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Drive Backup™ 11 Server

User Manual

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Introduction

Paragon Drive Backup™ 11 Server is a complex disaster recovery and system migration solution. Compared to its predecessor, the current version can boast more efficiency and flexibility. Incremental chains to sector-based disk images and automatic exclusion of supported enterprise-level applications provide for better backup performance, minimize backup storage requirements, and eliminate any interference with special-purpose backup tools. Improved Paragon Adaptive Restore™ makes bare metal restore to dissimilar hardware easy and fast. After P2V migrations you've got not a bunch of virtual disks, but ready-to-use virtual machines. You can even get access to and connect disks of Windows guest machines hosted by ESX Server for maintenance or migration, etc.

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



Our company is constantly releasing new versions and updates to its software, that's why images shown in this manual may be different from what you see on your screen.

What's New in Drive Backup 11

- [Incremental backup to a sector image](#) is a further way of optimizing the process of disk imaging. Unlike differentials, it may not only contain data changed since the time of creating a full sector-based archive, but one of its increments as well, thus allowing to save more time and the backup storage. Introduction of a special index file that stores backup meta-information minimizes time and resources to create this type of archives.
- [Exclude filters for supported enterprise-level applications](#) (MS Exchange, SQL, SharePoint, Hyper-V, VMware Server) to provide for better backup performance of your Windows server, to minimize backup storage requirements, to eliminate any interference with special-purpose backup tools.
- [The updated P2P Adjust OS Wizard](#) to successfully start up a Windows physical system on a different hardware platform (P2P) by allowing injection of all required drivers and the other actions crucial for this type of migration. Including the third generation of Paragon's Adaptive Restore™ technology, it now can:
 - Analyze all installed drivers inside a target system to report on devices without drivers.
 - Search for and install lacking drivers from the built-in Windows repository.
 - Notify the user about boot critical devices without drivers (HDD/RAID controllers, etc.), automatically prompting to provide a path to a driver repository.
 - Name all devices according to their model description, not some alphanumeric code, which requires additional deciphering.
 - Determine and install drivers not only for boot critical devices, but for physically connected NICs as well.
- [The updated P2V Copy/Restore Wizards](#) to migrate a Windows physical system (live or from a Paragon's backup) to a virtual environment of one of the supported virtualization software vendors. In the latest version of the product the wizards enable to:
 - Create and properly configure virtual machines according to your preferences. Depending on the selected virtualization vendor you've got the option to specify a version of the future virtual machine, its name, location, RAM to allocate, a disk controller, the guest OS, etc. So when the migration is over, you'll get not only a virtual disk that contains an operating system and/or data, but a ready-to-use virtual machine.

- Convert any combination of hard disks and partitions to migrate your entire computer or certain partitions in one operation. Complex backups that contain partitions from different hard disks are supported as well.
- Employ MS VSS (Volume Shadow Copy Service) to synchronously migrate from several hard disks, thus ensuring data consistency during online migration of a system, which seats on several partitions or hard disks. This is achieved by taking a point-in-time snapshot of the whole disk subsystem.
- When migrating from several hard disks, all their signatures will be kept intact, so you'll get the same drive letters in a virtual environment.
- [The updated P2V Adjust OS Wizard](#) allows creation of virtual machines as well, so besides its primary function, you can now build virtual machines out of supported virtual disks or Windows Vista/7 backup images.
- [Create VD Wizard](#) to create an empty virtual disk or with specific data of one of the supported virtualization vendors.
- **Improved Connect VD** to connect a virtual disk as if it's an ordinary physical disk, thus opening up all functionality available for physical disks to virtual. You've now got the option to:
 - Mount Paragon's backups (.pbf images).
 - [Mount a virtual disk in the non-destructive mode](#). It's a special read/write mode, when all changes on the connected disk are being saved to a snapshot, thus providing complete safety for the original disk's contents. If needed, this snapshot can later be merged with its parental disk by using standard tools of virtualization software vendor.
 - [Connect to ESX Server through vSphere interface](#) to accomplish drive partitioning, data exchange, or OS migration of Windows virtual environments hosted by ESX. You've got the option to do these operations from one of Windows OS guests or from outside.
 - [Mount a virtual disk in the read-only mode](#) to make sure no data will be changed on the virtual disk during copy or any other operation on it.
- [Support of Oracle VirtualBox 4.0](#).
- [Backup files or entire disks to an FTP/SFTP server](#) to provide a new level of system and data protection.
- **Better performance for backup operations** by employing asynchronous data transfer.
- **Automatic backup/restore of ACL (Access Control List) for file backups** to inherit access permissions for backup contents when restoring to a different location.
- **Password protection for file backups** to prevent unauthorized access to your personal data.
- **Automatic partition alignment** during partitioning/copy operations to optimize performance of your hard disk.
- [Check FS Integrity and Data Loss Policies](#) to let you specify the acceptable balance between the operation performance and the risk of data loss.
- [Conversion of basic MBR disks to basic GPT](#) to enjoy all benefits of the newest partitioning scheme with minimal effort.
- [The updated Boot Corrector for WinPE](#) that now equals the functionality of the Linux/DOS counterpart.
- [WinPE traceroute/ping utility](#) to get detailed information on particular routes and measure transit delays of packets across an Internet Protocol (IP) network.

- **Support of the restart-free installation.**

Product Components

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

- [Windows based set of utilities](#) is the crucial part of the product. With the help of an easy to use launcher you may find and run tasks of any complexity in the field of data and system protection, hard disk partitioning and cloning, etc.
- [Linux/DOS based recovery environment](#) is a multi-platform bootable media that enables to run utilities under Linux or PTS DOS, and that way to get access to your hard disk for maintenance or recovery purposes. Both platforms have their strong sides, for instance Linux can boast support of FireWire (i.e. IEEE1394) or USB devices. It enables to burn CD/DVD discs. 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 environment 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 environment](#). Especially for keen followers of Windows, our product offers the option to prepare a WinPE based bootable media. Unlike the Linux/DOS recovery environment it can boast an excellent hardware support and the same interface as the Windows version can. However its system requirements are much tougher.

