Paragon Hard Disk Manager™ 2008 Server

User Manual

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1 Introduction

Paragon Hard Disk Manager™ 2008 Server is an integrated set of powerful tools that is specially designed to tackle most of the problems the user might face while using PC. Its functionality covers all aspects of a computer life cycle beginning from carrying out all the necessary partitioning operations to install the system from scratch and providing its data reliable protection to secure utilization of an outdated hard disk.

Setting up major operations is accomplished by using practical wizards. Each step of the wizard includes in-depth information in order to allow the user to make the right choice. Graphical representations of the data help the user to gain a better understanding.

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

2 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 the user may find and run tasks of any complexity in the field of hard disk partitioning and optimization, data and system backup, the on-disk data destruction, boot management, hard disk/partition 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 the 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 functionality is close to that of the Windows version, except limitations resulted from the very essence of a ready-to-use solution, i.e. inability to schedule tasks, keep an archive database, assign drive letters to backup images, etc. However it requires no installation and can be of great help when the system fails to boot. Besides it offers a Windows XP like environment.
- **WinPE based Recovery CD**. Especially for keen followers of Windows, our product also offers a WinPE based bootable media. Unlike Linux/DOS Recovery CD it can boast an excellent hardware support and the same interface as for the Windows version. However its system requirements are much tougher.

> **To know more about functionality of each particular component, please consult the Features Overview chapter.**

3 Features Overview

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

3.1 Key Features

Well let us list some of the product key features:

- ❑ **Comprehensive wizards** to simplify even the most complex operations.
- ❑ **Previewing the resulting layout of hard disks before actually executing operations** (so-called *virtual operations*).
- ❑ **Backup**/**Restore** facilities to provide a wide range of opportunities to back up/restore a separate partition or entire hard disk.
- ❑ **Support of all present day techniques to store backup images**:
  - *Backup to local mounted/unmounted (without drive letter assigned) partitions*;
  - *Backup to a network drive* to stand a better chance of success in case of a hard disk failure;
  - *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 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.
- ❑ **Archive database** to help the user easily manage backup images (get properties, add, delete, mount, etc.).

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

- ❑ **Bootable Backup Capsule** to start up the computer from an image contained in the backup capsule in case of an operating system corruption.

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

- ❑ **Copy partition/hard disk** facilities to successfully transfer all on-disk information including standard bootstrap code and other system service structures, thus maintaining the operating system's working capability. Besides it can be used as another means to back up data.
- ❑ **Partition/Hard disk management** facilities to perform partitioning operations (create, format, delete, convert, move/resize, merge, redistribute, etc.), mount partitions of different file system types, modify file system parameters, providing the ability to successfully migrate operating systems to larger hard disks, optimize the disk system performance (defragmentation), etc.
- ❑ **Wipe** facilities to irreversibly destroy all on-disk information including standard *bootstrap code* and other system service structures (*Wipe* function), thus providing high level of security or just destroy any remnants of deleted files/directories left on disk without affecting the used data (*Clear Free Space* function).
- ❑ **Advanced automatization facilities** to automate operation routines of almost any complexity (Cyclic Backup, Scheduling, Scripting)

> ⚠️ *Cyclic Backup* and *Scheduling* are only available for the Windows installation of the program.

- ❑ **File Transfer Wizard** 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, cased either by a virus attack or files corruption, in order to get the system back on track again. The key advantage of it is that it provides access to Paragon backups as regular folders to browse through their contents or copy required files.

- ❑ **Volume Explorer** is a handy tool when you have different file systems on the disk, whether they contain an operating system or just data. Volume Explorer will let you explore a file system of any type and will provide access to the necessary files and directories regardless of their security attributes.

- ❑ **Recovery Media Builder** to create a bootable media, which can be used to boot your computer in case of an operating system failure. Besides, it gives you such functions as saving data from partitions on your hard disk directly to compact discs and burning ISO-images. The utility supports various formats of laser disks: CD-R/RW, DVD-R/RW, DVD+R/RW, DVD-R, DVD+R double layer 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 restoration purposes.

3.2 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 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 Intelligent Disk Defrag™** technology (IDD) to efficiently and securely defragment almost full partitions (less than 2% of available space).

- ❑ **Paragon Shutdown After Apply™** technology to set the computer to automatically switch off on the successful accomplishment of any operation.

- ❑ **Microsoft Volume Shadow Copy Service** (VSS) to provide the backup infrastructure for the Microsoft Windows XP/Server 2003 operating systems. Unlike Paragon Hot Backup the VSS technology provides a unique possibility to make a synchronous snapshot of multiple volumes.

- ❑ **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.

3.3 Supported File Systems

Paragon Hard Disk Manager 2008 Server provides support of major file systems presented on the market today:

- ❑ Full read/write access to Ext2FS/Ext3FS partitions under all versions of Windows, DOS 5.0 and later.
- ❑ 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.
- ❑ Basic partitioning operations (*create, format, delete*) for Linux Swap.

3.4 Supported Media

- ❑ Large hard disks (up to 1,5 TB tested, 2 TB limit in theory)
- ❑ IDE, SCSI and SATA hard disks
- ❑ CD-R, CD-RW, DVD-R, DVD+R, DVD-RW, DVD+RW and also DVD-R, DVD+R double layer discs
- ❑ FireWire (i.e. IEEE1394), USB 1.0, USB 2.0 hard disks, ZIP® and Jazz® disks, MBR Flash Cards
- ❑ PC card storage devices (MBR flash memory, etc.)

4 Getting Started

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

4.1 Distribution

Paragon Hard Disk Manager 2008 Server is distributed in two ways:

- ❑ Boxed package from Paragon Technology GmbH and resellers
- ❑ Downloadable package over the Internet at the company's web-site

4.1.1 Distributive CD

The boxed package includes a distributive CD that is in fact a bootable 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).

Thus in order to run the Windows components, you need to install them first (see Installing the Program).

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).

4.1.2 Online Distribution

Hard Disk Manager 2008 Server purchased over the Internet contains two downloadable files:

- ❑ Self-extracting file for Windows components installation;
- ❑ Recovery CD ISO image-file with a built-in tool for CD/DVD burning

These files can be downloaded individually as found necessary.

To burn an ISO image of the Recovery CD, simply do the following:

1. **Launch the *Unpack & Burn Wizard*** by clicking on the downloaded executable file;
2. On the *Destination* page of the wizard **select the *CD/DVD* option** to write directly to a CD/DVD disk;
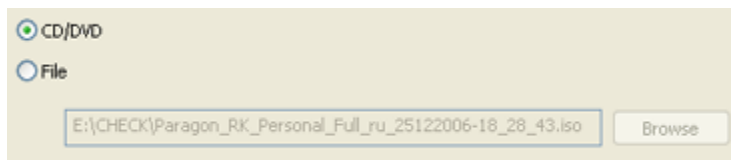
⚠ **The *File* option enables just to save the image as an ISO file in the required location.**

3. On the *CD/DVD Writing Parameters* page **choose the required recording device** from the list of all available devices, then **define the writing options** (speed and whether to eject the recorded disc after completing the operation or not);
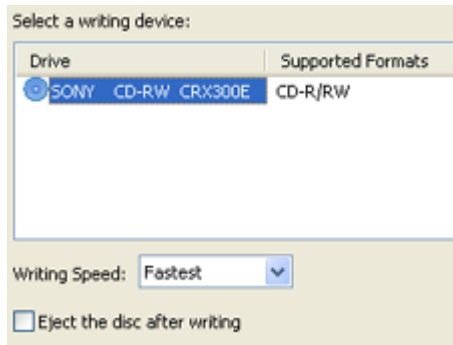
4. **Insert a blank disk into the recording CD/DVD drive** and click the *Next* button to start the operation.

4.1.3 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.**

4.1.3.1 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.**

4.1.3.2 To Register a New Product

If you are a registered user and would like to register Hard Disk Manager 2008 Server, 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 Hard Disk Manager 2008 Server** 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.

4.1.4 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.

4.2 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	www.paragon-software.com
Registration & updates web-service	kb.paragon-software.com
Knowledge Base & Technical Support	kb.paragon-software.com
Pre-sale information	sales@paragon-software.com

4.3 System Requirements
4.3.1 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 2000/XP/Server 2003/Vista and XP/Server 2003/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 40 MB of available space
- SVGA video adapter and monitor
- Mouse

4.3.2 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 backups 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.

4.3.3 WinPE based Recovery CD

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

❑ Intel Pentium CPU or its equivalent, with 300 MHz processor clock speed
❑ At least 384 MB of RAM (512+ is recommended)
❑ Hard disk drive with 40 MB of available space
❑ SVGA video adapter and monitor
❑ Mouse

4.4 Installing the Program

As we have already mentioned only Windows components of the product require installation. So to install the Hard Disk Manager 2008 Server under Windows, simply do the following:

1. **Run Setup Application**
From the folder, where the setup files are kept, run the *SETUP.EXE* file. This application will guide the user 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 click the *Yes* button to accept. If the user does not agree with any conditions stated there, the installation process will be interrupted.

4. **Select an Installation Folder**
The Destination Location page allows the user to choose the folder where the program will be installed. By default, the installation folder will be created as:

C:\Program Files\Paragon Software\Paragon Hard Disk Manager 2008 Server. To select another folder, click the *Browse* 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**

5. **Select a Program Group**
The Program Folder page enables the user to select the application's program group for the Start Menu. By default, it will be the program group:

Start > Programs > Paragon Hard Disk Manager 2008 Server.

Click the *Next* button to continue.

6. **Verify Setup Settings**
The Start Copying page allows the user to verify settings, which have already been made and correct them if necessary. Press the *Back* button to return to the previous page and modify the installation settings. Click the *Next* button to complete the installation process.

7. **Copying Files**
The Setup Status 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.

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

4.5 Starting the Program

To start the program, please click the Windows **Start** button and select **Programs > Paragon Hard Disk Manager 2008 Server**.

> ⚠ **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 *Express Launcher*. In general it enables to run components of the product, launch the help system or go to the program's home page.
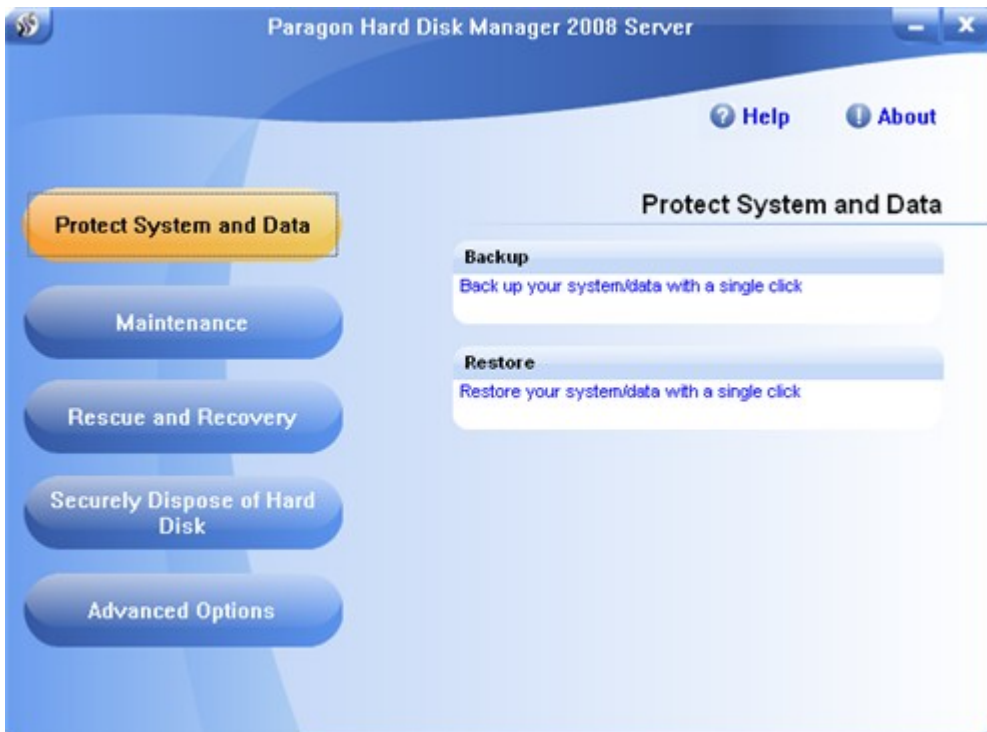
But its crucial benefit lies in the way information is offered, namely the well thought-out categorization and hints systems allow the user to find what is needed just in two clicks, while minimizing the possibility of making any mistake.

So, all the product functionality is categorized according to a particular sphere of application, thus by choosing from the list on the left the required issue, the user gets on the right a number of available tasks with easy to catch descriptions.

There are the following issues the program can be used for to tackle:

- ❑ **System and Data Protection** to secure your system and data;
- ❑ **Maintenance** to automate routine service operations and enhance your hard disk performance;
- ❑ **Rescue and Recovery** to provide a full set of tools to get a corrupted operating system back on track again or at least to retrieve valuable data from a failed hard disk;
- ❑ **HDD Utilization** to make sure your data will in no way fall into hands of other people;
- ❑ **Advanced Options** to create a dual boot system and provide a complete management of your hard disk.

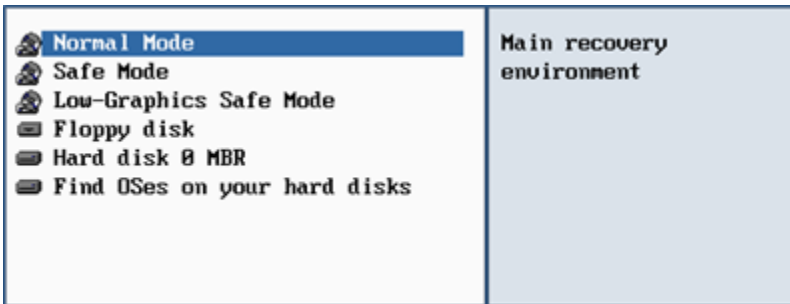So choose an item you need and then click on the required operation to start.

4.6 Booting from the Linux/DOS Recovery CD

The Linux/DOS Recovery CD can be used to boot your computer into PTS DOS or Linux to get access to the hard disk without use of the failed operating system.

You also have an option to boot in the PTS DOS safe mode. The reboot of the computer from the Recovery CD in the safe mode may be of great use 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.

4.6.1 Boot Menu

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

```
Normal Mode              Main recovery
Safe Mode                environment
Low-Graphics Safe Mode
Floppy disk
Hard disk 0 MBR
Find OSes on your hard disks
```

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. No partitions mounted.
- ❑ **Floppy Disk.** Reboot the computer from a system floppy disk.
- ❑ **Hard Disk 0.** Boot from the primary hard disk.
- ❑ **Find OS(es) 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.

