partition* item of the Wizards menu.
- In the Toolbar: click the *Back up a Disk or Partition* button.

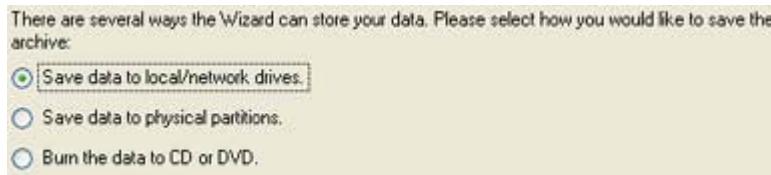
#### Setup

The wizard offers the following steps to accomplish the backup operation:

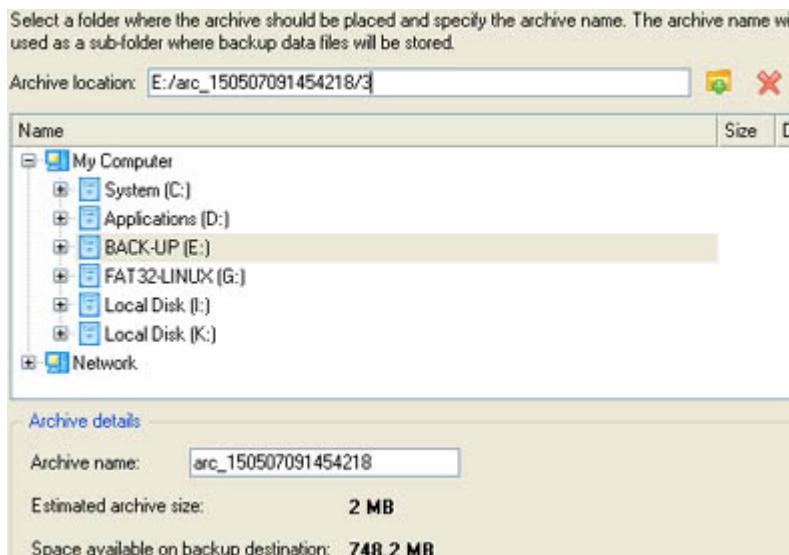
- The object to back up.** You can back up either an entire disk or separate partitions of the disk (primary, extended or logical). In case of backing up an entire disk, you've got the possibility to include into the image such disk elements as the Master Boot Record (MBR) and the first track of the hard disk. This can be very helpful for serious disk recovery procedures.

My Computer		My Computer		
<input checked="" type="checkbox"/>	Basic Hard Disk 0 (ST340014A)	Basic Hard Disk Drive	37.2 G	
<input checked="" type="checkbox"/>	First Hard Disk Track	First Track	0 Byte	
<input checked="" type="checkbox"/>	Master Boot Record	MBR	0 Byte	
<input checked="" type="checkbox"/>	Logical Disk (C:)	Primary	NTFS	12.2 G
<input type="checkbox"/>	Extended Partition	Extended		25 G
<input type="checkbox"/>	Logical Disk (D:)	Logical	NTFS	14.7 G
<input type="checkbox"/>	Logical Disk (E:)	Logical	NTFS	10.2 G
<input type="checkbox"/>	Basic Hard Disk 1 (FUJITSU MPF3102AT)	Basic Hard Disk Drive		9.5 G

- **Backup destination.** The wizard allows saving backup archives to local or network drives, to physical partitions (without drive letters assigned), the Backup Capsule or burning them to CD/DVDs. You need to select a destination, taking the estimated archive size and available space on the backup destination into account.



- **Name and location of the resulted image.** Provide a file name for the new image and its exact location. The program automatically offers an easy to understand name containing the date and the time of the archive creation, which can anyway be modified.



**The program automatically calculates size of the future archive and informs the user about space available on the selected destination.**

- **Archive Comment.** You can add some additional description to the archive that will later help to distinguish it from the others.



In addition, there is the possibility to make further detailed settings (although the default values will do in most cases). To activate the advance mode, you need to mark the appropriate option on the second page of the wizard. When it is marked, the next page enables to define:

- Whether the **archive integrity** will be controlled.



**Checking archive integrity enables to guarantee that all backup images created with the program are 100 percent flawless. Nevertheless if you decided not to control the archive integrity, the backup operation would take about 3-5% less time.**

- Whether **image file names** will be set automatically in complex archives.
- **Compression level** for the backup image (including the *No compression* variant).

- Whether the archive will be **split** (if yes, you can set the maximum size for the archive files).



**Splitting images enables to tackle issues caused by a file size limitation of some file systems.**

- Whether the archive will be **protected by password**.
- Whether the selected disk (or the selected partition) will be copied in the **sector-to-sector mode** (including unused sectors as well).
- Whether the **OS auxiliary files** (pagefile.sys, hyperfil.sys) will be included in the backup image.
- Recording speed** when the user wants to burn the backup image onto CD/DVDs.
- ISO image folder** where the archive that is to be recorded on a disc, is placed.
- Whether the operation will be performed **without rebooting the system**. The program needs to reboot the system in order to have exclusive access to processing data. In a Windows environment this is difficult to achieve because even when all the other applications are closed, the system service programs are still running. However, there is a way to avoid rebooting. The mode of processing the backup operation without rebooting is named **Hot Processing**. You can also define specific parameters for the Hot Processing mode.

## Result

After the backup operation is completed you receive an image of the selected disk (or the selected partition). This image is placed into the specified destination (a local (mounted/unmounted) or network disk, the Backup Capsule or a CD/DVD disc), its features defined by the wizard.

### Available operation scenarios:

- [Backing up a Hard Disk or Partition to the Backup Capsule](#)
- [Backing up a Hard Disk or Partition to External Media \(CD/DVD\)](#)
- [Backing up a Hard Disk or Partition to a Network Drive](#)
- [Backing up Files to a Local Mounted/Unmounted \(without Drive Letter Assigned\) Partition](#)
- [Creating a Differential to a Full Partition Backup](#)
- [Creating an Incremental to a Full Partition Backup](#)
- [Creating an Incremental to a Full File Backup](#)

## Restoring System and Data

The program includes a convenient and reliable restore wizard. With its help you can restore all types of backup images created with the program. It provides easy to understand instructions to configure and perform all the necessary settings. Moreover you can get an in-depth description to any setting, control, or field of the wizard just by clicking the hint button and then the object you need.

## Startup

There are several ways to start the *Restore Wizard*:

- In the Main Menu: select *Wizards > Restore Wizard...*
- On the Common Tasks Bar: click the *Restore Wizard* item of the Wizards menu.
- In the Toolbar: click the *Restore Wizard* button.

## Setup

The wizard offers the following steps to accomplish the restore operation:

- **A backup image to be restored.** The *Browse for Archive* page enables to find a backup image you need.

By clicking the *Switch to Archive List View* link, you can see a list of images contained in the [Archive Database](#) (if any).

Type	Creation Date	Source Object	Size	Flags	Comm	Mounted
	20.05.2008 16:09:10	Master Boot Record	0 Bytes		N...	
	20.05.2008 16:08:35	Master Boot Record	0 Bytes		N...	
	20.05.2008 16:06:43	File-level Archive	0 Bytes			
	20.05.2008 16:05:48	File-level Archive	2.2 MB			
	14.12.2007 20:02:19	Master Boot Record	0 Bytes			

[Switch to File View](#)

**Archive File Details**

Name: **FB Archive**  
 Comment: [No comment is available]  
 Backup date: 20.05.2008 16:05:48 Total size: 2.2 MB (2 317 380 Bytes)  
 File: F:/Backup Images/file archive/FL000000000000000000/archive.pbf

To get a clear-cut picture on properties of the required image, just click on it and the section below will (i.e. *Archive File Details*) display a short description.



To know more on the subject, please consult the [Viewing Image Properties](#) chapter.

By clicking the *Switch to File View* link, you can find the required image in the browser-like window. The section below (i.e. *Archive File Details*) will also display a short description of the selected image.

Look in: Local Disk (F:)

Name	Size	Date
arc_181207091158701	18.12.2007 13:21:32	
arc_181207091158701.PBF	6.3 KB	18.12.2007 13:21:33
arc_181207091158701_0100.p.000	1.9 GB	18.12.2007 13:13:39
arc_181207091158701_0100.p.001	1.9 GB	18.12.2007 13:14:32
arc_181207091158701_0100.p.002	1.9 GB	18.12.2007 13:15:22
arc_181207091158701_0100.p.003	1.0 GB	18.12.2007 13:16:17

[Switch to Archive List View](#)

**Archive File Details**

Name: **Basic Hard Disk 1 (Unknown Model)**  
 Comment: [No comment is available]  
 Type: Basic Hard Disk Drive  
 Total size: 149 GB  
 File: Backup Images/arc\_181207091158701/arc\_181207091158701.PBF

Moreover, on this page you've got the possibility to create new folders, delete existing files/folders or map network drives by clicking the appropriate buttons.



To know more on the subject, please consult the [Viewing Image Properties](#) chapter.

## File Backup Restore

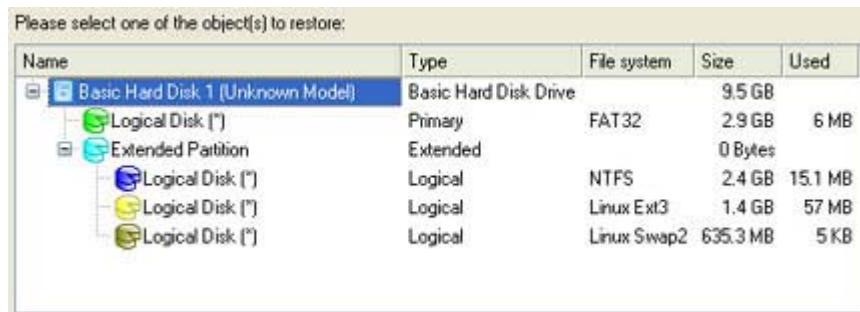
- **A place to restore the archive to.** From the pull-down list you can choose whether to restore contents of the backup image to its original location or specify some other one.



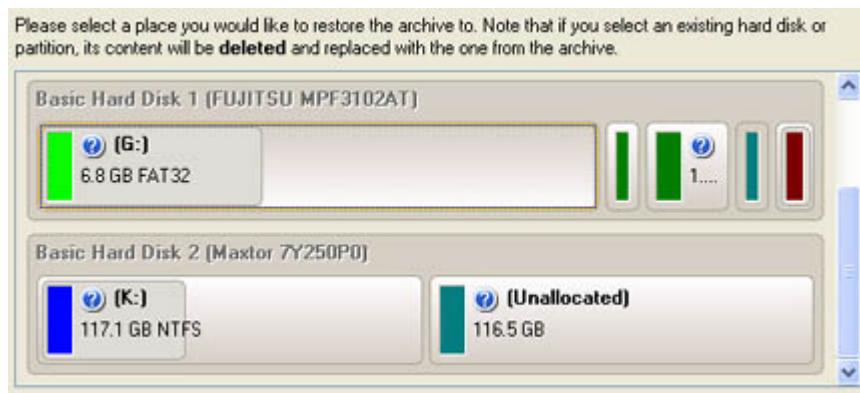
Besides if you select the *Original location* option, you can additionally define whether to replace already existing files during the restore operation (good for recovering presumably corrupted files) or leave them intact (good for recovering accidentally deleted files).

## Sector Backup Restore

- **An item of the selected archive to be restored.** The program allows you to restore not only an entire archive, but also separate items of the archive. It is very convenient in case of restoring separate partitions from the entire disk archive.



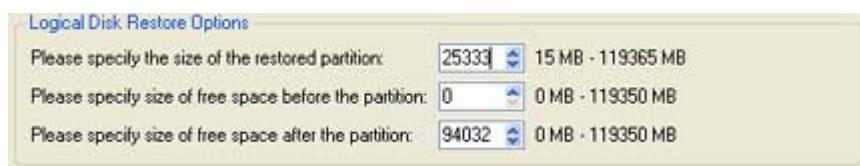
- **A place to restore the archive to.** Selecting the destination, please note - all contents on the disk selected for restoring purposes will be deleted during the operation.



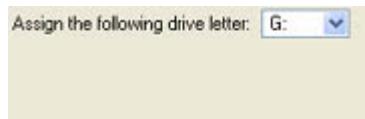
To help you get a clear-cut picture of the operation outcome, the program allows inspecting the resulted disk layout.

## Restoring Partition:

- **Size of the restored volume and free space before and after it** on the disk.

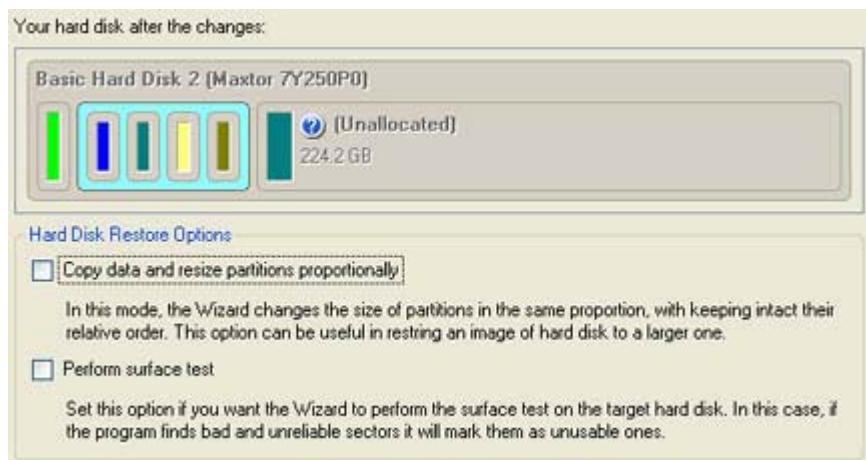


- **Drive letter assignment after restore.** The pull-down list contains vacant drive letters that can be associated with the restored partition.



### Restoring Hard Disk:

- **Copy data and resize partitions proportionally.** If this option is activated, the program proportionally changes the size of partitions keeping their relative order intact. The option can be useful when restoring to a larger hard disk.
- **Perform surface test.** Define whether the surface test will be accomplished during the operation or not.



All contents on the disk selected for restoring purposes will be deleted during the operation.

### Result

The wizard will restore the archived data, and make it available to use in the operating system.

### Available operation scenarios:

- [Restoring a Hard Disk from the Bootable Backup Capsule](#)
- [Restoring a System Partition from External Media \(CD/DVD\)](#)
- [Restoring a System Partition from a Local Drive](#)
- [Restoring Vista to a Different Hardware Configuration](#)
- [Restoring a File Increment](#)
- [Restoring a File Increment to a Partition Backup](#)

## Building Recovery Media

The *Recovery Media Builder* provides the possibility to prepare the Linux/DOS recovery environment on external media (CD, DVD, flash memory or floppy disks) to boot and run utilities under Linux or PTS DOS, and that way to get access to your hard disk for maintenance or recovery purposes. Besides it enables to save data from partitions of your hard disk directly to compact discs or just burn ISO-images.

## Startup

There are several ways to start the *Recovery Media Builder*:

- ❑ In the Main Menu: select *Tools > Recovery Media Builder* ...
- ❑ On the Common Tasks Bar: click the *Recovery Media Builder* item of the Wizards menu.

## Setup

The wizard offers the following steps to build recovery media:

- ❑ **Type of the recovery media.** You can place it either on a CD/DVD disc, flash memory or a floppy disk.



- ❑ **Contents of the recovery set.** You can choose whether to use the default Linux/DOS recovery environment (included in the installation package) or your own bootable image (need to provide a path to it). Besides you're free to add any data you like to the standard image what is very convenient.



- ❑ **A recording device.** The appropriate external media (CD/DVD, flash memory or a floppy disk) needs to be available in the system.



- ❑ **CD/DVD writing parameters** (in case you select this kind of media). Writing parameters include writing speed (maximum or minimum) and the ability of ejecting the recorded disc after completing the operation.



The program supports CD-R, CD-RW, DVD-R, DVD+R, DVD-RW, DVD+RW, DVD-R, DVD+R double layer and also Blu-ray discs.



If the inserted disc is not empty, the wizard will suggest erasing its contents (if possible). Once the operation has been confirmed, the program will delete the re-writable disc's contents and begin the recording process.

## Result

As a result of the operation, you receive recovery media to use in most emergencies.

# Partition Management

In this chapter you will find all the information necessary to carry out partitioning operations supported by the program.

## Basic Partitioning Operations

Here you can learn how to accomplish basic partitioning operations ([create](#), [format](#), [delete](#)).

### Creating Partitions

The program provides the ability to create a new partition by using the *DOS partitioning scheme*. This operation can be accomplished with the *Create Partition Dialog*.

### Restrictions

1. Do not use the *Create Partition* function in order to undelete the last deleted partition.
2. The program cannot create new partitions on *Dynamic Disks*. The current version of the program supports only hard disks that use the *DOS partitioning scheme* (in Windows 2000 and XP these disks are named *Basic Disks*).
3. According to the rules of the DOS partitioning scheme, the following combinations of partitions cannot be created:
  - Two Extended Partitions on one hard disk
  - Five or more Primary partitions on one hard disk
  - If there is an Extended Partition on the disk, only three Primary partitions are allowed
4. The program allows creating new partitions only within blocks of un-partitioned space. It cannot convert a free space on an existing partition to a new partition.

### Startup

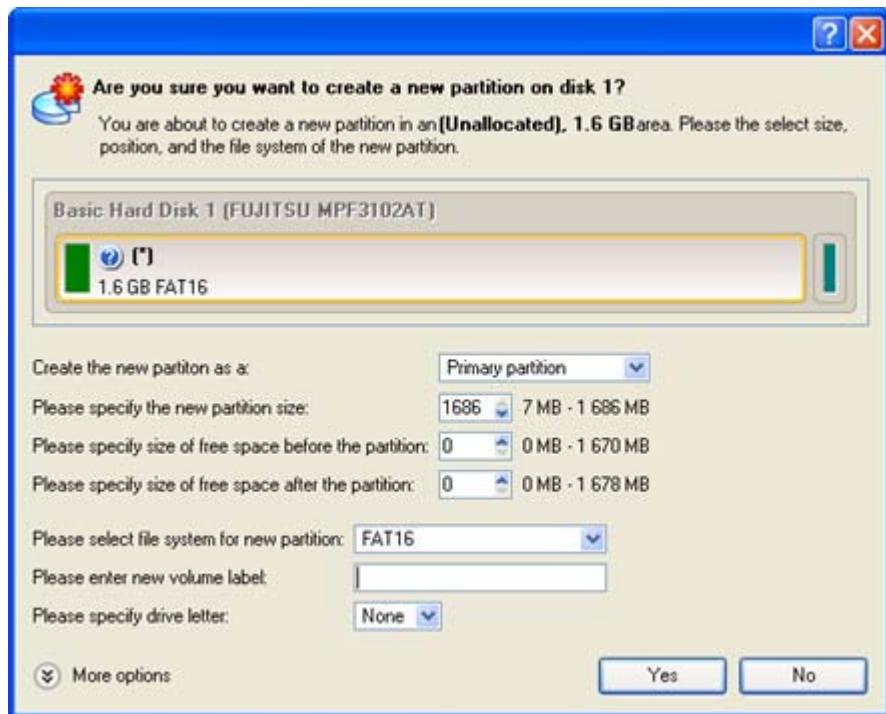
In order to start the operation you should take the following steps:

1. Select a block of free space on the Disk Map;
2. Call the *Create Partition Dialog* to set up the operation. There are several ways to do it:

- Select in the Main Menu: *Partition > Create Partition.*
- Call the popup menu for the block of free space (right click of the mouse button) then select the menu item: *Create Partition.*

## Setup

Initially the program suggests some consistent values for all parameters. In most cases, you can just press the *Yes* button to confirm the operation.



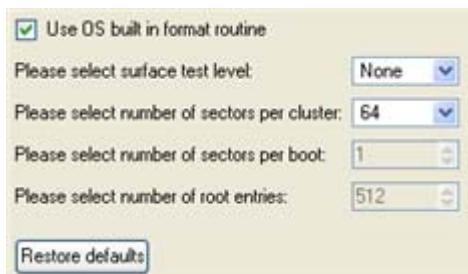
- Define whether the partition will be Primary, Extended or Logical.** You can choose the desired partition type from the pull-down list. As a matter of fact, the available alternatives fundamentally depend on the selected block of free space - within the Logical free space, only Logical partitions can be created; Within the Primary free space, both Primary partitions or the Extended Partition can be created.
- Partition Size.** Define the size (in Mb) of the new partition.
- Free space before.** Define the position (in Mb) of the new partition relative to the beginning of the block of free space.
- Free space after.** Define the amount of trailing free space (in Mb) at the end of the new partition.



**Partition size and position may also be defined by using the *drag-and-drop* technique. To do that, just carry out the required operation on the Disk Map. The virtual operations are to be available.**

- File system for new partition.** From the pull-down list select a file system the newly created partition will be formatted to, otherwise the partition will remain unformatted (so that it will not be ready to use).
- Volume label.** Enter a label for the selected partition in this textual field. It is an irrelevant parameter usually used for drive identification.
- Drive letter assignment.** The pull-down list contains vacant drive letters that can be associated with the newly formatted partition.

In addition, there is the possibility to make further detailed settings (although the default values will do in most cases). To activate the advance mode, you need to click the *More options* button at the foot of the dialog page. Depending on the chosen file system, the following options become available:



- **Use OS built-in routine.** Mark the option to restrict the available values according to the used OS.
- **Whether the surface test will be performed.** Define the level of the surface check to make the program find bad and unstable sectors and mark them unusable in the file system metadata.
- **The amount of sectors per boot.** This parameter is available exclusively for FAT16 and FAT32 file systems. Set the number of sectors to be reserved for the boot area on the partition with this spinner control.
- **The amount of root entries.** This parameter is available exclusively for FAT16 file system. Set the maximum amount of files/directories to be placed in the Root Directory on the FAT16 partition.
- **The amount of sectors per cluster.** Define the Cluster Size for the formatted partition with this spinner control.



## Result

After the operation is completed you receive a fully functional partition.

## Formatting Partitions

Any partition should contain some file system to be used for keeping data. The process of installing a file system is commonly known as formatting. A huge variety of file systems have been developed these days.

## Supported File Systems

The program provides the ability to format partitions of the following file systems:

- FAT12 & FAT16
- FAT32
- NTFS
- Ext2
- Ext3
- Linux Swap v. 2
- HPFS

This operation can be accomplished with the *Format Partition Dialog*.

## Startup

In order to start the operation you should take the following steps:

1. Select a partition on the Disk Map;
2. Call the *Format Partition Dialog* to set up the operation. There are several ways to do it:

- Select in the Main Menu: *Partition > Format Partition*.
- Call the popup menu for the selected partition (right click of the mouse button) then select the menu item: *Format Partition*.

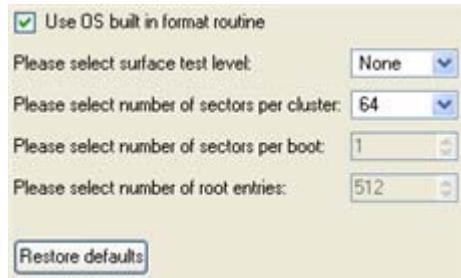
## Setup

Initially the program suggests some consistent values for all parameters. In most cases, you can just press the *Format* button to confirm the operation.



- File system.** From the pull-down list select the desired file system type. In fact, the program displays only those file systems that can correctly be placed to the selected partition, taking its capacity into account.
- Volume label.** Enter a label for the selected partition in this textual field. It is an irrelevant parameter usually used for drive identification.

In addition, there is the possibility to make further detailed settings (although the default values will do in most cases). To activate the advance mode, you need to click the *More options* button at the foot of the dialog page. Depending on the chosen file system, the following options become available:



- Use OS built-in routine.** Mark the option to restrict the available values according to the used OS.
- Whether the surface test will be performed.** Define the level of the surface check to make the program find bad and unstable sectors and mark them unusable in the file system metadata.
- The amount of sectors per boot.** This parameter is available exclusively for FAT16 and FAT32 file systems. Set the number of sectors to be reserved for the boot area on the partition with this spinner control.
- The amount of root entries.** This parameter is available exclusively for FAT16 file system. Set the maximum amount of files/directories to be placed in the Root Directory on the FAT16 partition.
- The amount of sectors per cluster.** Define the Cluster Size for the formatted partition with this spinner control.



Number of available options depends on the selected file system type.

## Result

After the operation is completed you receive a fully functional partition formatted to the specified file system.

## Deleting Partitions

With the *Delete Partition Dialog* you can delete a partition on a hard disk partitioned with the *DOS partitioning scheme*. Unlike the majority of other utilities (*Windows Disk Manager* included), the program can not only remove references to the deleted partition from the *Partition Table*, thus making it unavailable for the operating system, but also enables to irreversibly destroy its data. This feature will guarantee security of your personal information.

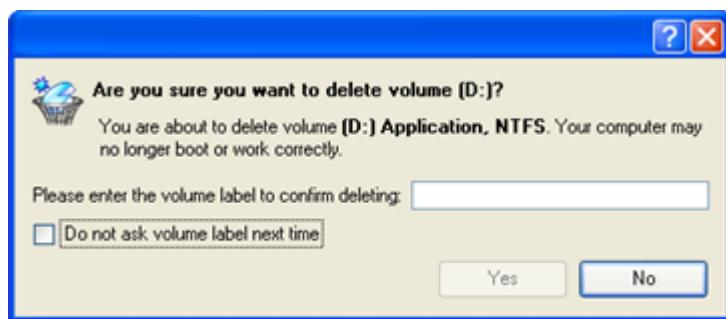
## Startup

In order to start the operation you should take the following steps:

1. Select a partition on the Disk Map;
2. Call the *Delete Partition Dialog* to set up the operation. There are several ways to do it:
  - Select in the Main Menu: *Partition > Delete Partition*.
  - Call the popup menu for the selected partition (right click of the mouse button) then select the menu item: *Delete Partition*.

## Setup

Initially the program suggests you just to remove references to the selected partition from the *Partition Table*.



- **Enter the volume label to confirm deleting.** To confirm deletion of the selected partition, enter its *Volume Label*. The current volume label is displayed above.
- **Do not ask volume label next time.** Mark the option to inhibit confirmation next time you start the dialog.

## Result

By default, the operation takes only a fraction of a second. However, the program waits until Windows completes the modification of the disk layout. In case you decide to wipe the on-partition data as well, the operation will take much longer, depending on the set wipe parameters.

## Changing Partition Attributes

This chapter explains how you can change partition attributes ([Active flag](#), [Hidden flag](#), [Partition ID](#), [Volume Label](#), etc.).

### Mark Partition Active/Inactive

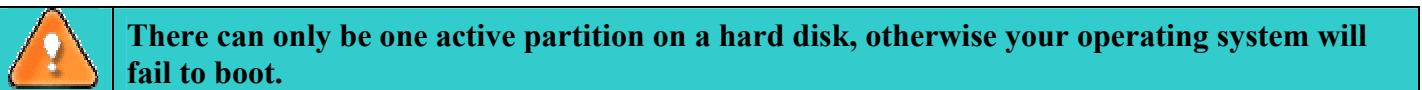
The program enables to set an active/inactive flag for primary partitions of a hard disk. By default, an operating system will boot only if its partition is active or bootable.

In order to mark a partition active/inactive you should take the following steps:

1. Select a primary partition on the Disk Map.
2. Call the *Mark Partition Active/Inactive Dialog* to set up the operation. There are several ways to do it:
  - Select in the Main Menu: *Partition > Mark Partition as Active/Inactive*.
  - Call the popup menu for the selected partition (right click of the mouse button) on the Disk Map, then select the menu item: *Mark Partition as Active/Inactive*.