Features Overview

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

Features

Let us list some of the features:

User Friendly Fault Minimizing Interface

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

Backup Facilities

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



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

- [Available location for backup images:](#)
- *Backup to local mounted partitions.*

- *Backup to local unmounted (without drive letter assigned) partitions.*
- *Backup to an external mounted storage to provide for a higher level of data protection and system independence.*
- *Backup to a special secured place on the hard disk called the Backup Capsule that has an independent system layout (e.g. a separate partition) and will stay operable should the active file system be damaged. To avoid an accidental removing or unauthorized access of the backup data, this partition is hidden and thus cannot be mounted in the operating system.*
- *Backup to external media (CD/DVD) to guarantee a high level of data protection as long as the backup media is kept secure.*
- *Backup to a network drive to stand a better chance of success in case of a hard disk failure.*
- *Backup to an FTP/SFTP server to provide a new level of system and data protection.*
- **[Smart Backup Wizard](#)** to secure system and data with the minimal efforts possible. With a unique intelligent work algorithm and a highly intuitive user interface, you can easily back up exactly what you need - the whole system, e-mail databases (MS Outlook, Express, Windows Mail) media files or office documents of the My Documents folder, or any other files and folders.
- **[Differential backup](#)** to a sector image to only archive changes since the last full sector-based image, thus considerably saving the backup storage space. To restore this kind of backup you will require a full image and one of its differentials.
- **[Incremental backup to a sector image](#)** is a further way of optimizing the process of disk imaging. Unlike differentials, it may not only contain data changed since the time of creating a full sector-based archive, but one of its increments as well, thus allowing to save more time and the backup storage. Introduction of a special index file that stores backup meta-information minimizes time and resources to create this type of archives.
- **[Incremental backup to a file image](#)** to only archive changes since the last full or incremental file-based image. An incremental image is smaller and takes less time to create, but you will require the initial full image and all of its incrementals to restore the latest point of this kind of backup.
- **[File backup to a sector image](#)**. It is a unique technology on the market so far that bridges two principally different approaches of the data backup: the file-based backup and the disk imaging backup. With its help you can now create a sector-based backup of your system to get it back on track in minutes in case of a virus attack or a hardware malfunction and then just make file-based incremental images to the previously created sector-based backup to keep updated only information that is critical for you. Thus you will considerably save your system resources.
- **[Cyclic backup](#)** to automate the backup of separate partitions. It is an ideal option if you want to establish a self-acting data protection system.



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

- **[Synthetic backup](#)** to change any property (merge a given differential image with its full image, split/un-split, compress/de-compress, etc.) of an existing backup image without carrying out a physical backup operation.

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

Restore Facilities

- **Restore an entire disk, separate partitions or only files you need** from the previously created backup image.
- **Restore with Shrink** to restore a backup image to a free block of smaller size taking into account only the amount of actual data of the image.
- [Adaptive Restore](#) to successfully migrate a Windows physical system to a different hardware platform (P2P) by allowing automatic injection of all required drivers and the other actions crucial for a migration of this kind.



This feature is only available for the bootable recovery environment.

Copy Facilities

- [Partition/hard disk copy](#) to successfully transfer all on-disk information including standard bootstrap code and other system service structures, thus maintaining the operating system's working capability.



Copy functionality can also be used as an alternative way of data protection.

Virtualization Facilities

- [Connect VD](#) to connect a virtual disk as if it's an ordinary physical disk, thus opening up all functionality available for physical disks to virtual.
- [P2V Copy](#) to migrate a Windows physical system to a virtual environment in the online mode.
- [P2V Restore](#) to migrate a Windows physical system backed up with a Paragon disaster recovery tool to a virtual environment.
- [P2V Adjust](#) to recover the startup ability after unsuccessful virtualization with a 3rd party tool.
- [Create VD](#) to create an empty virtual disk or with specific data of one of the supported virtualization vendors.



Virtualization is the latest trend in the system migration, protection, and evaluation.

Partition/Hard Disk Management Facilities

- [Basic functions for initializing, partitioning and formatting hard disks](#) (create, format, delete). Instead of the standard Windows disk tools, the program supports all popular file systems.
- [Mount a partition](#) (assign a drive letter) of any file system type to make it available for your operating system.

- [Modify file system parameters](#) (make active/inactive, hide/unhide, etc.).
- [Undelete Partitions Wizard](#) to recover an accidentally deleted partition.

Automatization Facilities

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



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

- [Scripting](#) to make the program create a script of any set of operations you need. Besides support of all operations available in the interactive mode, the unattended mode provides some additional features, such as conditional execution, subroutines, repeatable iterations, disk/partition properties analysis, errors management, etc.

Auxiliary Facilities

- [Conversion of basic MBR disks to basic GPT](#) to enjoy all benefits of the newest partitioning scheme with minimal effort.
- [File Transfer Wizard](#) to make such operations as transferring of files/directories or burning of them to CD/DVD as easy and convenient as possible. Providing access to Paragon backups as regular folders, it may also help to replace corrupted data from a previously created image in case of an operating system failure.
- [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 provide access to the necessary files and directories regardless of their security attributes.
- [Recovery Media Builder](#) to create a bootable recovery media on a CD, DVD disc, or flash memory, which can later be used to boot and recover your computer in case of an operating system failure. Moreover, with its help you can save data from partitions of your hard disk directly to compact discs or burn ISO-images. The utility supports various formats of laser discs: CD-R/RW, DVD-R/RW, DVD+R/RW, DVD-R, DVD+R double layer, Blu-ray and can handle multi-session burning.
- [Network Configuration Wizard](#) to establish a network connection on a bootable recovery media either to save a backup of a partition/hard disk or just several files on a network computer or retrieve a previously made backup from a network computer for recovery purposes.
- [Boot Corrector](#) to fix most of the system boot problems that can be a result of a human factor, program error or a boot virus activity.



Boot Corrector is only available for the bootable recovery environment.

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 Hot Copy™** technology to copy locked partitions and hard disks under Windows NT+ family operating systems providing both high operating efficiency as well as low hardware requirements.
- **Paragon Adaptive Restore™** technology to successfully migrate a Windows physical system to a different hardware platform (P2P).
- **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 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 during the system restart, thus saving from the need to use a bootable media when modifying system partitions.
- **Paragon VIM™** (Virtual Image Management) technology that enables Paragon products work with virtual disks as though they are physical hard disks.
- **Microsoft Volume Shadow Copy Service (VSS)** to provide the copy/backup infrastructure for the Microsoft Windows XP/Vista/7/Server 2003/2008 operating systems. It offers a reliable mechanism to create consistent point-in-time copies of data known as shadow copies. Developed by Microsoft in close cooperation with the leading copy/backup solution vendors on the market, it is based on a snapshot technology concept.
- **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.
- **GUID Partition Table (GPT)**. It is the next generation of a hard disk partitioning scheme developed to lift restrictions of the old MBR. GPT disks are now supported by Windows Vista/7, Server 2008, Mac OS X and Linux.