> **To automatically boot from the Recovery CD make sure the on-board BIOS is set up to *boot from CD first*.**
>
> **While working with the Recovery CD you might experience some inconvenience caused by possible video artifacts. It is just a result of changing video modes and in no way will affect the program functionality. If this is the case, please wait a bit and everything will be OK.**

4.6.1.1 Normal Mode

When the Normal mode is selected, the Linux launch menu appears:
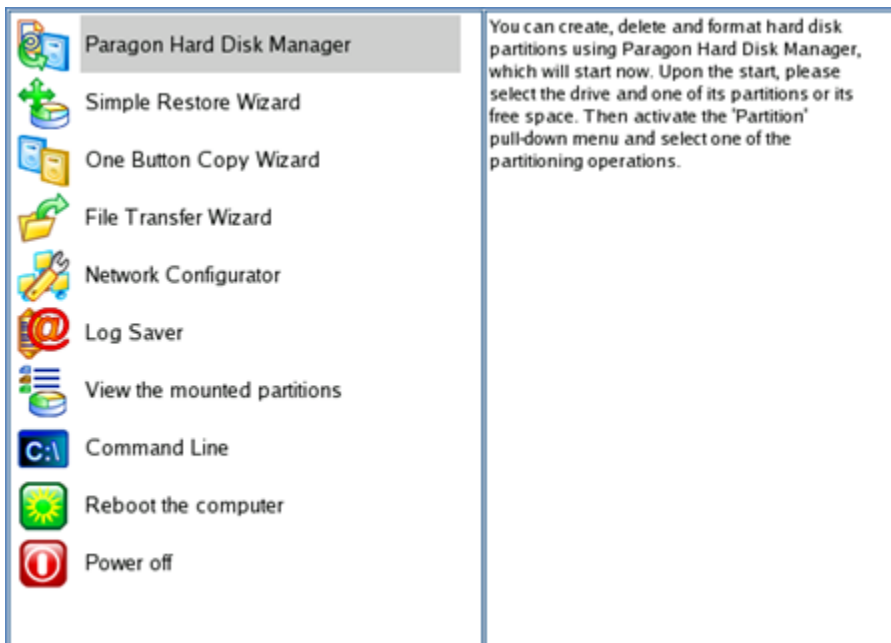
- ❑ **Paragon Hard Disk Manager** (enables to copy, back up and restore separate partitions or entire hard disks then save backups onto local, network and USB disks or record them to CD and DVD, carry out partitioning operations of any complexity, etc.);
- ❑ **Simple Restore Wizard** (allows restoring hard disks and partitions);
- ❑ **One Button Copy Wizard** (helps to copy the first found hard disk including all of its partitions to the first empty hard disk);
- ❑ **File Transfer Wizard** (allows coping files/folders to another disk or a partition as well as recording them to CD/DVD);
- ❑ **Network Configurator** (starts the Network Configuration Wizard);

> ⚠ **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);

> ⚠ **Paragon 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** (The command line allows experienced users to execute any program);
- ❑ **Reboot the computer;**
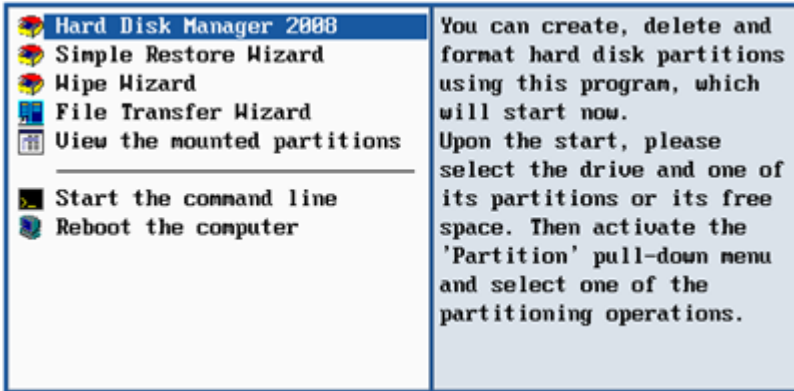- ❑ **Power off the computer.**

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

4.6.1.2 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.

4.6.1.3 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.

```
Hard Disk Manager 2008        You can create, delete and
Simple Restore Wizard         format hard disk partitions
Wipe Wizard                   using this program, which
File Transfer Wizard          will start now.
View the mounted partitions   Upon the start, please
                              select the drive and one of
Start the command line        its partitions or its free
Reboot the computer           space. Then activate the
                              'Partition' pull-down menu
                              and select one of the
                              partitioning operations.
```

4.6.2 Running Commands

To launch the required command you should take the following steps:

1. Insert Paragon Recovery CD into your CD/DVD drive;
2. Reboot the computer;
3. Select one of the boot modes (**Normal, Safe, Low Graphics**) in the Boot menu;

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

4. Choose a command by using the arrow keys of the computer keyboard to move within the menu;
5. Launch the command by pressing the *Enter* button.
6. After it has been launched 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*.**

5 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 can this tragedy be prevented?

Our program offers the most reliable way of data protection for the hard disk – the **ability to create archive duplications**. A modern backup archive uses the so-called *image*, 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 recover the system with all its contents into its initial state without any additional efforts.

5.1 Creating Backup Images

Creation of backup images is accomplished with the *Backup Wizard*. The wizard is so well designed that the user simply needs to follow its easy instructions to make an exact image of a separate partition/hard disk.

5.1.1 Starting

To launch the *Backup Wizard*, click the **Protect System and Data** button of the *Express Launcher* and select **Backup**. After the mentioned action the Welcome page of the wizard will be displayed.
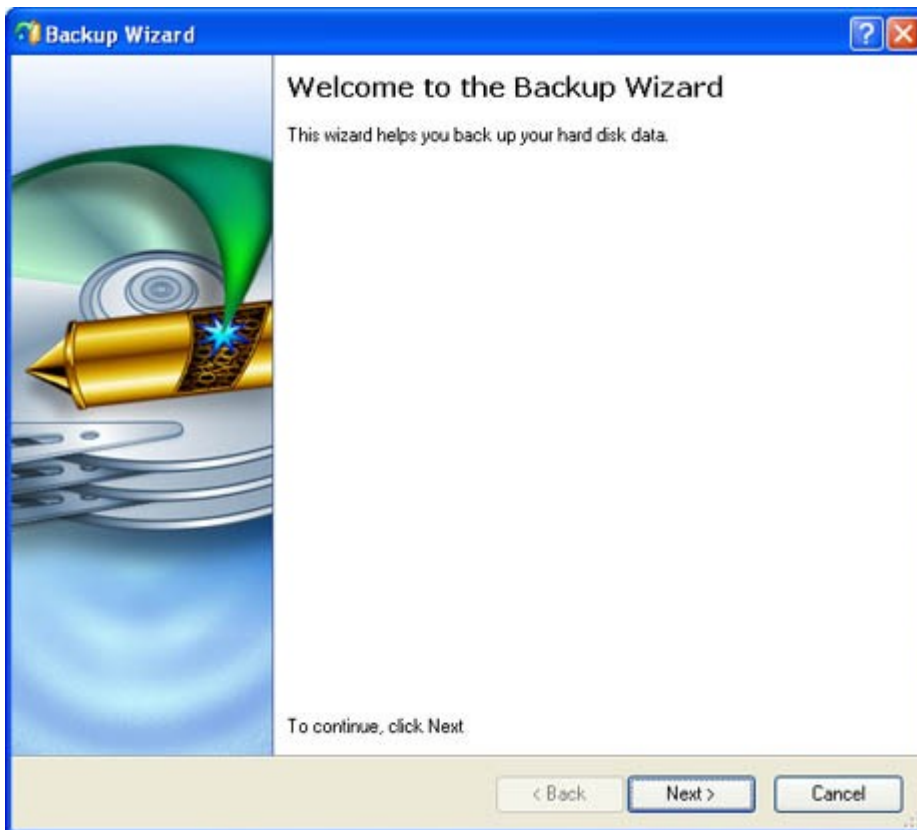
5.1.2 Settings

The Backup Wizard allows the user to configure the settings and then start the operation in accordance with the entered parameters. Here the user sets the parameters of the backup operation defining:

❑ **The object to back up**. The user can backup either an entire disk or separate partitions of the disk (primary, extended or logical). In case of backing up an entire disk, the user has 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.


❑ **Backup destination**. The Backup Wizard allows saving backup archives to local or network drives, to physical partitions (without drive letters assigned), or burning them to CD/DVDs. It is also possible to place the archives in the Backup Capsule. The user needs to select a destination, taking the estimated archive size and available space on the backup destination into account.


> **To use the Backup Capsule as a backup destination, first create it with the Manage Backup Capsule Wizard.**

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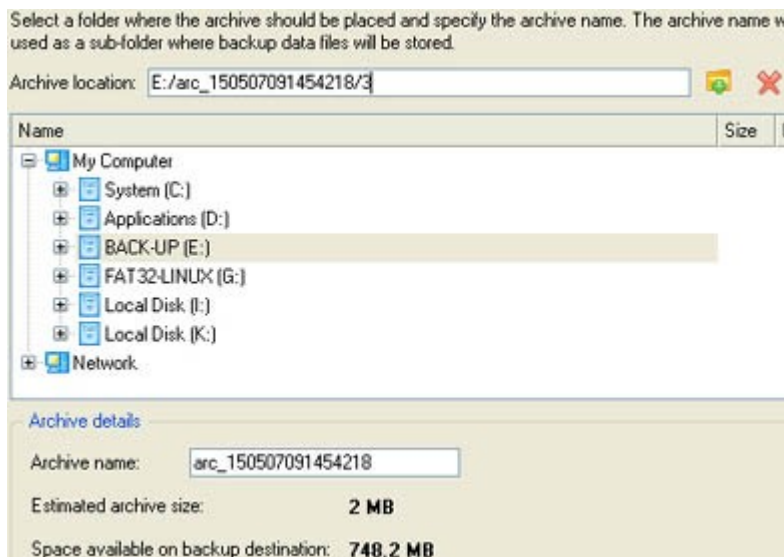
> **The program automatically calculates size of the future archive and informs the user about space available on the selected destination.**

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

> Please enter a short comment to describe the archive
>
> ✎ No comment
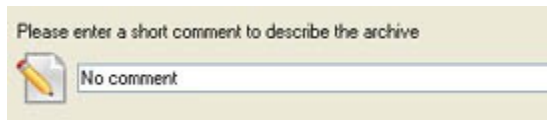
In addition, there is the possibility to make further detailed settings (although the default values will do in most cases). To activate the advance mode, the user needs to mark the appropriate option on the second page of the wizard (i.e. the **What to back up** page). The checkbox is to be found at the foot of the page

☐ Change backup settings
Note: This option is recommended for advanced users only. When it is marked, the next page allows the user 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 this is the case the user 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, hyberfil.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**. The user is also able to define specific parameters for the Hot Processing mode.

5.1.3 Results

After the backup operation is completed the user receives an image of the selected disk (or the selected partition). This image 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.

> ⚠ **The program allows the user to back up all five types of dynamic volumes (simple, spanned, striped, mirrored, RAID-5).**
>
> **The operation will be performed immediately after confirmation. No virtual mode is available.**

Available operation scenarios:

- ❑ [Backup to a Local Mounted/Unmounted (without Drive Letter Assigned) Partition](#)
- ❑ [Backup to a Network Drive](#)
- ❑ [Backup to External Media (CD/DVD)](#)
- ❑ [Backup to the Backup Capsule](#)
- ❑ [Differential Backup](#)
- ❑ [Cyclic Backup](#)
- ❑ [Synthetic Backup](#)

6 Maintenance

One of the crucial components of a present day computer is a hard disk as it keeps the most valuable thing – information. As any mechanism it requires permanent servicing in order to function properly and efficiently. But as average users we only are able to carry out the so-called indirect servicing, i.e. to provide the on-disk data protection and its optimal performance.

Our program offers a number of maintenance procedures for a hard disk:

- ❑ **File system defragmentation**. A common problem that negatively affects a hard disk performance is a non-optimal allocation of files. It is an operating system that accounts for it, as fragments of one file appear to be in different places on the disk. Thus by re-writing files more compactly you can considerably improve the hard disk performance.
- ❑ **Ability to clone hard disks**. Many people clone hard disks just to back up data for security reasons as it enables to successfully transfer all on-disk information including standard bootstrap code and other system service structures, thus maintaining the operating system's working capability. In case of a system malfunction, the user can get the system back on track in minutes. No additional configuration is required, what is very convenient.
- ❑ **Backup/Copy Scheduling**. Scheduling enables to automate such routine operations as backup and copy, in that way allowing the user to organize a reliable data protection system.

6.1 Hard Disk Optimization

Defragmentation is the process of rewriting parts of a file to contiguous sectors on a hard disk to increase the speed of access and retrieval. When files are updated, the computer tends to save these updates on the largest continuous space on the hard disk, which is often on a different sector than the other parts of the file. When files are thus fragmented, the computer must search the hard disk each time the file is opened to find all of the file's parts, which slows down response time.

Paragon Total Defrag™ enables to defragment NTFS and FAT file systems. In order to launch it, click the **Maintenance** button of the *Express Launcher* and select **Hard Disk Optimization**.

> ⚠️ **To know more about Paragon Total Defrag, please consult documentation that comes with the program.**

**Available operation scenarios**:

- ❑ Hard Disk Optimization

6.2 Cloning Hard Disks

The program provides the ability to clone hard disks of any file system. During the hard disk copying process, the program moves controlling records of used *partitioning scheme*, the *bootstrap code* and on-disk partitions. This operation cannot be substituted by simply copying all on-disk partitions.

The operation can be accomplished with the *Copy Hard Disk Wizard*.

6.2.1 Starting

To launch the *Copy Hard Disk Wizard*, click the **Maintenance** button of the *Express Launcher* and select **Hard Disk Migration**. After the mentioned action the Welcome page of the wizard will be displayed.
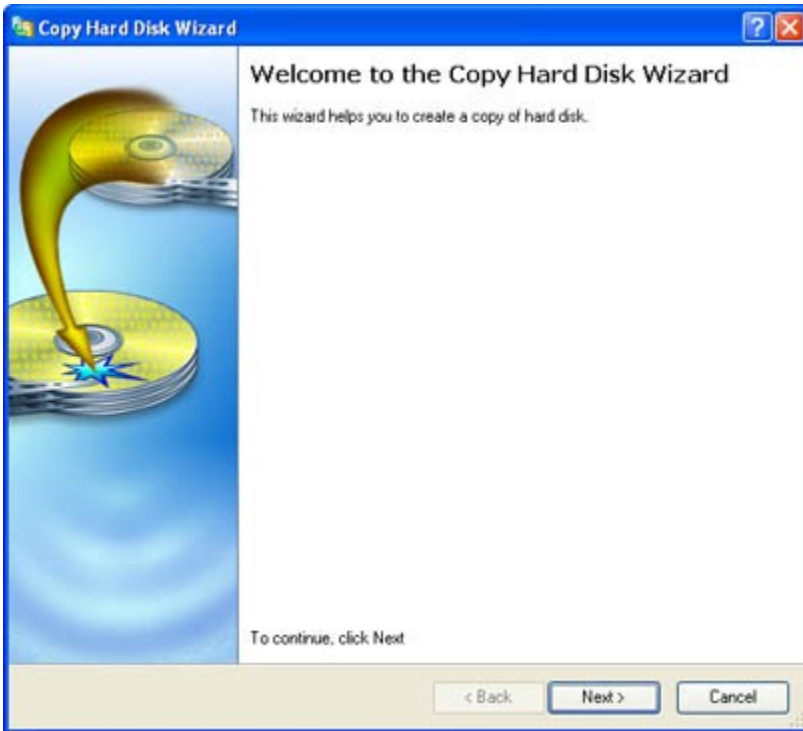
6.2.2 Settings

The Copy Hard Disk Wizard allows the user to configure the settings and then start the operation in accordance with the entered parameters. Here the user sets the parameters of the operation defining:

- ❑ **The hard disk to copy**. Select a hard disk you want to copy
- ❑ **Copy parameters**. The Copy Hard Disk Wizard allows the user to specify the following options:

- **Copy options**. This section enables to switch between two options:
HDD raw copy (allows to copy a hard disk in the sector-by-sector mode to successfully process unknown file systems).
Partition raw copy (allows to copy a partition in the sector-by-sector mode to successfully process unknown file systems).
*Perform incremental cop*y (once the complete copy of a hard disk is created, it can be used as a base for the incremental copy. Mark the option to make the program perform the exact bit-wise comparison of the previous data (saved in the parental copy) with the current data (that is actually the hard disk itself). After that only most recent information will be processed. It considerably decreases the amount of data written).
- **Resize options**. This section enables to switch between two options:
Remove free blocks between partitions. If this option is activated, the program does not keep blocks of free space between partitions on the targeted 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 upgrading the hard disk to a larger one.
- **Verification options**. This section allows the user to define whether the Surface test and/or the Writing Verification test will be accomplished during the operation.

6.2.3 Results

After the operation is completed the user receives a fully functional duplicate of the existing hard disk.

> ⚠️ **The operation will be performed immediately after confirmation. No virtual mode is available.**

Available operation scenarios:

❑ System Hard Disk Migration

6.3 Backup/Copy Scheduling

The program provides the possibility to automate the backup/copy operations with the *Schedule Backup* and the *Schedule Hard Disk Copy* wizards. The functionality of these two wizards is close to that of the *Backup* and the *Copy Hard Disk* wizards, except the embedded Scheduler, which is used to specify the time for the execution of the backup/copy operation. There are two categories for time settings (these correspond to appropriate items in the *Schedule type* menu):

❑ **Initiating the backup/copy operation by an event**:

- One time only (i.e. the *Once* item)
- When system starts (i.e. the *At System Startup* item)
- When the user logs on (i.e. the *At Logon* item).