3. The operation will be performed immediately after confirmation.

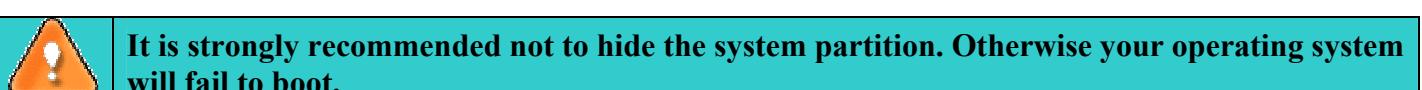


### Hide/Unhide Partition

The program allows you to hide/unhide primary and logical partitions. By default, an operating system does not mount hidden partitions, thus preventing access to their contents.

In order to hide/unhide a partition you should take the following steps:

1. Select a partition on the Disk Map.
2. Call the *Hide/Unhide Partition Dialog* to set up the operation. There are several ways to do it:
  - Select in the Main Menu: *Partition > Hide/Unhide Partition*.
  - Call the popup menu for the selected partition (right click of the mouse button) on the Disk Map, then select the menu item: *Hide/Unhide Partition*.
3. The operation will be performed immediately after confirmation.

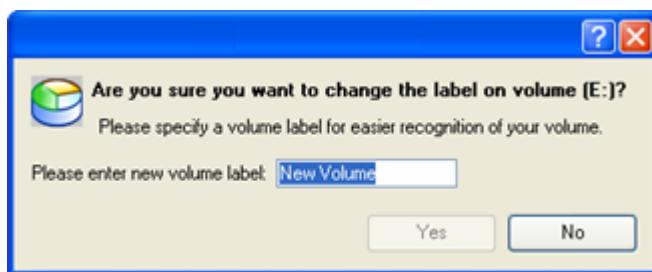


## Set Label of a Partition

The *Partition Label* is a small textual field (up to 11 characters) that is located in the *partition's boot sector*. It is detectable by any partitioning tool and is used for notification purposes only.

In order to change a partition label you should take the following steps:

1. Select a partition on the Disk Map.
2. Call the *Change Volume Label* dialog to set up the operation. There are several ways to do it:
  - Select in the Main Menu: *Partition > Modify > Change Volume Label*.
  - On the Explorer Bar: click on the current *volume label*.
  - Call the popup menu for the selected partition (right click of the mouse button) on the Disk Map, then select the menu item: *Change Volume Label*.
3. Enter a label for the selected partition.



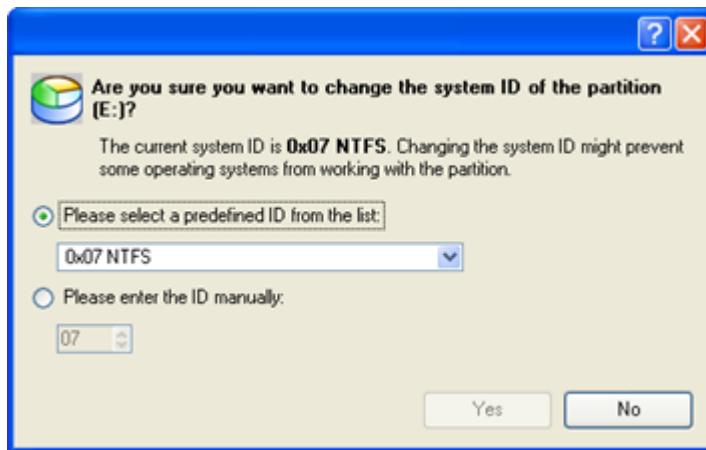
4. The operation will be performed immediately after confirmation.

## Change Partition ID

*Partition ID* is a file system identifier. It is saved in the *Partition Table* and is used to quickly detect a partition of the supported type. By manually changing its value, you can manipulate accessibility of partitions.

In order to change a partition ID you should take the following steps:

1. Select a partition on the Disk Map.
2. Call the *Change Partition ID* dialog to set up the operation. There are several ways to do it:
  - Select in the Main Menu: *Partition > Modify > Change Partition ID...*
  - On the Explorer Bar: click on the current *partition ID*.
  - Call the popup menu for the selected partition (right click of the mouse button) on the Disk Map, then select the menu item: *Change Partition ID...*
3. Set a new ID for the selected partition.



- Predefined ID.** Select from the pull-down list the required ID.
- Enter ID manually.** With the spinner control set the required ID value. It has to be a 1-2 digit hexadecimal number.

4. The operation will be performed immediately after confirmation.

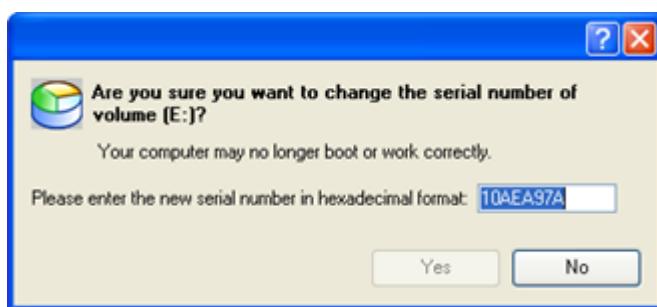
### Change Serial Number of a Partition

FAT16, FAT32, HPFS and NTFS file systems include the *Serial Number* parameter. A partition's serial number is saved in the *boot sector*. Its value is generated while formatting.

The program enables to modify the serial number parameter for FAT16, FAT32, HPFS or NTFS partitions without re-formatting.

In order to change a serial number you should take the following steps:

1. Select a partition on the Disk Map.
2. Call the *Change Partition Serial Number* dialog to set up the operation. There are several ways to do it:
  - Select in the Main Menu: *Partition > Modify > Change Serial Number*.
  - On the Explorer Bar: click on the current *serial number*.
3. Enter a new serial number for the selected partition. It should contain 8 hexadecimal figures (0..9 or A..F). The operation cannot proceed until you enter all 8 symbols.



4. The operation will be performed immediately after confirmation.

## Hard Disk Management

In this chapter you will find all the information necessary to carry hard disk operations supported by the program ([Update MBR](#), [Convert to Basic](#), [Change Primary Slot](#)).

## Updating MBR

The program enables to overwrite the current *bootable code* in the MBR (Master Boot Record) by the standard *bootstrap code*. This can help to repair a corrupted bootable code of a hard disk resulted from a *boot virus* attack or a malfunction of boot management software.

In order to update MBR of a hard disk you should take the following steps:

1. Select a hard disk on the Disk Map.
2. Call the *Update MBR* dialog to set up the operation. There are several ways to do it:
  - Select in the Main Menu: *Hard Disk > Update MBR*.
  - Call the popup menu for the selected hard disk (right click of the mouse button) on the Disk Map, then select the menu item: *Update MBR*.



3. The operation will be performed immediately after confirmation.

## Changing Primary Slot

Different operating systems apply different approaches to enumeration of the primary partitions.

### In Linux:

In Linux, every partition has a special symbolic name that encodes a hard disk containing a partition, and a partition itself. Partitions are addressed and accessed by using their symbolic names. Symbolic names are automatically generated by Linux in accordance with the order of hard disks in BIOS and the order of partition records in the *Partition Table*. Thus changing enumeration of the primary partitions can lead to changing of paths to some important resources.

### In DOS:

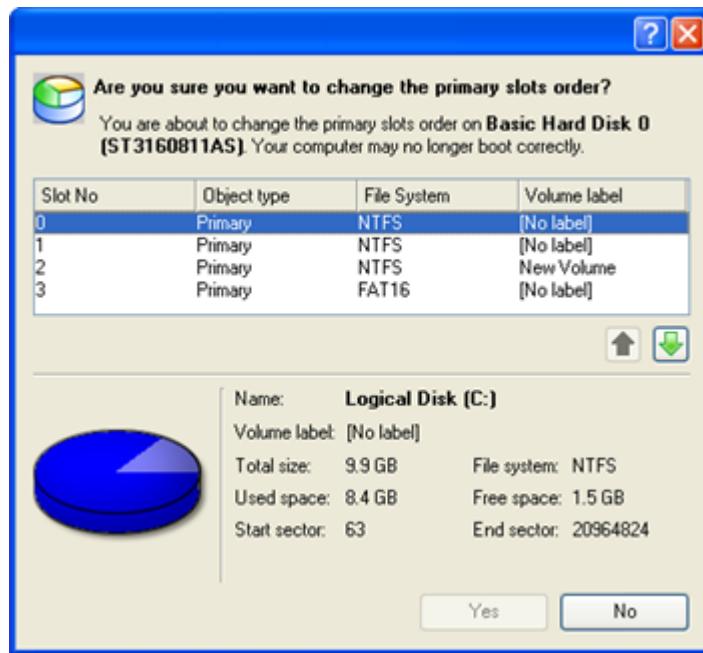
The last versions of MS-DOS use a rather sophisticated algorithm for a drive letter assignment. A drive letter, which is assigned to a partition, depends on the order of records in the *Partition Table*. Thus changing enumeration of the primary partitions affects the drive letters assignment. In early versions of MS-DOS, it could even lead to the unavailability of a partition.

The program provides the ability to change enumeration of the primary partitions. This feature will allow you to fix problems concerning an inappropriate order of partitions.

In order to modify enumeration of the primary partitions you should take the following steps:

1. Select a hard disk on the Disk Map.
2. Call the *Change Primary Slot* dialog to set up the operation. There are several ways to do it:
  - Select in the Main Menu: *Hard Disk > Change Primary Slot*.

- Call the popup menu for the selected hard disk (right click of the mouse button) on the Disk Map, then select the menu item: *Change Primary Slot*.



3. In the opened dialog you can see the current enumeration of the primary partitions of the selected hard disk in the *Partition Table*. To help you distinguish partitions from one another, the program provides the following parameters for every partition:

- Slot
- Volume
- Partition type
- File system
- Partition size
- Volume label

There are two buttons on the right to move the selected partition up and down within the primary part of the *Partition Table*.

4. The operation will be performed immediately after confirmation.

## Task Scheduling

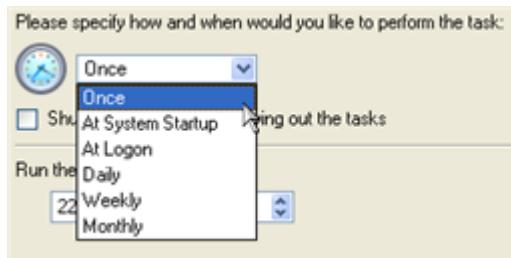
Automation of operations can really help you out when you've got to accomplish certain routine operations on a regular basis as it enables to execute them without your involvement while optimizing your computer's work-load.

### Setting a Timetable

Thanks to the embedded Scheduler, you can set a timetable for execution of any operation. It has two categories for time settings (these correspond to appropriate items in the *Schedule type* menu):

- Initiating the operation by an event:**
  - One time only (i.e. the *Once* item)
  - When the system starts (i.e. the *At System Startup* item)
  - When the user logs on (i.e. the *At Logon* item).

- Initiating the operation periodically (i.e. *Daily*, *Weekly*, *Monthly*).



You need to select one of the variants. Depending on your choice, the scheduler displays a form that enables to set a timetable.

Please specify how and when would you like to perform the task:

Once

Shutdown system after carrying out the tasks

Run the task on:

22.05.2008 at 00:00

Every  
1 week(s) on:  Monday  Friday  
 Tuesday  Saturday  
 Wednesday  Sunday  
 Thursday

Do not run the task after:  
22.05.2008

[Specify user name and password](#)

	<p>To run the task in the log-off mode, please specify administering login info by following the appropriate link in the left lower corner of the page.</p> <p>The <i>Shutdown System on Complete</i> option enables to automatically switch off the computer on the successful accomplishment of the operation.</p>
--	--

## Managing Tasks

All scheduled tasks are placed in a separate list, which can be retrieved by clicking the **Scheduled Tasks** tab in the [Explorer Bar](#):

Scheduled Tasks						
Name	Script	When to Run	Next Run Time	Last Run Time	La	
<input checked="" type="checkbox"/> Backup of MBR of hard disk 0	scr_031007070958500.ps1	At 0:00:00 on day 1 of every ...	01.11.2007 0:00:00			

On every task you can get in-depth information, including:

- The task name
- The full path to the generated script of the task
- Scheduled time of launch
- Statistics on the last launch
- Scheduled time of the next launch
- Used account information

- Comments to the task

To easily manage tasks, the program enables to arrange them according to a certain characteristic just by clicking on the required property.



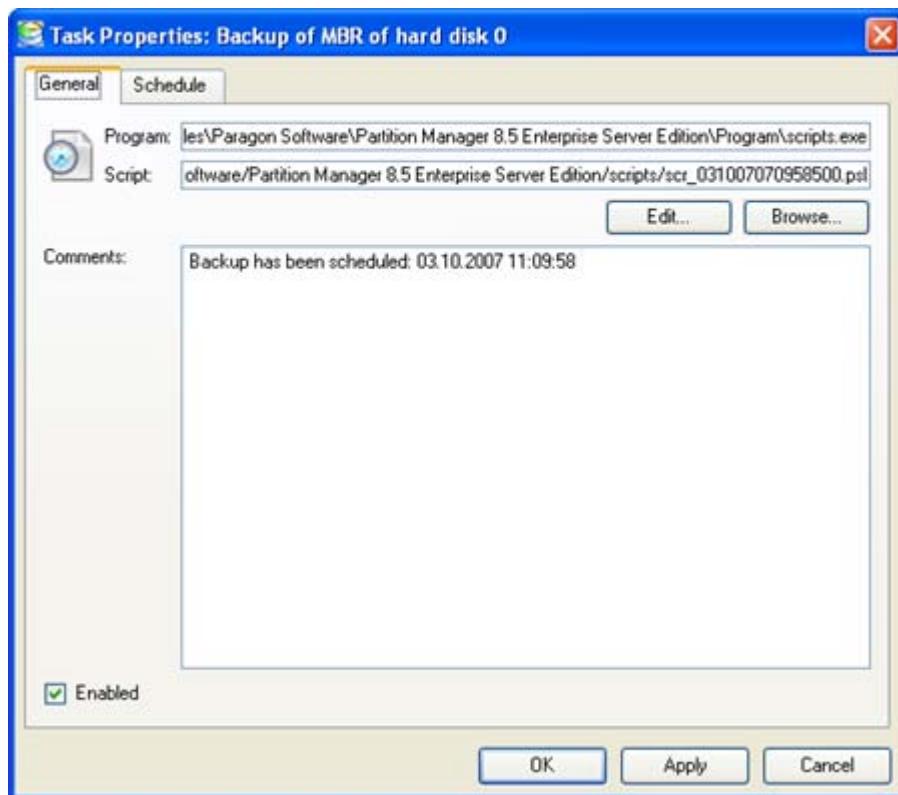
This feature can be particularly beneficial when the *Scheduled Tasks* list contains too many items.

You can also enable/disable, rename, delete, refresh or modify properties of the selected task.

## Task Editor

With the Task Editor you can easily modify properties of scheduled tasks. To do that, you should take the following steps:

1. Select a task on the Scheduled Tasks list.
2. Call the *Task Editor* dialog. There are several ways to do it:
  - Click the *Properties* button on the Scheduled Tasks list.
  - Call the popup menu for the selected task (right click of the mouse button), then select the menu item: *Properties*.



3. In the opened dialog window you can see two tabs - *General* and *Schedule*. Click the *General* tab to modify:
  - Full path to the macro-command program-interpreter, which describes the scheduled task;
  - Command line for starting the interpreter (i.e. the task described in macro-language)
  - Comments referring to the task
  - The option of enabling/disabling the task.**

By clicking the *Schedule* tab you can modify the task timetable.

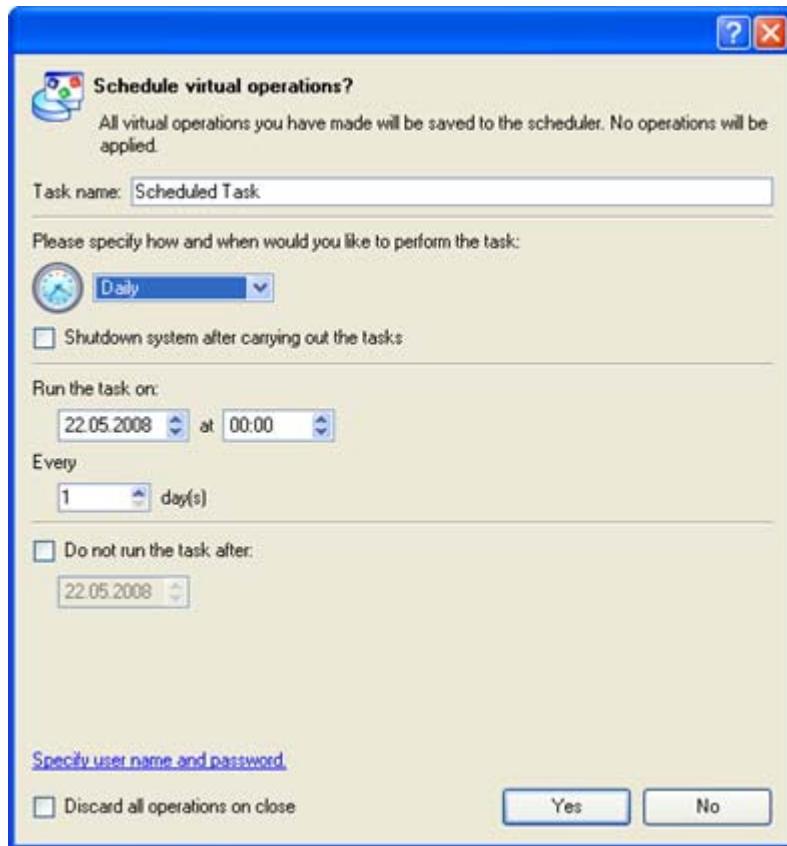
In order to apply the changes, you need to click the *Apply* button at the foot of the dialog.

## Creating a Scheduled Task

You can set a timetable for execution of any operation. For backup and copy operations the program offers handy wizards, while all the others can be scheduled with the *Save to Scheduler* dialog.

To create a scheduled task you should take the following steps:

1. Make sure the [virtual mode of execution is enabled](#);
2. Carry out with the program all operations you need to schedule;
3. Call the *Save to Scheduler* dialog in the Main Menu: *Tools > Save to Scheduler...*;



4. In the opened dialog enter the required task name and specify the task timetable;
5. The operation will be performed immediately after confirmation.



This command is unavailable if there are no operations on the List of Pending Operations.

## Extra Functionality

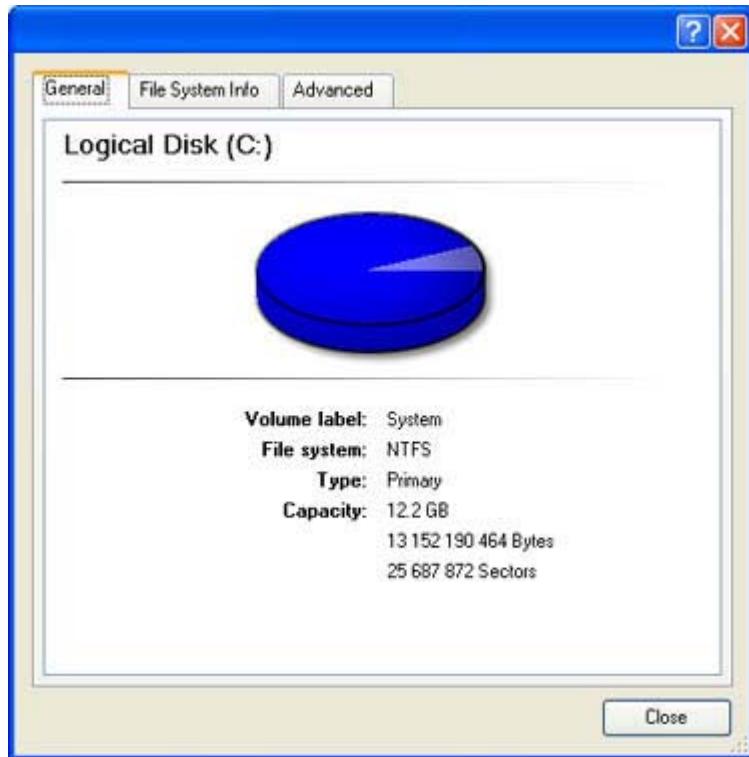
This chapter describes the supplementary functionality available in the program.

### View Partition/Hard Disk Properties

The program enables to obtain in-depth information on the properties of hard disks and partitions. Besides the general information, such as capacity, used space or file system type it provides the possibility to get info on hard disk geometry, cluster size, exact partition location, etc.

There are several ways to get properties on a partition/hard disk:

1. Choose a partition/hard disk on the Disk Map, then select in the Main Menu: *Partition/Hard Disk > Properties...*;
2. Call the popup menu for the selected partition/hard disk (right click of the mouse button) on the Disk Map, then select the menu item: *Properties...*



In the opened dialog information will be grouped according to its properties, thus by clicking tabs you can get information you need.

## File Transfer Wizard

*File Transfer Wizard* is designed to make such operations as copying of separate files/directories or burning of them to CD/DVD as easy and convenient as possible. It may be of particular use in case of a system malfunction, caused either by a virus attack or files corruption, in order to get the system back on track again. Besides it provides access to Paragon backups as regular folders to browse through their contents or copy required files.

### Startup

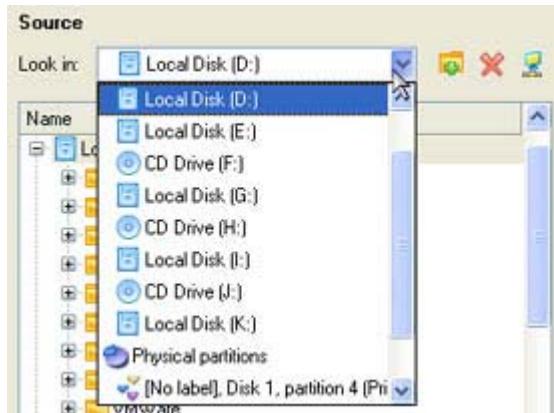
There are several ways to start the *File Transfer Wizard*:

1. Select in the Main Menu: *Tools > File Transfer Wizard*.
2. Select the *Transfer Files* item on the Tools panel.

### Setup

The wizard offers the following steps to accomplish the transfer operation:

- **Place to look for files/directories.** Select a source disk from the pull-down list in the left pane of the page. The program enables to process both mounted and unmounted (without drive letter assigned) partitions. Besides it is possible to map a network drive.

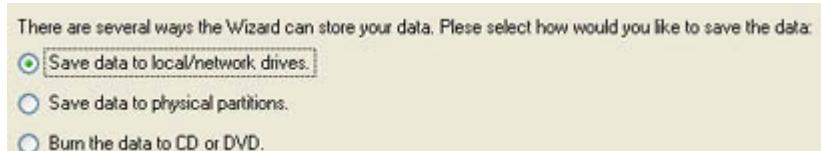


- **Object(s) of operation.** Choose files/directories you want to copy and place them to Clipboard by pressing the *Add* button. To delete a file/directory from the Clipboard, select it in the Clipboard pane and press the *Remove* button. You can also create a new folder, rename or irreversibly delete existing files/directories of the left pane by pressing the appropriate buttons.

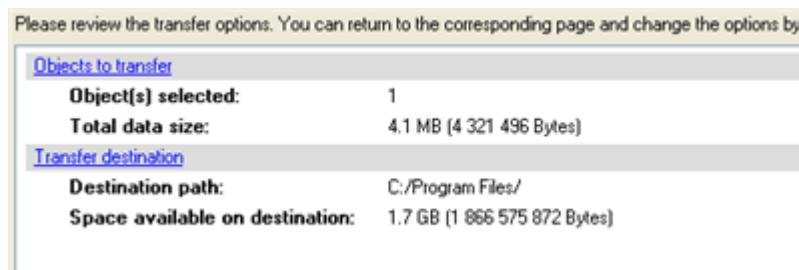


**Files/directories deleted from the Clipboard remain intact on source disks.**

- **Destination to store the object(s).** The File Transfer Wizard allows copying data to local or network drives, to physical partitions (without drive letters assigned), or burning them to CD/DVDs. Choose the way the data will be stored.



- **Revision of changes.** The *Transfer Summary* page provides structurally divided information on all the actions made in the wizard. Check the changes and come back to any step of the wizard (if necessary) by following the required hyperlink.



## Result

After the operation is completed the required data will be placed into the specified destination.

- [Copying of data from the corrupted system disk to another hard disk](#)
- [Burning of data from the corrupted system disk to CD/DVD](#)
- [Copying of data from a backup to the corrupted system partition](#)
- [Restoring Separate Files and Folders from a Backup](#)

## Mount Partition

The program enables to assign or remove drive letters of existing formatted partitions.

### Assign Drive Letter

In order to mount a partition you should take the following steps:

1. Select a partition on the Disk Map.
2. Call the *Add Drive Letter* dialog to set up the operation. There are several ways to do it:
  - Select in the Main Menu: *Partition > Assign Drive Letter...*
  - Call the popup menu for the selected partition (right click of the mouse button) on the Disk Map, then select the menu item: *Assign Drive Letter...*
3. Specify a drive letter for the selected partition. Initially the program suggests some consistent value for this parameter. So you may just press the *Yes* button to confirm the operation.



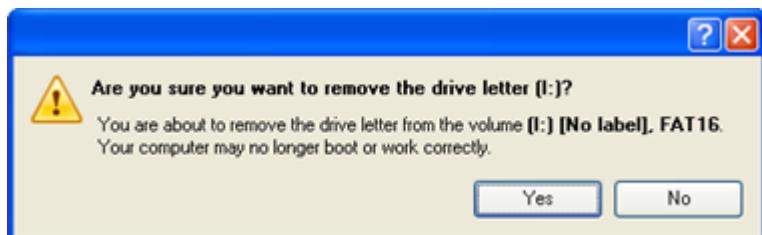
However you can manually define the required letter by selecting it from the pull-down list of available drive letters.

4. The operation will be performed immediately after confirmation.

### Remove Drive Letter

In order to un-mount a partition you should take the following steps:

1. Select a partition on the Disk Map.
2. Call the *Remove Drive Letter* dialog to define appropriate settings. There are several ways to do it:
  - Select in the Main Menu: *Partition > Remove Drive Letter*.
  - Call the popup menu for the selected partition (right click of the mouse button) on the Disk Map, then select the menu item: *Remove Drive Letter*.



3. The operation will be performed immediately after confirmation.

**Modifying drive letter of the system partition will result in inability to boot the operating system.**

**After having processed partitions with installed software, some programs may not run properly.**

## Mount Archive

The program provides the ability to assign a drive letter to a partition backup image. As a result of the operation you will get a new read-only partition in the system to easily browse through its contents and copy the required information even with the standard Windows tools.

### Assign Drive Letter

In order to mount an archive you should take the following steps:

1. Select a backup image in the [Archive Database](#).
2. Call the *Mount Archive* dialog to set up the operation. There are several ways to do it:
  - Select in the Main Menu: *Archives > Mount the Selected Archive*.
  - On the Explorer bar: select the *Mount Archive* item.
  - Call the popup menu for the selected image (right click of the mouse button), then select the menu item: *Mount the Selected Archive...*
3. Specify a drive letter for the selected backup image. Initially the program suggests some consistent value for this parameter. So you may just press the *Yes* button to confirm the operation.



However you can manually define the required letter by selecting it from the pull-down list of available drive letters.