Supported Virtualization Software

For remote connection to virtual hard drives

- VMware ESX 4.x and higher
- VMware ESXi 4.x and higher
- VMware ESXi 5.x and higher

The maximum number of simultaneously connected virtual disks is limited:

For ESX 4.x – 9 direct connections or 27 through vCenter Server;



For ESXi 4.x – 11 direct connections or 23 through vCenter Server;

For ESXi 5.x – depends on the workload of the host's hardware resources.

VMware products with prohibited vStorage API (Freeware ESXi, etc.) are not supported.

For direct access to virtual hard drives

- Microsoft Virtual PC 2007
- Microsoft Windows Virtual PC
- Microsoft Virtual Server
- Microsoft Hyper-V R1/R2
- Oracle Virtual Box 1.0-4.x
- VMware Player
- VMware Workstation
- VMware Server
- VMware Fusion



Snapshot disks of Oracle VirtualBox are not supported.

Supported virtual hard drive types

- VMware - Virtual Machine Disk Format (VMDK)
- Microsoft - Virtual Hard Disk (VHD)
- Oracle - Virtual Desktop Image (VDI)
- Paragon's backups (PBF)

Supported virtual machines for P2V scenarios

- Microsoft Virtual PC
- Microsoft Virtual Server
- Microsoft Hyper-V
- VMware Workstation
- VMware Fusion
- VMware ESX Server
- Oracle VirtualBox 4.0

Supported File Systems

- Full read/write access to FAT16/FAT32 partitions.
- Full read/write access to NTFS (Basic Disks) under Windows, Linux and PTS DOS. Compressed NTFS files are also supported.
- Full read/write access to Ext2FS/Ext3FS/Ext4FS partitions.
- Limited read/write access to Apple HFS+ partitions.



Unfortunately, support of non-Roman characters for the HFS+ file system is unavailable at the moment. The company is about to implement it in the nearest future.

Supported Media

- Support of both MBR and GPT hard disks (2.2TB+ disks included)
- IDE, SCSI and SATA hard disks
- SSD (Solid State Drive)
- AFD (Advanced Format Drive)
- Non-512B sector size drives
- CD-R, CD-RW, DVD-R, DVD+R, DVD-RW, DVD+RW, DVD-R, DVD+R double layer and also Blu-ray discs
- FireWire (i.e. IEEE1394), USB 1.0, USB 2.0, USB 3.0 hard disks
- PC card storage devices (MBR and GPT flash memory, etc.)

Getting Started

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

Distribution

Paragon Drive Backup 11 is distributed in two ways:

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

Distributive CD

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

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

Online Distribution

Drive Backup 11 purchased over the Internet will be in form of an MSI package. After installing the product you can launch the Recovery Media Builder [to prepare a recovery media](#).

Registration

Paragon Software GmbH provides a wide range of online services through its web-portal - www.paragon-software.com/support/:

- 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.



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

To register as a new user

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

1. Run an Internet browser and visit the page: www.paragon-software.com/my-account/;
2. Click **Create** of the **Create a Paragon Account** section;
3. Fill out a registration form;
4. Click **Register**.

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

To register a new product

If you are a registered user and would like to register Drive Backup 11, please do the following:

1. Run an Internet browser and visit the page: www.paragon-software.com/my-account/;
2. In the **Email** field of the **Authorization** section, enter an E-mail used for registration;
3. In the **Password** field enter a password received after registration;
4. Click **Sign in**;
5. If the user name and password are valid, you will get to your account;
6. Click **Register new product** of the **Products** section;
7. Enter your product serial number in the **Serial Number** field. You can find it in the product box or obtain from your reseller. Click **Next**;
8. On the next page you will be asked to provide some additional data. Also you will need to decide whether you want to get confirmation on registering the product by E-mail or not. Click **Next**, and then click **Finish**.

That is all. The product is now registered.

How to Download Updates/Upgrades

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

1. Run an Internet browser and visit the page: www.paragon-software.com/my-account/;
2. In the **Email** field of the **Authorization** section, enter an E-mail used for registration;
3. In the **Password** field enter a password received after registration;
4. Click **Sign in**;
5. If the user name and password are valid, you will get to your account;
6. Select **My Downloads** of the **Products** section to see what updates are available for you;
7. Select the desired update and click **Download**.

Contacting Paragon Software GmbH

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

Service	Contact
Visit Paragon Software web site	www.paragon-software.com
Registration & updates web-service	www.paragon-software.com/support
Knowledge Base & Technical Support	kb.paragon-software.com
Pre-sale information	sales@paragon-software.com

System Requirements

For the Windows installation package

- Windows XP SP3
- Windows Server 2003 SP2
- Windows Vista
- Windows Server 2008
- Windows 7
- Windows Server 2008 R2
- Windows SBS 2011

Additional requirements:

- To install and run the product the target OS should have Visual Studio C++ 2010 Runtime Library installed (comes with the installation package – you will be prompted to install it, if it's not been found in the system).
- To install and run the product the target OS should have Microsoft .NET 4.0 or later installed (you should download and install it yourself).
- If you installing our product on Windows Server 2003 SP2, you additionally need to have Visual Studio C++ 2005 SP1 Runtime Library installed (you should download and install it yourself).

You can download Microsoft .NET 4.0 from Microsoft's website:

<http://www.microsoft.com/downloads/details.aspx?FamilyID=0a391abd-25c1-4fc0-919f-b21f31ab88b7&displaylang=en>



During the installation additional free space (up to 1GB) will be required.