❑ **Initiating the backup/copy operation periodically** (i.e. *Daily, Weekly, Monthly*).

The user just needs to select one of the variants. Depending on the choice, the scheduler will display a form that enables to set the schedule.
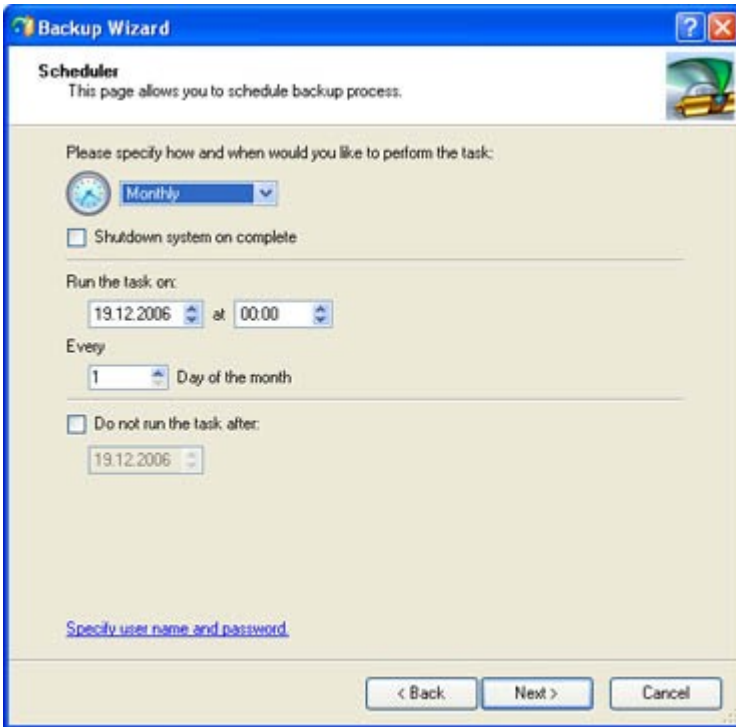
⚠️	**To run the task in the log-off mode, please specify administering login info by following the appropriate link in the left lower corner of the page.** **The *Shutdown System on Complete* option enables to automatically switch off the computer on the successful accomplishment of the operation.**

7 Rescue and Recovery

This section is for those who already know what it feels like when your system fails to boot because of a hard disk malfunction or a virus attack and your precious data is under threat. If this is the case, it is too early to despair - you still have a good chance to get everything back on track again.

Our program offers a number of facilities to tackle issues of this kind:

- **System and Data Restoration**. Actually it is the reverse of the backup operation, thus without having a previously made backup image, you will not be able to use it. However it is the most efficient and easy to use way to recover the system and data.
- **Data Transfer**. With the *File Transfer Wizard* the user can retrieve important data from a failed hard disk and copy it to another hard disk or burn it to CD/DVD before reinstalling the system or replace damaged files by using a previously made backup image.
- **Bootable Recovery Media Creation**. The program provides the possibility to prepare a set of recovery tools on external media (CD, DVD or floppy disks). The tool set can be of assistance in case of an operating system corruption, which means that the user is able to boot the computer even when the operating system is not able to do so.

7.1 Restoring System and Data

The program includes a convenient and reliable restore wizard. It provides easy to understand instructions which allow the user to configure and perform all the necessary settings.

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

7.1.1 Starting

To launch the *Restore Wizard*, click the **Rescue and Recovery** button of the *Express Launcher* and select **Restore**. After the mentioned action the Welcome page of the wizard will be displayed.

7.1.2 Settings

The Restore Wizard allows the user to configure the settings and start the operation in accordance with the entered parameters. In our case we set the following parameters of the restore operation:

❑ **A backup image to be restored**. The *Browse for archive* page enables to browse disks for an appropriate backup image.

By clicking the *Switch to File View* link, the user 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.
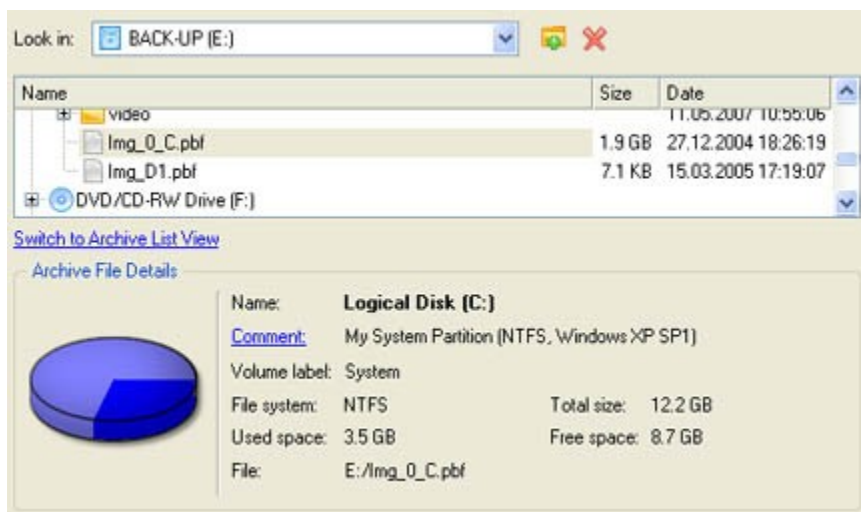

Moreover, on this page the user has the possibility to create new folders or delete existing files/folders by clicking the appropriate buttons.

By clicking the *Switch to Archive List View* link, the user can see the list of all images created with the Backup Wizard. To get a clear-cut picture on properties of the required image, just click on it and the section below (i.e. *Archive File Details*) will display a short description.
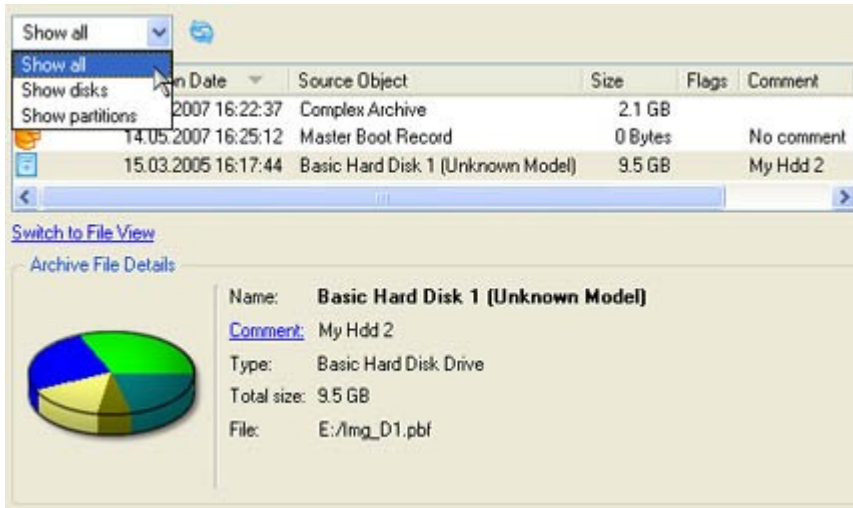
Besides, the user may differentiate images of partitions or hard disks by setting up the filter in the left top corner of the page.

❑ **An item of the selected archive to be restored**. The program allows the user 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.
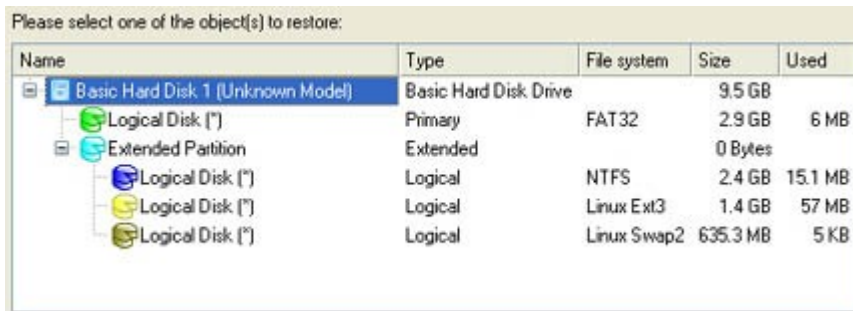
❑ **A place to restore the archive to**. Selecting the destination, please note - all contents on the disk selected for restoring purposes will be deleted during the operation.
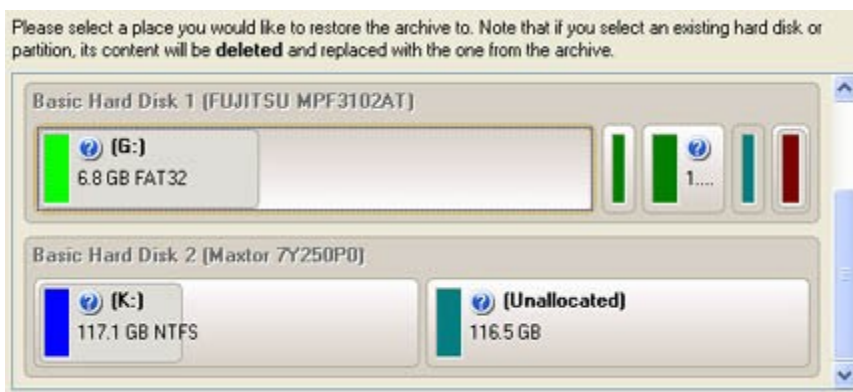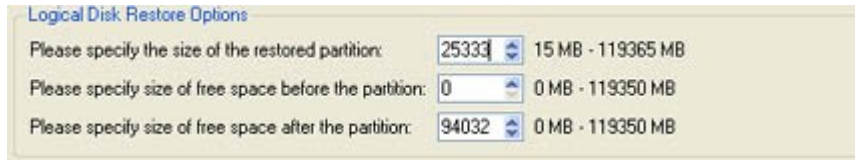
To help the user get a clear-cut picture of the operation outcome, the program allows inspecting the resulted disk layout.
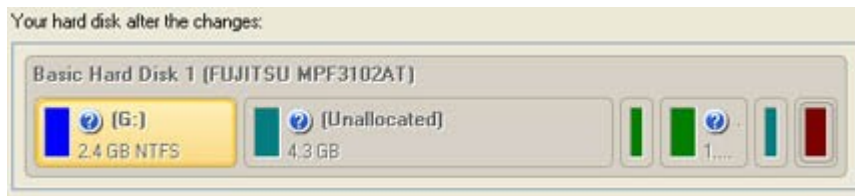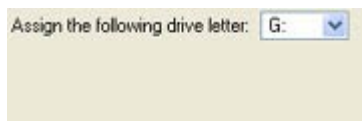
7.1.2.1 Restoring Partition:

❑ **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.

7.1.2.2 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.
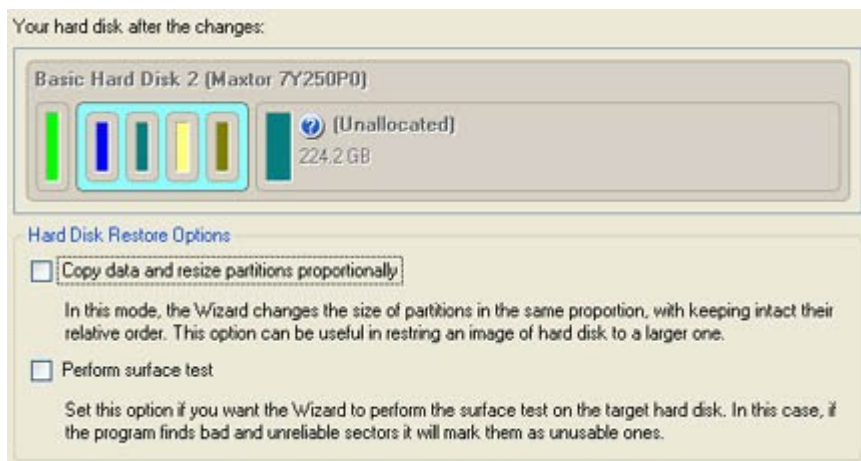
7.1.3 Results

The wizard will restore a disk (or partition) that has been archived, and make it available to use in the operating system.

 The user has the ability to restore original dynamic volumes as dynamic volumes of any type, providing the targeted dynamic disk is of the appropriate size. Moreover the program enables to restore dynamic volumes as basic partitions and vice versa.

The operation will be performed immediately after confirmation. No virtual mode is

> **available.**

Available operation scenarios:

- ❑ [Restoring from the Backup Capsule](#)
- ❑ [Restoring from External Media (CD/DVD)](#)
- ❑ [Restoring from a Network Drive](#)

7.2 Transferring Files

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. Besides it provides access to Paragon backups as regular folders to browse through their contents or copy required files.

7.2.1 Starting

To launch the *File Transfer Wizard*, click the **Rescue and Recovery** button of the *Express Launcher* and select **Transfer Files**. After the mentioned action the Welcome page of the wizard will be displayed.

7.2.2 Settings

The File Transfer Wizard allows the user to configure the settings and then start the operation in accordance with the entered parameters. Here the user sets the parameters of the operation defining:

- ❑ **Place to look for files/directories**. Select a source disk from the pull-down list in the right 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.
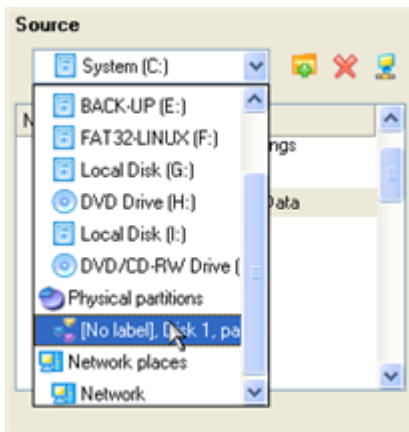
❑ **Object(s) of operation**. Choose files/directories you want to copy and place them to Clipboard by pressing the *Add* button. To delete a file/directory from the Clipboard, select it in the Clipboard pane and press the *Remove* button. You can also create a new folder, rename or irreversibly delete existing files/directories of the left pane by pressing the appropriate buttons.
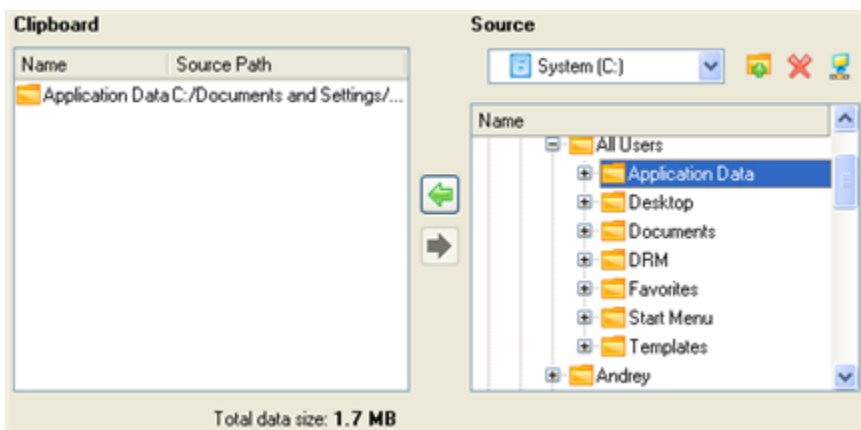
> **Files/directories deleted from the Clipboard remain intact on source disks.**

❑ **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 *Operation Summary* page provides structurally divided information on all the actions made in the wizard. Check the changes and come back to any of the steps of the wizard to correct them (if necessary) by following the required hyperlink.

Please overview the transfer options. You can return to the corresponding page and change the options by cliking on title hyperlinks.

Objects to transfer

    Object(s) selected: 1

    Total data size: 1.7 MB (1 834 592 Bytes)

Transfer destination

    Destination path: C:/

    Space available on destination: 6.3 GB (6 808 829 952 Bytes)
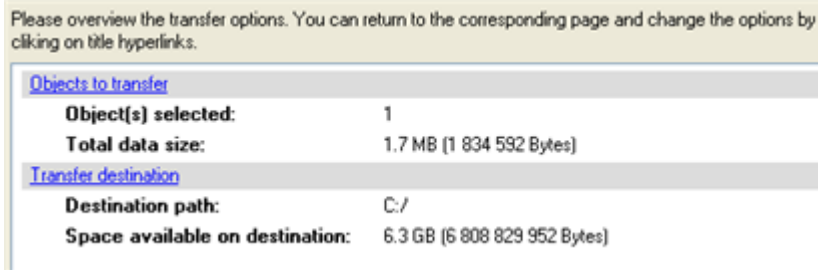
7.2.3 Results

The wizard will transfer files/folders to the specified destination (a local or network disk or a CD/DVD disc).