4. The operation will be performed immediately after confirmation.



<b>The current version of the program allows the user to mount archives of separate partitions only.</b> <b>There is no possibility to mount archives located on physical (unmounted) partitions or in the bootable capsule.</b> <b>Archives will only be mounted for the current session and won't be available after the system restart.</b> <b>It is strongly recommended not to un-mount backup images with Windows Disk Manager or other third side software.</b>
---

## Remove Drive Letter

In order to un-mount a backup image you should take the following steps:

1. Select a backup image in the [Archive Database](#).
2. Call the *Unmount Archive* dialog to set up the operation. There are several ways to do it:
  - Select in the Main Menu: *Archives > Unmount the Selected Archive*.
  - On the Explorer bar: select the *Unmount Archive* item.
  - Call the popup menu for the selected image (right click of the mouse button), then select the menu item: *Unmount the Selected Archive...*



3. The operation will be performed immediately after confirmation.

## Test Surface

The program enables to test surface of existing partitions and blocks of free space for bad or unstable sectors. If found any it automatically marks them unusable in the file system metadata, thus minimizing the risk of data loss.

In order to start the surface test you should take the following steps:

1. Select a partition or a block of free space on the Disk Map.
2. Call the *Test Surface* dialog to set up the operation. There are several ways to do it:
  - Select in the Main Menu: *Partition > Test Surface...*
  - Call the popup menu for the selected partition (right click of the mouse button) on the Disk Map, then select the menu item: *Test Surface...*
3. From the pull-down list choose the level of the surface check.



- The operation will be performed immediately after confirmation.

## Check File System Integrity

The program allows you to check integrity of a file system. It can be used to detect possible file system errors before performing any operation on a partition.

To start the system integrity check you should take the following steps:

- Select a partition on the Disk Map
- Call the *Check File System Integrity* dialog to set up the operation. There are several ways to do it:
  - Select in the Main Menu: *Partition > Check File System Integrity*.
  - Call the popup menu for the selected partition (right click of the mouse button) on the Disk Map, then select the menu item: *Check File System Integrity*.
- Initially the program suggests some consistent values for all parameters. In most cases, you can just press the *Yes* button to confirm the operation.



- Automatically fix file system errors.** Mark the checkbox to automatically fix any found error without requesting a confirmation.
  - Scan for and attempt to recover bad sectors.** Mark the checkbox to additionally process sectors marked bad in the file system metadata for the purpose of their possible recovery.
- The operation will be performed immediately after confirmation.

## Check Archive Integrity

The program provides the ability to check integrity of a backup image. The function allows distinguishing between valid and corrupted images before using them. The *Check Archive Integrity Wizard* will help you do that.

## Startup

There are several ways to start the *Check Archive Integrity Wizard*:

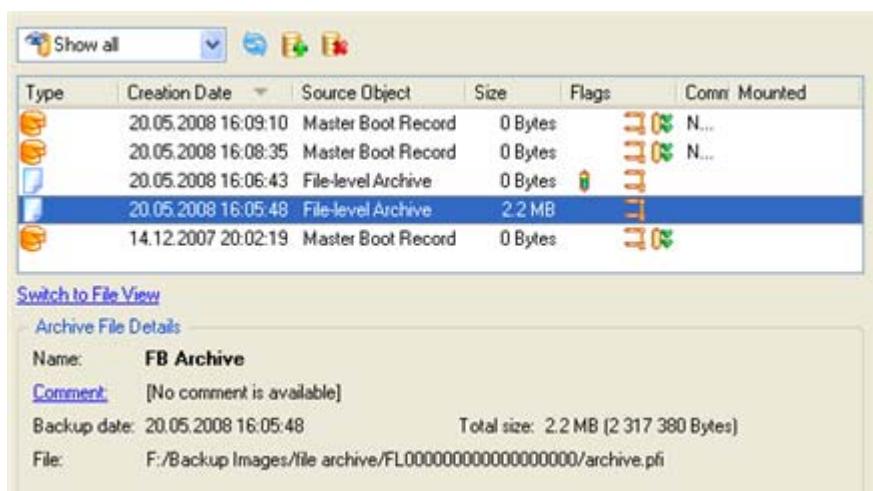
- In the Main Menu: select *Wizards > Backup Utilities > Check Archive Integrity...*
- On the Common Tasks Bar: click the *Check Archive Integrity* item of the Wizards menu.
- Select a backup image in the [Archive Database](#), then call the popup menu for it and choose the menu item: *Check Archive Integrity...*

## Startup

The wizard offers the following steps to accomplish the operation:

- An archive to verify.** The *Browse for Archive* page enables to find a backup image you need.

By clicking the *Switch to Archive List View* link, you can see a list of images contained in the [Archive Database](#) (if any).

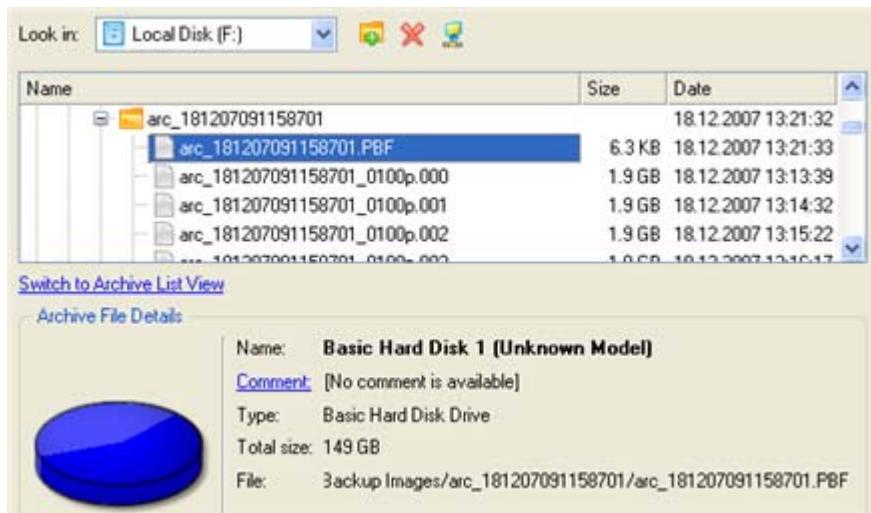


To get a clear-cut picture on properties of the required image, just click on it and the section below will (i.e. *Archive File Details*) display a short description.



To know more on the subject, please consult the [Viewing Image Properties](#) chapter.

By clicking the *Switch to File View* link, you can find the required image in the browser-like window. The section below (i.e. *Archive File Details*) will also display a short description of the selected image.



Moreover, on this page you've got the possibility to create new folders, delete existing files/folders or map network drives by clicking the appropriate buttons.



To know more on the subject, please consult the [Viewing Image Properties](#) chapter.

## Result

After the operation is completed you can see results of the check.

## Check Recovery Discs

You've got the ability to check whether backup media created with the program is 100 percent error-free and ready to use. The *Check Recovery Disc Wizard* will help you do that.

### Startup

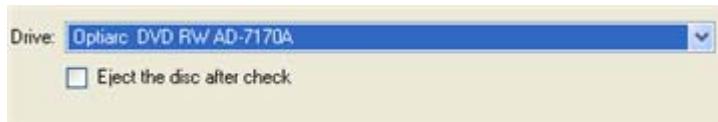
There are several ways to start the *Check Recovery Disc Wizard*:

- In the Main Menu: select *Tools > Check Recovery Discs...*
- On the Common Tasks Bar: click the *Check Recovery Discs* item of the Wizards menu.

### Startup

The wizard offers the following steps to accomplish the operation:

- **CD/DVD drive.** Select from the pull-down list of available CD/DVD devices the required drive to use during the operation.



- **Set whether to eject the disk after the operation is completed or not.**

## Result

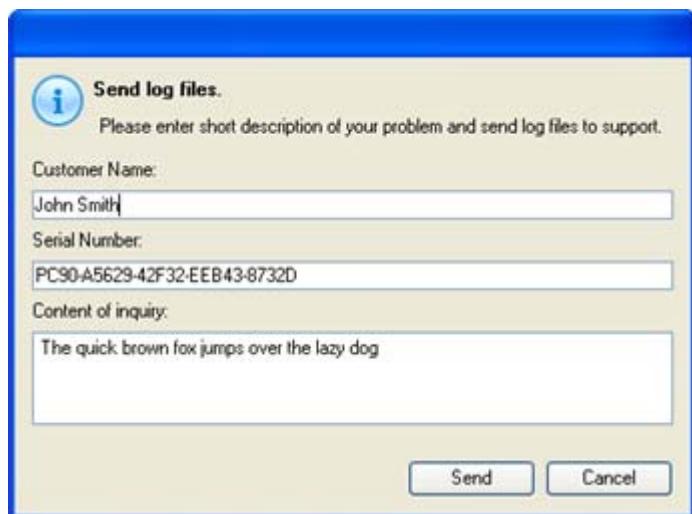
After the operation is completed you can see results of the check.

## Send Log Files

The program enables to simplify the procedure of sending support requests to the Paragon Support Team. In case of having difficulties with handling the program, you, with the help of this very function, can address the company support engineers and provide them with all the information they need such as the disk layout, performed operations, etc. in order to tackle the encountered problem. Information of that kind is stored in Log files.

In order to send log files to the Paragon Support Team you should take the following steps:

1. Call the *Send Log Files* dialog in the Main Menu: *Tools > Send Log Files*;
2. Provide a customer name and a product serial number;
3. Give a detailed description on the encountered problem.

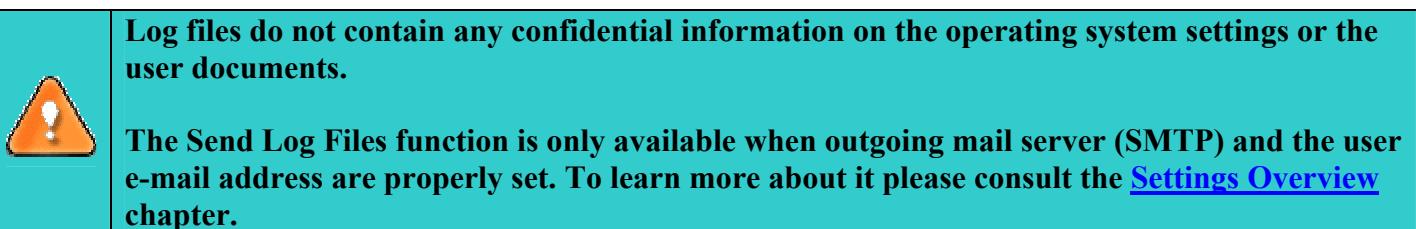


By clicking the *Send* button the built-in mail client will generate a template request with attached compressed log files and then send it to the Paragon Support Team.

## Log Files

Log files are simple textual files that can be opened by any text editor. There are several log files automatically generated by the program:

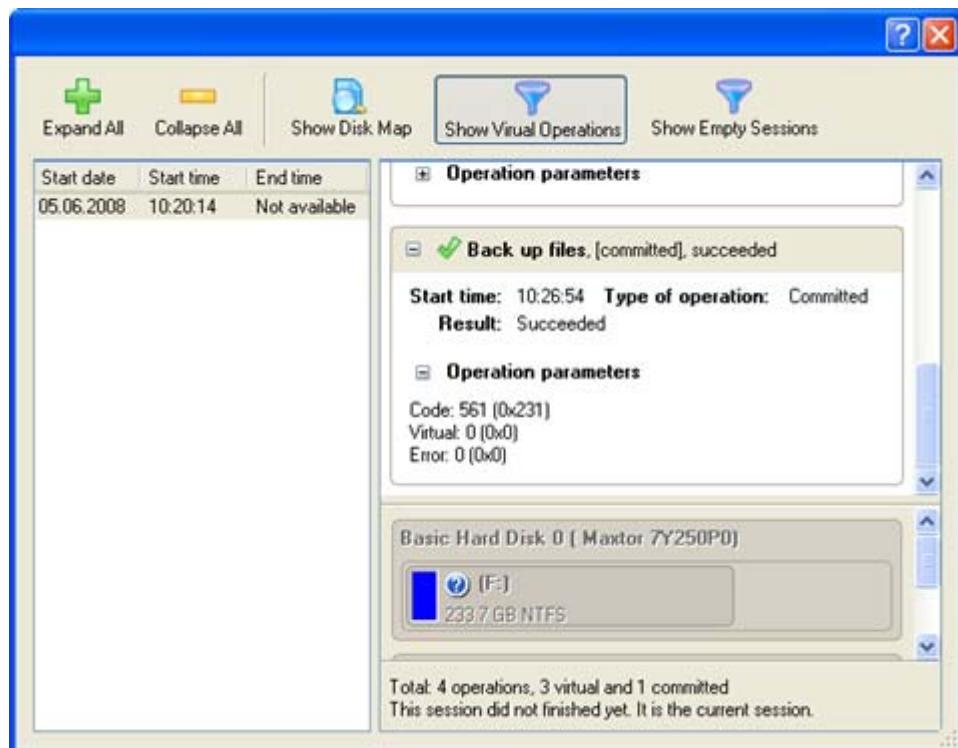
Stubact.log	Contains in-depth information on parameters and performance of all operations carried out by the program
Pwlog.txt	Besides brief overview on operations it also contains detailed information about the state of all hard disks
Cdb.log	Contains low-level information on the CD/DVD devices used in the system
BioNTlog.txt or Bio95log.txt	It is an OS-dependent supplementary log file derived from Bioxx.dll. It may contain valuable information on Windows family operating systems



## View Logs

With a handy dialog you can study logs on any operation carried by the program. To make this job as easy as possible, all the information is structurally divided, besides there is the possibility to see the disk layout before and after an operation, what is very convenient.

In order to view logs on carried out operations call the *View Logs* dialog in the Main Menu: *Tools > View Logs...*



## Typical Scenarios

This chapter lists a number of the most frequently used scenarios that may be accomplished with the program. You can find here useful recommendations and descriptions of operations.

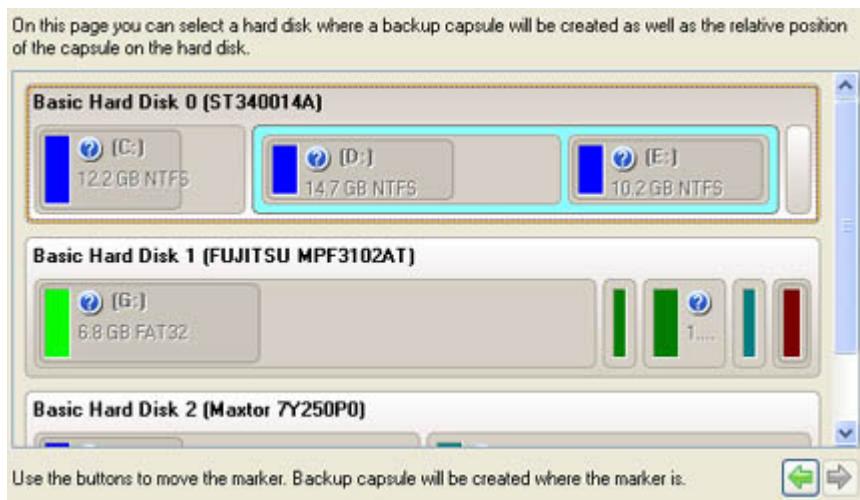
## Backup Scenarios

### Creating the Backup Capsule

Let us take a computer of a rank and file user who is most likely to have only one hard disk with only one partition (the only partition is always system). Suppose that there is enough free space on the hard disk to create the backup capsule as well. It can be created with the *Manage Backup Capsule Wizard*:

1. Launch the **Manage Backup Capsule Wizard**. There are several ways to do it:

- In the Main Menu: select *Wizards > Manage Backup Capsule*.
  - On the Common Tasks bar: click the *Manage Backup Capsule* item of the Wizards menu.
2. On the Wizard's Welcome page, click the *Next* button.
  3. Select a place on the disk where the backup capsule will be created. It can be created as a primary partition or as a logical drive within an extended partition. It can be inserted into any place on the hard disk: at the end (preferable), at the beginning or somewhere in the middle between other partitions.



**By default, the program allows the user to create the backup capsule only as the last primary or as the last logical drive within the extended partition. However, by activating the advance mode on the first page of the wizard you can remove this restriction that in its turn might result in some boot problems.**

4. Set the size for the backup capsule. It will be created at the expense of free space of the selected disk.



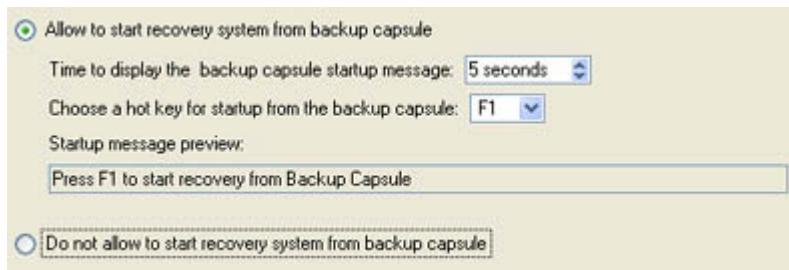
There is no restriction on the size of the backup capsule, merely depending on the available space of the hard disk and the capacity needed for the backup.

If the wizard cannot find enough free space in one block, it will redistribute free space, joining all free space blocks together into one united block and moving partitions if necessary. If the total amount of free space is still not enough, it is possible to split a fragment of space from one of the existing partitions, thus resizing it.



**If the partition is locked and cannot be resized, the wizard makes the system reboot to create the backup capsule and automatically boots the system again. (The rebooting mechanism is different for different versions of Windows)**

5. Activate the bootable recovery environment if needed. With its help you will get the choice to boot directly from the backup capsule for maintenance or recovery purposes every time you start up the computer.



**This operation will result in overwriting of the current MBR, thus in case of having a third side boot manager, it will be removed.**



**The backup capsule can only be bootable if it is located on the bootable device (assigned in the BIOS).**

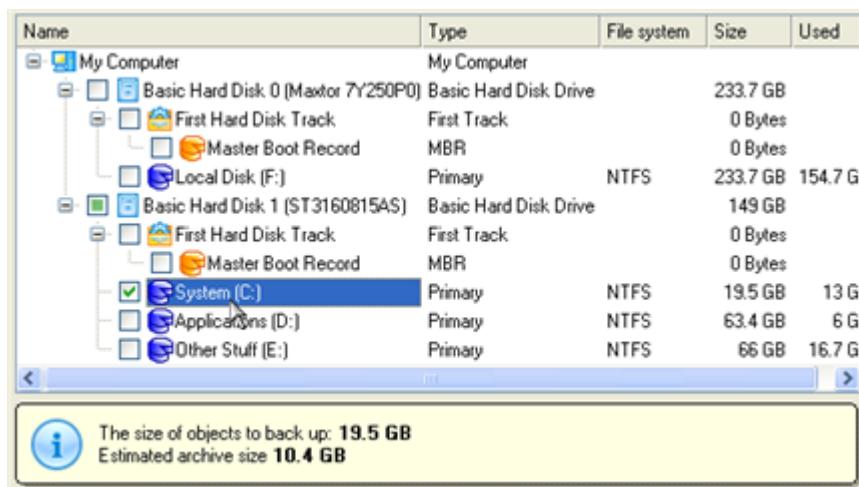
- Start the operation (by clicking the *Next* button) or return to correct the settings.

After the operation is completed you can place backup archives into the created backup capsule.

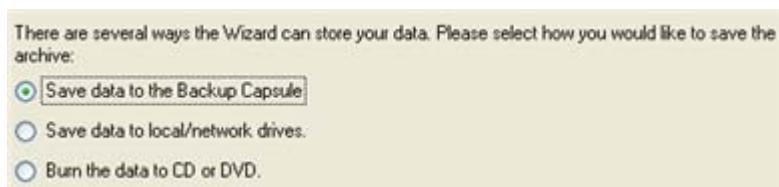
## Backing up a Hard Disk or Partition to the Backup Capsule

To back up an entire hard disk or a separate partition and then place the resulted image into the backup capsule, please do the following:

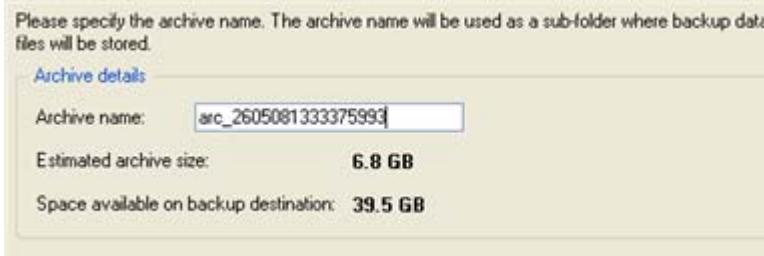
- Create the backup capsule with the *Manage Backup Capsule Wizard*.
- Click the **Back up a Disk or Partition** item of the Wizards menu (any of the ways described earlier can also be used here).
- On the Wizard's Welcome page, click the *Next* button.
- On the **What to back up** page, mark the appropriate option opposite a hard disk's name or a partition's name depending on the chosen task.



- On the **Backup Destination** page, select the *Save data to the Backup Capsule* option.



- Edit the archive name if necessary.

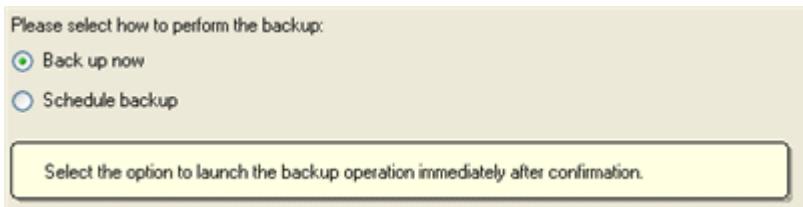


Please take into account values of the parameters *Estimated archive size* and *Space available on backup destination* - if the archive size exceeds the available space, delete outdated backups from the **Backup Capsule** or resize it with the *Manage Backup Capsule Wizard*.

7. Add comments to your backup describing its contents.



8. Choose whether to accomplish the operation immediately or [set a timetable for it](#).



9. On the **Backup Summary** page review all parameters of the operation and modify them if necessary. Click the *Next* button to start the backup process.

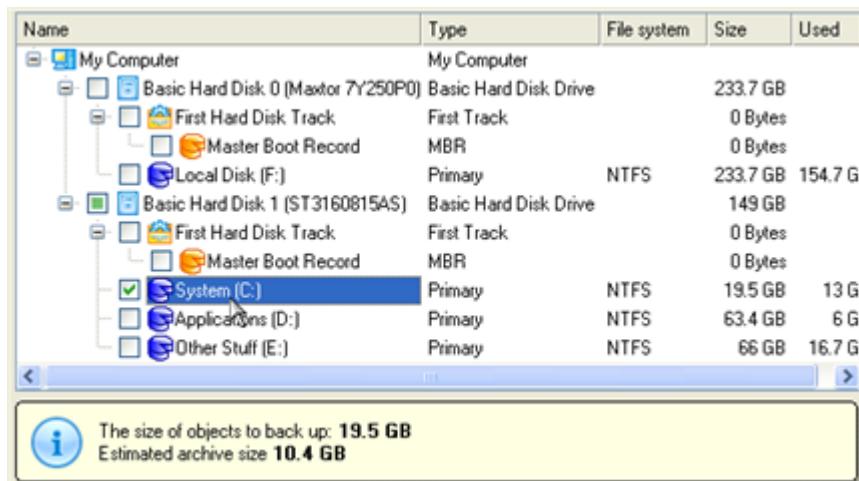


This operation can also be accomplished with the [Linux/DOS](#) environment.

## Backing up a Hard Disk or Partition to External Media (CD/DVD)

To back up an entire hard disk or a separate partition and then burn the resulted image to CD/DVD, please do the following:

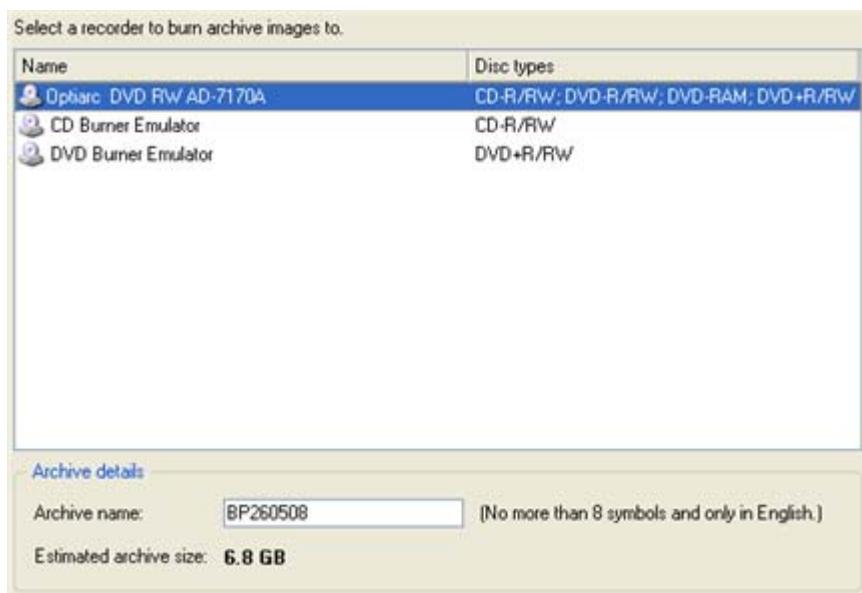
1. Click the **Back up a Disk or Partition** item of the Wizards menu (any of the ways described earlier can also be used here).
2. On the Wizard's Welcome page, click the *Next* button.
3. On the **What to back up** page, mark the appropriate option opposite a hard disk's name or a partition's name depending on the chosen task.



- On the **Backup Destination** page, select the *Burn the data to CD or DVD* option.



- Select a recordable device on the list of available CD/DVD devices and edit the archive name, if necessary.



Please take into account the *Estimated archive size* value. It can give you a hint about the number of CD/DVD discs required for the operation.

- Add comments to your backup describing its contents.



- On the **Backup Summary** page review all parameters of the operation and modify them if necessary. Click the *Next* button to start the backup process.

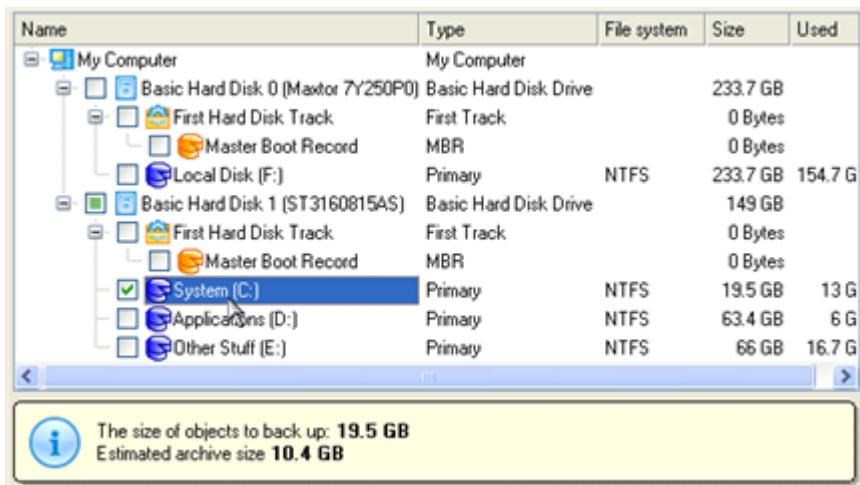


This operation can also be accomplished with the [Linux/DOS](#) environment.

## Backing up a Hard Disk or Partition to a Network Drive

To back up an entire hard disk or a separate partition and then place the resulted image to a network share, please do the following:

1. Click the **Back up a Disk or Partition** item of the Wizards menu (any of the ways described earlier can also be used here).
2. On the Wizard's Welcome page, click the *Next* button.
3. On the **What to back up** page, mark the appropriate option opposite a hard disk's name or a partition's name depending on the chosen task.