For the Linux bootable environment

- Intel Pentium CPU or its equivalent, with 300 MHz processor clock speed
- 256 MB of RAM
- SVGA video adapter and monitor
- Keyboard
- Mouse

For the WinPE bootable environment

- Intel Pentium III CPU or its equivalent, with 1000 MHz processor clock speed
- At least 512 MB of RAM
- SVGA video adapter and monitor
- Keyboard
- Mouse

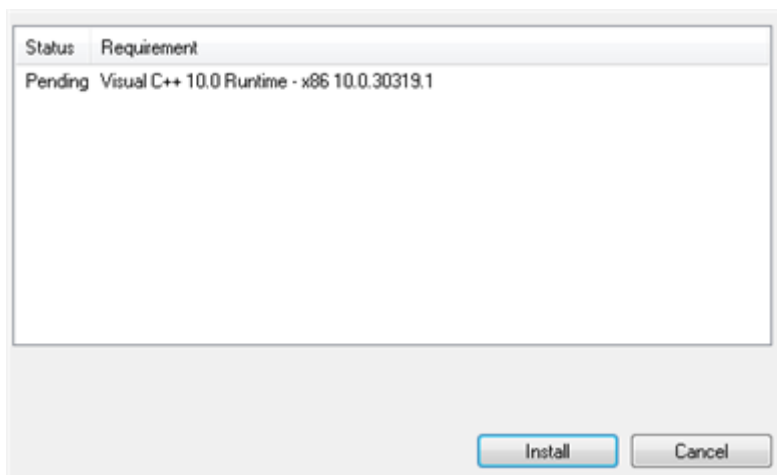
Installation

Before the installation, please make sure the [systems requirements](#) are met. If everything is OK, please do the following to install the product:

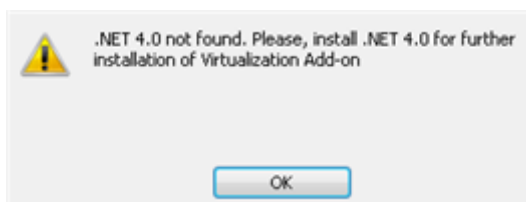


In case there is some previous version of the program installed on the computer, the program will offer the user to uninstall it first.

1. Click on the supplied setup file to initiate the installation. First your system will be checked for the presence of Visual Studio C++ 2010 Runtime Library and if not found, you will be prompted to install it (comes with the installation package). Click **Install** to continue.



2. Then your system will be checked for the presence of Microsoft .NET 4.0 or later. If not found, the installation won't continue with the corresponding warning:



You can download Microsoft .NET 4.0 from Microsoft's website:

<http://www.microsoft.com/downloads/details.aspx?FamilyID=0a391abd-25c1-4fc0-919f-b21f31ab88b7&displaylang=en>

3. The Welcome page will inform that the application is being installed. Click **Next** to continue.

4. Please Read Paragon License Agreement carefully and then select the appropriate option to accept. Otherwise you won't be able to proceed with the installation. By clicking the **Print** button, the license agreement may also be printed out.
5. Provide your product key and serial number.
6. On the Customer Information page you are to provide the standard customer information, i.e. a user name and an organization. Besides you need to decide whether to make the program available for all users of this computer (if several) or only for the current one.
7. On the next page, click **Change** to install the utility to a different location (by default **C:\Program Files\Paragon Software\Paragon Drive Backup™ 11 Server**). Otherwise click **Next** 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.

8. On the Ready to Install the Program page click **Install** to start the installation or **Back** to return to any of the previous pages and modify the installation settings.
9. The Final page reports the end of the setup process. Click **Finish** to complete the wizard.

First Start

To start Paragon Drive Backup 11 under Windows, please click the Windows Start button and then select **Programs > Paragon Drive Backup™ 11 > Paragon Drive Backup™**.



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

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



To know more on how to handle the product's interface and accomplish typical operations, please consult the [Windows Components](#) chapter.

Building Recovery Media

Recovery Media Builder can help you accomplish the following operations:

- Prepare the Linux/DOS recovery environment (included in the installation package) on external media (CD, DVD, or flash memory) to boot and run utilities under Linux or PTS DOS, and that way to get access to your hard disk for maintenance or recovery purposes (strongly recommended);
- Prepare a custom Linux/DOS recovery environment by adding any data you like to the standard image;
- Prepare a bootable recovery environment from any ISO image;
- Create from the master CD the Linux/DOS recovery environment on a CD/DVD disc, or flash memory.

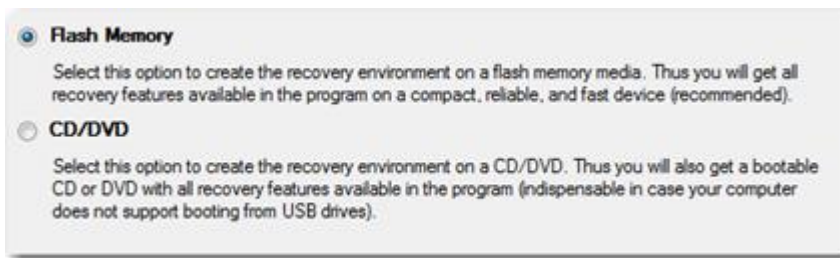
Below you can find how to build our Linux/DOS based recovery environment on a thumb drive:

1. Plug in a thumb drive of at least 250 MBs in size. Please note all data on that drive will be deleted.
2. In the Main Menu: select **Tools > Recovery Media Builder...**

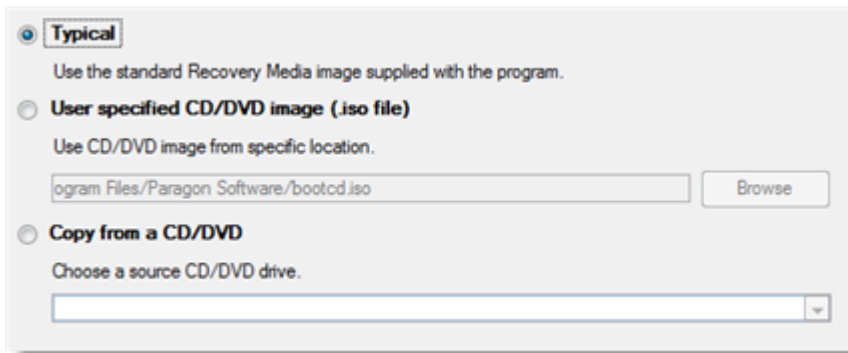


There are other ways to start up this function, please consult the [Interface Overview](#) chapter to know more on the subject.

3. On the Wizard's Welcome page, click the Next button.
4. Select the **Flash Memory** option.

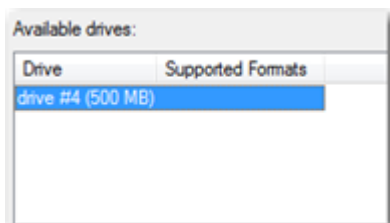


5. Select the **Typical** option.



Please use **Boot Media Builder** to prepare the WinPE recovery environment, which you can get here: www.paragon-software.com/my-account/.