> ⚠️ **The operation will be performed immediately after confirmation. No virtual mode is available.**

Available operation scenarios:

- ❑ [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](#)

7.3 Building Recovery Media

Creation of bootable recovery media is performed with the *Recovery Media Wizard*. The wizard is so well designed that the user simply needs to follow its easy instructions to carry out the operation.
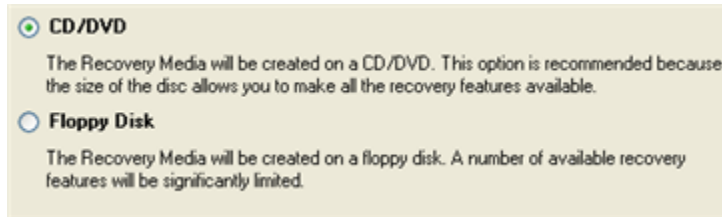
7.3.1 Starting

To launch the *Recovery Media Wizard*, click the **Rescue and Recovery** button of the *Express Launcher* and select **Burn Rescue Kit**. After the mentioned action the Welcome page of the wizard will be displayed.

7.3.2 Settings

The Recovery Media Wizard allows the user to configure the settings and start the operation in accordance with the entered parameters. In our case we set the parameters of the future recovery tool by defining:

❑ **Type of the recovery media the user is creating**. The recovery tools can be placed either on a CD/DVD disc or on a floppy disk.

> ⦿ **CD/DVD**
>
> The Recovery Media will be created on a CD/DVD. This option is recommended because the size of the disc allows you to make all the recovery features available.
>
> ○ **Floppy Disk**
>
> The Recovery Media will be created on a floppy disk. A number of available recovery features will be significantly limited.

❑ **Contents of the recovery set**. The recovery tools can include the standard Recovery Media image (included in the installation package) or software defined by the user. In the last case the user can record a prepared image by setting the path to the image file on the disk.

> ⦿ **Typical**
>
> Use the standard Recovery Media image supplied with the program.
>
> ○ **Advanced**
>
> You can add some files or folders to the standard Recovery Media image supplied with the program.
>
> ○ **User specified CD/DVD image (.iso file)**
>
> Use CD/DVD image from specific location.
>
> `s/Paragon Software/Hard Disk Manager 2008 Suite/ISO/bootcd_ea.iso` [Browse]

❑ **A recording device**. The appropriate external media (CD/DVD or a floppy disk) needs to be inserted into the selected device.

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

> Writing speed: [Maximum ▾]
>
> ☐ Eject the disc after writing

The program supports CD-R, CD-RW, DVD-R, DVD+R, DVD-RW, DVD+RW and also DVD-R, DVD+R double layer discs. If the inserted disc is not empty, the Wizard suggests the user erasing its contents. When the user confirms the operation, the program deletes the re-writable disc's contents and begins the recording process.

7.3.3 Results

As a result, the user receives recovery media, which can be used in most emergencies.

> ⚠ **The operation will be performed immediately after confirmation. No virtual mode is available.**

8 HDD Utilization

Data security nowadays is the burning issue not only for companies and government agencies, but rank and file people as well. Our personality is now fully embedded in computer technology. It is computer you apply to when at work, it is also computer you use at home for entertainment or as a reservoir for containing some valuable data such as personal correspondence, banking account information, credit card numbers, financial records, whatever… It is obvious that this kind of data should in no way be available to others. That is why, when disposing of a storage device (a hard disk or a flash memory drive), the crucial thing is to make sure it does not contain any information, because simple deletion, or even reformatting do not guarantee data security at all. To do that, you need a specially designed tool.

Our program provides the ability to wipe hard disks/partitions of any file system or only destroy any remnants of deleted files/directories left on disk without affecting the used data, thus providing high level of security.

The operation can be accomplished with the *Wipe Wizard*. The wizard is so well designed that the user simply needs to follow its easy instructions to carry out the operation.

8.1.1 Starting

To launch the *Wipe Wizard*, click the **Securely Dispose of Hard Disk** button of the *Express Launcher* and select **Disk Wiper**. After the mentioned action the Welcome page of the wizard will be displayed.
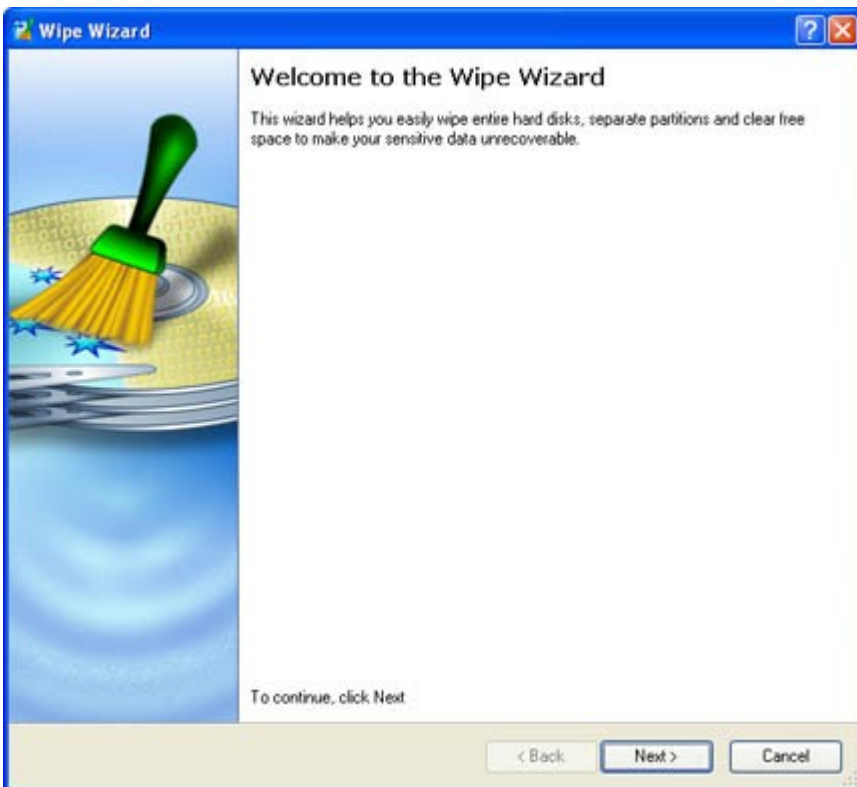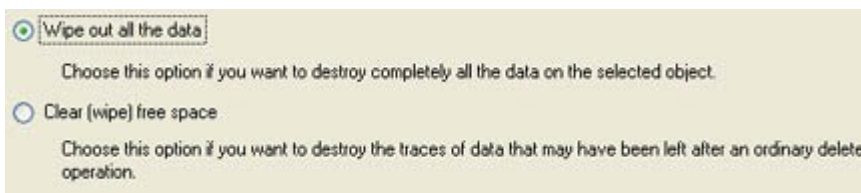

8.1.2 Settings

The Wipe Wizard allows the user to configure the settings and then start the operation in accordance with the entered parameters. Here the user sets the parameters of the operation defining:

❑ **The hard disk/partition to wipe**. Select a hard disk/partition the data of which you want to destroy.
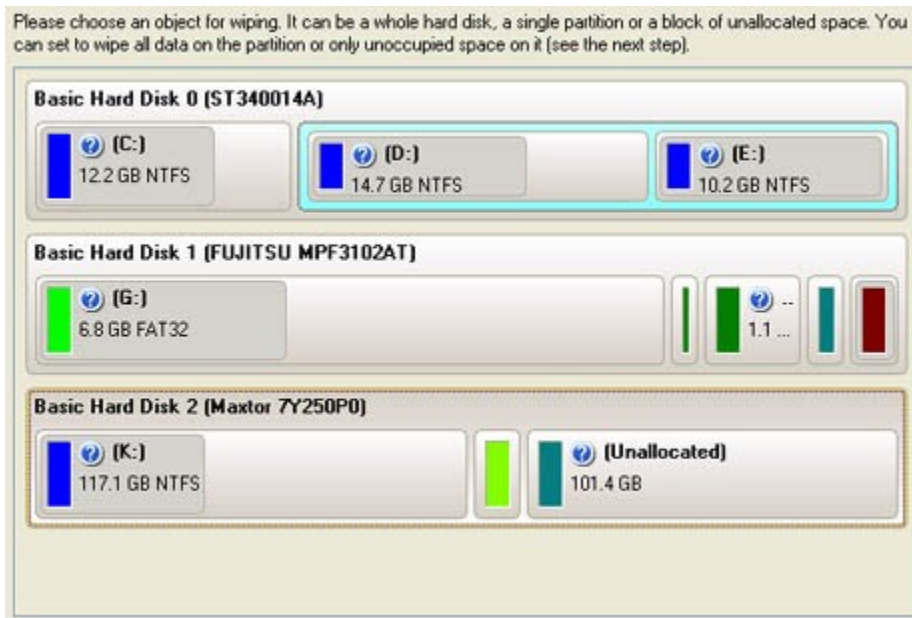
❑ **Wipe mode**. This section enables to switch between two options:

- **Wipe out all data**. Mark the option to irreversibly destroy all on-disk data of the selected object.
- **Clear (wipe) free space**. Mark the option to destroy any remnants of deleted files/directories left on disk without affecting the used data.

> **The Clear Free Space operation is available only for Logical and Primary partitions of known file systems.**

❑ **Wipe method**. Here the user can create a customized algorithm by defining up to 4 wiping patterns, number of passes for each wiping pattern and for the group of patterns. The **Mask** spinner control allows the user to set a two-figure hexadecimal character value ("00" by default). The available range is from "00" to "FF". The user can also choose whether to carry out residual data verification or not specifying the percentage of sectors to check.
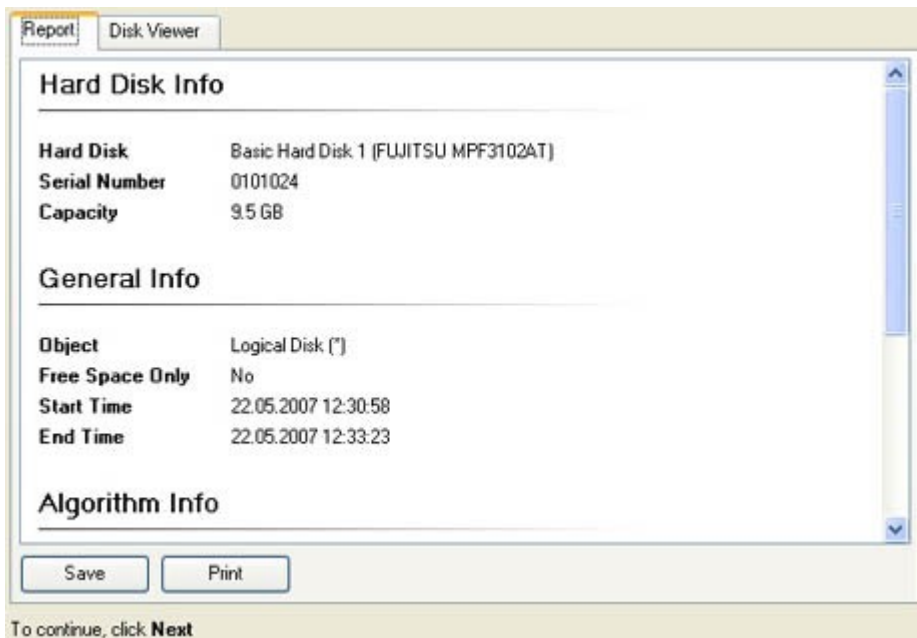
❑ **Revise your changes**. This page informs the user on all the actions to be made in the wizard in a bright, graphical form.
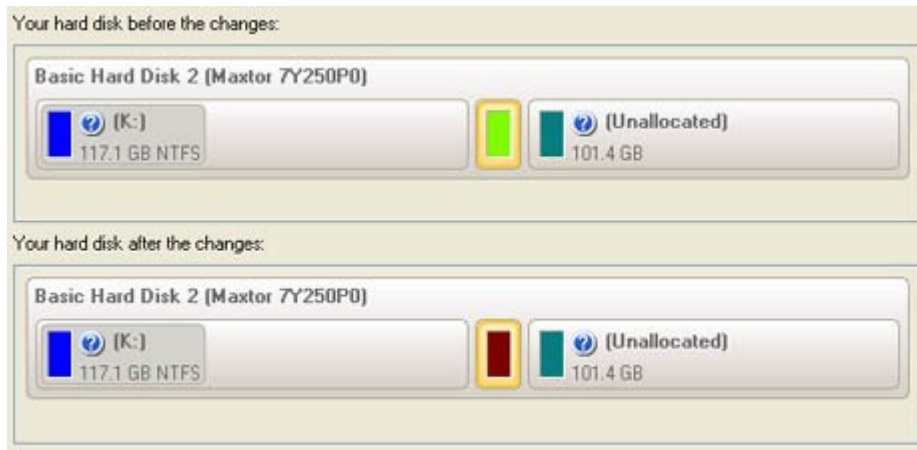
8.1.3 Results

After the operation is completed the user can see a well informative summary page, providing structurally divided in-depth information on all the actions made in the wizard.

The program also enables to store the resulted report. To do that, just press the *Save* button and choose the exact location in the opened dialog.

To make sure that all on-disk data is irreversibly destroyed call the *Disk Viewer* dialog by clicking the appropriate tab and see it for yourself.

⚠	The operation will be performed immediately after confirmation. No virtual mode is available.

Available operation scenarios:

❑ Hard Disk Utilization

9 Advanced Functionality

The bulk of the Hard Disk Manager™ 2008 Server functionality is intended for experienced users, who are willing to get the most of their systems. Before using these features you should realize pretty well what you are going to do and what negative after-effects your actions might have. If so, let us see what else the program can offer you:

❑ **Traditional Hard Disk Manager 2008 Server**. It offers its own interface and covers most of the product functionality from carrying out partitioning operations of any complexity and providing reliable protection of your system and data to secure utilization of an outdated hard disk. Actually it is a set of wizards and operation dialogs which can be started with the help of a handy launcher. Besides thanks to an advanced program engine you can see all changes made to your hard disk in an easy to catch graphical form before they are in fact accomplished thus minimizing the possibility of any mistake.

❑ **Backup Capsule Management**. Paragon Backup Capsule™ is designed as another alternative to provide protection of your system and data. It is a specially secured place on the hard disk which is used to store backup images. The backup capsule has an independent system layout (e.g. a separate partition) and is even operable when the active file system is damaged. To avoid a removal or unauthorized access to the data, this partition is hidden and cannot be mounted in the operating system. The content of the backup capsule is only available for browsing when using special software.

❑ **Boot Management**. Many PC users today feel the need for having several operating systems on one computer. It has to do with a number of factors, one of which is the rapidly developing IT market itself that makes people constantly upgrade their operating systems. But it is a common practice that when dealing with a brand new OS, the majority of applications either fail to run or work incorrectly on it (as it is the case with Windows Vista). Of course, you might wait for software updates or just refuse to use the latest OS for a while and install the older version, but the best way out is to have at the disposal both versions of the same product. After all you might just want to try out the latest version of OS, as you seriously doubt the need of it.

9.1 Hard Disk Manager 2008 Server

In order to launch Hard Disk Manager 2008 Server, click the **Advanced Options** button of the *Express Launcher* and select **Hard Disk Manager 2008 Server**.

> ⚠️ **To know more about Paragon Hard Disk Manager 2008 Server, please consult documentation that comes with the program.**

Available operation scenarios:

❑ Creating Dual Boot Systems

9.2 Backup Capsule Management

All operations related to the Backup Capsule, including its creating and managing, are performed with the *Manage Backup Capsule Wizard*.

9.2.1 Starting

To launch the *Manage Backup Capsule Wizard*, click the **Advanced Options** button of the *Express Launcher* and select **Manage Backup Capsule**. After the mentioned action the Welcome page of the wizard will be displayed.