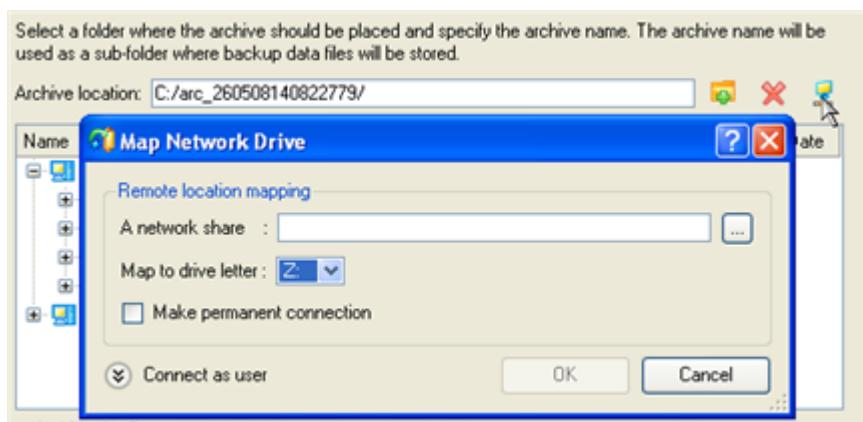


4. On the **Backup Destination** page, select the *Save data to local/network drives* option.

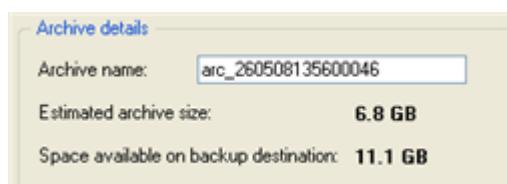


5. Map a network disk to place your backup image to:

- Call the Map Network Drive dialog by clicking the appropriate button;



- Click the standard browse button [...] to browse for the required network share or manually enter a path to it;
  - Define a letter from the pull-down list of available drive letters;
  - Mark the checkbox to make this connection permanent. Otherwise it will only be available for the current Windows session;
  - Click the *Connect as user* button at the foot of the dialog page to specify a user name and password to access the selected network share if necessary.
6. Edit the archive name if necessary.

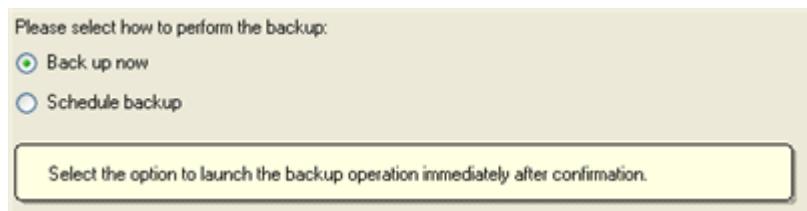


**Please take into account values of the parameters *Estimated archive size* and *Space available on backup destination* - if the archive size exceeds the available space, another network drive needs to be selected.**

7. Add comments to your backup describing its contents.



8. Choose whether to accomplish the operation immediately or [set a timetable for it](#).



9. On the **Backup Summary** page review all parameters of the operation and modify them if necessary. Click the *Next* button to start the backup process.



**This operation can also be accomplished with the [Linux/DOS](#) environment.**

## Backing up Files to a Local Mounted/Unmounted (without Drive Letter Assigned) Partition

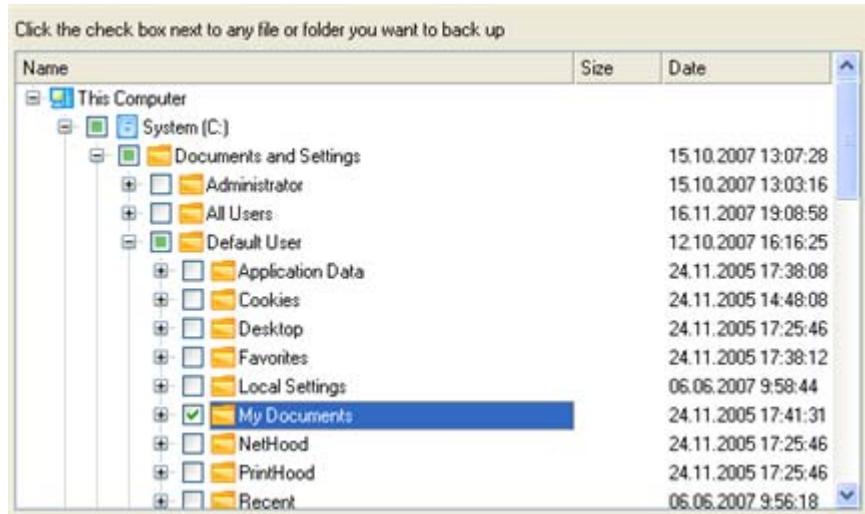
To back up required files or folders and then place the resulted image to a local mounted/unmounted drive, please do the following:

1. Launch the **File Backup Wizard**. There are several ways to do it:

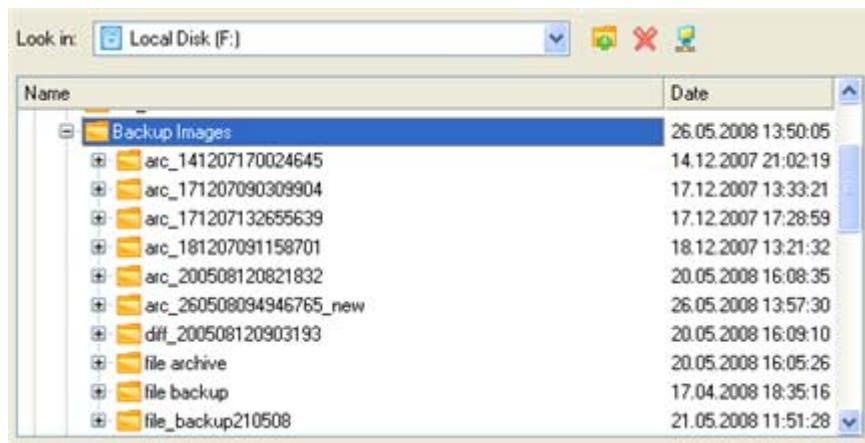
- In the Main Menu: select *Wizards > Back up Files*.
- On the Common Tasks bar: click the **Back up Files** item of the Wizards menu.

2. On the Wizard's Welcome page, click the *Next* button.

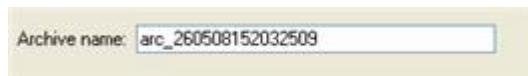
3. On the **What folders and files to back up** page you can see a list of all partitions (both mounted and unmounted) available in the system. Mark a checkbox opposite a file, folder or even a whole partition to build up contents of the future backup image.



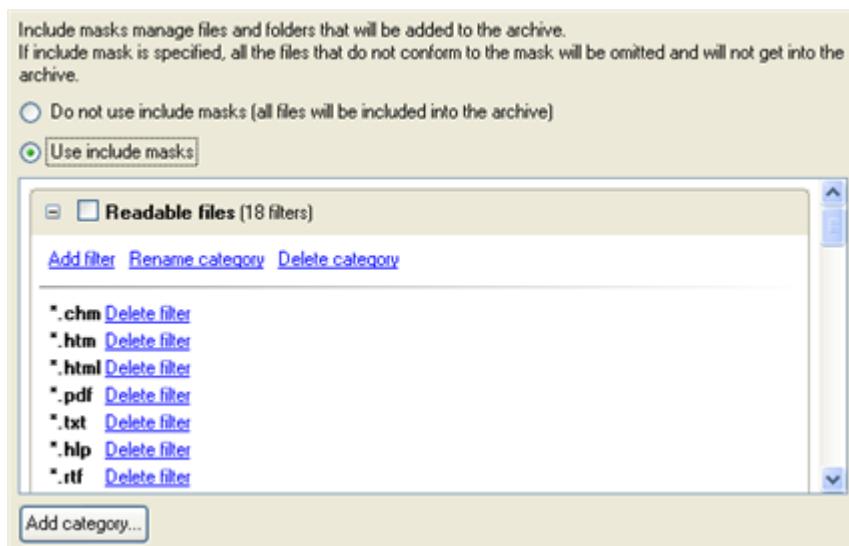
4. On the **Backup Destination** page, select a local mounted/unmounted (without drive letter assigned) disk as a backup destination.



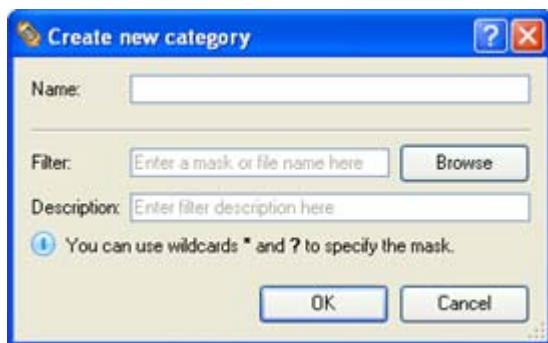
5. Edit the archive name if necessary.



6. Specify include masks. The program includes a lot of ready-made filters to effectively control contents of your backup images.



You can also create your own filter by clicking the *Add category...* button.



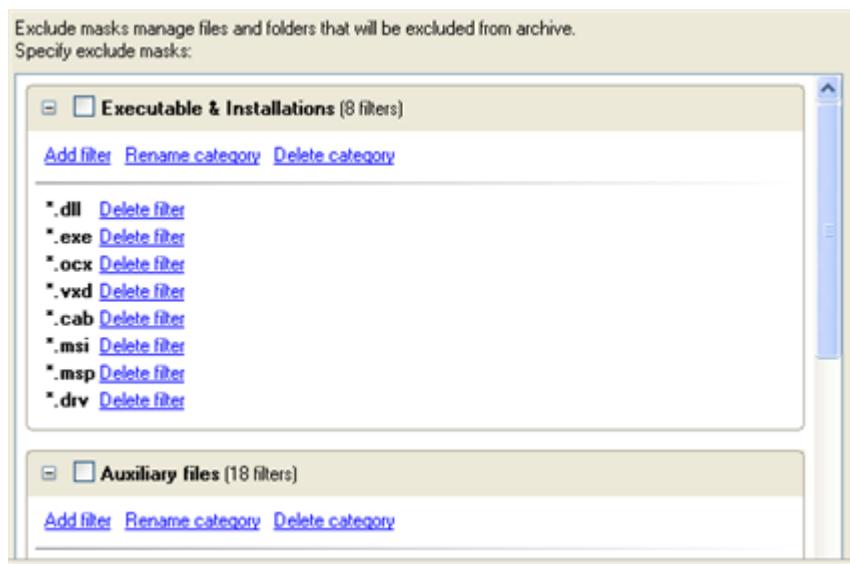
- Name.** Give to the filter any name you like, but try to use an informative one;
- Filter.** Press the *Browse* button to select files or folders you would like to be included or specify a filter mask by using \* or ? wildcards;
- Description.** Add a short description to the filter not to miss it up later.

Click the *OK* button and you will get a new item on the list of filters. By marking/unmarking a checkbox opposite its name you can choose whether to use it or not.



**By setting an include mask, you automatically ignore files that do not match to it, thus they won't be added to the backup image.**

7. Specify exclude masks. The program includes a lot of ready-made filters to effectively control contents of your backup images.



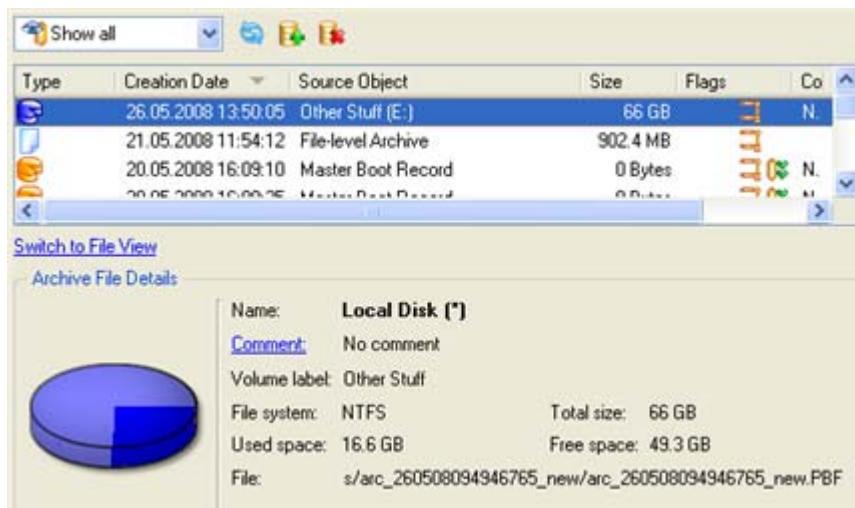
- Add comments to your backup describing its contents.



## Creating a Differential to a Full Partition Backup

To update an image of the selected partition, please do the following:

- Click the **Differential Partition Backup** item of the Wizards menu.
- On the Wizard's Welcome page, click the *Next* button.
- On the **Browse for Archive** page, specify the required full (base) partition archive:
  - By clicking the *Switch to Archive List View* link, you can see a list of images contained in the [Archive Database](#) (if any).

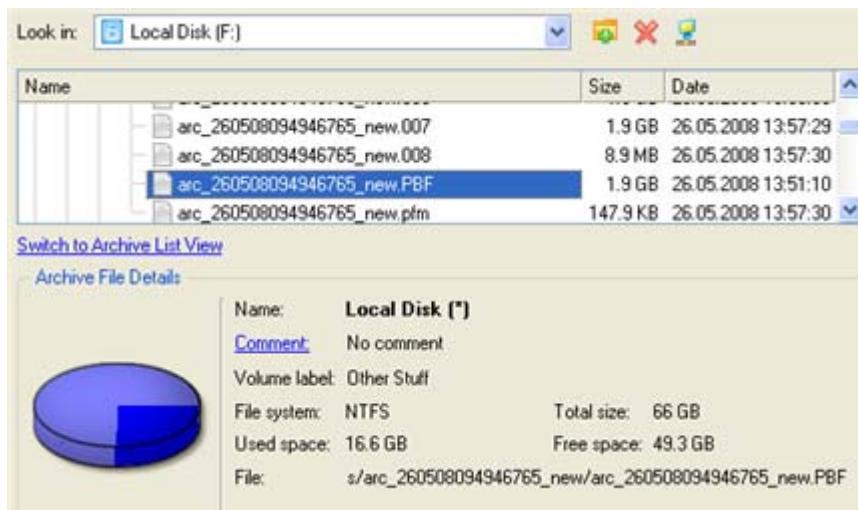


To get a clear-cut picture on properties of the required image, just click on it and the section below will (i.e. *Archive File Details*) display a short description.



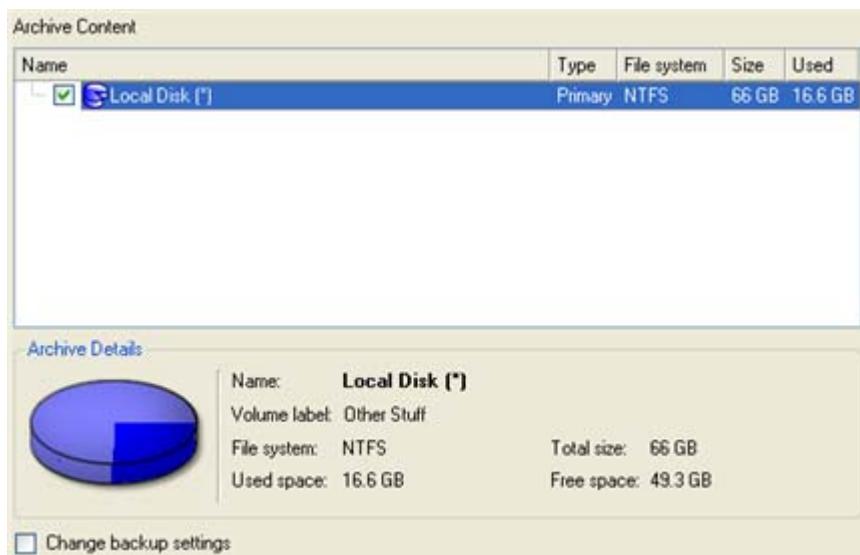
To know more on the subject, please consult the [Viewing Image Properties](#) chapter.

- By clicking the *Switch to File View* link, you can find the required image in the browser-like window. The section below (i.e. *Archive File Details*) will also display a short description of the selected image.



To know more on the subject, please consult the [Viewing Image Properties](#) chapter.

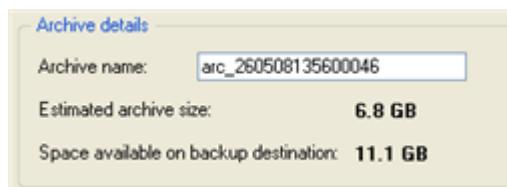
4. The **Archive Content** page displays detailed information about the contents of the archive. It includes a full description of properties about the partition. In addition, there is the possibility to modify backup settings. To activate the advance mode, you need to mark the appropriate option at the foot of the page.



5. On the **Backup Destination** page, select where you want to place your backup image.

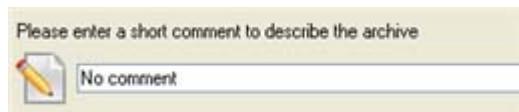


6. Edit the archive name if necessary.

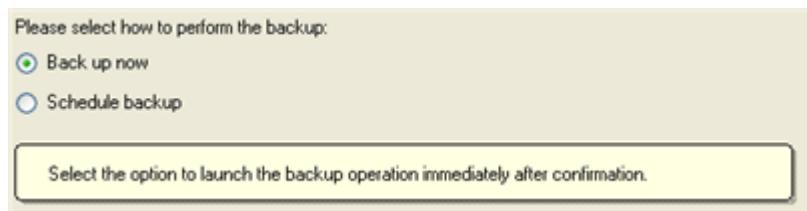


**Please take into account values of the parameters *Estimated archive size* and *Space available on backup destination* - if the archive size exceeds the available space, another drive needs to be selected.**

7. Add comments to your backup describing its contents;



8. Choose whether to accomplish the operation immediately or [set a timetable for it](#).



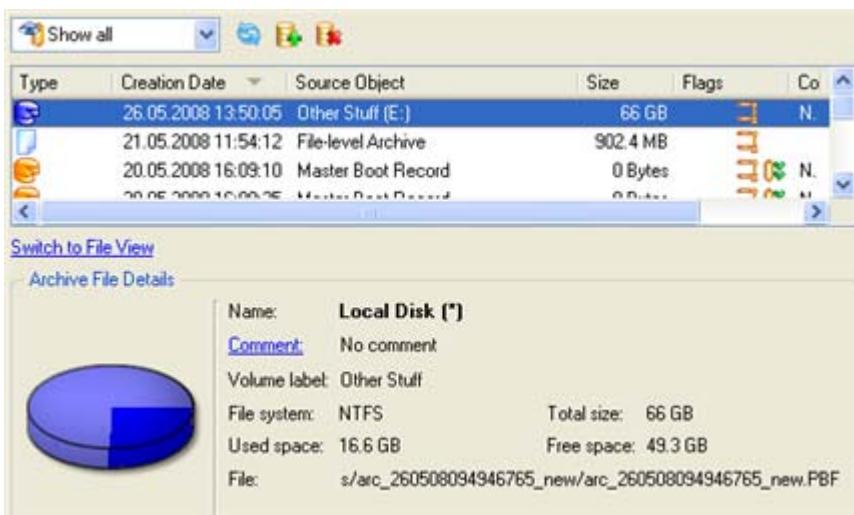
9. On the **Backup Summary** page review all parameters of the operation and modify them if necessary. Click the *Next* button to start the backup process.

After the operation is completed you receive a differential backup of the selected partition. It is placed into the specified destination (a local or network disk, the Backup Capsule or a CD/DVD disc), its features defined by the wizard.

## Creating an Increment to a Full Partition Backup

To update only files you need since the last full partition backup, please do the following:

1. Click the **Incremental File Backup** item of the Wizards menu.
2. On the Wizard's Welcome page, click the *Next* button.
3. On the **Browse for Archive** page, specify the required full (base) partition archive:
  - By clicking the *Switch to Archive List View* link, you can see a list of images contained in the [Archive Database](#) (if any).

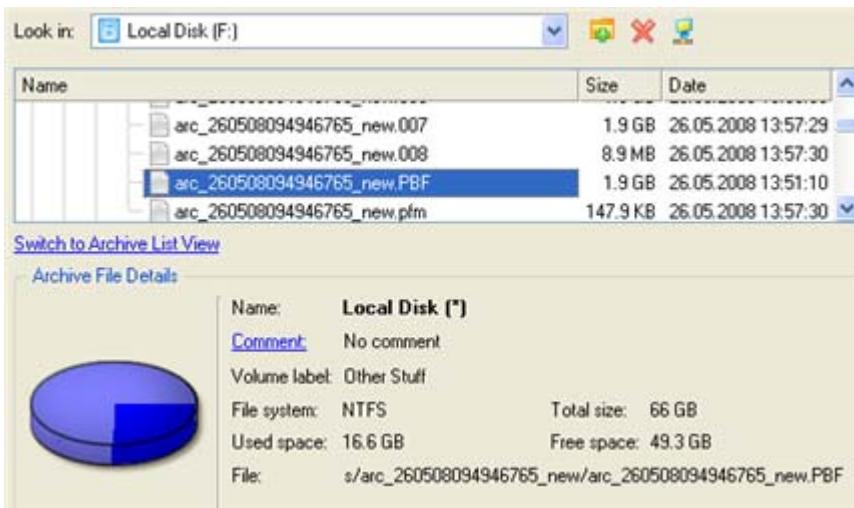


To get a clear-cut picture on properties of the required image, just click on it and the section below will (i.e. *Archive File Details*) display a short description.



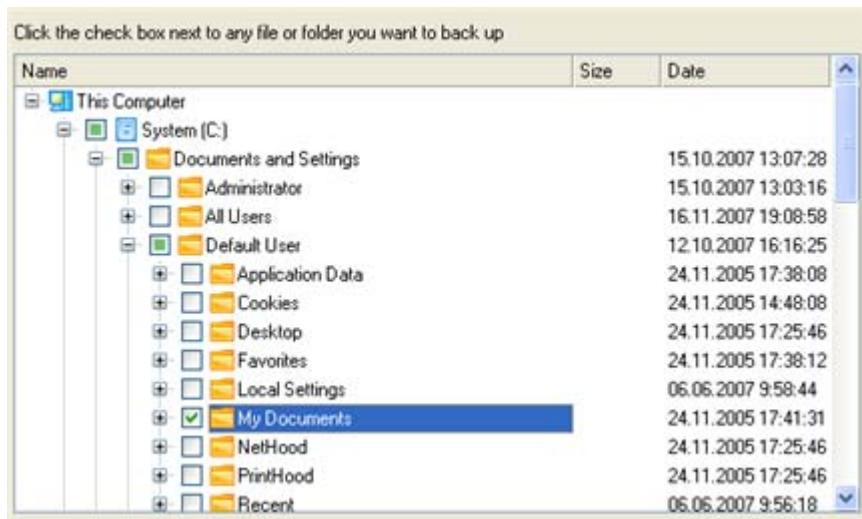
To know more on the subject, please consult the [Viewing Image Properties](#) chapter.

- By clicking the *Switch to File View* link, you can find the required image in the browser-like window. The section below (i.e. *Archive File Details*) will also display a short description of the selected image.

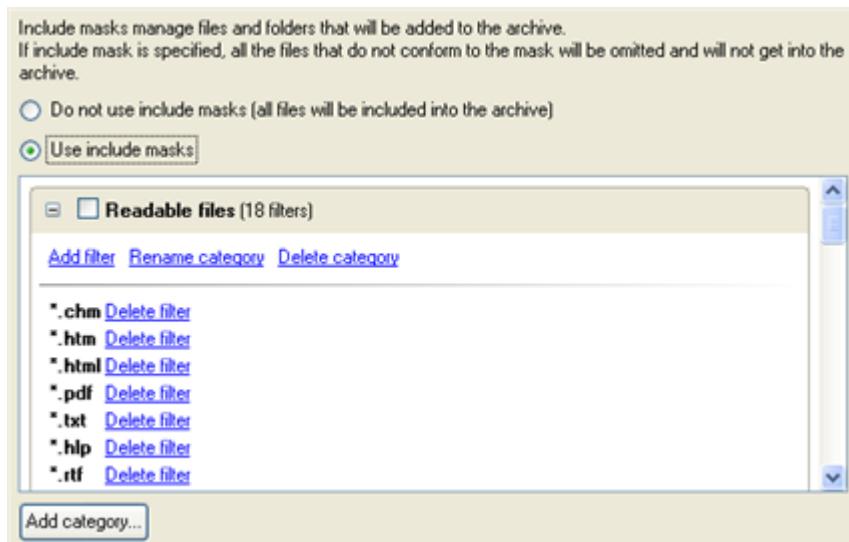


To know more on the subject, please consult the [Viewing Image Properties](#) chapter.

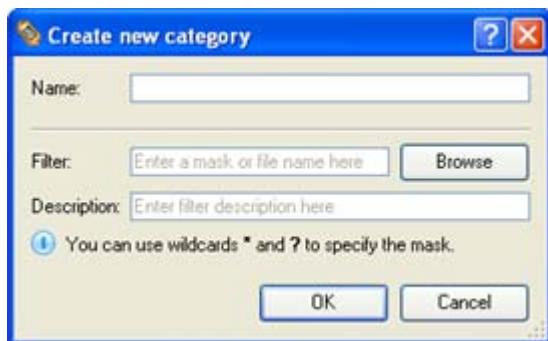
4. On the **What folders and files to back up** page you can see contents of the selected partition archive. Mark a checkbox opposite a file or folder to build up contents of the future incremental image.



5. **Specify include masks.** The program includes a lot of ready-made filters to effectively control contents of your backup images.



You can also create your own filter by clicking the *Add category...* button.



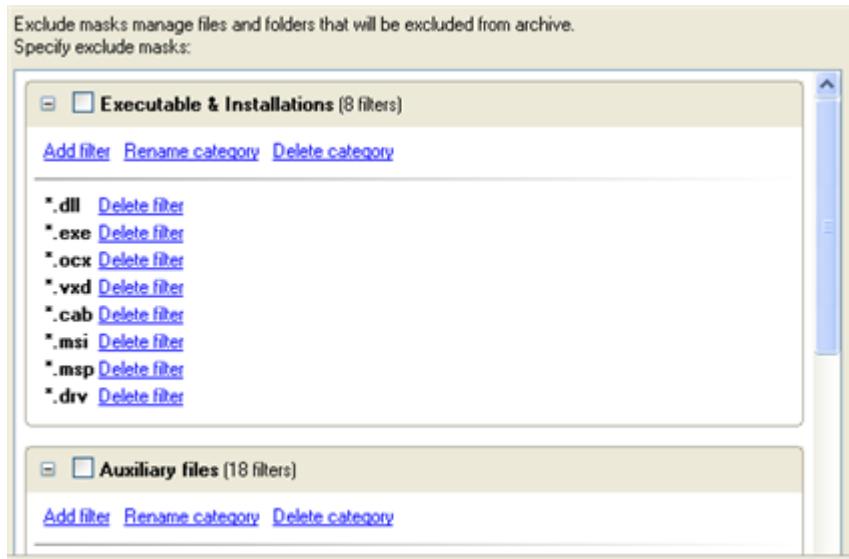
- Name.** Give to the filter any name you like, but try to use an informative one;
- Filter.** Press the *Browse* button to select files or folders you would like to be included or specify a filter mask by using \* or ? wildcards;
- Description.** Add a short description to the filter not to miss it up later.