6. Select the required thumb drive from the list of flash memory devices available in the system at the moment (if several).



7. You will have to confirm the operation.



Booting from the Linux/DOS Recovery Media

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

Startup

To start working with the Linux/DOS recovery environment, please take the following steps:

1. Start up the computer from our Linux/DOS recovery media.



[Recovery Media Builder](#) can help you prepare our recovery environment either on a CD/DVD disc or a thumb drive.

To automatically boot from the recovery media please make sure the on-board BIOS is set up to boot from CD/USB first.

2. Launch a boot mode you need (Normal, Safe, Low-Graphics Safe) in the Boot menu.

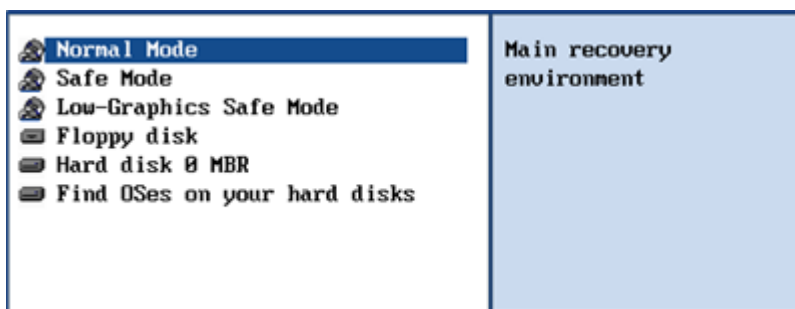


By default the Normal Mode will be automatically initiated after a 10 second idle period.

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

Boot menu

The Boot menu contains the following commands:



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

- **Find OS(s) on your hard disks.** The program will scan hard disks of your computer to find any bootable operating system.

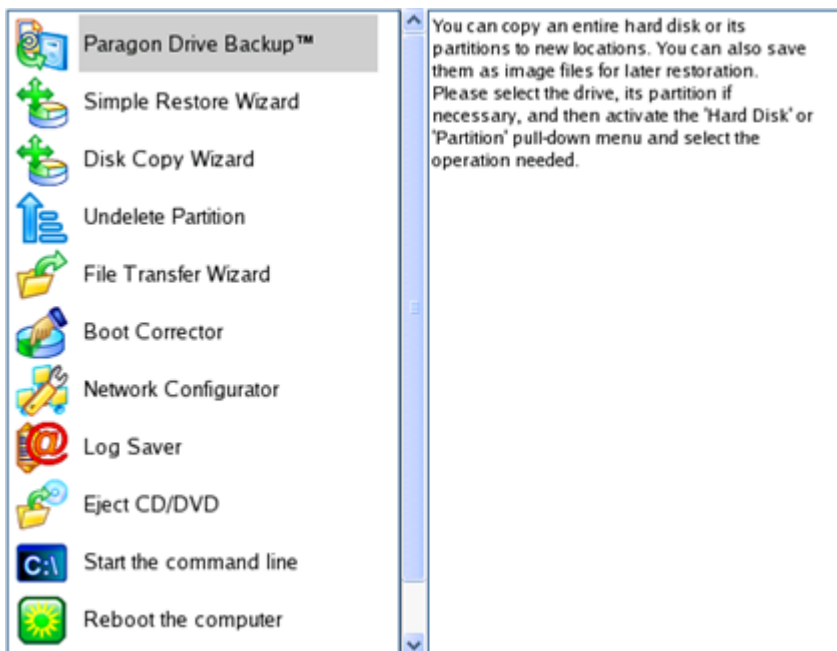
To move within the menu, please use the arrow keys of the computer keyboard.



While working with the recovery environment 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.

Normal Mode

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



- **Drive Backup** (enables to run wizards and dialogs, to specify program settings, to visualize the operating environment and the hard disk configuration);
- **Simple Restore Wizard** (allows restoring hard disks and partitions);
- **Disk Copy Wizard** (helps to clone a hard disk);
- **Undelete Partition** (allows recovery of accidentally deleted partitions);
- **File Transfer Wizard** (allows coping files/folders to another disk or a partition as well as recording them to CD/DVD);
- **Boot Corrector** (helps to correct the Windows System Registry without Windows being loaded);
- **Network Configurator** (enables to establish a network connection under Linux);



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

- **Log Saver** (helps to collect and send the necessary log files to the Technical Support);

- **View the mounted partitions** (the list of all mounted partitions will be displayed);



The Linux/DOS recovery environment 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.

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

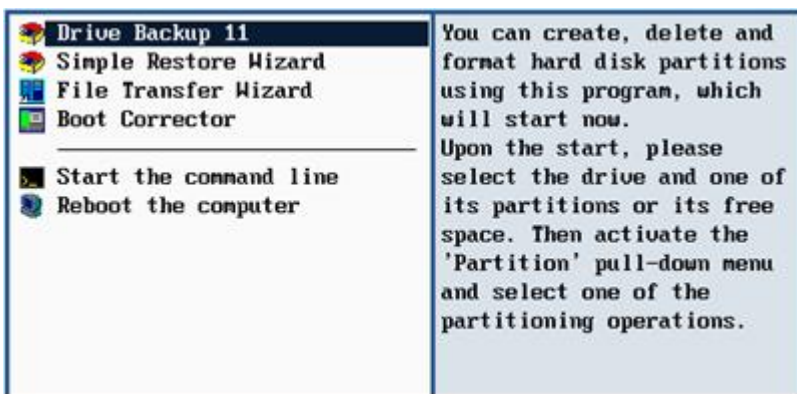
To move within the menu, please use the arrow keys of the computer keyboard.

Safe Mode

When the Safe mode is selected, the PTS DOS launch menu appears. It has nearly the same functionality as for the Normal mode except for 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 discs.

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.



Booting from the WinPE Recovery Media

The WinPE recovery environment can be a real alternative to the Linux/DOS recovery environment. Providing nearly the same level of functionality it offers an excellent hardware support and the same interface as the Windows version does.