9.2.2 Settings

The Manage Backup Capsule Wizard allows the user to configure the settings and then start the operation in accordance with the entered parameters. In our case we set the following parameters of the backup capsule:

1. **The place where the backup capsule will be created**. The user should select a hard disk (if the computer has several hard disks) and then select position for the future backup capsule on the disk.
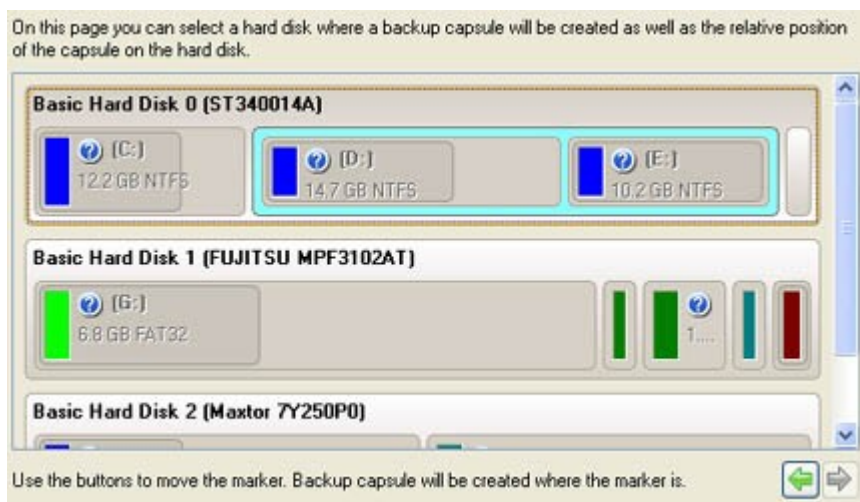
The backup capsule can be created as a primary partition or as a logical drive within an extended partition. It can be inserted into any place on the hard disk: at the end (preferable), at the beginning or somewhere in the middle between other partitions.

> **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.**

2. **The size of the backup capsule**. It will be created at the expense of free space of the selected disk.

Backup capsule - current size is 2.6 GB

Min capsule size: 40 MB ——————————[ ]—————————— Max capsule size: 3.5 GB
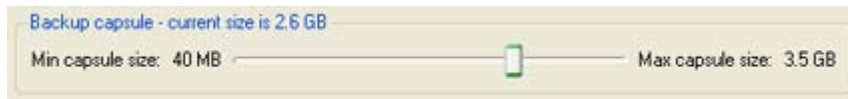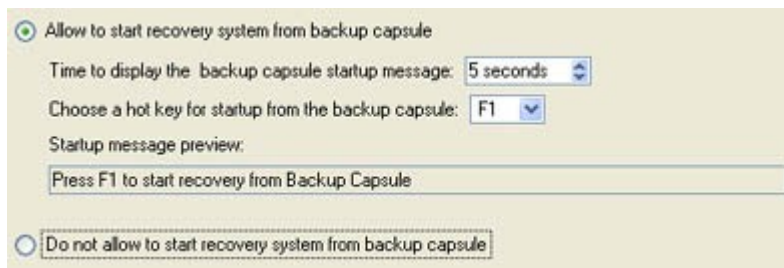
There is no restriction on the size of the backup capsule, merely depending on the available space of the hard disk and the capacity needed for the backup.

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 when 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)**

3. **Possibility to boot the system from the backup capsule**.

⦿ Allow to start recovery system from backup capsule

Time to display the backup capsule startup message: 5 seconds ⇅

Choose a hot key for startup from the backup capsule: F1 ⌄

Startup message preview:

Press F1 to start recovery from Backup Capsule

○ Do not allow to start recovery system from backup capsule

The program enables the user to start up the computer from the image contained in the backup capsule. This may be of great use in case of the operating system corruption. There are the following additional parameters for this operation:
- *Time period* in seconds the startup message will be displayed;
- *A hot key* used to choose the backup capsule as the bootable device.

Besides the user can preview the startup message in the box below the settings.

> **It is recommended to create the bootable backup capsule, as it will help in case of the operating system corruption.**
>
> **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).

9.2.3 Results

After the wizard has completed, the user will have created a secured place, i.e. the backup capsule, in which new backup archives can be stored.

⚠	**The operation will be performed immediately after confirmation. No virtual mode is available.**

Available operation scenarios:

❑   [Creating the Backup Capsule](#)

9.3 Boot Management

Our program enables to easily manage several operating systems on one computer with the help of the Boot Manager Setup Wizard. Among the key features of the wizard the following should be mentioned:

❑   Up to 16 operating systems on one PC;
❑   Secure adding/removing of the Boot Manager startup record to/from the MBR;
❑   *Auto Boot* option to automatically start up the previously chosen OS after a certain time period;
❑   Hiding of any primary partition except selected at the moment.

The wizard is so well designed that the user simply needs to follow its easy instructions to properly configure the startup process.

9.3.1 Starting

To launch the *Boot Manager Setup Wizard*, click the **Advanced Options** button of the *Express Launcher* and select **Boot Manager**. After the mentioned action the Welcome page of the wizard will be displayed.
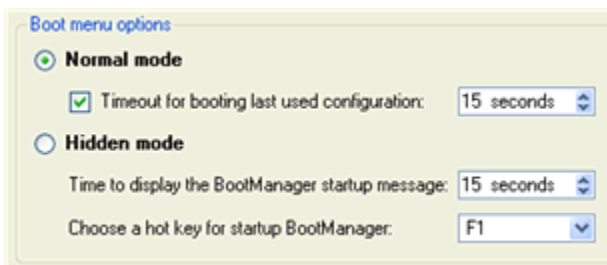
9.3.2 Settings

The *Boot Manager Setup Wizard* allows the user to configure the settings and then start the operation in accordance with the entered parameters. Here the user should set the following parameters:
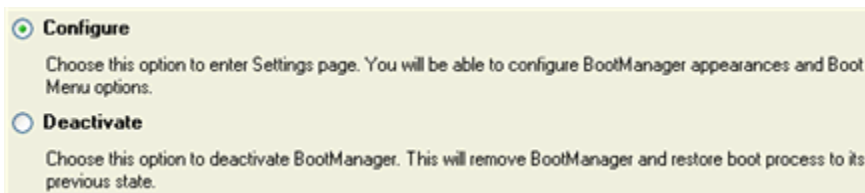
❑ **Hiding other primary partitions**. By marking this option the program will automatically assign the hidden flag to all primary partitions of the hard disk(s) except the one selected to boot. This will help to avoid any problems when dealing with different operating systems or different versions of one and the same OS, as they will be unaware of each other.

> ☑ Hide other primary partitions
>
> Choose this option to hide other primary partitions except one that will be s
> incapsulate different Operating Systems.

❑ **Boot menu options**. In this section the user can switch between the following modes:

- *Normal mode*. Choose this mode to display the boot menu every time the computer starts up and define a timeout on the expiry of which the program will automatically select the previously chosen item of the menu.

- *Hidden mode*. Choose this mode not to display the boot menu until pressing a hot key. For this mode the user should define a *hot key* used to enable the Boot Manager and a *time period* in seconds the startup message will be displayed.

> Boot menu options
> ⦿ **Normal mode**
>   ☑ Timeout for booting last used configuration: 15 seconds ⇕
> ◯ **Hidden mode**
>   Time to display the BootManager startup message: 15 seconds ⇕
>   Choose a hot key for startup BootManager: F1 ▾

❑ **Deactivating/Configuring the Boot Manager**. These two options will only be available once the wizard has been completed and launched again. Select the **Deactivate** option to remove the Boot Manager from the MBR (Master Boot Record) or **Configure** to modify the previously set parameters of the startup process.

> ⦿ Configure
>   Choose this option to enter Settings page. You will be able to configure BootManager appearances and Boot Menu options.
> ◯ Deactivate
>   Choose this option to deactivate BootManager. This will remove BootManager and restore boot process to its previous state.

9.3.3 Results

After the Boot Manager Setup Wizard is completed the program updates the original record in the MBR to get control of the booting process and to be able to display the boot menu.

> ⚠️ **The operation will be performed immediately after confirmation. No virtual mode is available.**

Available operation scenarios:

❑ [Creating Dual Boot Systems]{.underline}

10 Typical Scenarios

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

10.1 Backup Scenarios
10.1.1 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** by clicking the **Advanced Options** button of the *Express Launcher* and then selecting the **Manage Backup Capsule** item.
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 (see the illustration below). Click the *Next* button.
4. **Set the size** for the backup capsule. Click the *Next* button

> ⚠ **To boot your system directly from the Backup Capsule in case of a system failure, please enable the appropriate option.**

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

After this, the user can place backup archives into the created backup capsule.

10.1.2 Backup to a Local Mounted/Unmounted (without Drive Letter Assigned) Partition

To save a backup archive on a local mounted/unmounted drive with the Backup Wizard, simply do the following:

1. Launch the **Backup Wizard** by clicking the **Protect System and Data** button of the *Express Launcher* and then selecting the **Backup** item.
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. Click the *Next* button.
4. On the **Backup Destination** page, select the *Save data to local/network drives* or *Save data to physical partitions* option. Click the *Next* button.
5. Depending on the choice, select **a local mounted/unmounted (without drive letter assigned) disk** as a backup destination.

> ⚠ **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.**

6. **Edit the archive name** if necessary and click the *Next* button.
7. *Add comments* to your backup describing its contents. Click the *Next* button.
8. 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.

10.1.3 Backup to a Network Drive

To save a backup archive on a network drive with the Backup Wizard, simply do the following:

1. Launch the **Backup Wizard** by clicking the **Protect System and Data** button of the *Express Launcher* and then selecting the **Backup** item.
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. Click the *Next* button.
4. On the **Backup Destination** page, select the *Save data to local/network drives* option. Click the *Next* button.
5. Select **a network disk** (it must be mounted and be available in the system by a drive letter).

> ⚠ **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.**

6. **Edit the archive name** if necessary and click the *Next* button.
7. *Add comments* to your backup describing its contents. Click the *Next* button.
8. 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.

10.1.4 Backup to External Media (CD/DVD)

To store backup images on CD/DVD with the Backup Wizard, simply do the following:

1. Launch the **Backup Wizard** by clicking the **Protect System and Data** button of the *Express Launcher* and then selecting the **Backup** item.
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. Click the *Next* button.

4. On the **Backup Destination** page, select the *Burn the data to CD or DVD* option. Click the *Next* button.
5. Select **a recordable device** on the list and edit the archive name, if necessary. Click the *Next* button.
6. *Add comments* to the backup describing its contents. Click the *Next* button.
7. 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.

10.1.5 Backup to the Backup Capsule

To place backup images into the backup capsule with the Backup Wizard, simply do the following:

1. Create the backup capsule with the Manage Backup Capsule Wizard.
2. Launch the **Backup Wizard** by clicking the **Protect System and Data** button of the *Express Launcher* and then selecting the **Backup** item.
3. On the Wizard's Welcome page, click the *Next* button.
4. 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. Click the *Next* button.
5. On the **Backup Destination** page, select the *Save data to the Backup Capsule* option. Click the *Next* button.

> ⚠️ **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.**

6. **Edit the archive name** if necessary and click the *Next* button.
7. *Add comments* to your backup describing its contents. Click the *Next* button.
8. 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.

10.1.6 Differential Backup

To update the image of the selected partition, simply do the following:

1. **Launch Hard Disk Manager 2008 Server** by clicking the **Advanced Options** button and then selecting **Hard Disk Manager 2008 Server** in the Express Launcher;
2. In the main window of HDM click the **Differential Backup** item of the Wizards menu on the Common Tasks bar;
3. On the Wizard's Welcome page, click the *Next* button;
4. On the **Browse for Archive** page, select the required base archive in the browser-like window. The *Archive File Details* section displays a short description of the selected image;
5. 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, the user needs to mark the appropriate option at the foot of the page;
6. On the **Backup Destination** page, select the necessary operation:

   - ❑ Save data to local/network drives
   - ❑ Save data to physical partitions
   - ❑ Burn the data to CD/DVD

> **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 the backup describing its contents;
8. Select how to perform the operation:
   - immediately (the *Back up now* option)
   - *schedule the operation*
   - or *generate a script* in accordance with the entered settings

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

10.1.7 Cyclic Backup

To automate the backup process and make a cyclic backup of the selected partition, simply do the following:

1. **Launch Hard Disk Manager 2008 Server** by clicking the **Advanced Options** button and then selecting Hard Disk Manager 2008 Server in the Express Launcher;
2. In the main window of HDM click the **Cyclic Backup** item of the Wizards menu on the Common Tasks bar;
3. On the Wizard's Welcome page, click the *Next* button;
4. On the **What to back up** page, mark the appropriate option opposite a partition's name depending on the chosen task;
5. On the **Backup Destination** page, select the necessary operation:
   - Save data to local/network drives
   - Save data to physical partitions

> **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.**

6. On the next page, **select a folder to place the image to** and **specify its name**;
7. **Add comments** to the backup describing its contents;
8. **Schedule the operation**. The program allows the user to automate the backup operation. The utility for this purpose is referred to as the [embedded Scheduler](#), which is used to specify the time for the execution. There are several available options. Depending on the choice, the scheduler will display a form that allows the user to set the schedule:
   - *Once*. Mark the option to define the date and time when the operation is to be launched.
   - *At System Startup* or *At Logon*. Mark the option to define where the operation is to be launched with every logon (system startup), only once, or periodically.
   - *Daily*. Mark the option to define the time when the operation is to be launched, a period during which the operation will be performed (in days), the date when the operation will be started first and the date after which the task will be deleted from the scheduler's waiting list.
   - *Weekly*. Mark the option to define the time when the operation is to be launched, a period during which the operation will be performed (in weeks), days of the week, when the operation will be started, the date when the operation will be started for the first time and the date when the operation will cease to run.
   - *Monthly*. Mark the option to define the time when the operation is to be launched, a day of a month when the operation starts, the date when the operation will be started for the first time and the date when the operation will cease to run.

Shutdown system on complete. Mark the option to automatically switch off the computer on the successful accomplishment of the operation.

9. On the **Cyclic backup type** page, choose the way of creating a cyclic backup:
   - *Base type*. Every image created during the operation will be made as a complete base archive.
   - *Differential type*. Every first image will be made as a complete base archive and all the others will be differentiated from it. This operation requires much less space, thus considerably saving your system resources. By setting *Maximum disk space to store images* and *Maximum number of images to store* the user defines when the operation will be cycled. That means that on exceeding these two parameters the oldest archives (only differential) will be automatically overwritten.

10. The **Operation Summary** page provides structurally divided information on all the actions made in the wizard. Check the changes and come back to any of the steps of the wizard to correct them (if necessary) by following the required hyperlink.

The operation will be run according to the specified parameters. The resulted backup image will be placed into the specified destination (a local or network disk), its features defined by the wizard.

10.1.8 Synthetic Backup

To synthesize a new property modified archive based on the existed backup images of the selected disk/partition, simply do the following:

1. **Launch Hard Disk Manager 2008 Server** by clicking the **Advanced Options** button and then selecting Hard Disk Manager 2008 Server in the Express Launcher;
2. In the main window of HDM click the **Synthetic Backup** item of the Wizards menu on the Common Tasks bar;
3. On the Wizard's Welcome page, click the *Next* button;
4. On the **Browse for Archive** page, select the required archive in the browser-like window. The *Archive File Details* section displays a short description of the selected image;
5. The **Archive Contents** page displays detailed information about the contents of the archive. It includes a full description of properties about the archived disks or partitions;
6. On the **Synthesis Settings** page the user can 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.**

   - **Compression level** for the backup image (including the *No compression* variant)
   - Whether the archive will be **split** (if this is the case the user can set the maximum size for the archive files).
   - Whether the archive will be **protected by password**.
   - **Recording speed** when the user wants to burn the backup image onto CD/DVDs.

7. On the **Synthetic Archive Destination** page, select the necessary operation:

   - Save data to local/network drives
   - Save data to physical partitions
   - Burn the data to CD/DVD

8. **Add comments** to the backup describing its contents.

After the operation is completed the user receives a new synthesized backup of the selected disk/partition. It is placed into the specified destination (a local or network disk, or a CD/DVD disc), its features defined by the wizard.