Click the *OK* button and you will get a new item on the list of filters. By marking/unmarking a checkbox opposite its name you can choose whether to use it or not.



**By setting an include mask, you automatically ignore files that do not match to it, thus they won't be added to the backup image.**

6. **Specify exclude masks.** The program includes a lot of ready-made filters to effectively control contents of your backup images.



7. **Add comments** to your backup describing its contents.



After the operation is completed you receive an incremental backup of the selected partition archive containing information specified in the wizard. It is placed into the same destination as the base image.

## Creating an Increment to a Full File Backup

To update a file backup, please do the following:

1. Click the **Incremental File Backup** item of the Wizards menu.
2. On the Wizard's Welcome page, click the *Next* button.
3. On the **Browse for Archive** page, specify the required full (base) file archive:
  - By clicking the *Switch to Archive List View* link, you can see a list of images contained in the [Archive Database](#) (if any).

The screenshot shows a software interface for managing backups. At the top, there's a toolbar with icons for 'Show all', 'Switch to File View', 'Archive File Details', 'Print', 'Exit', and 'Help'. Below the toolbar is a table with columns: Type, Creation Date, Source Object, Size, Flags, Comment, and Mounted. The table lists several items:

Type	Creation Date	Source Object	Size	Flags	Comment	Mounted
File-level Archive	26.05.2008 13:50:05	Other Stuff (E:)	66 GB		No c...	
File-level Archive	21.05.2008 11:54:12	File-level Archive	902.4 MB			
Master Boot Record	20.05.2008 16:09:10	Master Boot Record	0 Bytes		No c...	
Master Boot Record	20.05.2008 16:08:35	Master Boot Record	0 Bytes		No c...	
File-level Archive	20.05.2008 16:06:43	File-level Archive	0 Bytes		No c...	
File-level Archive	20.05.2008 16:05:48	File-level Archive	2.2 MB		No c...	

Below the table, a link 'Switch to File View' is visible. Under 'Archive File Details', it shows:

- Name: **FB Archive**
- Comment: [No comment is available]
- Backup date: 21.05.2008 11:54:12
- Total size: 902.4 MB (946 273 004 Bytes)
- File: F:/Backup Images/file\_backup210508/FL00000000000000000000/archive.pfi

To get a clear-cut picture on properties of the required image, just click on it and the section below will (i.e. *Archive File Details*) display a short description.



To know more on the subject, please consult the [Viewing Image Properties](#) chapter.

- By clicking the *Switch to File View* link, you can find the required image in the browser-like window. The section below (i.e. *Archive File Details*) will also display a short description of the selected image.

The screenshot shows a file browser window with 'Local Disk (F:)' selected in the 'Look in:' dropdown. The main area displays a tree view of files and folders. The 'fb archive' folder is expanded, showing its contents: 'file backup', 'file\_backup210508', and 'archive.pfi'. The 'archive.pfi' file is selected and highlighted in blue. Below the tree view, a link 'Switch to Archive List View' is visible. Under 'Archive File Details', it shows:

- Name: **FB Archive**
- Comment: [No comment is available]
- Backup date: 21.05.2008 11:54:12
- Total size: 902.4 MB (946 273 004 Bytes)
- File: F:/Backup Images/file\_backup210508/FL00000000000000000000/archive.pfi



To know more on the subject, please consult the [Viewing Image Properties](#) chapter.

After the operation is completed you receive an incremental backup of the selected file archive. It is placed into the same destination as the base image.

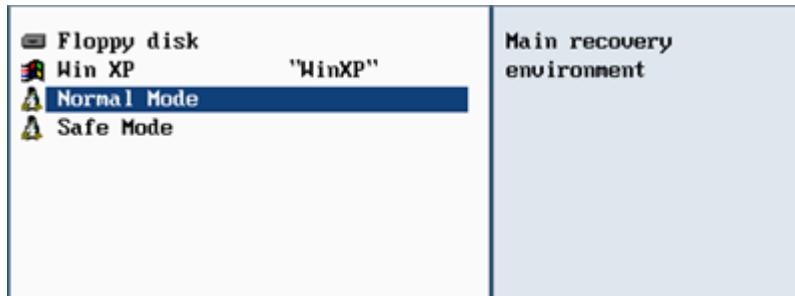
## Recovery Scenarios

### Restoring a Hard Disk from the Bootable Backup Capsule

Let's assume that your computer fails to boot because of a virus attack or corruption of some system critical files. But you've got the bootable backup capsule containing a backup of your hard disk. That's just enough to easily get your system back on track again.

To restore your hard disk from a backup image contained in the backup capsule when the current OS is down, please do the following:

1. Start up the computer from the bootable backup capsule. By default, the program offers to use the **F1** hot key to boot from it.

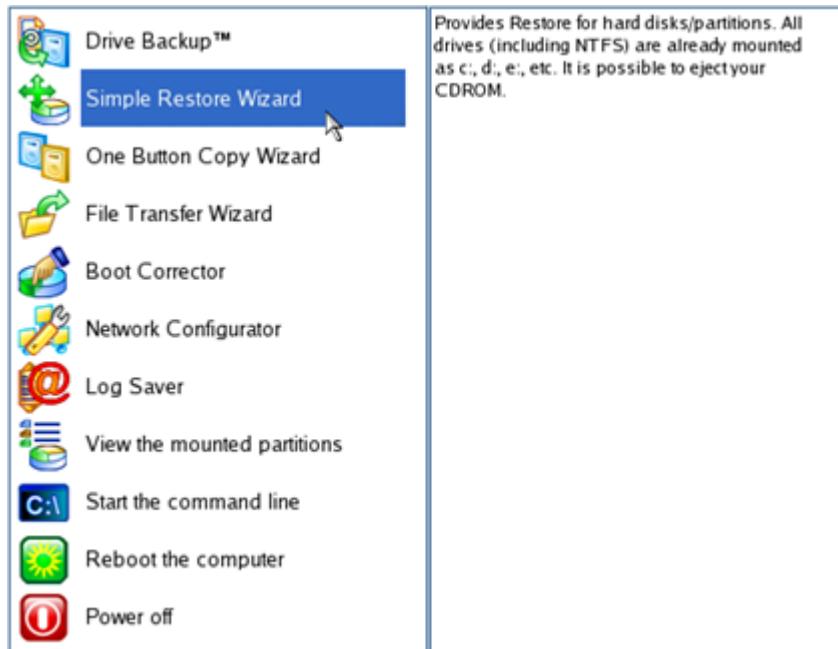


 This scenario implies that the [backup capsule is bootable](#).

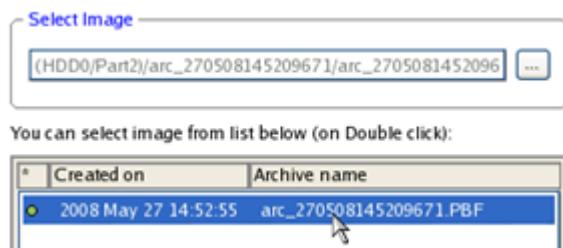
2. In the boot menu select **Normal Mode** to use the Linux recovery environment (more preferable) or **Safe Mode** to use the PTS DOS recovery environment (in case you've got problems with Linux).

 By default the **Normal Mode** will be automatically initiated after a 10 second idle period.

3. In the Linux launch menu select the **Simple Restore Wizard**. You can find the same wizard in PTS DOS as well.



4. On the Wizard's Welcome page, click the *Next* button.
5. On the **What to Restore** page, you can see a list of available images (if several). Most likely the required archive will be there too. If not, click the standard browse button [...] to find it. When you find your image, double click on it to proceed.



- On the **Image Properties** page, make sure that you select the correct image by viewing the provided information about the archive.

Volume	Type	File System	Size	Used	Volume label
<b>Basic Disk 0 (Size 40.0 Gb)</b>					
0:	Primary	NTFS	3.0 Gb	1.8 Gb	WinXP
1:	Primary	NTFS	9.8 Gb	52.8 Mb	Application

**Archive details:**

Type: Image of the hard disk  
Archive name: /arc\_270508145209671/arc\_270508145209671.PBF  
Created: 2008 May 27 Tue 14:52:55

- On the next page specify a hard disk to restore the image to (if several in your computer). By default, the program offers to restore the archive exactly where it belongs. That's what we actually need.

N	Volume	Type	File System	Size	Volume label	Active	Hidden
<b>Basic Disk 0 (Size 40.0 Gb)</b>							
0	C:	Primary	NTFS	3.0 Gb	WinXP	No	No
1	D:	Primary	NTFS	9.8 Gb	Application	No	No
2	:	Primary	BackupCapsule	10.0 Gb	[No label]	Yes	Yes
3	:	Primary	Free	17.2 Gb		No	No

Resize proportionally

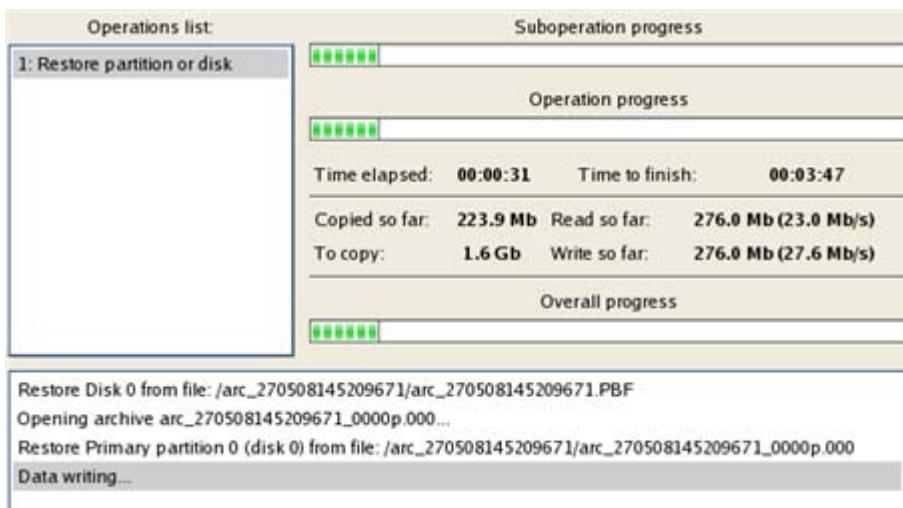
You can also make the program resize the on-disk partitions proportionally if necessary by marking the appropriate checkbox.



- On the **Restore Summary** page you can see your hard disk layout before and after the operation. Click the *Next* button to initiate the restore process.



9. In the **Progress** window you can see in real-time a detailed report on all actions carried out by the program.



10. After completing the operation close the wizard and reboot the computer.

## Restoring a System Partition from External Media (CD/DVD)

Let's assume that your computer fails to boot because of a virus attack or corruption of some system critical files. But you've got a backup of your system partition on a bootable DVD disc. That's just enough to easily get your system back on track again.

To restore your system partition from a backup image located on CD/DVD when the current OS is down, please do the following:

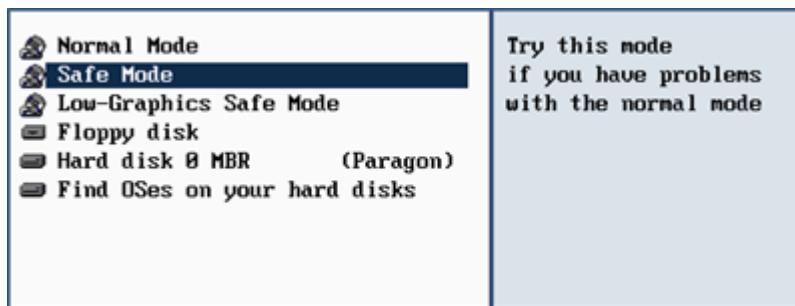
1. Insert a CD/DVD disk containing the previously prepared backup image into a CD/DVD drive (the BIOS must be enabled to boot the system from the CD/DVD device).



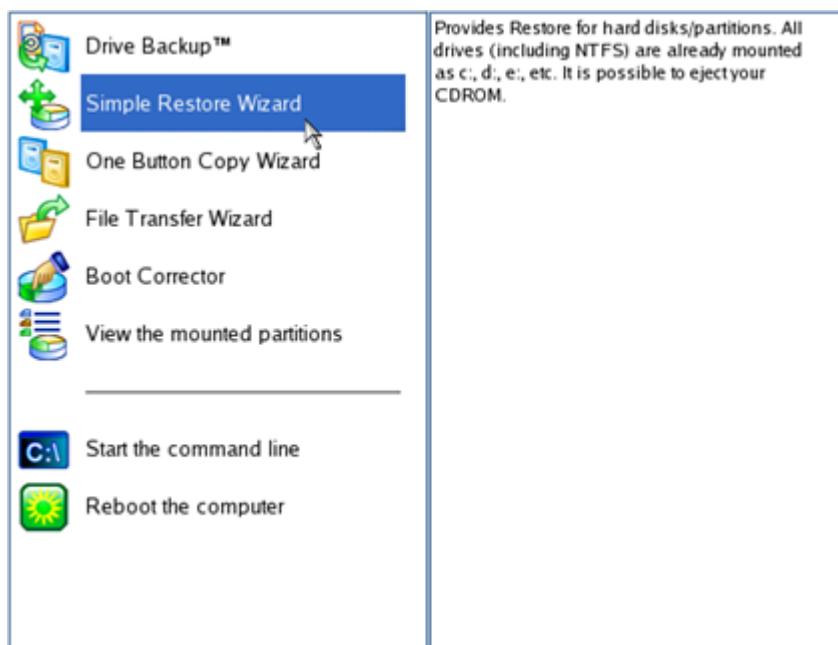
**This scenario implies that you have got a bootable archive on your CD/DVD.**

**In case the backup image is stored on several CD/DVD disks, please insert the first one.**

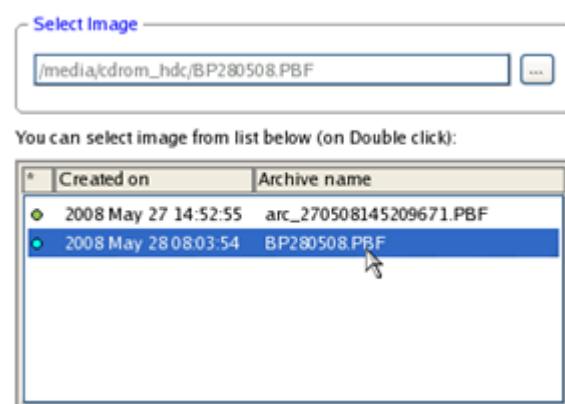
2. Restart the computer.
3. In the boot menu select **Normal Mode** to use the Linux recovery environment (more preferable) or **Safe Mode** to use the PTS DOS recovery environment (in case you've got problems with Linux). Moreover you've got the option to boot into the **Low-Graphics Safe Mode** (PTS DOS safe mode) to cope with a serious hardware incompatibility. In this case, only the minimal set of drivers will be included, like hard disk, monitor, and keyboard drivers. This mode has simple graphics and a simple menu.



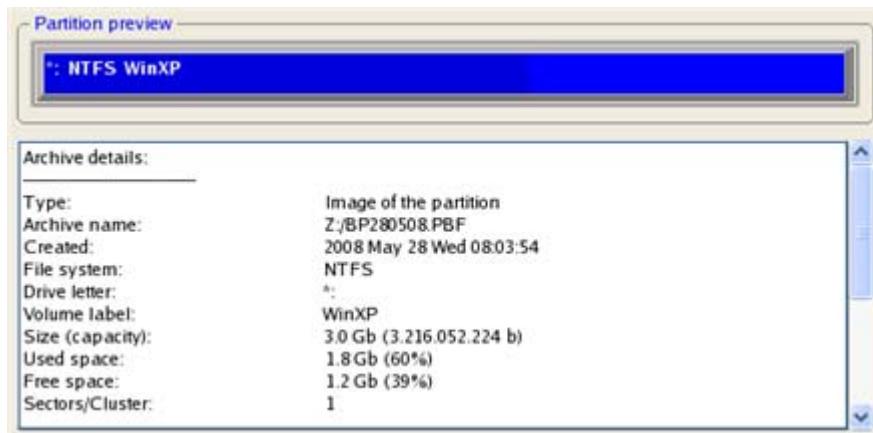
4. In the PTS DOS launch menu select the **Simple Restore Wizard**. You can find the same wizard in Linux as well.



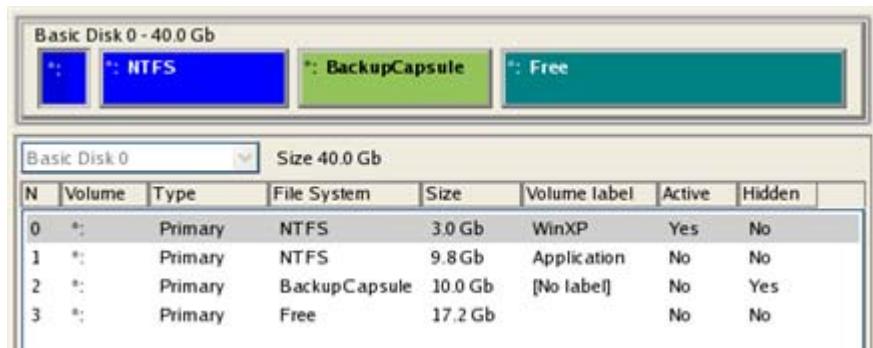
5. On the Wizard's Welcome page, click the *Next* button.
6. On the **What to Restore** page, you can see a list of available images (if several). Most likely the required archive will be there too. If not, click the standard browse button [...] to find it. When you find your image, double click on it to proceed.



- On the **Image Properties** page, make sure that you select the correct image by viewing the provided information about the archive.

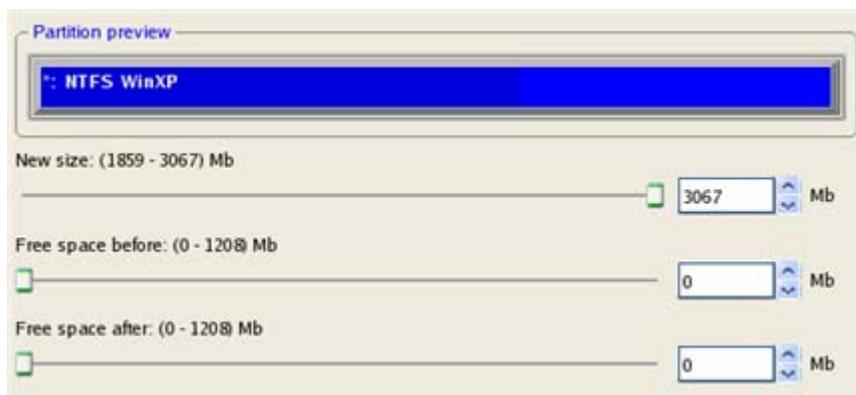


- On the next page specify a hard disk, then one of its partitions to restore the image to (if several in your computer). By default, the program offers to restore the archive exactly where it belongs. That's what we actually need.

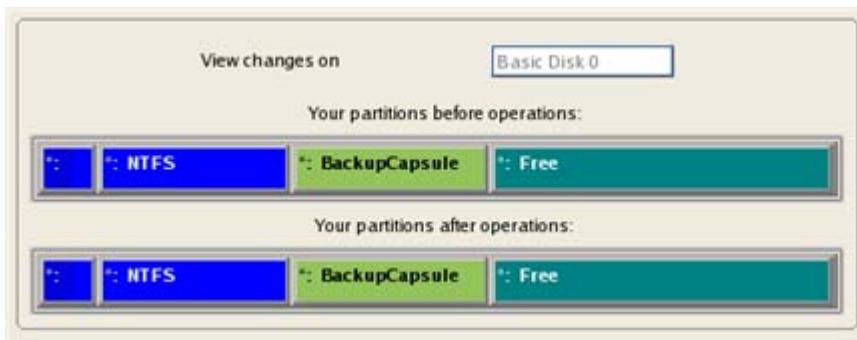


All contents on the partition selected for restoring purposes will be deleted during the operation.

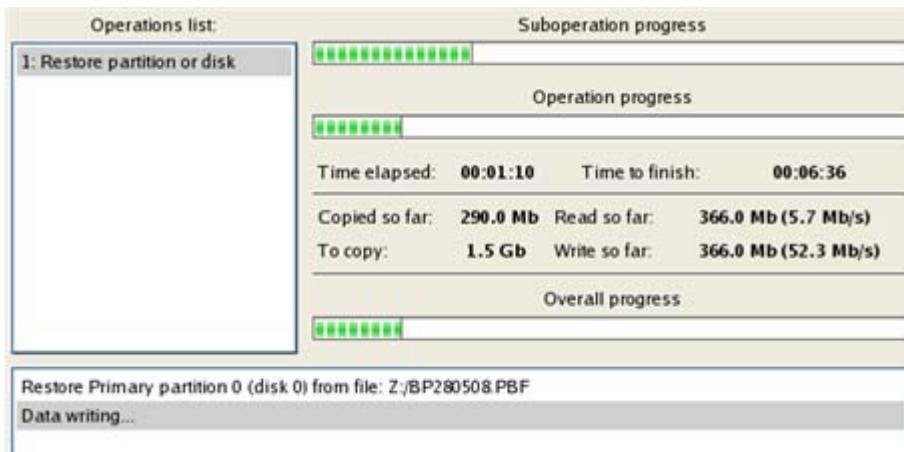
- On the **Partition Start and Size** page you can change size of the partition and its location if necessary.



- On the **Restore Summary** page you can see your hard disk layout before and after the operation. Click the *Next* button to initiate the restore process.



11. In the **Progress** window you can see in real-time a detailed report on all actions carried out by the program.



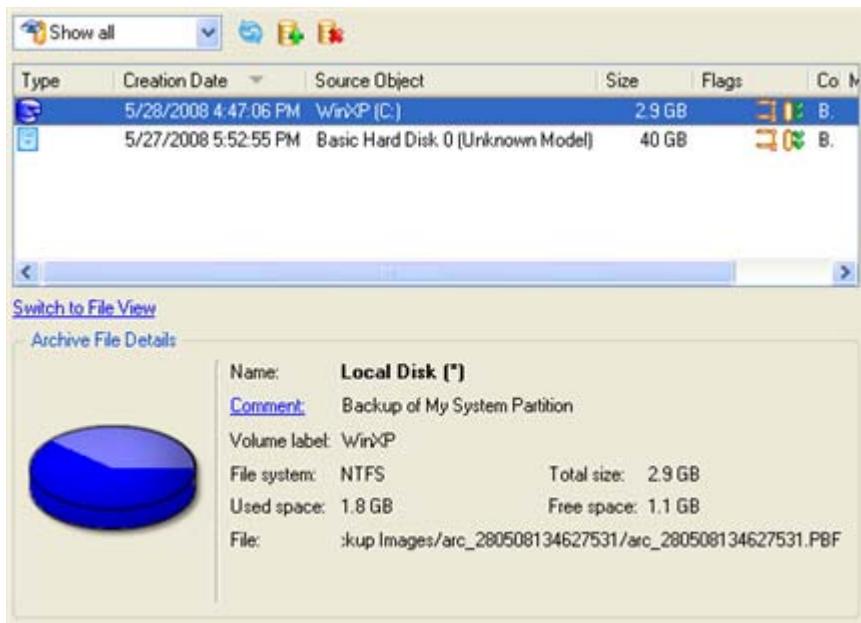
12. After completing the operation close the wizard, take out the disc and then reboot the computer.

## Restoring a System Partition from a Local Drive

Let's assume that your operating system gives trouble after having installed brand new software. But you've got a backup of the system partition on a local disk. That's just enough to easily roll it back to the point when run smoothly.

To restore your system partition from a backup image located on a local disk, please do the following:

1. Launch the **Restore Wizard**. There are several ways to do it:
  - In the Main Menu: select *Wizards > Restore a Disk or Partition*.
  - On the Common Tasks bar: click the *Restore a Disk or Partition* item of the Wizards menu.
2. On the Restore Wizard's Welcome page, click the *Next* button.
3. On the **Browse for Archive** page, specify the required archive:
  - By clicking the *Switch to Archive List View* link, you can see a list of images contained in the [Archive Database](#) (if any).

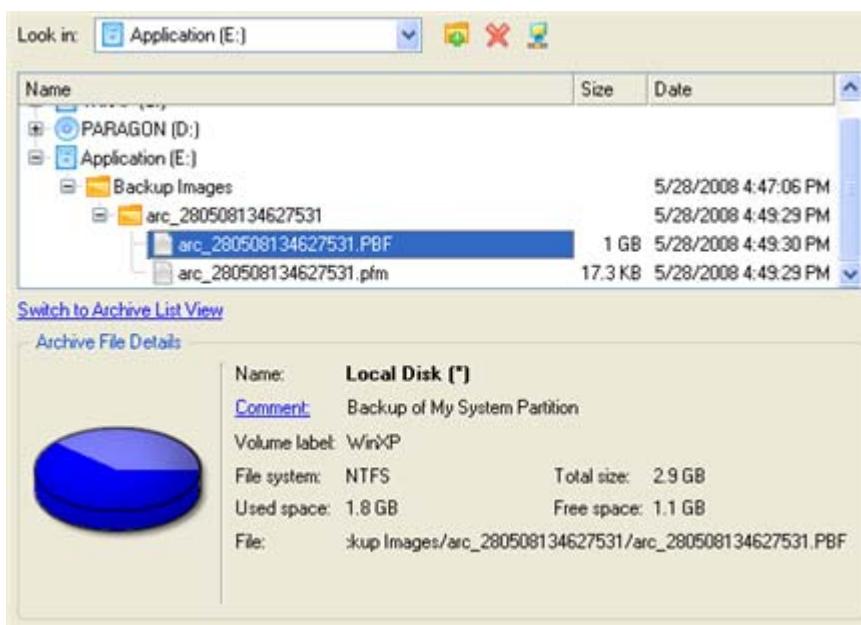


To get a clear-cut picture on properties of the required image, just click on it and the section below will (i.e. *Archive File Details*) display a short description.



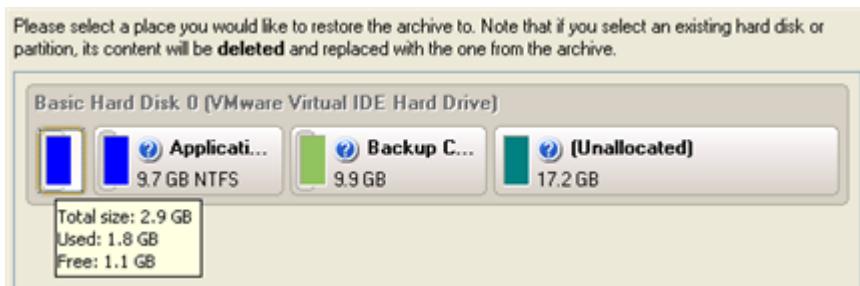
To know more on the subject, please consult the [Viewing Image Properties](#) chapter.

- By clicking the *Switch to File View* link, you can find the required image in the browser-like window. The section below (i.e. *Archive File Details*) will also display a short description of the selected image.