Startup

To start working with the WinPE recovery environment, please take the following steps:

1. Start up the computer from the WinPE recovery media.



Please use **Boot Media Builder** to prepare the WinPE recovery environment, which you can get here: www.paragon-software.com/my-account/.

To automatically boot from the recovery media please make sure the on-board BIOS is set up to boot from CD/USB first.

- Once it has been loaded you will see the Universal Application Launcher. In general it enables to run components of the product, load drivers for undefined hardware or establish a network connection.



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



The WinPE based recovery environment offers excellent hardware support. However in case it doesn't have a driver for your disk controller, your hard disks will be unavailable. Please consult the [Adding specific drivers](#) scenario to know how to tackle this issue.

Basic Concepts

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

System and Data Protection

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

File Backup versus Sector Backup

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

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

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

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

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

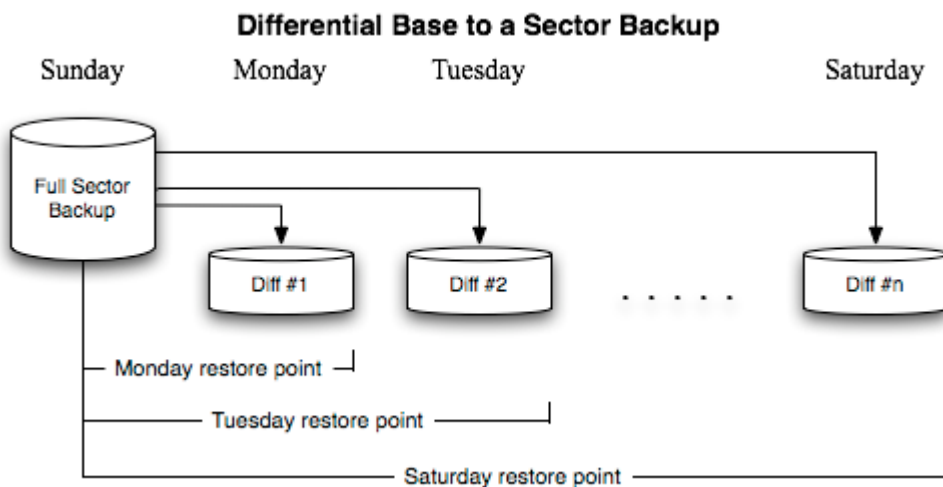
Backup Types

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

Full, Differential, and Incremental Sector Backups

A full sector-based backup image includes all contents of a partition or a hard disk at the moment of its creation. If you roll back your system to the initial state on a regular basis, that's exactly what you're looking for. But if you want to have multiple backup archives of the same partition reflecting certain time stamps, unchanged data will inevitably be duplicated in all archives and take additional space on backup media. To tackle this issue there has been developed a supplementary technique called Differential Sector Backup.

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

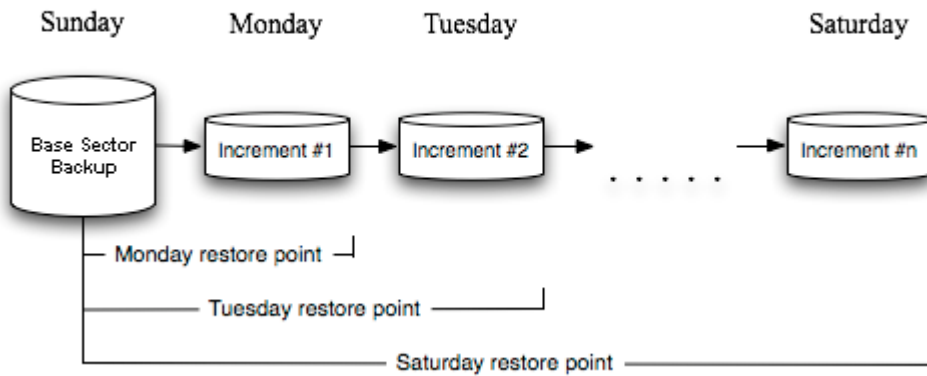


This function is only available for single primary and logical partitions.

Incremental archive is a further way of optimizing the process of disk imaging. Unlike differentials, it may not only contain data changed since the time of creating a full sector-based archive, but one of its increments as well, thus allowing to save more time and the backup storage. The main principal here is the shorter the interval between increments, the less data is backed up. In general this type of backup is great except for one thing – when you restore an incremental archive there will be processed the initial full image and all increments between, which depending on the size of your backup chain, may take plenty of time. Anyway unlike backups, the restore operation is an emergency, which might not happen at all.

Paragon's incremental sector-based archive employs an innovative technology that significantly improves the backup performance. Its core is in introduction of a special index file (.pfi) that keeps meta-information on the corresponding incremental image. It's much smaller than the image itself and is used to calculate the difference between the current and previous state of a backup object. Thus, when you're going to do an increment to a full archive of your system partition stored on the network, only its index file is processed over the net (a couple of megabytes at most), not the entire image, which minimizes both, the network traffic and backup time. Another new thing is change of a backup format – all increments are saved in .vhd (Virtual Hard Drive) containers.

Incremental Chain to a Sector Backup



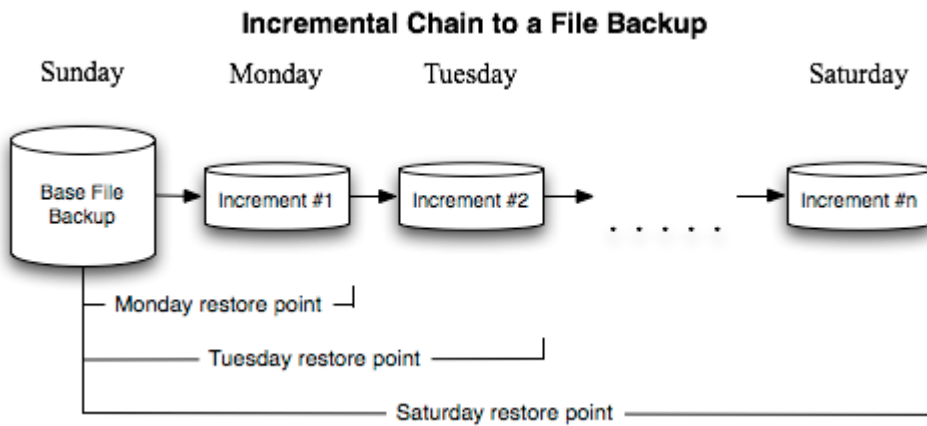
Please note that the current version of the product has a number of limitations regarding sector-based increments:

- Increments can only be created for full archives of the new type (with a .pfi index file). Any of our flagship products since Hard Disk Manager 12 supports this functionality;
- Increments can only be created for full archives stored on a local mounted drive or a network share;
- Increments cannot be created for archives of entire GPT disks;
- Increments can only be restored under Windows or WinPE;
- Increments cannot be processed with the Synthetic Backup Wizard;
- Increments cannot be processed with the Check Archive Integrity Wizard;
- Increments cannot be processed with the Create File Complement Wizard;
- Increments cannot be browsed in Volume Explorer;
- Increments can only be used with our software;
- Increments cannot be compressed;
- Increments cannot be encrypted;
- Increments cannot be splitted.