> ⚠️ **This function is currently unavailable for modification of entire hard disk backups.**

10.2 Recovery Scenarios
10.2.1 Restoring from the Backup Capsule

10.2.1.1 OS is still bootable

To restore a hard disk/partition from the backup image contained in the Backup Capsule with the [Restore Wizard](#), simply do the following:

1. Launch the **Restore Wizard** by clicking the **Rescue and Recovery** button of the *Express Launcher* and then selecting the **Restore** item.
2. On the Wizard's Welcome page, click the *Next* button.
3. On the **Browse for Archive** page, select the required archive in the browser-like window. The *Archive File Details* section displays a short description of the selected image. Click the *Next* button.
4. The **What to Restore** page displays detailed information about the contents of the archive. It includes a full description of properties about the archived disks or partitions. In case you have a complex archive, select the required item to restore.

> ⚠️ **To restore a differential backup it is required to have at disposal both the necessary differential backup archive and its base image. Only the differential backup archive is to be selected. The Wizard then will automatically attempt to find the corresponding base image and start the operation.**
>
> **In case the base image was burned to a CD/DVD or its location changed since the time of creation, the program would ask the user to provide the exact path to it.**

5. On the **Where to Restore** page select a place you would like to restore the archive to.
6. On the **Restore Results** page review all parameters of the operation and modify them if necessary. Click the *Next* button to start the restore process.

10.2.1.2 OS is not bootable due to some failure

To restore a hard disk/partition from the backup image contained in the Backup Capsule when the current OS is down, simply do the following:

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

1. Start up the computer from the bootable backup capsule.
2. The *Simple Restore Wizard™* will be started automatically. Click the *Next* button on the Welcome page.
3. On the **What to Restore** page, either type the **full path to the backup image of the disk, which you are going to restore**, or click the standard browse button **[...]** to find it. Click the *Next* button.

> ⚠️ **To restore a differential backup it is required to have at disposal both the necessary differential backup archive and its base image. Only the differential backup archive is to be**

> **selected. The Wizard then will automatically attempt to find the corresponding base image and start the operation.**
>
> **In case the base image was burned to a CD/DVD or its location changed since the time of creation, the program would ask the user to provide the exact path to it.**

4. On the **Image Properties** page, **make sure that you select the correct image** viewing the provided information about the archive. When the archive has been chosen, click the *Next* button.
5. On the disk layout map, **select a disk**, to be restored. Click the *Next* button.
6. **Set the size of the partition**. The user can compress or expand it at the expense of available unused space. Click the *Next* button.
7. Click the *Finish* button to initiate the restoring process.
8. After completing the operation **reboot the computer**.

10.2.2 Restoring from External Media (CD/DVD)

10.2.2.1 OS is still bootable

To restore a hard disk/partition from the backup image located on CD/DVD with the [Restore Wizard](#), simply do the following:

1. **Insert a CD/DVD disk** containing the previously prepared backup image into a CD/DVD drive.

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

2. Launch the **Restore Wizard** by clicking the **Rescue and Recovery** button of the *Express Launcher* and then selecting the **Restore** item.
3. On the Restore Wizard's Welcome page, click the *Next* button.
4. On the **Browse for Archive** page, select the required archive in the browser-like window. The *Archive File Details* section displays a short description of the selected image. Click the *Next* button.

> **To restore a differential backup it is required to have at disposal both the necessary differential backup archive and its base image. Only the differential backup archive is to be selected. The Wizard then will automatically attempt to find the corresponding base image and start the operation.**
>
> **In case the base image was burned to a CD/DVD or its location changed since the time of creation, the program would ask the user to provide the exact path to it.**

5. The **What to Restore** page displays detailed information about the contents of the archive. It includes a full description of properties about the archived disks or partitions. In case you have a complex archive, select the required item to restore.
6. On the **Where to Restore** page select a place you would like to restore the archive to.
7. On the **Restore Results** page review all parameters of the operation and modify them if necessary. Click the *Next* button to start the restore process.

10.2.2.2 OS is not bootable due to some failure

To restore a hard disk/partition from the backup image located on CD/DVD when the current OS is down, simply 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. The *Simple Restore Wizard™* will be started automatically. Click the *Next* button on the Welcome page.
4. On the **What to Restore** page, either type the **full path to the backup image of the disk, which you are going to restore**, or click the standard browse button **[...]** to find it. Click the *Next* button.

> **To restore a differential backup it is required to have at disposal both the necessary differential backup archive and its base image. Only the differential backup archive is to be selected. The Wizard then will automatically attempt to find the corresponding base image and start the operation.**
>
> **In case the base image was burned to a CD/DVD or its location changed since the time of creation, the program would ask the user to provide the exact path to it.**

5. On the **Image Properties** page, **make sure that you select the correct image** viewing the provided information about the archive. When the archive has been chosen, click the *Next* button.
6. On the disk layout map, **select a disk**, to be restored. Click the *Next* button.
7. **Set the size of the partition**. The user can compress or expand it at the expense of available unused space. Click the *Next* button.
8. Click the *Finish* button to initiate the restoring process.
9. After completing the operation **reboot the computer**.

10.2.3 Restoring from a Network Drive

To restore a hard disk/partition from the backup image located on a network drive, simply do the following:

10.2.3.1 WinPE Recovery CD

1. **Insert Paragon WinPE Recovery CD** (the BIOS must be enabled to boot the system from the CD/DVD device).
2. **Restart** the computer.
3. Launch the **Restore Wizard** by clicking the **Rescue and Recovery** button of the *Express Launcher* and then selecting the **Restore** item.
4. On the Restore Wizard's Welcome page, click the *Next* button.
5. On the **Browse for Archive** page, select the required archive in the browser-like window. The *Archive File Details* section displays a short description of the selected image. Click the *Next* button.

> **To restore a differential backup it is required to have at disposal both the necessary differential backup archive and its base image. Only the differential backup archive is to be selected. The Wizard then will automatically attempt to find the corresponding base image and start the operation.**
>
> **In case the base image was burned to a CD/DVD or its location changed since the time of creation, the program would ask the user to provide the exact path to it.**

6. The **What to Restore** page displays detailed information about the contents of the archive. It includes a full description of properties about the archived disks or partitions. In case you have a complex archive, select the required item to restore.
7. On the **Where to Restore** page select a place you would like to restore the archive to.
8. On the **Restore Results** page review all parameters of the operation and modify them if necessary. Click the *Next* button to start the restore process.
9. After completing the operation **reboot the computer**.

10.2.3.2 Linux/DOS Recovery CD

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. **Set up a network connection** by selecting the **Network Configurator** item of the main menu.
4. Launch the **Simple Restore Wizard**. Click the *Next* button on the Welcome page.
5. On the **What to Restore** page, either type the **full path to the backup image of the disk, which you are going to restore**, or click the standard browse button **[...]** to find it. Click the *Next* button.

> ⚠️ To restore a differential backup it is required to have at disposal both the necessary differential backup archive and its base image. Only the differential backup archive is to be selected. The Wizard then will automatically attempt to find the corresponding base image and start the operation.
>
> In case the base image was burned to a CD/DVD or its location changed since the time of creation, the program would ask the user to provide the exact path to it.

6. On the **Image Properties** page, **make sure that you select the correct image** viewing the provided information about the archive. When the archive has been chosen, click the *Next* button.
7. On the disk layout map, **select a disk**, to be restored. Click the *Next* button.
8. **Set the size of the partition**. The user can compress or expand it at the expense of available unused space. Click the *Next* button.
9. Click the *Finish* button to initiate the restoring process.
10. After completing the operation **reboot the computer**.

10.2.4 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, simply do the following:

1. **Connect the second hard disk** to the computer.
2. **Insert Paragon WinPE or Linux/DOS Recovery CD** (the BIOS must be enabled to boot the system from the CD/DVD device).
3. **Restart** the computer.
4. **Launch the File Transfer Wizard**. Click the *Next* button to continue.

> ⚠️ You can start up the File Transfer Wizard in the WinPE version of the program just the way it is done in Windows. However when dealing with the Linux/DOS Recovery CD, you can do it from the main menu.

5. **Select a disk where the files you need are stored** from the pull-down list in the right pane of the page.
6. **Choose files you want to copy and place them to Clipboard** by pressing the left arrow-button.

7. **Choose the way the data will be stored**. Select the **Save data to local drives or physical partitions** item. Click the *Next* button to continue.
8. On the **Select Destination Path** page, select a hard disk to copy the data to by pressing the *Browse* button. Click the *Next* button to accomplish the operation.
9. After the operation is completed, **exit the wizard** by pressing the appropriate button.
10. **Eject the CD**.
11. **Turn off the computer**.

10.2.5 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, simply do the following:

1. **Insert Paragon WinPE or Linux/DOS Recovery CD** (the BIOS must be enabled to boot the system from the CD/DVD device).
2. **Restart** the computer.
3. **Launch the File Transfer Wizard**. Click the *Next* button to continue.

> ⚠ **You can start up the File Transfer Wizard in the WinPE version of the program just the way it is done in Windows. However when dealing with the Linux/DOS Recovery CD, you can do it from the main menu.**

4. **Select a disk where the files you need are stored** from the pull-down list in the right pane of the page.
5. **Choose files you want to copy and place them to Clipboard** by pressing the left arrow-button.
6. **Estimate the resulted data size** by pressing the *Calc* button. Click the *Next* button to continue.
7. **Choose the way the data will be stored**. Select the **Burn data to CD/DVD** item. Click the *Next* button to continue.
8. On the **Choose a recorder** page, select a recorder from the list and then set a volume label by typing it in the appropriate field. Click the *Next* button to continue.

> ⚠ **The program enables to burn data either to a CD/DVD or an ISO image.**

9. **Insert a blank CD/DVD**. In case the inserted disc is not empty, the program suggests the user erasing its contents. Click the *Next* button to accomplish the operation.
10. After the operation is completed, **exit the wizard** by pressing the appropriate button.
11. **Eject the CD**.
12. **Turn off the computer**.

10.2.6 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 WinPE or Linux/DOS Recovery CD** (the BIOS must be enabled to boot the system from the CD/DVD device).
2. **Restart** the computer.
3. **Launch the File Transfer Wizard**. Click the *Next* button to continue.

> ⚠ **You can start up the File Transfer Wizard in the WinPE version of the program just the way it is done in Windows. However when dealing with the Linux/DOS Recovery CD, you can do**

it from the main menu.

4. **Select a disk where the system backup is stored** from the pull-down list in the right pane of the page.
5. **Open the required backup**, choose files you want to copy and place them to Clipboard by pressing the left arrow-button.
6. **Choose the way the data will be stored**. Select the **Save data to local drives or physical partitions** item. Click the *Next* button to continue.
7. On the **Select Destination Path** page, select the required system disk to copy the data to by pressing the **Browse** button. Click the *Next* button to accomplish the operation.
8. After the operation is completed, **exit the wizard** by pressing the appropriate button.
9. **Eject the CD**.
10. **Turn off the computer**.

10.3 System Hard Disk Migration

To migrate your system hard disk to another disk with the [Copy Hard Disk Wizard](#), simply do the following:

1. **Connect both source and destination disks to the computer**.
2. **Restart the computer.**
3. **Start the Copy Hard Disk Wizard** by clicking the **Maintenance** button of the *Express Launcher* and then selecting the **Hard Disk Migration** item. Click the *Next* button to continue.
4. On the **Select Hard Disk to Copy** page, select a source disk (a hard disk you want to copy). Click the *Next* button to continue.
5. On the **Select Target Hard Disk** page, select a destination disk (a hard disk to copy contents of the source disk). Click the *Next* button to continue.

⚠	**During the operation all contents of the destination disk will be deleted.**

6. **Define Copy Options** By default, the program offers to remove free blocks between partitions and resize them proportionally. That is just what we need. Besides we recommend you to enable the surface test to make sure your new hard disk is flawless.

Choose copy options that suit best your task:

Copy options:
☐ HDD raw copy
☐ Partitions raw copy
☐ Perform incremental copy

Resize options:
☑ Remove free blocks between partitions
☐ Copy data and resize partitions proportionally

Verification options:
☐ Perform surface test
☐ Verify writing

7. On the next page of the wizard page **review all parameters of the operation** and modify them if necessary. Click the *Next* button to start the operation
8. When copying is completed, **shut down the computer**.
9. **Disconnect (physically) the source hard disk**.
10. **Boot the computer from the destination hard disk**.

10.4 Hard Disk Optimization

To defragment an NTFS or FAT partition, simply do the following:

> ⚠️ **The user must have administrator's privileges to accomplish defragmentation of the system partition.**

1. Start **Paragon Total Defrag** by clicking the **Maintenance** button of the *Express Launcher* and then selecting the **Hard Disk Migration** item.
2. In the main window **Select a partition you want to defragment** on the Disk Map.
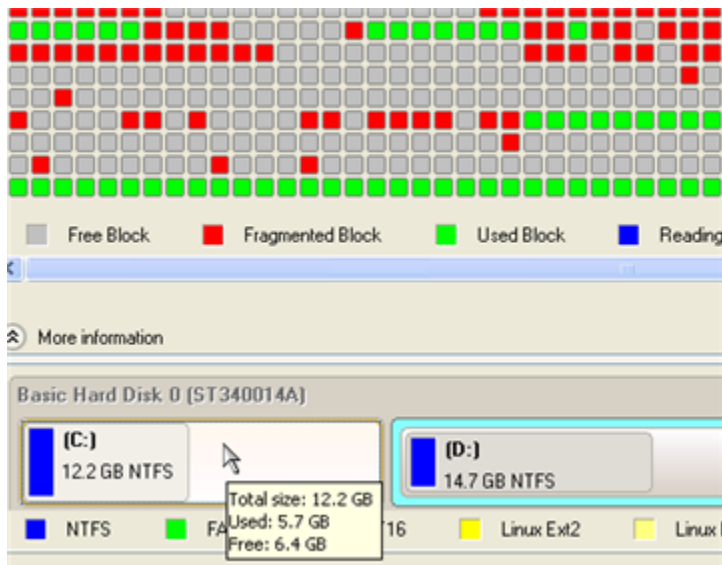
3. Launch the **Defragment Partition** dialog by calling the popup menu for the selected partition (right click of the mouse button) and then selecting the menu item: *Defragment Partition…*
4. In the opened dialog **define settings of the operation**. To improve the performance we recommend you to mark the *Do not save content of the Pagefile.sys or (and) Hiberfile.sys* option as these files are only needed for the current Windows session.
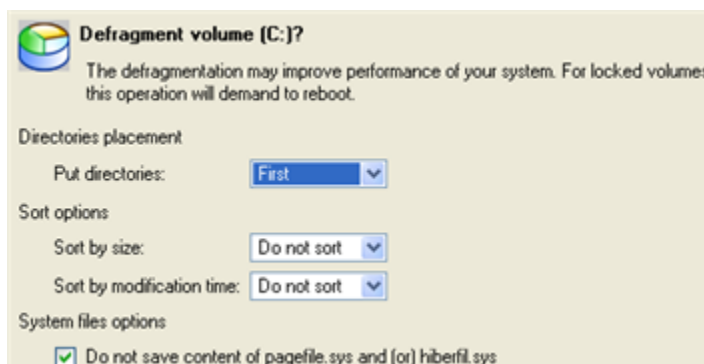
> ⚠️ **The Defragment Partition dialog offers a number of additional parameters that can also be of help. However here we pay attention to the most relevant to fulfill our task.**

5. **Start the operation** by clicking the *Yes* button.

10.5 Hard Disk Utilization

To irreversibly destroy all on-disk information without any possibility to recover and that way providing maximum level of security, simply do the following:

1. **Start the Wipe Wizard** by clicking the **Securely Dispose Hard Disk** button of the *Express Launcher* and then selecting the **Disk Wiper** item. Click the *Next* button to continue.
2. On the **What to Wipe** page, select a hard disk, the data of which you want to wipe out. Click the *Next* button to continue.
3. On the **Wipe Mode** page, select the wipe out all the data to irreversible destroy all on-disk information including standard *bootstrap code* and other system service structures. Click the *Next* button to continue.
4. On the the next page of the wizard **create a customized algorithm** by defining up to 4 wiping patterns, number of passes for each wiping pattern and for the group of patterns. The **Mask** spinner control allows the user to set a two-figure hexadecimal character value ("00" by default). The available range is from "00" to "FF". The user can also choose whether to carry out residual data verification or not specifying the percentage of sectors to check.
5. **Review all parameters of the operation** and modify them if necessary. Click the *Next* button to start the operation.