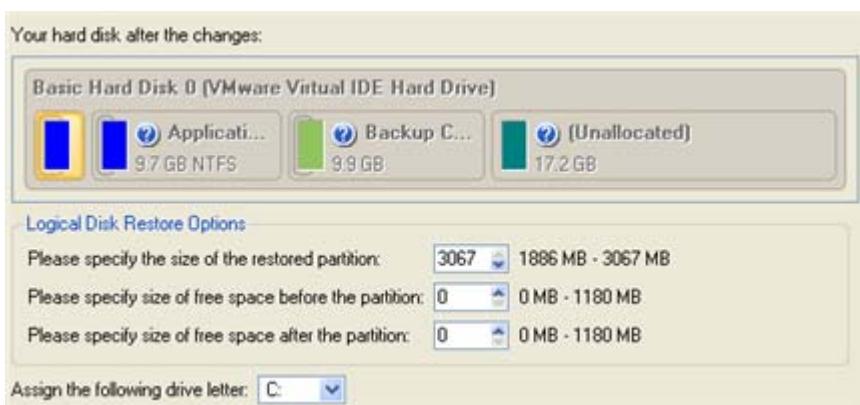
To know more on the subject, please consult the [Viewing Image Properties](#) chapter.

4. On the **Where to Restore** page specify a hard disk, then one of its partitions to restore the image to (if several in your computer). By default, the program offers to restore the archive exactly where it belongs. That's what we actually need.



**All contents on the partition selected for restoring purposes will be deleted during the operation.**

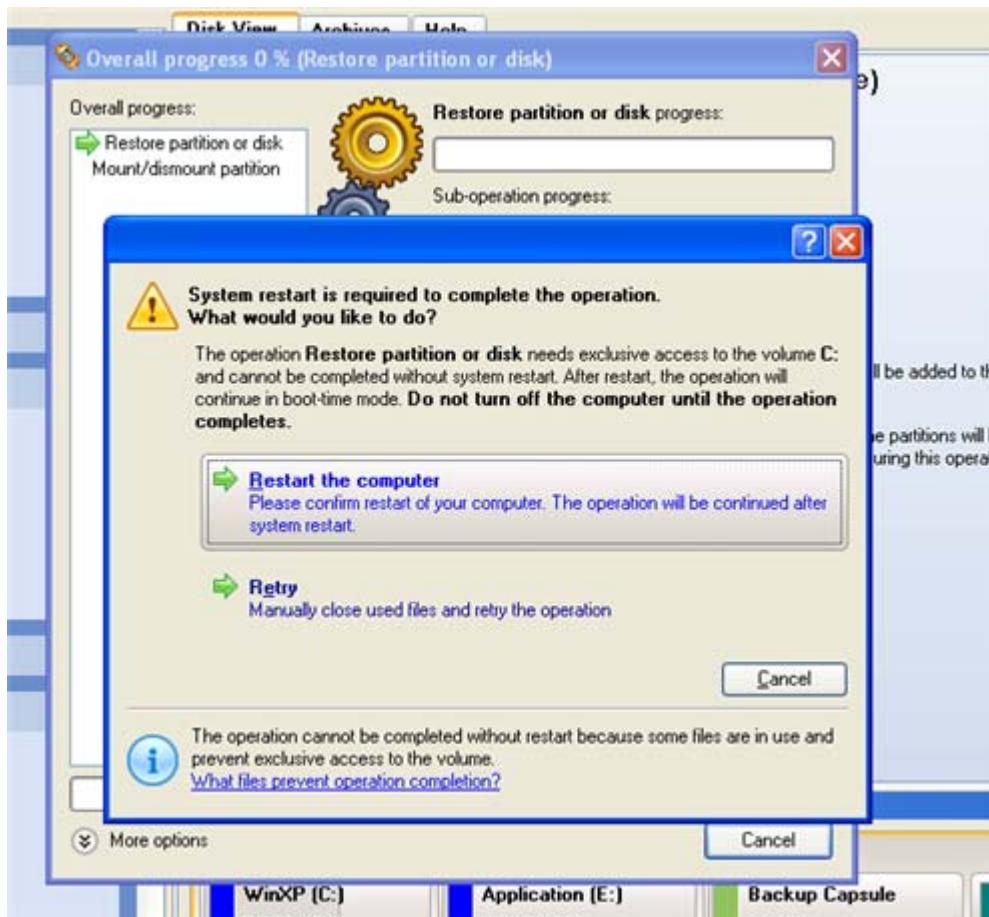
5. On the **Restore Results** page you can see the resulted disk layout. Besides there's the possibility to change size of the partition and its location if necessary as well as assign a particular drive letter.



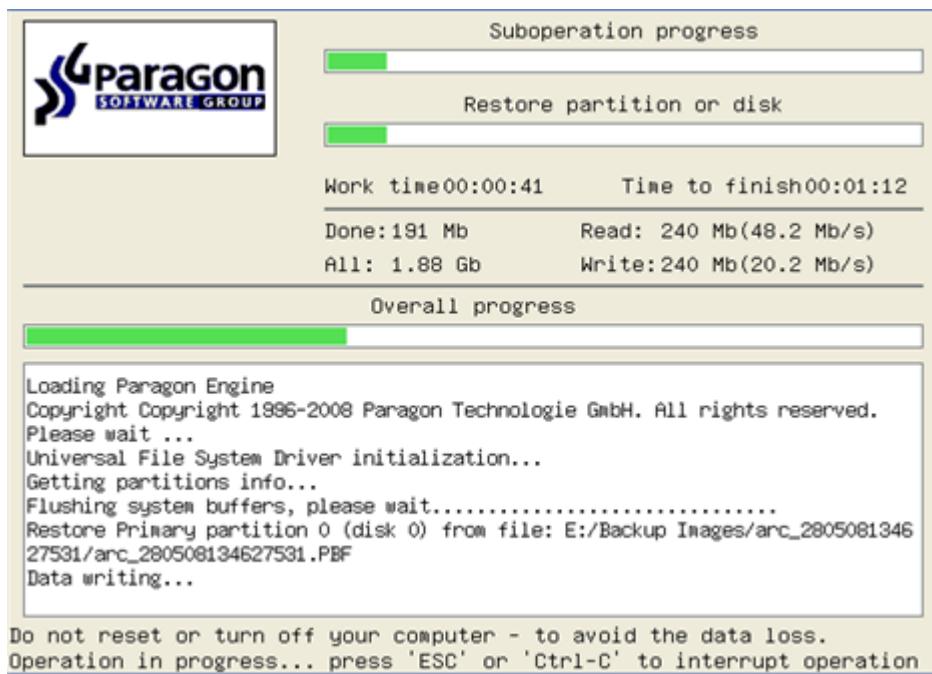
6. Complete the wizard and then apply the pending changes.



7. The program will require the system restart to accomplish the operation in a special boot-up mode. Click the appropriate button to agree.



8. In the **Progress** window you can see in real-time a detailed report on all actions carried out by the program.



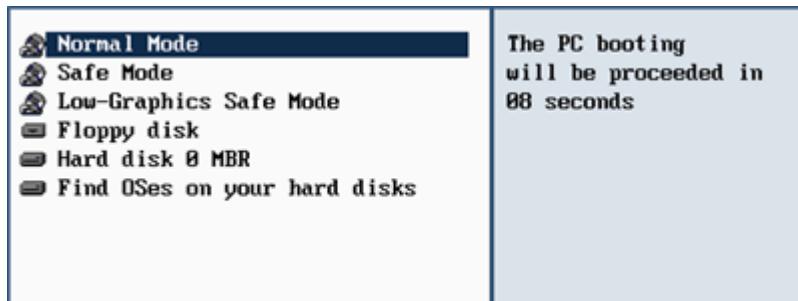
After completing the operation the program will automatically reboot the computer.

## Restoring Vista to a Different Hardware Configuration

Let's assume that the most terrible disaster has happened to your Vista-based computer – it's broken to pieces because of a power outage. You've got a backup of your system partition on a remote backup server, but cannot find an exact match for your original system specifications to replace failed hardware. Well it's too early to give up – our program will help you easily restore your Vista to a different hardware configuration.

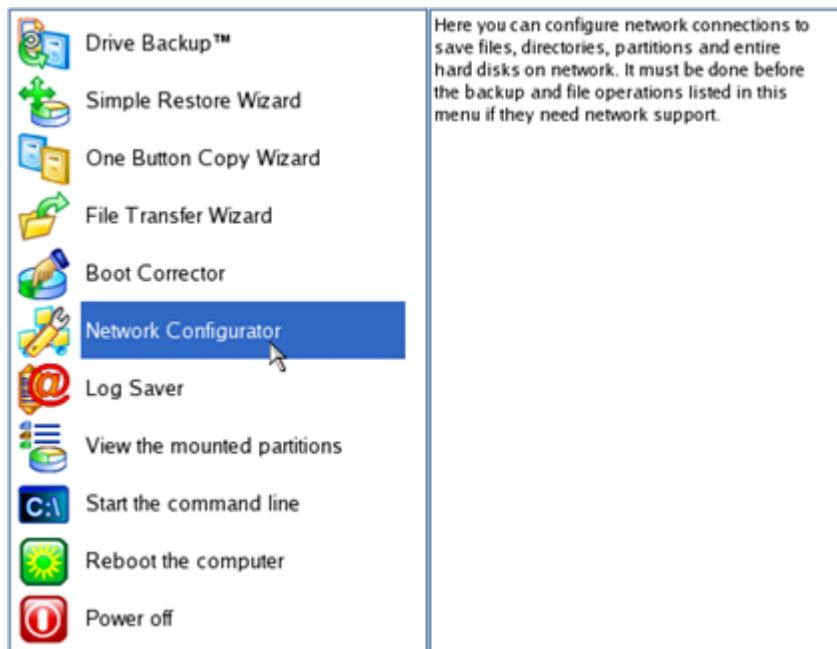
To carry out a bare metal restore from a backup image located on a network drive, please do the following:

1. Insert **Paragon Linux/DOS Recovery CD** (the BIOS must be enabled to boot the system from the CD/DVD device).
2. Restart the computer.
3. In the boot menu select **Normal Mode** to use the Linux recovery environment, since it's the only mode that provides a network support.

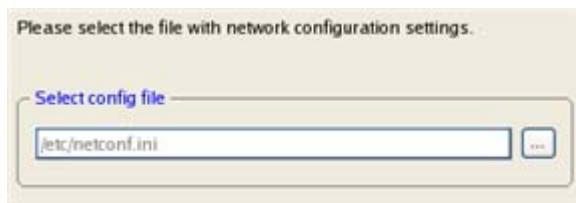


**By default the *Normal Mode* will be automatically initiated after a 10 second idle period.**

4. In the Linux launch menu select **Network Configurator** to establish a network connection.



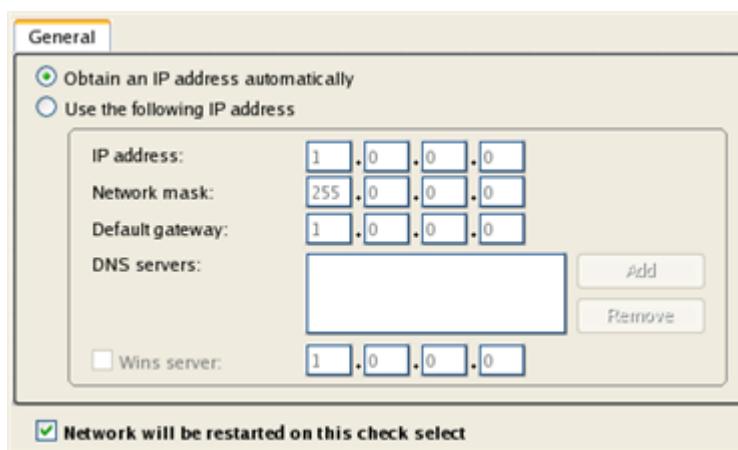
5. On the Wizard's Welcome page, click the *Next* button.
6. On the **Load Config** File page, click the *Next* button. By default, the wizard saves all network settings in the **netconf.ini** file located on the Linux RAM drive, thus it will only be available until you restart the computer. However, you can just once configure your network device and then save this file to some other destination, for instance a local drive, and this way avoid constant re-configuration, just by providing a path to it.



7. On the next page the wizard automatically attempts to detect all available network devices and then displays them (if any) in form of a list. On every found device there's information about its interface and used driver as well as a brief description. You can manually add a network device in case it hasn't been found automatically by clicking the *Add a device* button and selecting a device you need from the list. Do not forget to check it by clicking the *Probe* button.



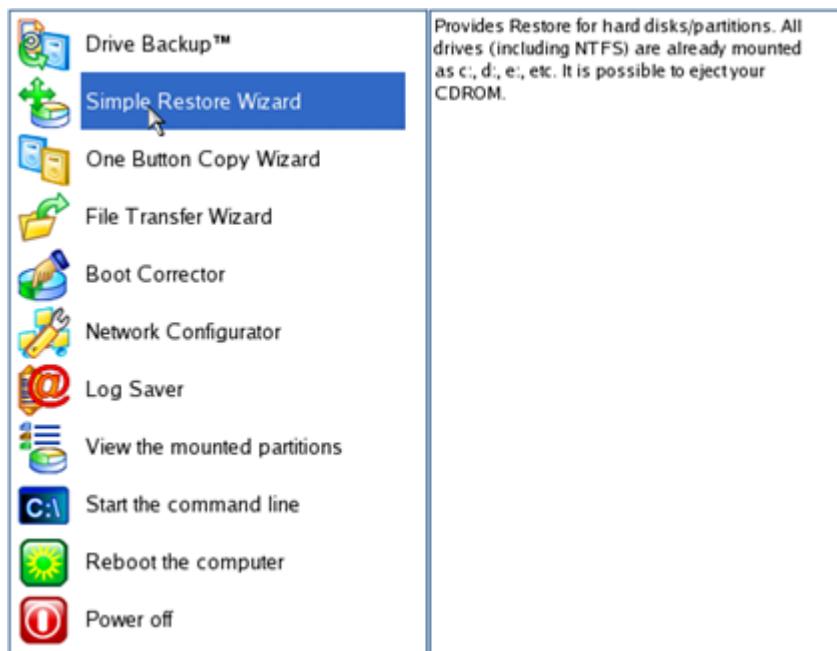
8. On the **Settings for Interface** page you need to properly set up the selected network device. If your local network has a DHCP Server, you can just leave everything as is, otherwise manually type in an IP address, a network mask, default gateway, etc.



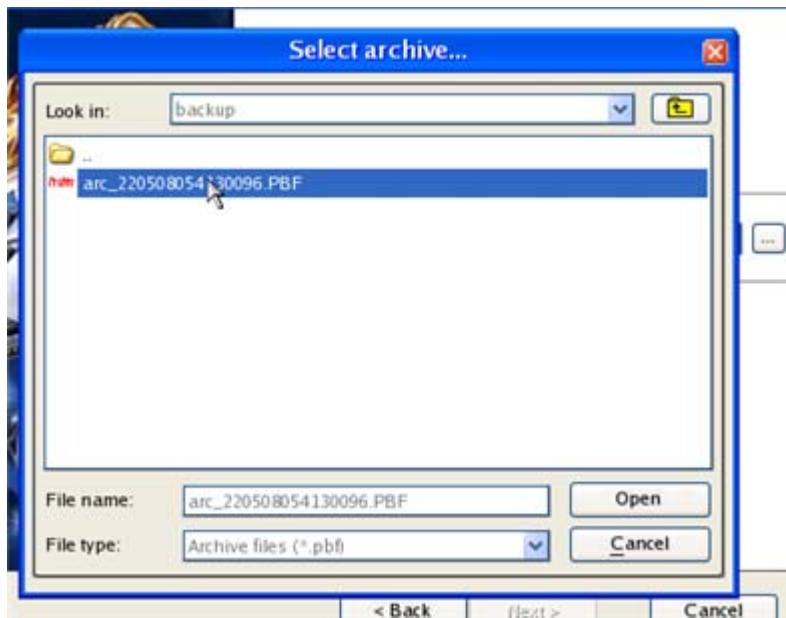
9. On the **Configure Network Connections** page, click the *Add* button and provide all the necessary information to map a network share in the opened dialog. Click the *Unmount* button to delete an existing network connection if necessary.



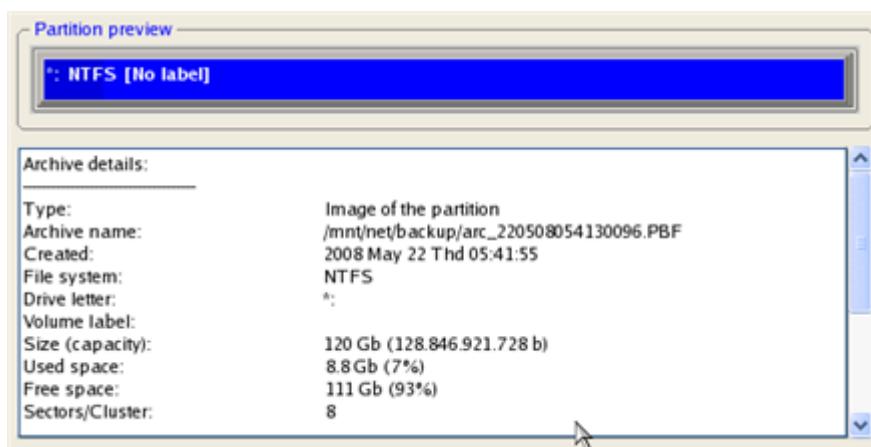
10. On the next page, save the **netconf.ini** file if necessary and click the *Finish* button to complete the wizard.
11. In the Linux launch menu select the **Simple Restore Wizard**.



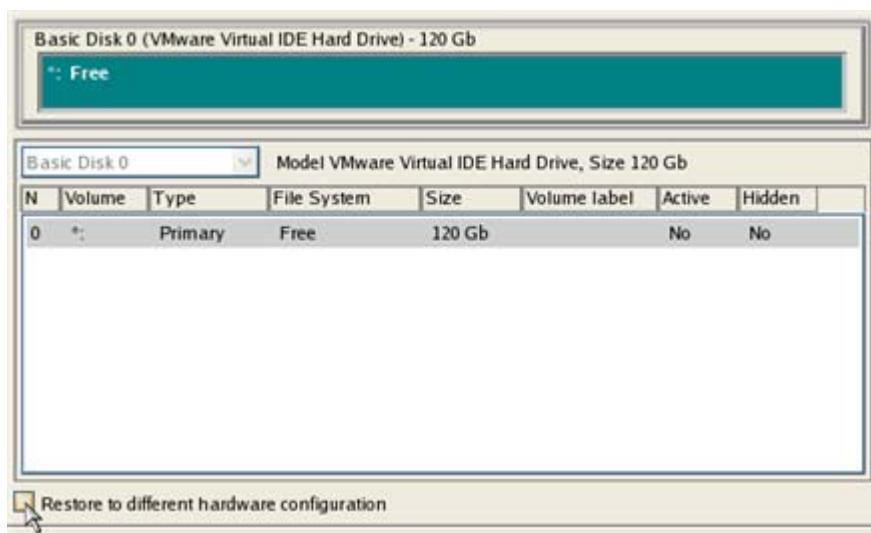
12. On the Wizard's Welcome page, click the *Next* button.
13. On the **What to Restore** page, click the standard browse button [...] to find the required archive. When done, double click on it to select.



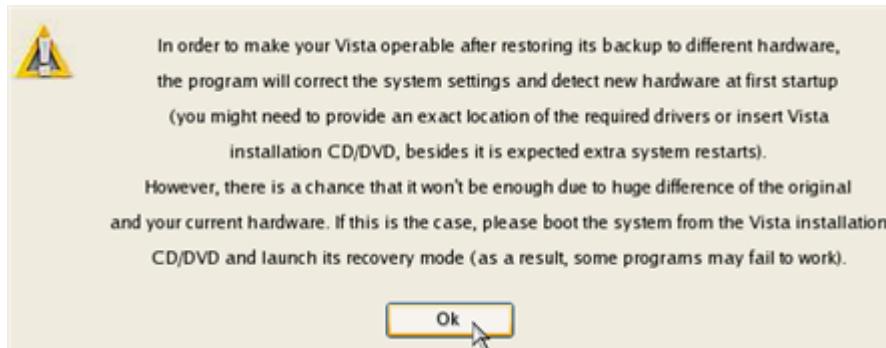
14. On the **Image Properties** page, make sure that you select the correct image by viewing the provided information about the archive.



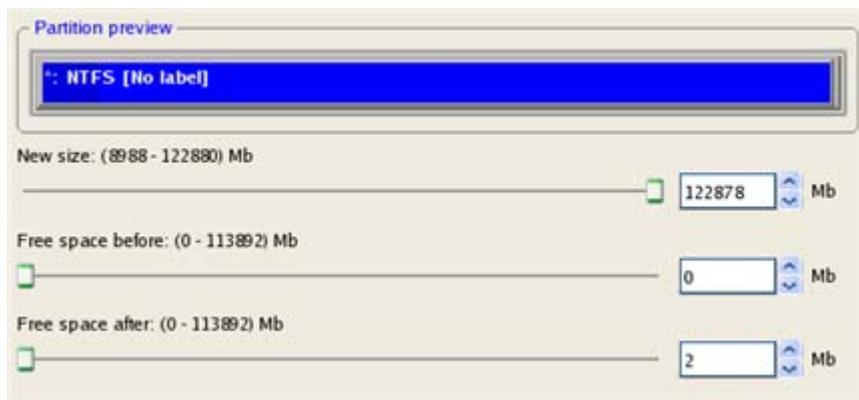
15. On the next page specify a hard disk to restore the image to (if several in your computer).



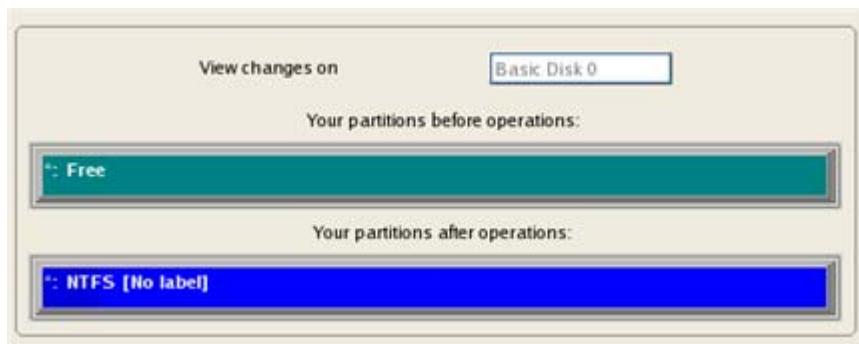
Mark the checkbox at the bottom of the page to make your Vista restore to a different hardware configuration. Once you've done that, the program will display a warning message. Read it carefully and then click the *OK* button to proceed.



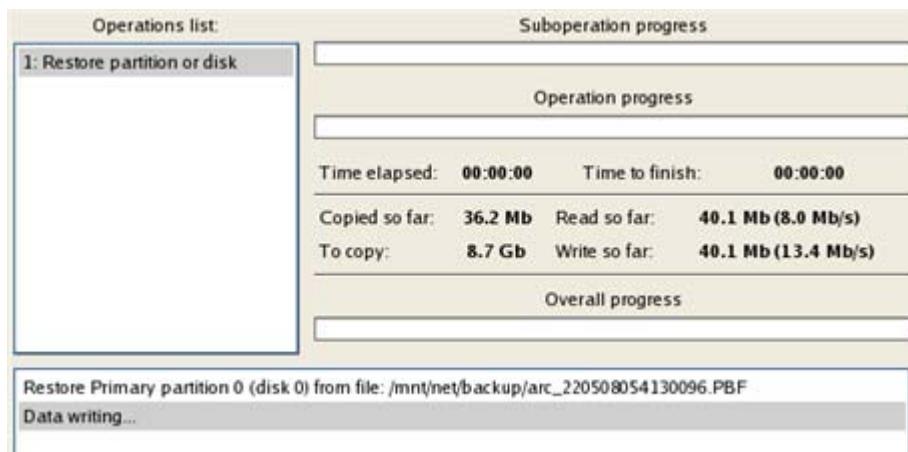
16. On the **Partition Start and Size** page you can change size of the partition and its location if necessary.



17. On the **Restore Summary** page you can see your hard disk layout before and after the operation. Click the *Next* button to initiate the restore process.



18. In the **Progress** window you can see in real-time a detailed report on all actions carried out by the program.



19. After completing the operation close the wizard, take out the disc and then reboot the computer.



You can also use this scenario to restore Windows 2000/XP to a different hardware configuration, but additionally you may need to select the required platform in the boot menu, in case your system fails to boot.

## Restoring a File Increment

Let's assume that you're busy with developing some project and you make file increments of it on a day-to-day basis not to lose valuable information. So you've got a file backup chain. One day you understand that the job of the last three days is a complete and utter failure. Don't give up – recover your project to the state when everything's ok.

To restore a file increment, please do the following:

1. Launch the **Restore Wizard**. There are several ways to do it:
  - In the Main Menu: select *Wizards > Restore Files*.
  - On the Common Tasks bar: click the *Restore Files* item of the Wizards menu.
2. On the Restore Wizard's Welcome page, click the *Next* button.
3. On the **Browse for Archive** page, specify the required file increment:
  - By clicking the *Switch to Archive List View* link, you can see a list of images contained in the [Archive Database](#) (if any).

**Archive File Details:**

Name:	<b>FB Archive</b>
Comment:	Backup of My Project
Backup date:	29.05.2008 9:56:40
File:	F:/Backup Images/arc_290508055145147/FL128565139612578422/archive.pfi
Base archive:	F:/Backup Images/arc_290508055145147/FL00000000000000000000000000000000/archive.pfi

To get a clear-cut picture on properties of the required image, just click on it and the section below will (i.e. *Archive File Details*) display a short description.



To know more on the subject, please consult the [Viewing Image Properties](#) chapter.

- By clicking the *Switch to File View* link, you can find the required image in the browser-like window. The section below (i.e. *Archive File Details*) will also display a short description of the selected image.

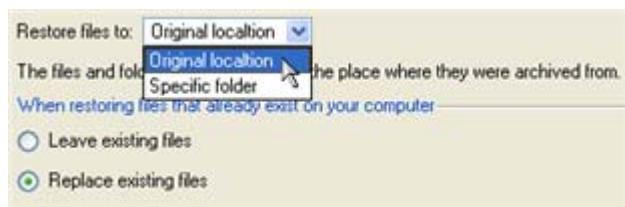
**Archive File Details:**

Name:	<b>FB Archive</b>
Comment:	Backup of My Project
Backup date:	29.05.2008 9:56:40
File:	F:/Backup Images/arc_290508055145147/FL128565139612578422/archive.pfi
Base archive:	F:/Backup Images/arc_290508055145147/FL00000000000000000000000000000000/archive.pfi



To know more on the subject, please consult the [Viewing Image Properties](#) chapter.

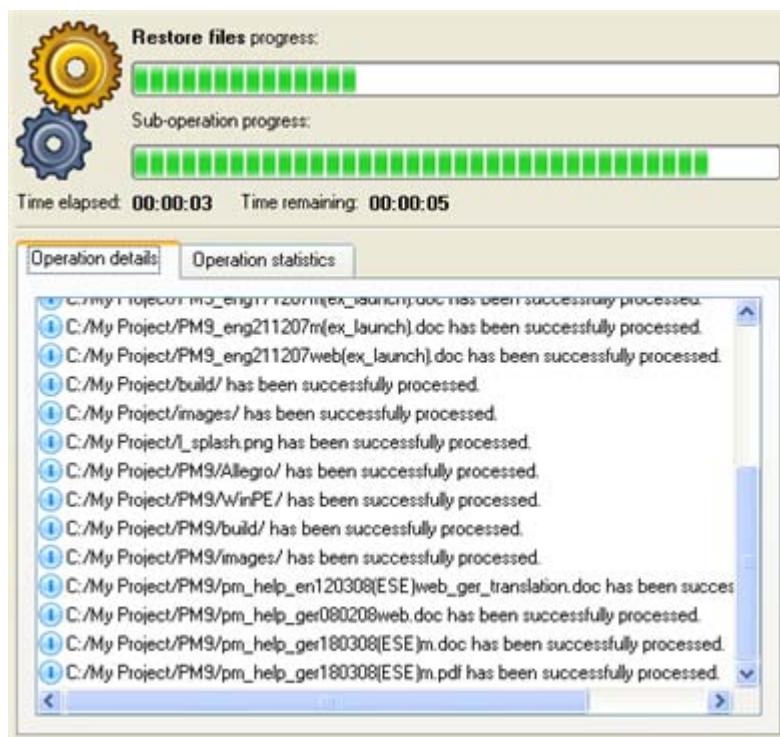
4. On the **How to Restore** page specify the way your archive will be restored. In our case we'd rather restore contents of the backup to its original location with replacing existing files as well.