Full and Incremental File Backups

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

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



File Increment to a Sector Backup

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

Backup Storage

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

- You can place a backup image to a local partition. Despite the fact that it is the most convenient way, try not to use it. You can delete your backup just by accident or lose it as a result of a hardware malfunction, or a virus attack;
- You can place a backup image to an external mounted storage to provide for a higher level of data protection and system independence;
- You can place a backup image to a special secured place on the hard disk called the Backup Capsule that has an independent system layout (e.g. a separate partition) and will stay operable should the active file system be damaged. To avoid an accidental removing or unauthorized access of the backup data, this partition is hidden and thus cannot be mounted in the operating system. However it won't help you in case of a hardware malfunction;
- You can place a backup image to external media (CD/DVD) to guarantee a high level of data protection as long as the backup media is kept secure;
- You can place a backup image to a network drive to stand a better chance of success in case of a hard disk failure. Moreover, by storing it on a special-purpose server you may be pretty sure nothing will happen to it;
- Finally you can place a backup image to an FTP server to provide a new level of system and data protection.

Known Issues on FTP/SFTP

1. You need to check out yourself Windows Firewall or programs of this kind let our program work with the required port (21 by default).
2. You cannot restore data selectively (with Restore Wizard) from an FTP/SFTP server.
3. You can browse an FTP server in the passive mode only.

4. Parallel access to several FTP/SFTP servers is limited - only one password for all servers is available.

Adaptive Restore

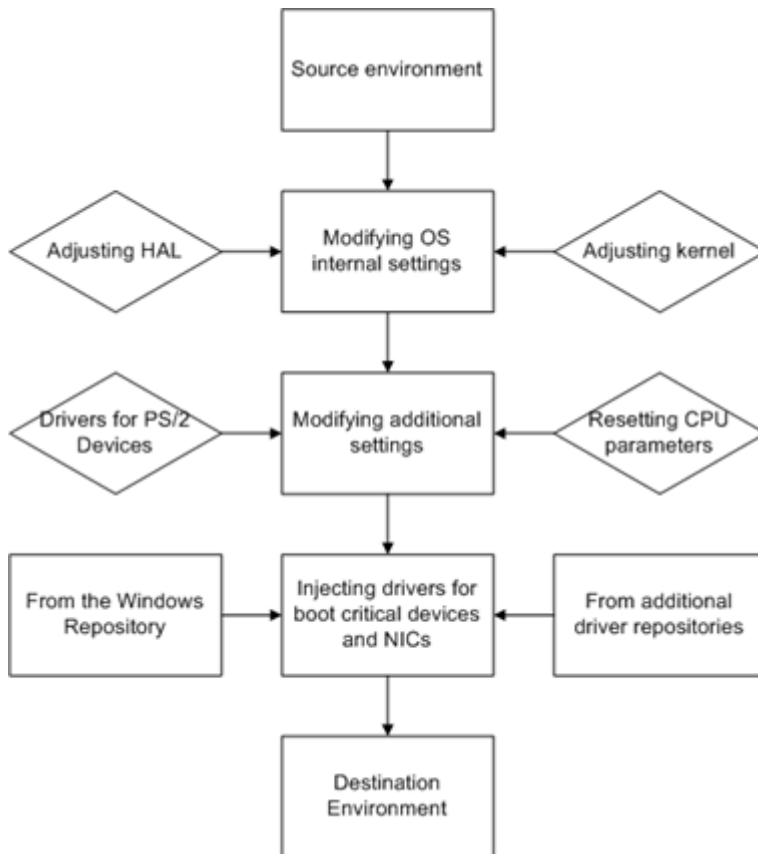
Technology Background

Windows family operating systems are notorious for their excessive sensibility to hardware, especially when it turns to replacement of such a crucial device as HDD controller or motherboard – actually Windows will most likely fail to boot as a result of this operation.

In 2008 our company came with an exclusive technology called Paragon Adaptive Restore™. Initially aimed at restore of Windows Vista or Server 2008 from a backup to a different hardware configuration, its current realization, available in the P2P Adjust OS Wizard, enables to make any Windows OS since XP bootable on dissimilar hardware by allowing automatic injection of all required drivers and the other actions crucial for this type of migration.

Technology Concept

Let's take a closer look at how Paragon Adaptive Restore works.



As you see, successful migration of a Windows system to a different hardware platform involves several actions:

1. **Change of the Windows kernel settings according to the new configuration.** The program detects the given hardware profile and automatically installs the appropriate Windows HAL and kernel.
2. **Installation of drivers for boot critical devices.** The program detects those without drivers and automatically tries to install lacking drivers from the built-in Windows repository. If there's no driver in the repository, it prompts the user to set a path to an additional driver repository, strongly recommending not to proceed until all drivers for the found boot critical devices are installed. In case drivers for these devices are installed, but disabled, they will be enabled.
3. **Installation of drivers for a PS/2 mouse and keyboard.** This action will only be accomplished for Windows XP/Server 2003.

4. **Installation of drivers for network cards.** The program detects those without drivers and automatically tries to install lacking drivers from the built-in Windows repository. If there's no driver in the repository, it prompts the user to set a path to an additional driver repository.

These actions guarantee a Windows system will start up on dissimilar hardware. After the startup, Windows will initiate reconfiguration of all Plug'n'Play devices. It's a standard procedure, so please don't worry and prepare the latest drivers at this step to get the most out of the system.



Though all Windows systems have built-in driver repositories, please be prepared to have additional drivers when dealing with Windows XP/Server 2003, because for these systems they are very modest.