10.6 Creating Dual Boot Systems

Release of Windows Vista has given a new impetus to the problem of establishing a dual boot system. In this connection we decided to consider two the most frequently used situations a rank and file user may face, i.e. Windows Vista + Windows XP and Windows XP + Windows Vista. Please note that for reasons of better security and system independence these operating systems will be installed on different partitions. That is why we need to hide the first system partition before installation of the second OS.

10.6.1 Windows Vista + Windows XP

Suppose you have got Windows Vista coming with your brand new computer. Everything is great except one thing – your favourite applications simply reject to work correctly on it. Software updates are expected to release in the near future, but you cannot wait any more. Thus the best way out is to leave Windows Vista intact and install the time-proved Windows XP.

Most likely you have only one hard disk with only one partition (the only partition is always system). To install the second operating system you need to repartition your drive first, as it requires a separate primary partition. If this the case, the following scenario is just what you need:

> **This scenario implies that operating systems will be installed on different partitions to provide better security and system independence.**

1. **Launch Hard Disk Manager 2008 Server** by clicking the **Advanced Options** button and then selecting **Hard Disk Manager 2008 Server** in the Express Launcher;

2. In the main window of HDM **select your hard disk on the Disk Map** to make a block of free space on it;
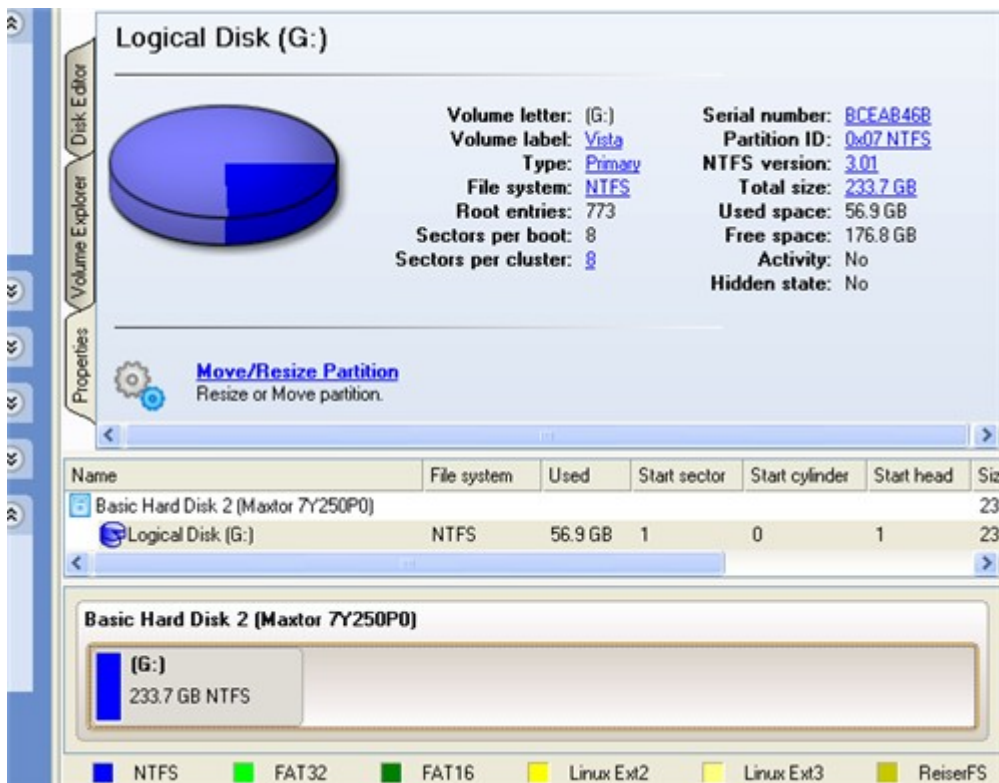
3. **Release some free space (not less than 10 GB to install Windows XP) from the partition**. To do that, please call the context menu for the selected partition (right click of the mouse button) and launch the Move/Resize dialog;
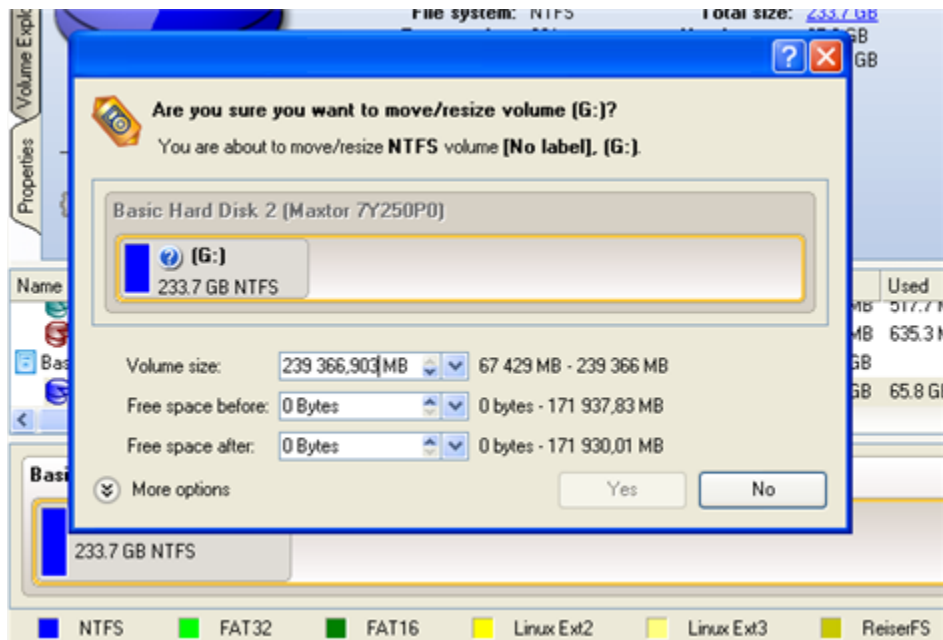
4. In the opened dialog **shift the edge of the partition to the left** by the *drag-and-drop* technique. While doing this, free space from the partition will be released (displayed in aqua-green). You can also do it manually by entering the exact size of free space. Click the *Yes* button to continue;
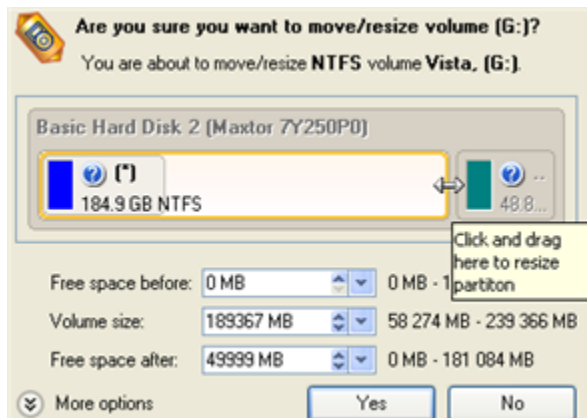
> The Move/Resize dialog offers a number of additional parameters that can also be of help. However here we pay attention to the most relevant to fulfill our task.

5. Now the user has a block of free space sufficient in size to hold a new partition;
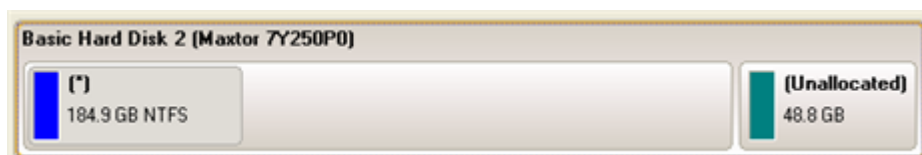
6. **Create a new partition to install Windows XP**. To do that, please call the context menu for a newly created block of free space (right click of the mouse button) and launch the Create Partition dialog;
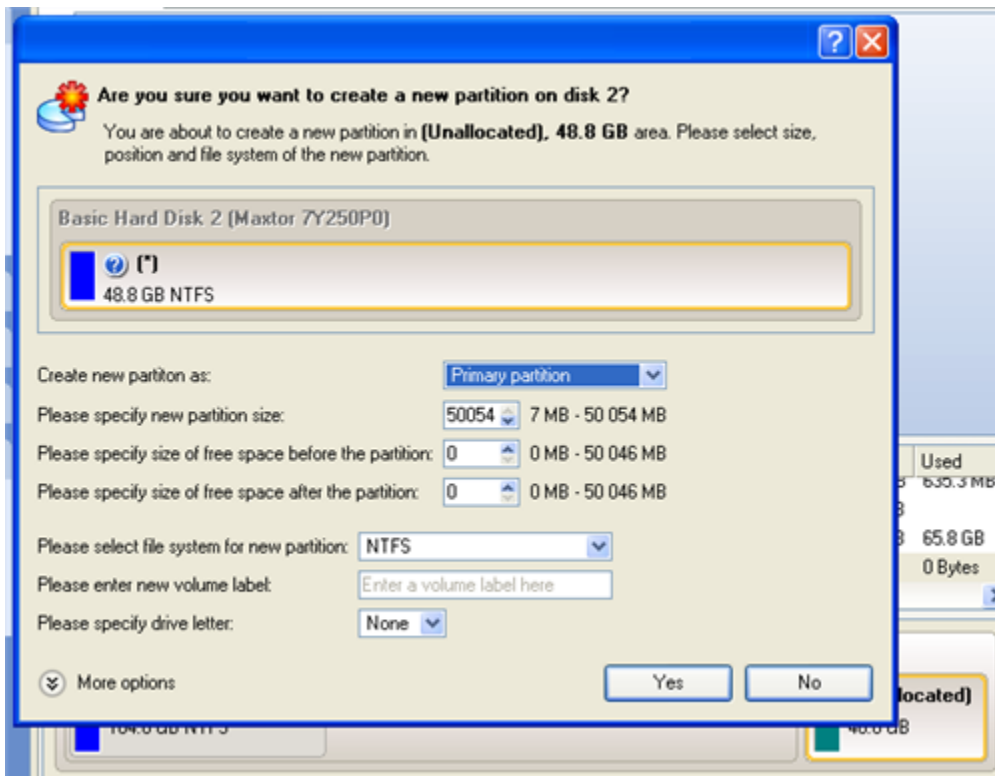
7. **Define parameters of the future partition**. By all means it has to be primary and since we are going to install Windows XP, the most preferable file systems are NTFS and FAT32. Click the *Yes* button to continue;
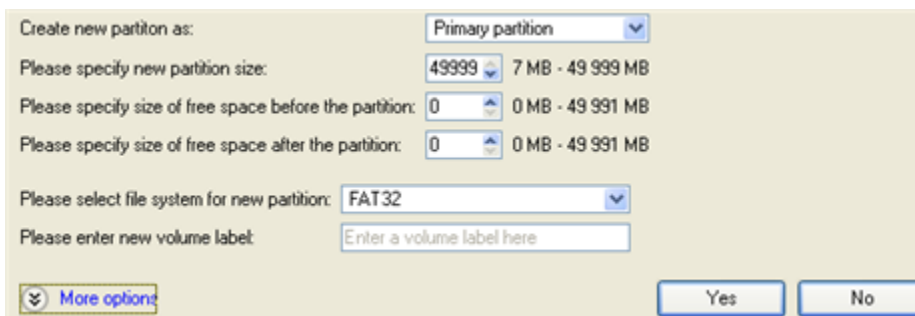
> ⚠ **The Create Partition dialog offers a number of additional parameters that can also be of help. However here we pay attention to the most relevant to fulfill our task.**

8. As a result of the operation we have got a newly created FAT32 partition just enough in size to comfortably work with Windows XP;
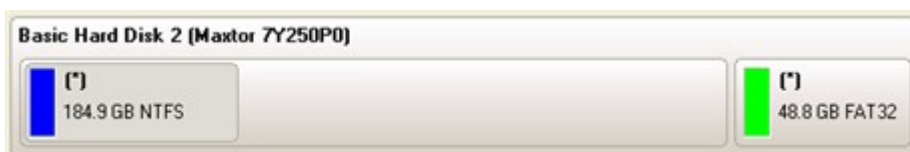

9. **Hide the Windows Vista partition** to avoid writing any data on it during the Windows XP installation, as it is the best way to provide system independence. To do that, please call the context menu for it (right click of the mouse button) and launch the Hide Partition dialog. Click the *Yes* button to continue;

> ⚠️ **Hiding of the system partition will make OS non-bootable, what is quite normal.**
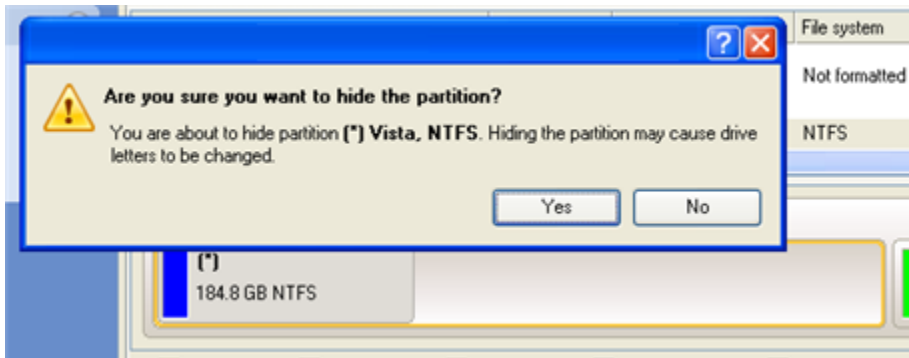
10. **Apply all introduced changes**. By default, HDM works in the virtual mode of execution, so you have to confirm all operations to let the program accomplish them. To do that, just click the *Apply* button on the Virtual Operations Bar;
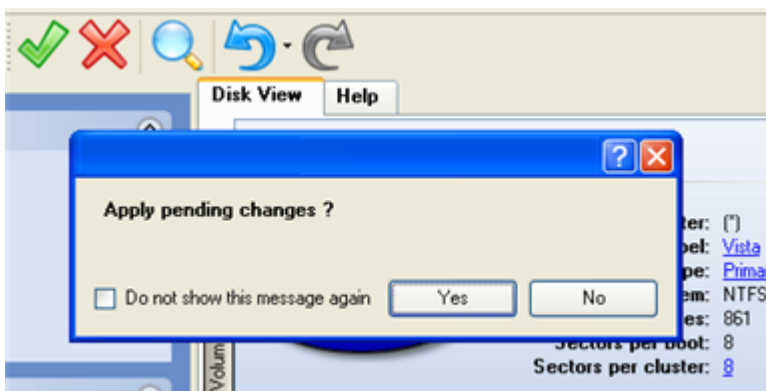
To perform the pending operations the program will need to restart the system into a special mode of execution.

> ⚠️ **After all the operations are completed you will not be able to restart the system, what is quite normal. Nevertheless if you do try it, the following error will occur:**
>
> ```
> STOP: c000021a {Fatal System Error}
> The initial session process or system process terminated unexpectedly with a sta
> tus of 0x00000000 (0xc0000034 0x0010037c).
> The system has been shut down.
> ```
>
> **All the mentioned above operations can be accomplished with the help of the Linux/DOS Recovery CD.**

11. **Install Windows XP on the newly created partition**. We won't go into details as for its installation, as you can find all the necessary information in documentation that comes with the product. However to avoid any problems, we consider it necessary to draw your attention on the following issues:
    - You need a bootable distributive CD of Windows XP to install it;
    - To automatically start your computer from this CD, make sure the on-board BIOS is set up to *boot from CD first* or press *F12* during startup to select a bootable device;
    - Do not forget to select the newly created partition as destination.

⚠	**Installation of Windows XP will make Windows Vista non-bootable.**

12. **Launch the Boot Manager Setup wizard**. As your Windows Vista is non-bootable any more, you need to install Hard Disk Manager 2008 Server once again, but this time in Windows XP to activate Boot Manager.