5. Complete the wizard and then apply the pending changes.



6. In the **Progress** window you can see in real-time a detailed report on all actions carried out by the program.

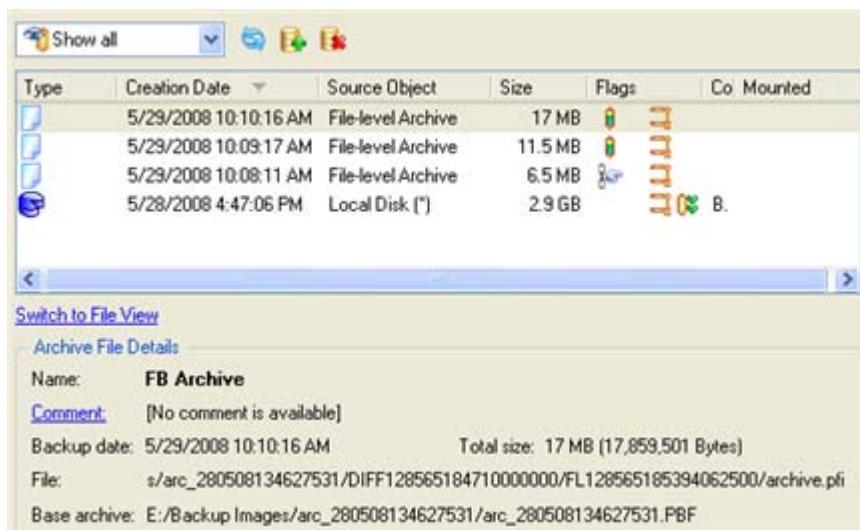


## Restoring a File Increment to a Partition Backup

Let's assume that your operating system gives trouble because of a virus attack. But you've got a backup of your system partition on a local disk. Besides you make file increments of your documents and e-mail database to that backup on a regular basis. That's just enough to easily roll everything back to the point when run smoothly.

To restore your system partition with a file increment from a backup image located on a local disk, please do the following:

1. Launch the **Restore Wizard**. There are several ways to do it:
  - In the Main Menu: select *Wizards > Restore a Disk or Partition/Restore Files*.
  - On the Common Tasks bar: click the *Restore a Disk or Partition/Restore Files* item of the Wizards menu.
2. On the Restore Wizard's Welcome page, click the *Next* button.
3. On the **Browse for Archive** page, specify the required file increment archive to your system partition backup:
  - By clicking the *Switch to Archive List View* link, you can see a list of images contained in the [Archive Database](#) (if any).

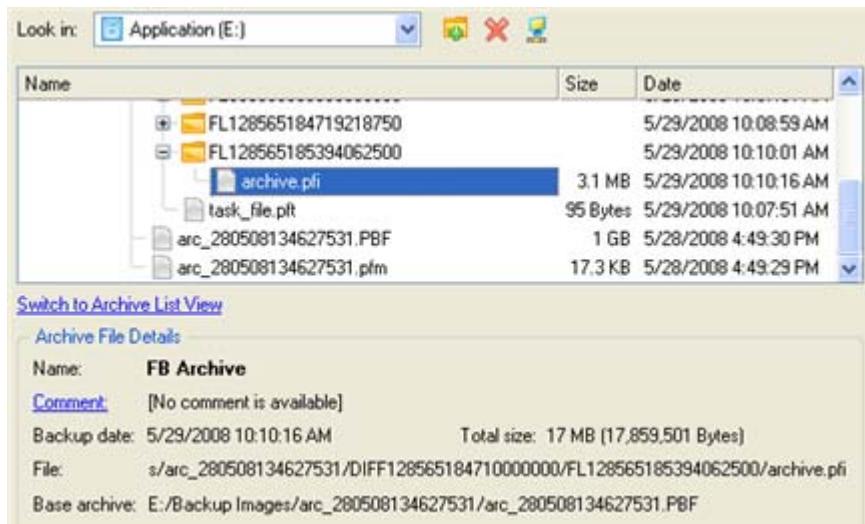


To get a clear-cut picture on properties of the required image, just click on it and the section below will (i.e. *Archive File Details*) display a short description.



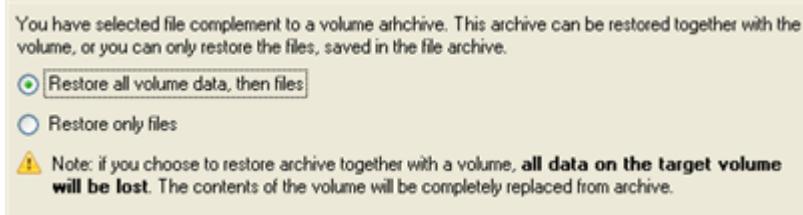
To know more on the subject, please consult the [Viewing Image Properties](#) chapter.

- By clicking the *Switch to File View* link, you can find the required image in the browser-like window. The section below (i.e. *Archive File Details*) will also display a short description of the selected image.



To know more on the subject, please consult the [Viewing Image Properties](#) chapter.

- On the **How to Restore File Complement** page select whether you want to restore both, the partition archive and the desired file increment or just the file increment. In our case we choose the first option.

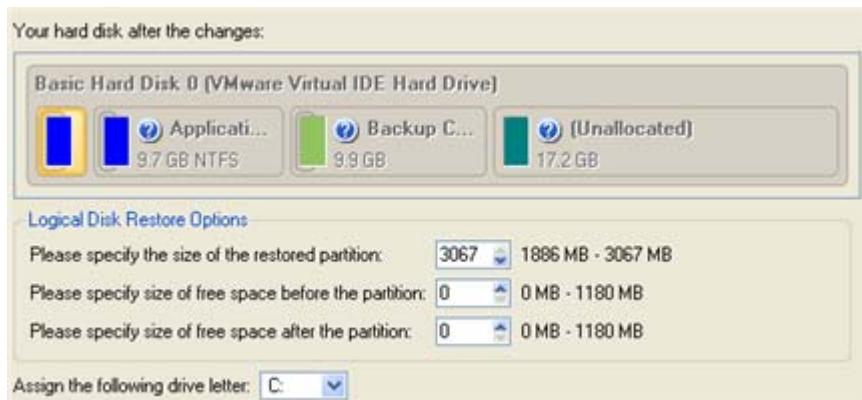


- On the **Where to Restore** page specify a hard disk, then one of its partitions to restore the image to (if several in your computer). By default, the program offers to restore the archive exactly where it belongs. That's what we actually need.

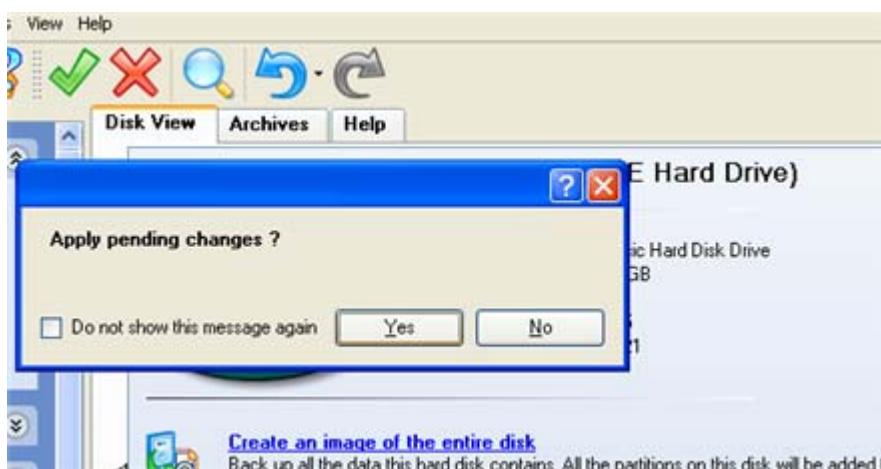


All contents on the partition selected for restoring purposes will be deleted during the operation.

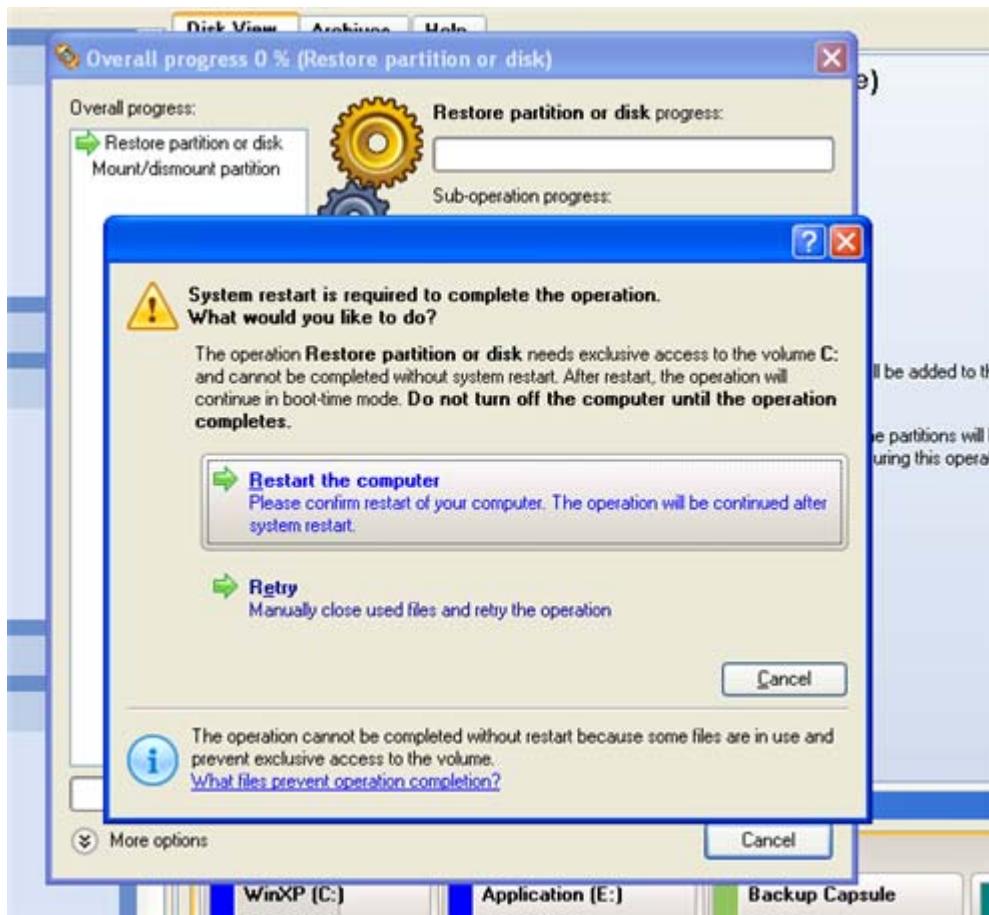
- On the **Restore Results** page you can see the resulted disk layout. Besides there's the possibility to change size of the partition and its location if necessary as well as assign a particular drive letter.



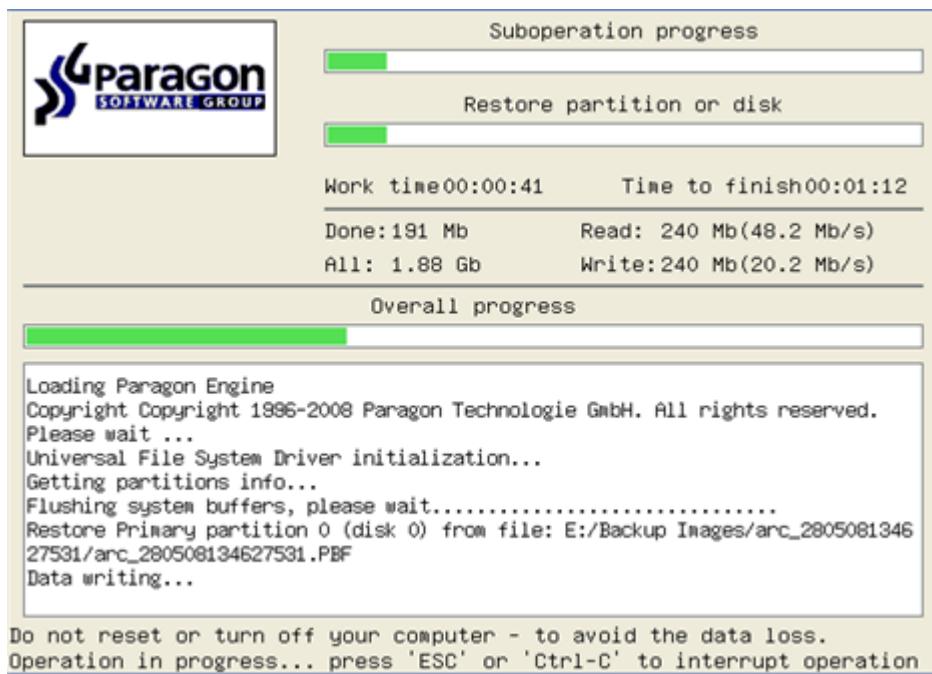
7. Complete the wizard and then apply the pending changes.



8. The program will require the system restart to accomplish the operation in a special boot-up mode. Click the appropriate button to agree.



9. In the **Progress** window you can see in real-time a detailed report on all actions carried out by the program.

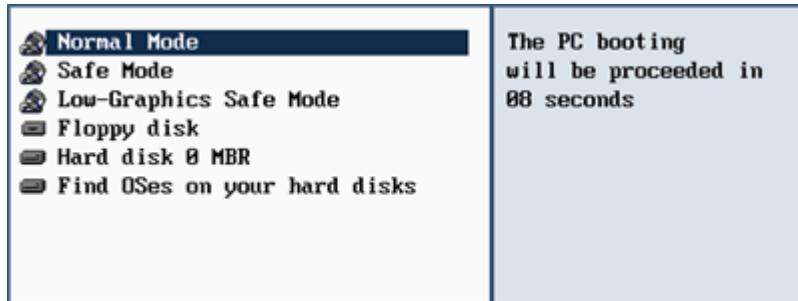


After completing the operation the program will automatically reboot the computer.

## Copying of data from the corrupted system disk to another hard disk

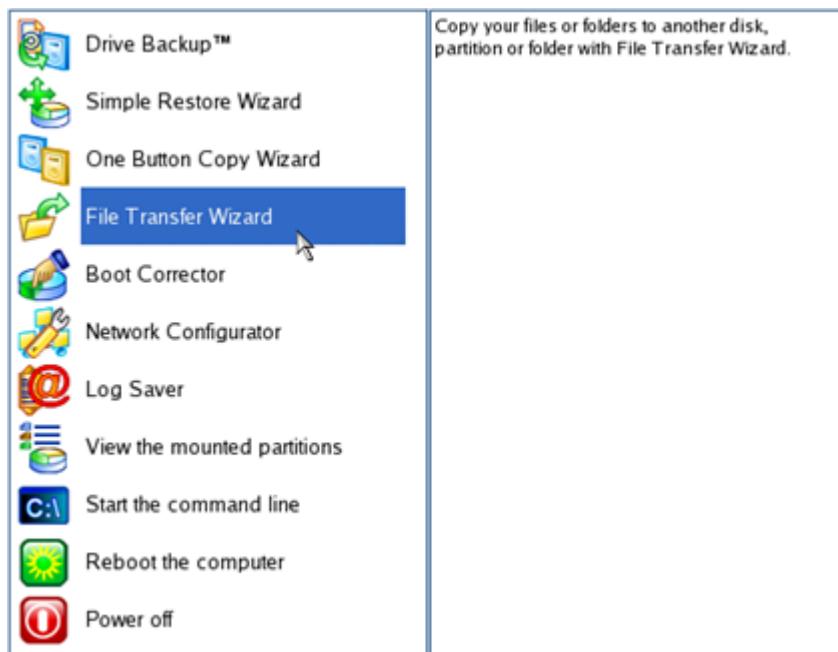
To retrieve valuable information from your hard disk and copy it to another hard disk when the system fails to boot, please do the following:

1. Connect the second hard disk to the computer.
2. Insert **Paragon Linux/DOS Recovery CD** (the BIOS must be enabled to boot the system from the CD/DVD device).
3. Restart the computer.
4. In the boot menu select **Normal Mode** to use the Linux recovery environment (more preferable) or **Safe Mode** to use the PTS DOS recovery environment (in case you've got problems with Linux). Moreover you've got the option to boot into the **Low-Graphics Safe Mode** (PTS DOS safe mode) to cope with a serious hardware incompatibility. In this case, only the minimal set of drivers will be included, like hard disk, monitor, and keyboard drivers. This mode has simple graphics and a simple menu.

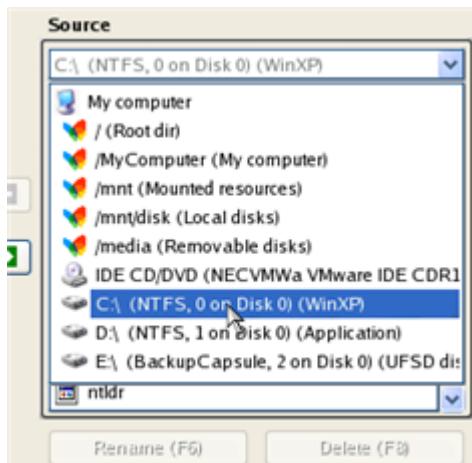


By default the **Normal Mode** will be automatically initiated after a 10 second idle period.

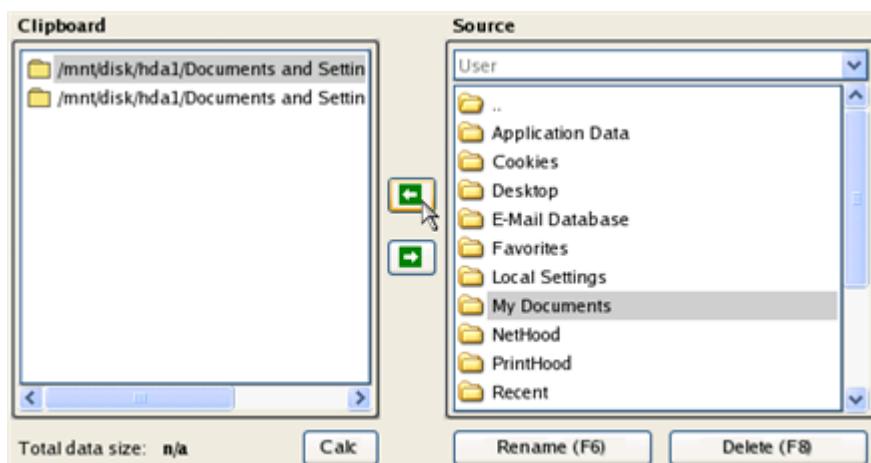
5. In the Linux launch menu select the **File Transfer Wizard**. You can find the same wizard in PTS DOS as well.



6. On the Wizard's Welcome page, click the *Next* button.
7. Select a disk where the files you need are stored from the pull-down list in the right pane of the page.



8. Select files you want to copy and place them to **Clipboard** by pressing the left arrow-button.



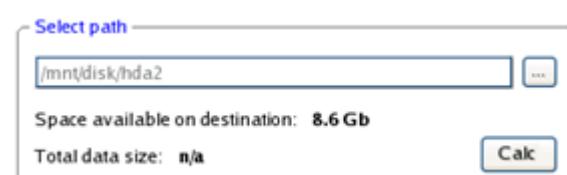
Click the *Calc* button to estimate the resulted data size.

9. On the **Select Destination Type**, choose the way the data will be stored. Select the **Save data to any local drive or a network share** item.

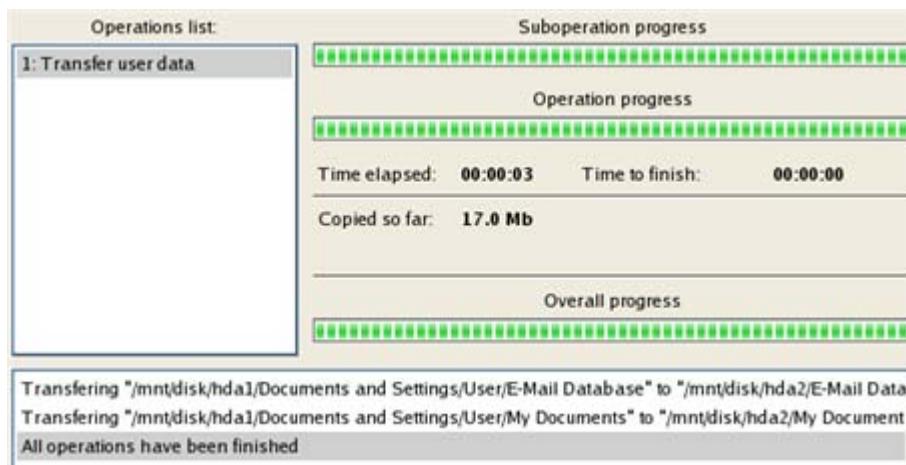
Please select how would you like to save the data:

- Save data to any local drives or a network share**  
Choose this option if you want to save your data to local mounted or physical partition, to USB or FireWare external drives and to a mounted network share. You will be prompted to choose a location you want to save the archive to.
- Burn data to CD/DVD**  
Choose this option if you want the Wizard to burn the data to CD or DVD. You will be prompted to choose a CD or DVD RW drive.

10. On the **Select Destination Path** page, select a hard disk to copy the data to by pressing the standard browse button [...].



11. On the **Transfer Summary** page check all parameters of the operation. Click the *Next* button to accomplish the operation.
12. In the **Progress** window you can see in real-time a detailed report on all actions carried out by the program.

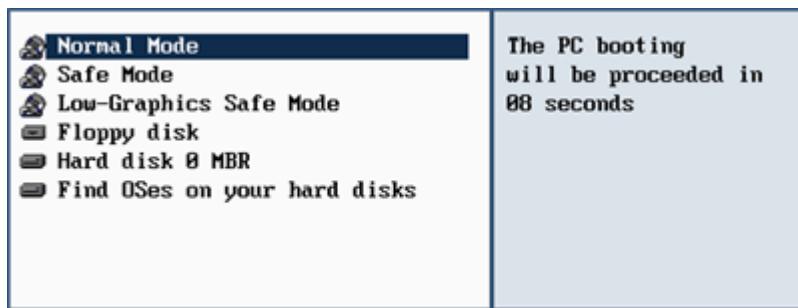


13. After the operation is completed, close the wizard by pressing the appropriate button.
14. Eject the CD.
15. Turn off the computer.

## Burning of data from the corrupted system disk to CD/DVD

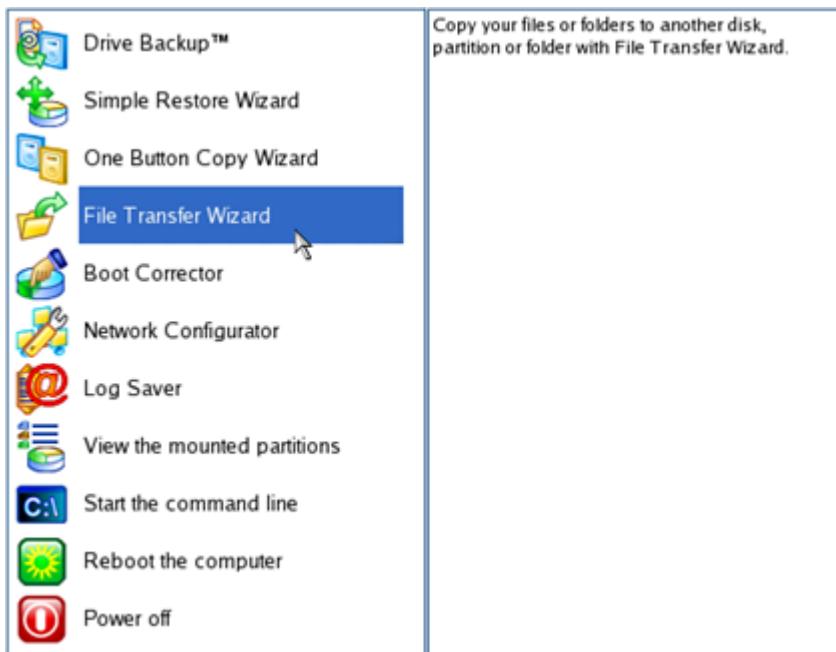
To retrieve valuable information from your hard disk and burn it to CD/DVD when the system fails to boot, please do the following:

1. Insert **Paragon Linux/DOS Recovery CD** (the BIOS must be enabled to boot the system from the CD/DVD device).
2. Restart the computer.
3. In the boot menu select **Normal Mode** to use the Linux recovery environment, since it's the only mode that enables to burn CD/DVD discs.

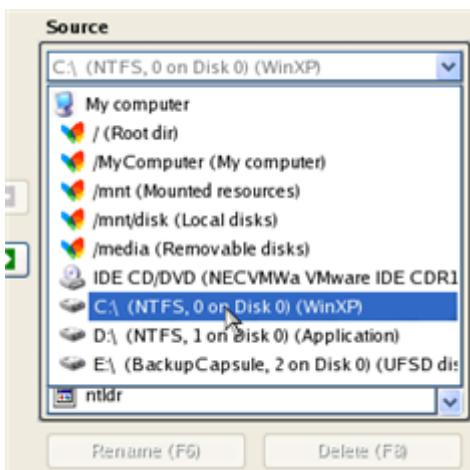


**By default the *Normal Mode* will be automatically initiated after a 10 second idle period.**

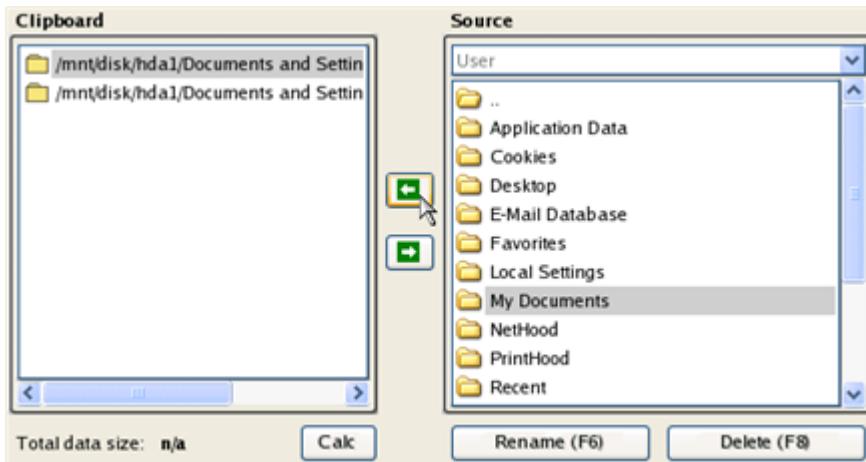
4. In the Linux launch menu select the **File Transfer Wizard**. You can find the same wizard in PTS DOS as well.



5. On the Wizard's Welcome page, click the *Next* button.
6. Select a disk where the files you need are stored from the pull-down list in the right pane of the page.