⚠	**To avoid double installation of the HDM 2008 Server, you can use WinPE Recovery CD to activate Boot Manager.**

13. To launch the Boot Manager Setup wizard, please click the **Advanced Options** button of the *Express Launcher* and select **Boot Manager**;

14. **Set up the Boot Manager wizard**. The most relevant option here is the possibility to hide other primary partitions except the one selected to boot and it is by all means should be activated to make Windows Vista and Windows XP unaware of each other. The rest of the parameters offered by default will do in our case, so just complete the wizard and it will automatically find the two operating systems and update the MBR.
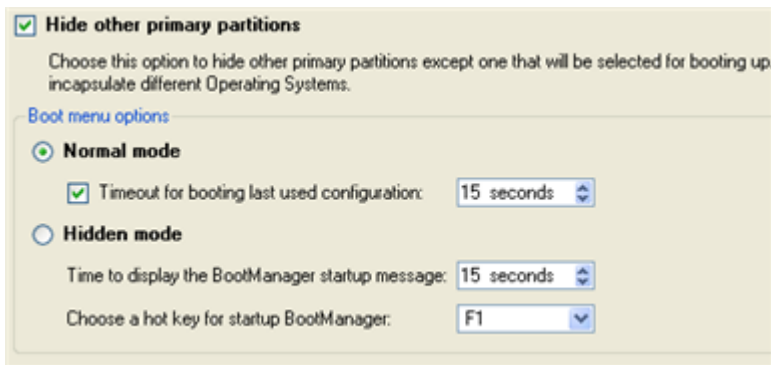
15. **Now restart the computer to make sure you have got a dual boot system**.

10.6.2 Windows XP + Windows Vista

If you've got Windows XP and are willing to try the latest Windows Vista but not sure your favorite applications will flawlessly work on it, the best way out is to leave the time-proved Windows XP intact and install Windows Vista for studying purposes.

As this very situation is very close to the previous one, please use the Windows Vista + Windows XP scenario but taking into consideration a number of peculiarities:

1. Besides hiding of the system partition before installation of the second OS **you need to make it inactive** as well. To do that, please call the context menu for it (right click of the mouse button) and launch the corresponding dialog. Click the *Yes* button to continue;
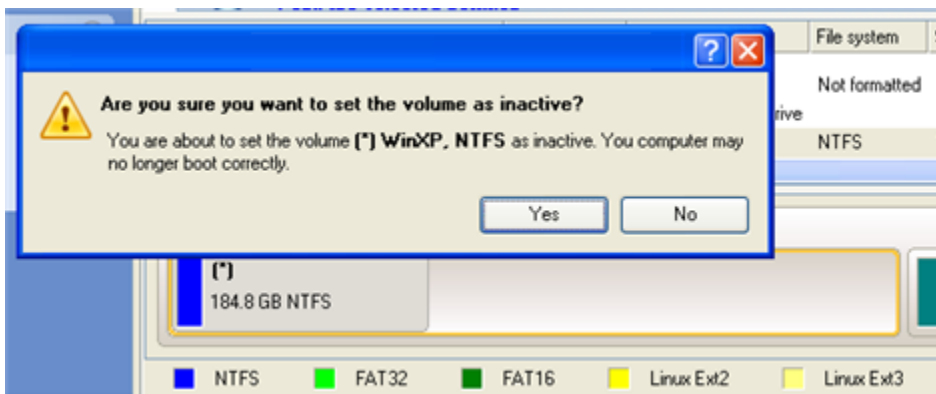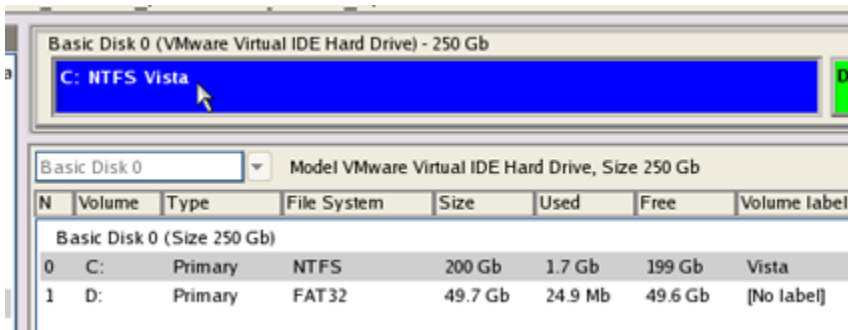

10.6.3 Reviving the System Partition

In case you are not able or not willing to complete the mentioned above scenarios, but have already reached the point when all changes are applied and everything is ready to install the second OS, simply do the following to make your system bootable once 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. Select the **Paragon Hard Disk Manager** item of the main menu.
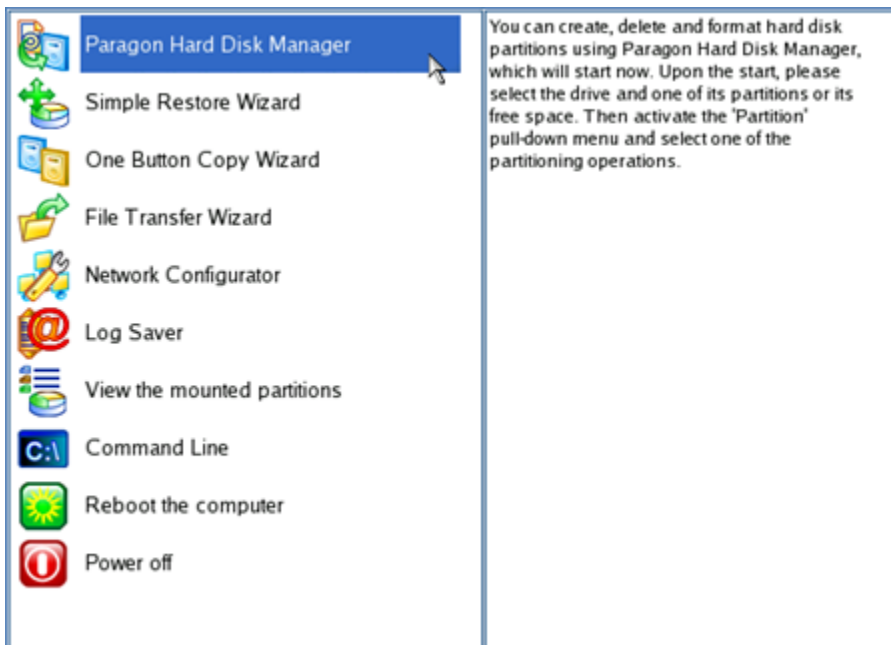
4. In the main window of HDM **select your non-bootable Windows partition on the Disk Map**;

5. **Unhide the partition** by calling the context menu for it (right click of the mouse button) and then selecting **Unhide**;
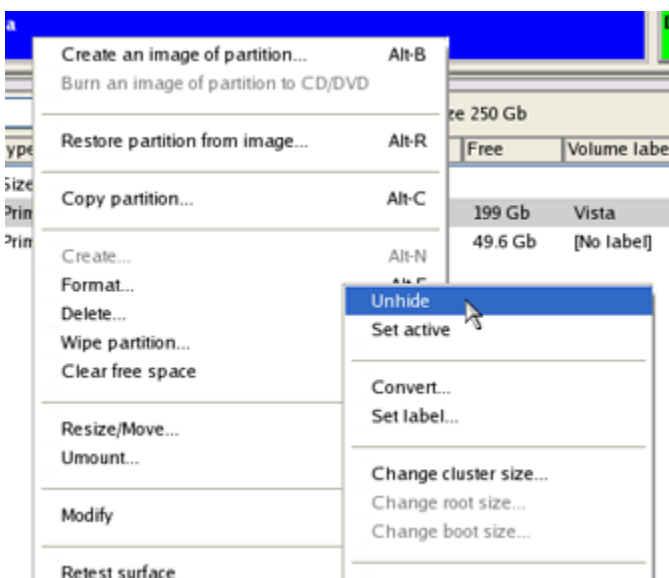
6. Only for the Windows XP + Windows Vista scenario you need to make the system partition active as well by calling the context menu for it (right click of the mouse button) and then selecting **Set Active**;
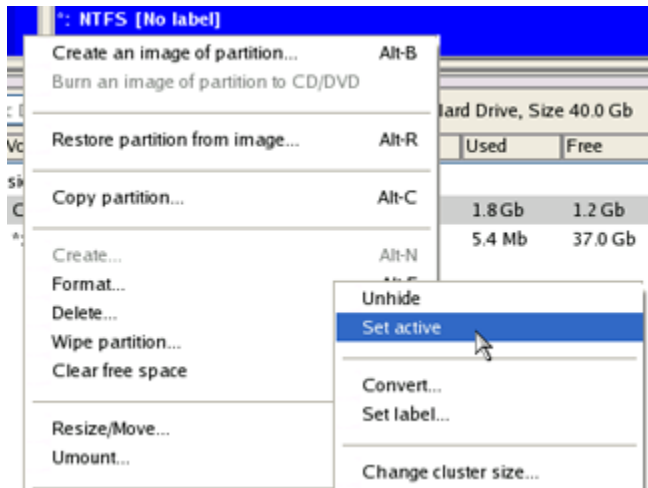
7. You will be notified after the operations are completed.
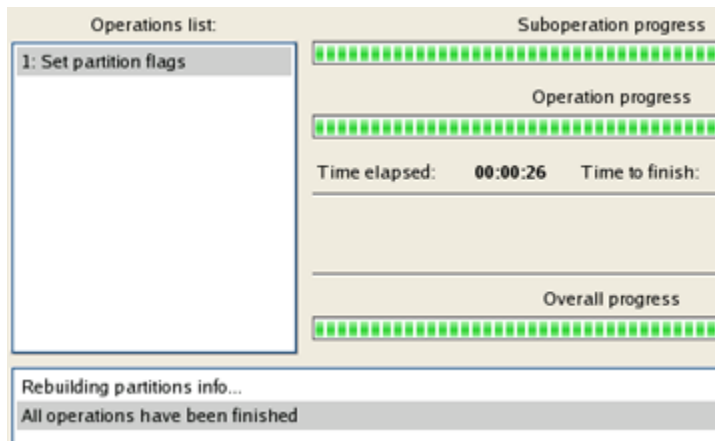
8. **Restart the computer**.

As a result your Windows becomes bootable once again.

10.7 Linux Network Configuration

In this section you will find out how to set up a network connection under Linux and configure settings of available network devices with the Network Configurator. The Network Configurator can be launched from the main menu of the Linux/DOS Recovery CD.

> **Due to certain limitations of the PTS DOS environment, *Network Configurator* is unavailable in DOS.**

10.7.1 Setting up a Network Connection

In order to establish a network connection and mount available shared resources, simply 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. Select the **Network Configurator** item of the main menu.

4. On the **Welcome** page of the wizard, select the **Configure Network Connections** option. Click the *Next* button.
5. On the **Configure Network Connections** page click the *Add* button to set up and mount a new network resource.
6. In the opened **Mount Setting** dialog, please define the following parameters for a new connection and available shared resources:
   - **Network path** to a shared resource on the net. Browse for it by clicking the appropriate button or manually enter the required path.
   - **Mount point**. It is a local directory where files from a shared network resource will be exported to. Browse for it by clicking the appropriate button or manually enter the required path.
   - **Username** and **Password** that will be given by a network administrator to connect to the shared resource.
7. Click the *Ok* button to confirm the entered parameters.

This connection will be added to the list of available network resources.

10.7.2 Setting up a Network Device

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. Select the **Network Configurator** item of the main menu.
4. On the **Welcome** page of the wizard, click the *Next* button.
5. The second page provides the possibility to select a file with network configuration settings (by default, **netconf.ini**). Click the *Next* button to continue.
6. The program performs autodetection of installed network devices and then displays a list of available devices (if any). The user can add a network device if it is not present on the list by clicking the *Add device* button.
7. Select the required device from the list and click the *Configure selected* button to configure it.
8. On the **Settings for Interface** page set an IP address (automatically defined by the DHCP Server or a static one), a network mask, a gateway and a DNS server address.
9. **Restart the network** to apply the entered parameters by clicking the *Restart network* button. Click the *Next* button.
10. Click the *Next* button to complete the operation.

11 Deinstalling the Program

To remove the program from your computer, please click the Windows **Start** button and select **Programs > Uninstall Paragon Hard Disk Manager 2008 Server**.

> **In case you have got the Bootable Backup Capsule or activated Boot Manager on your computer, please deactivate them before removing the program by launching the corresponding wizards. Otherwise their records will remain in the MBR.**

12 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.

Backup Capsule is a specially secured place on the hard disk which is used to store backup images. The backup capsule has an independent system layout (e.g. a separate partition) and is even operable when the active file system is damaged. To avoid a removal or unauthorized access to the data, this partition is hidden and cannot be mounted in the operating system. The content of the backup capsule is only available for browsing when using special software.

Backup Image is an archive of the disk, which includes all the on-disk files and service information on the disk layout. To restore disks from such an archive means retrieving all informational components of the disk (e.g. a hard disk image consists of its partitions, the Partition Table and even bootstrap code).

Bootable Archives are created by adding a special bootable section when the user is backing up the data to CD/DVDs. The user is 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 type of partition that you can create only on basic master boot record (MBR) disks. Extended partitions are useful if you want to create more than four volumes on a basic MBR disk. Unlike primary partitions, you do not format an extended partition with a file system and then assign a drive letter to it. Instead, you create one or more logical drives within the extended partition. After you create a logical drive, you format it and assign it a drive letter. An MBR disk can have up to four primary partitions, or three primary partitions, one extended partition, and 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 file system metadata. File system metadata are invisible for users and ordinary applications because accidental modifications of the metadata usually make 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 *Hard Disk Geometry* or *C/H/S geometry*.
Tracks and Cylinders are enumerated from "0", while Sectors are enumerated beginning with "1".
These disk parameters play an essential role in the *DOS Partitioning scheme*. The alignment of partitions takes the parameters of the hard disk geometry into consideration.

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 C/H/S geometry.

Hidden partitions. The concept of hidden partitions was introduced in the IBM OS/2 Boot Manager. Operating systems do not mount "hidden" partitions, which prevents access to their contents.

A method of hiding partitions consists in changing the Partition ID value that is saved in an appropriate entry of the Partition Table. This is achieved by XOR-ing the Partition ID with the 0x10 hexadecimal value.

This method only works when the set of usable Partition ID values is very limited, since large sets of usable Partition IDs can lead to confusing file system types; for example, Ext2 partitions are marked with the 0x83 Partition ID value. A hidden Ext2 partition would be marked with the 0x93 Partition ID value, which is identical with the Amoeba File system Partition ID.

Magnetic Force Microscopy (MFM) is an effective tool to magnetic investigations on submicron scale. Image obtained by MFM is the space distribution of some parameter characterizing magnetic probe-sample interaction, i.e. interaction force, amplitude of vibrating magnetic probe, etc. The MFM technology can be successfully used to resurrect deleted information.

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 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 capacity of the MBR is not sufficient to place sophisticated boot programs. This means that the on-boot software uses the entire 0th track of the hard disk in addition to the 0th sector because it is not included in any partition. 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 the identifier of a file system that is placed in the partition. The partition ID is used to quickly detect partitions of supported types. Some of the operating systems rely completely on the Partition ID when distinguishing supported partitions, while others again do not.
The partition ID is saved in appropriate entries of the *Partition Table*. It takes up only 1 byte of space.

Partition Label (sometimes also referred to as 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 DOS' FDISK utility.

Modern operating systems use other methods to save the Volume Label within the file system, e.g. as a special hidden file. The Volume Label is able to contain a relatively large amount of text in multiple languages. In general, the Volume Label and the Partition Label are rather different.

Partitioning scheme is a set of rules, constraints and the format of on-disk structures that keep information of the partitions that are located on the hard disk. There are several partitioning schemes, which can be used. The most popular partitioning scheme 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 *LDM* (Logical Disks Model) that originates from UNIX mainframe systems. The Veritas Executive accommodates the 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 older versions of Windows do not support DDM. In addition, most hard disk utilities do not support it as well.

Recovery Media is a CD or DVD (or even a floppy disk) from which the user can boot and recover the system.

Root Directory is the top-level directory of a formatted logical drive. The Root Directory includes other files and directories.
In modern file systems (e.g. Ext2/Ext3, FNTFS and even FAT32), the Root Directory does not differ from other directories in properties. 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 Serial Number, which consists of 32 bits and is represented by an 8-figure hexadecimal value.

The hard disk's Serial Number is stored in the MBR. Its value is assigned when the MBR sector is initialized by standard disk managing tools from Microsoft, such as Windows Disk Administrator and FDISK utility.

In fact, the hard disk's Serial Number is not important for most operating systems and software. It is known that Windows NT, 2000 and XP store hard disks' Serial Number values 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. In fact, the partition's Serial Number does not play an important role for most operating systems and software.