7. Select files you want to copy and place them to **Clipboard** by pressing the left arrow-button.



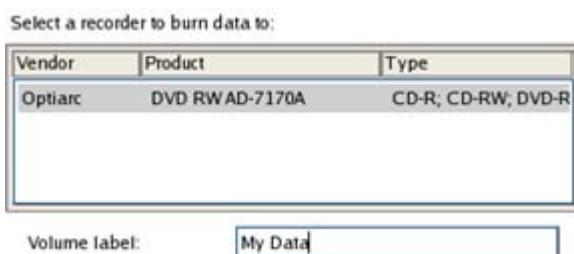
Click the *Calc* button to estimate the resulted data size.

8. On the **Select Destination Type**, choose the way the data will be stored. Select the **Burn data to CD/DVD** item.

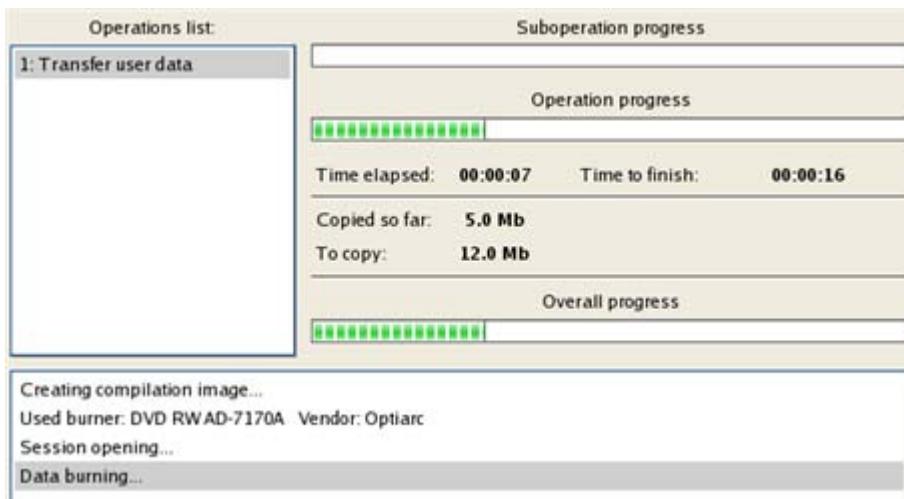
Please select how would you like to save the data:

- Save data to any local drives or a network share**  
Choose this option if you want to save your data to local mounted or physical partition, to USB or FireWare external drives and to a mounted network share. You will be prompted to choose a location you want to save the archive to.
- Burn data to CD/DVD**  
Choose this option if you want the Wizard to burn the data to CD or DVD. You will be prompted to choose a CD or DVD RW drive.

9. On the **Choose a Recorder** page, select a recorder from the list of available devices and then set a volume label by entering it in the appropriate field.



10. On the **Transfer Summary** page check all parameters of the operation. Click the *Next* button to accomplish the operation.
11. In the **Progress** window you can see in real-time a detailed report on all actions carried out by the program.

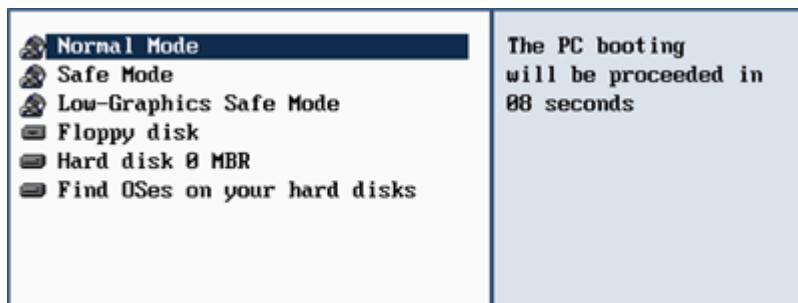


12. After the operation is completed, close the wizard by pressing the appropriate button.
13. Eject the CD.
14. Turn off the computer.

## Copying of data from a backup to the corrupted system partition

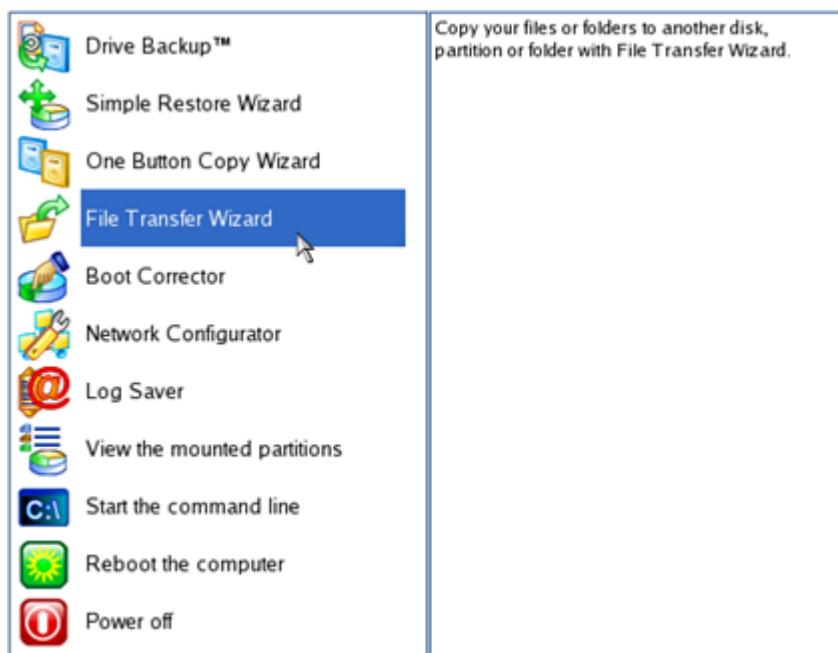
The system fails to boot since some files are damaged. If you have a backup of the system partition, you can recopy these files to make the system be operable again:

1. Insert **Paragon Linux/DOS Recovery CD** (the BIOS must be enabled to boot the system from the CD/DVD device).
2. Restart the computer.
3. In the boot menu select **Normal Mode** to use the Linux recovery environment (more preferable) or **Safe Mode** to use the PTS DOS recovery environment (in case you've got problems with Linux). Moreover you've got the option to boot into the **Low-Graphics Safe Mode** (PTS DOS safe mode) to cope with a serious hardware incompatibility. In this case, only the minimal set of drivers will be included, like hard disk, monitor, and keyboard drivers. This mode has simple graphics and a simple menu.

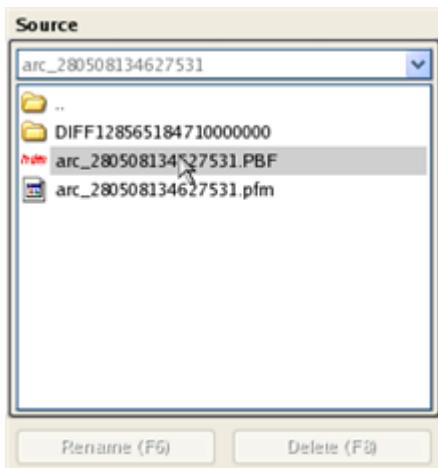


**By default the *Normal Mode* will be automatically initiated after a 10 second idle period.**

4. In the Linux launch menu select the **File Transfer Wizard**. You can find the same wizard in PTS DOS as well.



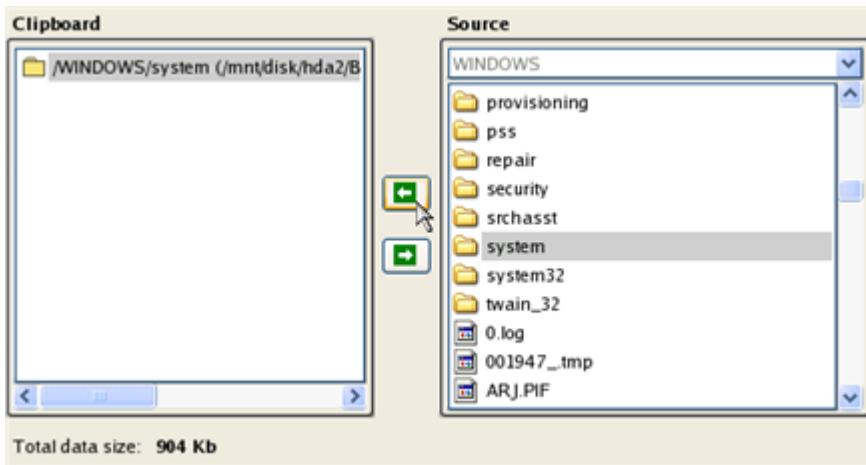
5. On the Wizard's Welcome page, click the *Next* button.
6. Select a disk where the system backup is stored from the pull-down list in the right pane of the page.



- Double click on the required backup to open.



- Select files you want to copy and place them to **Clipboard** by pressing the left arrow-button.



Click the *Calc* button to estimate the resulted data size.

- On the **Select Destination Type**, choose the way the data will be stored. Select the **Save data to any local drive or a network share** item.

Please select how would you like to save the data:

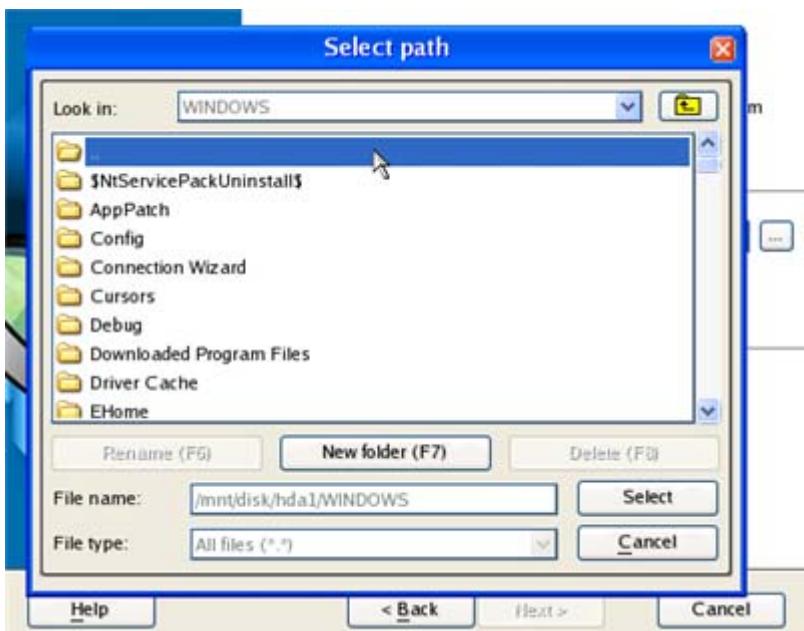
**Save data to any local drives or a network share**

Choose this option if you want to save your data to local mounted or physical partition, to USB or FireWare external drives and to a mounted network share. You will be prompted to choose a location you want to save the archive to.

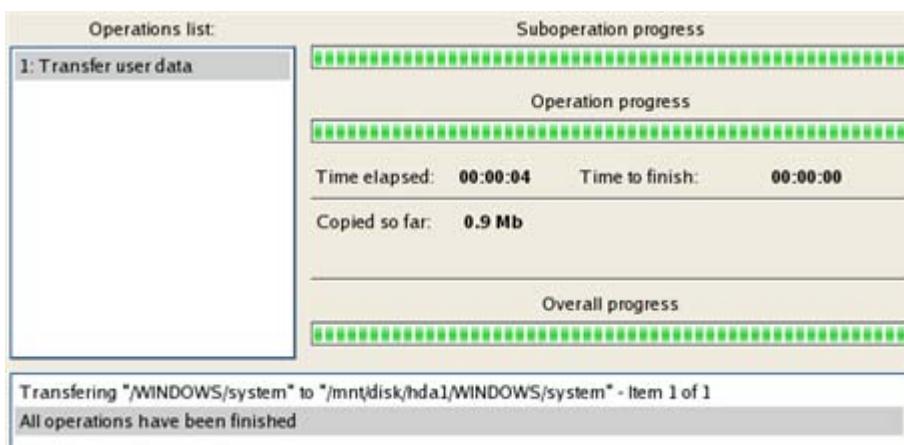
**Burn data to CD/DVD**

Choose this option if you want the Wizard to burn the data to CD or DVD. You will be prompted to choose a CD or DVD RW drive.

10. On the **Select Destination Path** page, select your system disk to copy the data to by pressing the standard browse button [...].



11. On the **Transfer Summary** page check all parameters of the operation. Click the *Next* button to accomplish the operation.
12. In the **Progress** window you can see in real-time a detailed report on all actions carried out by the program.



13. After the operation is completed, close the wizard by pressing the appropriate button.
14. Eject the CD.
15. Turn off the computer.

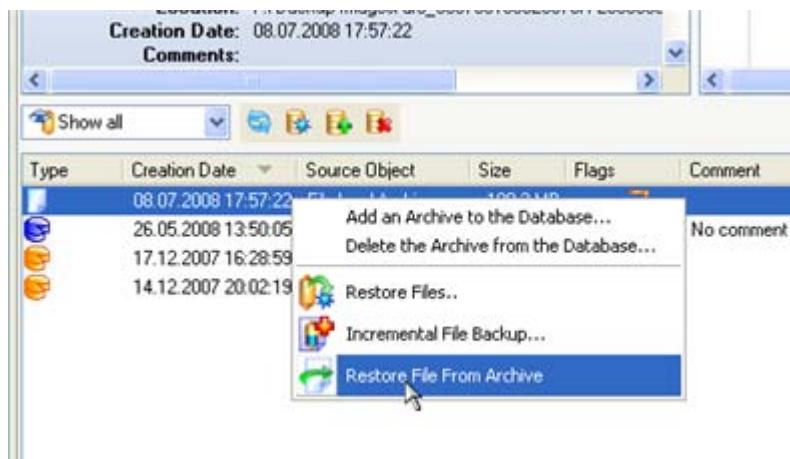
## Restoring Separate Files and Folders from a Backup

The program provides a very convenient option to access backup archives and restore only data you need. This operation can be accomplished either with the [File Transfer Wizard](#).

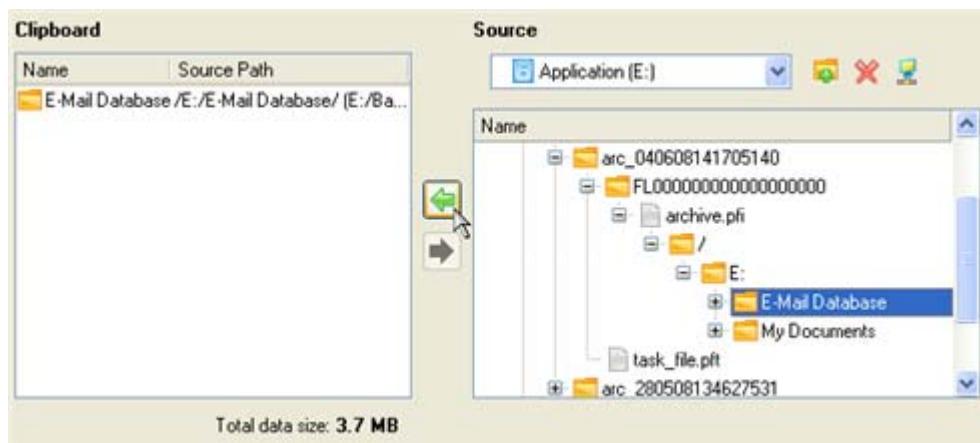
### File Transfer Wizard

To restore separate files and folders from a backup image with the [File Transfer Wizard](#), please do the following:

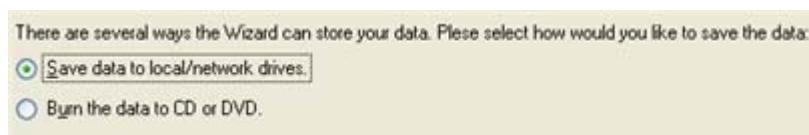
1. Call the popup menu for the required backup image (right click of the mouse button) in the Archive Database and then select the menu item: *Restore File from Archive*. Thus you automatically open it with the File Transfer Wizard.



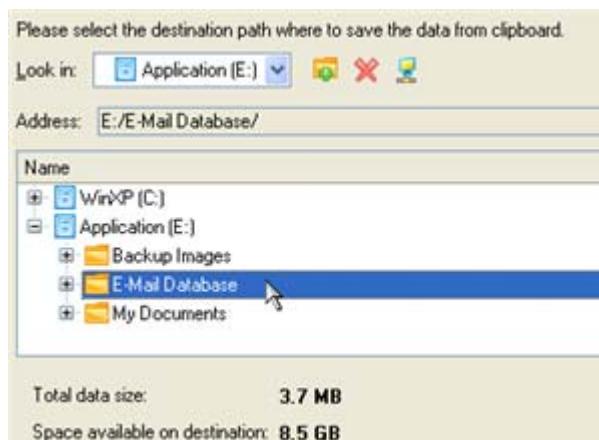
2. Select files you want to copy and place them to **Clipboard** by pressing the left arrow-button.



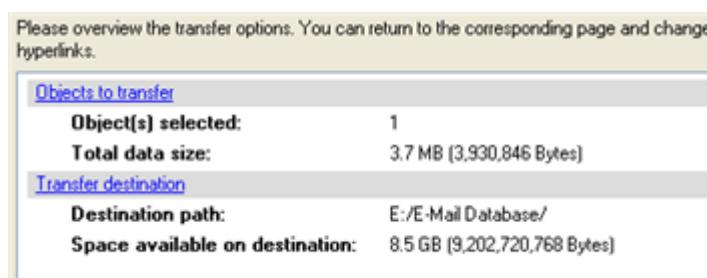
3. On the **Select Destination Type**, choose the way the data will be stored. Select the **Save data to any local drive or a network share** item.



4. On the **Select Destination Path** page, specify the exact place to copy the data to.



5. On the **Transfer Summary** page check all parameters of the operation. Click the *Next* button to accomplish the operation.



6. After the operation is completed, close the wizard by pressing the appropriate button.

## Troubleshooter

Here you can find answers to the most frequently asked questions that might arise while using the program.

1. I try to run an operation, but the program claims my partition is in use and suggests restarting the computer.

There are a number of operations that cannot be performed while your partition is in use (or locked in other words). Please agree to reboot your machine to make the program accomplish the operation in a special boot-up mode.

2. I run an operation and restart the machine as required, but it just boots back into Windows without accomplishing the operation.

Please run '**chkdsk /f**' for the partition in question.

3. I cannot create a new partition on the disk.

There can be a number of reasons for that:

- The program cannot create a new partition on a dynamic disk, but only on a hard disk that uses the DOS partitioning scheme.
- According to the rules of the DOS partitioning scheme, the following combinations of partitions cannot be created:

- Two Extended Partitions on one hard disk;
  - Five or more Primary partitions on one hard disk;
  - If there is an Extended Partition on the disk, only three Primary partitions are allowed.
- The program allows creating new partitions only within blocks of un-partitioned space. It cannot convert a free space on an existing partition to a new partition.
4. I cannot copy a partition.

There can be a number of reasons for that:

- The source or target disk you select is a dynamic disk;
  - 4 primary partitions (or three primary partitions and an extended one) already exist on the target disk.
5. I need to copy a partition. But when selecting a place where to make a copy, I always get a crossed circle sign no matter which partition is selected.

The program enables to copy a partition only to a block of un-partitioned space. If you don't have a block of free space on your hard disk, please delete or reduce an existing partition to accomplish the operation.

6. I cannot do anything with my USB flash drive. I get a crossed circle sign when trying to select any area on it.

Some USB flash drives don't have the MBR (Master Boot Record), that's the cause of your problem. To fix the issue please use the **Update MBR** function of our program or '**fixmbr**' of the Windows installation disc to write a standard code to your flash drive.

7. When trying to back up my system the program asks to restart the computer.

Most likely the Hot Processing mode is disabled. Please make it active in the program settings.

8. When backing up a partition with the *VSS* (Volume Shadow Copy Service) mode, the program throws "VSS could not be started for processed volume".

Most likely you try to back up a FAT32 partition, which is not supported by VSS. Please use the *Paragon Hot Processing* mode instead.

9. I cannot back up my hard disk to an external hard drive. Once started, the operation is aborted with the following error: **Hard Disk management, Error Code 0x1100a**. What is wrong here?

The problem is that the Microsoft VSS service is set as the default Hot Processing mode in the program. But this service has not been started in your WindowsXP/Windows2003/Vista. Please start this service (right click on My Computer > Manage > Services > find Microsoft Volume Shadow Copy Service and make it active. Set also to start it automatically).

10. When running a backup operation with the *Paragon Hot Processing* mode enabled, I get an error: **error code 0x1200e "Internal error during Hot Backup"**

Most likely your hard disk contains bad blocks. Please fix the issue with your HDD manufacturer's tool.

You can find a name of the tool you need here: <http://kb.paragon-software.com>

11. When running a backup operation with the *Microsoft VSS* mode enabled, I get the following error:  
**error code 0x12016 "VSS: can't read volume data"**

Most likely your hard disk contains bad blocks. Please fix the issue with your HDD manufacturer's tool.

You can find a name of the tool you need here: <http://kb.paragon-software.com>

12. When trying to back up to a network share, I get the following error: "**i/o error**" or "**can't open/create file**"

Please check whether you've got a permission to write to the selected destination or not.

13. When trying to restore a backup archive, I get the following error: "**Can't restore to current selection**" or "**Archive does not fit**"

Most likely you're trying to restore a backup of the whole hard disk to a partition or vice versa.

14. I set up a timetable for a task, but it fails to execute.

There can be a number of reasons for that:

- Windows Task Scheduler does not work properly. Check whether it is so or not by scheduling a simple task (call Notepad through scheduling);
- You don't have permission to write to the selected backup destination.

15. I've got hardware incompatibility when trying to restore an Intel-based computer with Windows XP to an AMD-based computer.

To tackle the problem, please do the following:

- Start up your computer in the Safe mode (press **F8** during the system startup);
- Launch Windows Registry Editor (regedit.exe);
- Please change the **start** parameter to **4** for the following registry keys:
  - HKEY\_LOCAL\_MACHINE\SYSTEM\ControlSet001\Services\Intelppm;
  - HKEY\_LOCAL\_MACHINE\SYSTEM\ControlSet002\Services\Intelppm.

Information has been taken from the Microsoft website: [support.microsoft.com/kb/953356/en-us](http://support.microsoft.com/kb/953356/en-us)

## Glossary

**Active Partition** is a partition from which an x86-based computer starts up. The active partition must be a primary partition on a basic disk. If you use Windows exclusively, the active partition can be the same as the system volume.

In the *DOS partitioning scheme*, only primary partitions can be active due to limitations of the standard bootstrap.

The term **backup** originates from the time when the best way to protect valuable information was to store it in form of archives on external media. It's become now a general notion to mean making duplications of data for protection purposes.

**Bootable Archive** is created by adding a special bootable section when backing up the data to CD/DVDs. Thus you will be able to restore the data from these archives without having to run the program, but by simply booting from these CD/DVDs.

**Cluster** is the smallest amount of disk space that can be allocated to hold a file. All file systems used by Windows organize hard disks based on clusters, which consist of one or more contiguous sectors. The smaller the cluster size, the more efficiently a disk stores information. If no cluster size is specified during formatting, Windows picks defaults based on the size of the volume. These defaults are selected to reduce the amount of space that is lost and the amount of fragmentation on the volume. A cluster is also called an allocation unit.

**Extended Partition** is a partition type you create only on a basic MBR (Master Boot Record) disk. Extended partition is used if you want to create more than four volumes on a disk, since it may contain multiple logical drives.

**File System Metadata.** The servicing structures of a file system, which contain information about allocating files and directories, security information etc, are named the *file system metadata*. It is invisible for users and regular applications because its accidental modification usually makes a partition unusable.

**Hard Disk Geometry.** Traditionally, the usable space of a hard disk is logically divided into cylinders, cylinders are divided into tracks (or heads), and tracks are divided into sectors.

The triad of values {[Sectors-per-Track], [Tracks-per-Cylinder], [Amount-of-Cylinders]} is usually named the *Hard Disk Geometry* or *C/H/S geometry*.

Tracks and cylinders are enumerated from "0", while sectors are enumerated from "1". These disk parameters play an essential role in the *DOS Partitioning scheme*.

Modern hardware uses an advanced scheme for the linear addressing of sectors, which assumes that all on-disk sectors are continuously enumerated from "0". To allow backward compatibility with older standards, modern hard disks can additionally emulate the C/H/S geometry.

**Hidden Partition.** The concept of a "hidden" partition was introduced in the IBM OS/2 Boot Manager. By default, an operating system does not mount a hidden partition, thus preventing access to its contents.

A method of hiding a partition consists in changing the partition ID value saved in the Partition Table. This is achieved by XOR-ing the partition ID with a 0x10 hexadecimal value.

**Master File Table (MFT)** is a relational database that consists of rows of file records and columns of file attributes. It contains at least one entry for every file on an NTFS volume, including the MFT itself. MFT is similar to a FAT table in a FAT file system.

**MBR & 1st track of the hard disk** is the 0th sector of the disk. MBR (Master Boot Record) contains important information about the disk layout:

- The used partitioning scheme;
- The starting records of the Partition Table;
- The standard bootstrap code (or the initial code of boot managers, disk overlay software or boot viruses).

Generally, the 0th sector is used for similar purposes in all existing partitioning schemes.

The MBR capacity is not sufficient to contain sophisticated boot programs. That's why the on-boot software is allowed to use the entire 0th track of the disk. For example, boot managing utilities such as LILO, GRUB and Paragon Boot Manager are located in the 0th track.

**Partition ID (or File system ID)** is a file system identifier that is placed in the partition. It is used to quickly detect partitions of supported types. A number of operating systems completely rely on it to distinguish supported partitions.

Partition ID is saved in appropriate entries of the *Partition Table* and takes only 1 byte of space.

**Partition Label (or Volume Label)** is a small textual field (up to 11 characters) that is located in the partition's boot sector. This value is used for notification purposes only. It is detectable by any partitioning tool including the DOS FDISK utility.

Modern operating systems save it within a file system, e.g. as a special hidden file. Thus it is able to contain a relatively large amount of text in multiple languages.

**Partitioning Scheme** is a set of rules, constraints and format of the on-disk structures to keep information on partitions located on a hard disk.

There are known several partitioning schemes. The most popular of them is the so-called *DOS partitioning scheme*. It was introduced by IBM and Microsoft to use multiple partitions in the disk subsystems on IBM PC compatible computers.

Another popular partitioning scheme is the so-called *Logical Disks Model* (LDM) that originates from the UNIX mainframe systems. Veritas Executive accommodates a simplified version of LDM to the Windows 2000 operating system.

Windows 2000 and XP support two quite different partitioning schemes: the old *DOS partitioning scheme* and the new *Dynamic Disk Management* (DDM). The problem is that earlier versions of Windows do not support DDM. In addition, most hard disk utilities do not support it as well.

**Recovery Media** is a CD/DVD disc, a USB flash card or even a floppy disk from which you can boot for maintenance or recovery purposes.

**Root Directory** is the top-level directory of a formatted logical drive to include other files and directories. In modern file systems (Ext2/Ext3, NTFS and even FAT32) it does not differ from other directories. This is not the case for old FAT12 and FAT16 file systems.

**Serial Number.** In the DOS partitioning scheme, every hard disk and every partition has a 32-bit serial number represented by an 8-figure hexadecimal value. It is stored in the MBR and its value is assigned when the MBR sector is initialized by Microsoft standard disk managing tools, such as Windows Disk Administrator and the FDISK utility.

In fact, a hard disk's serial number is not important for most operating systems and software. It is known that Windows NT, 2000 and XP store its value in the database of assigned drive letters.

A partition's serial number is stored in its boot sector (in FAT16, FAT32 and NFTS file systems). Its value is assigned when the partition is formatted. It does not play an important role for most operating systems and software as well.