Technology Application

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

- If you need to migrate to a different hardware platform with minimal effort
- If you need to upgrade hardware while keeping all programs and settings intact
- If you need to replace failed hardware and cannot find an exact match for original system specifications

Known Issues

1. After transferring Microsoft Vista and later versions to different hardware, you will need to re-activate license of the system. It's normal behavior as these systems keep tracking any change of hardware. Re-activation is legally justified in this case, as you transfer your system to another PC.
2. If you've installed several operating systems on one partition, we can only add drivers to the latest version of OS. Microsoft highly recommends that you install an operating system on a separate partition.
3. Please note drivers are not cached during selection. That's why if you select a driver to add to the system, but it's already unavailable during the operation, the program will end the operation with an error.

System Virtualization

With new powerful x86 computers, system virtualization has become extremely popular. It's a software technology that enables to run several virtual machines on one physical machine, providing resources of that single computer are shared across several environments. As a result one and the same physical computer can have multiple OSs and applications operating simultaneously, thus opening up enormous opportunities for both, business and home users, exactly:

- Avoid underutilization of up-to-date powerful computers;
- Increase flexibility of a physical infrastructure;
- Provide for increased availability of hardware and applications;
- Cut expenses on hardware and energy;
- Guarantee smooth and cost saving system migration;
- Enjoy working with old applications you can't launch on your current PC;
- Take advantage of having multiple operating systems on one Windows PC, including Linux, Mac OS X, etc.;

- Forget about hunting for replacement of the failed hardware, and many more...

Known Issues

1. You should install integration services (e.g. VMware Tools) on the virtual system yourself. We only guarantee its smooth startup.
2. After transferring Microsoft Vista and later versions to a virtual disk, you will need to re-activate license of the system. It's normal behavior as these systems keep tracking any change of hardware. Re-activation is legally justified in this case, as you transfer your system to another PC.
3. If your system hosts several Windows OSes, our program will find them all and automatically patch to run in a virtual environment. However we cannot guarantee smooth startup of all found Windows systems, but the guest OS, for its configuration parameters may be incompatible with the others.

Paragon Hot Processing & Volume Shadow Copy Service

Offline versus Online Data Processing

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

As the name infers, offline data processing can only be accomplished when the data is in consistent state (the operating system and all the applications are completely shut down). Actually it is the most preferable way of image creation or data cloning, since software can obtain an exclusive right to process data that guaranties high level of operating efficiency. However, the offline data processing is absolutely out of question when dealing with 24/7 production environments.

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

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

Paragon Hot Processing Technology

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

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

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



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

Volume Shadow Copy Service

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

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

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



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

Dynamic Disks

As you probably know, MS-DOS, Microsoft Windows 95/98/Me/NT/2000/XP/Vista/Server 2003/2008 support four primary partitions per physical hard disk, one of which can be extended. Certainly there is the possibility to create logical drives within the extended partition. Such types of disks are called basic. Windows XP Professional, Windows 2000, Windows Vista and Windows Server 2003/2008 follow the same strategy: You can have a maximum of four primary partitions, one of which can be an extended partition with logical drives. However, these operating systems also introduce a new disk configuration type - dynamic disk - which must be understood to effectively configure and manage hard disks.

Dynamic disk is a physical disk that doesn't use partitions or logical drives. Instead, it contains only dynamic volumes. Regardless of what format you use for the file system, only Win2K computers can access dynamic volumes directly. However, computers that aren't running Win2K can access the dynamic volumes remotely when connected to the shared folders over the network.

Dynamic disks can co-exist on a system with basic disks. The only limitation is that you cannot mix Basic and Dynamic disks on the same hard drive.

There are five types of dynamic volumes: simple (uses free space from a single disk), spanned (created from free disk space that is linked together from multiple disks), striped (a volume the data of which is interleaved across two or more physical disks), mirrored (a fault-tolerant volume the data of which is duplicated on two physical disks, and RAID-5 volumes (a fault-tolerant volume the data of which is striped across an array of three or more disks).

With dynamic storage, you can perform disk and volume management without the need to restart Windows.

Limitations:

- Dynamic disks are not supported on portable computers.

- Dynamic disks are not supported on Windows XP Home Edition-based computers.
- You cannot create mirrored volumes or RAID-5 volumes on Windows XP Home Edition, Windows XP Professional, or Windows XP 64-Bit Edition-based computers.

Thus, the dynamic disk is a new way of looking at hard disk configuration. Dynamic disks offer you more management flexibility without the partition limitation of basic disks. Dynamic disks can contain an unlimited number of volumes, but they cannot contain partitions or logical drives. Dynamic storage can be particularly beneficial for large-scale businesses when dealing with many physical hard disks involving complex setup.

GPT versus MBR

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

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

Apple Boot Camp

Boot Camp is a special utility to help you set up a dual boot system (Mac OS X and 32-bit Windows XP/Vista) on Intel-based Macs. It enables to securely re-partition your hard disk (resize an existing HFS+ partition to create a separate partition for Windows) and then launch the installation process. With Boot Camp all the necessary drivers will be at your disposal. Moreover after Windows has been installed it will serve as a boot manager to choose what operating system to start up.



It is strongly recommended not to modify the hard disk configuration with Windows Disk Manager. Otherwise it may lead to unexpected consequences, right up to BSOD and inability to boot in Windows XP/Vista. Please use our program to correctly update both MBR and GPT.

64-bit Support

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

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

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

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

Copy Operations

Hard drive duplication nowadays is becoming highly popular among PC users. That is due to some definite advantages it can offer. First of all, many people clone hard disks just to back up data for security reasons. The present day copy utilities enable 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.

The second possible application is the upgrade of a hard disk to a new one. The capacity of a modern hard drive doubles every two years, thus opening up new possibilities for software developers. As a result programs become more complicated and require considerable amount of free space. One day the user realizes that there is no more free space left on the hard disk and the only way out is to upgrade. Usually that means that besides purchasing a new hard disk, the user is to face a large re-installation procedure spanning several days of tedious work. But all of this can be avoided just by copying the contents of the old hard disk to a new one proportionally resizing the partitions.

And the last but not least is the copying of hard disks for cloning purposes. It may be of great use when setting up similar computers. There is no need for a system administrator to install an operating system from scratch on every one of them. It is enough just to configure one and then clone it to the others.

Drive Partitioning

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

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

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

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

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

Scheduling

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

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

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

Windows Components

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

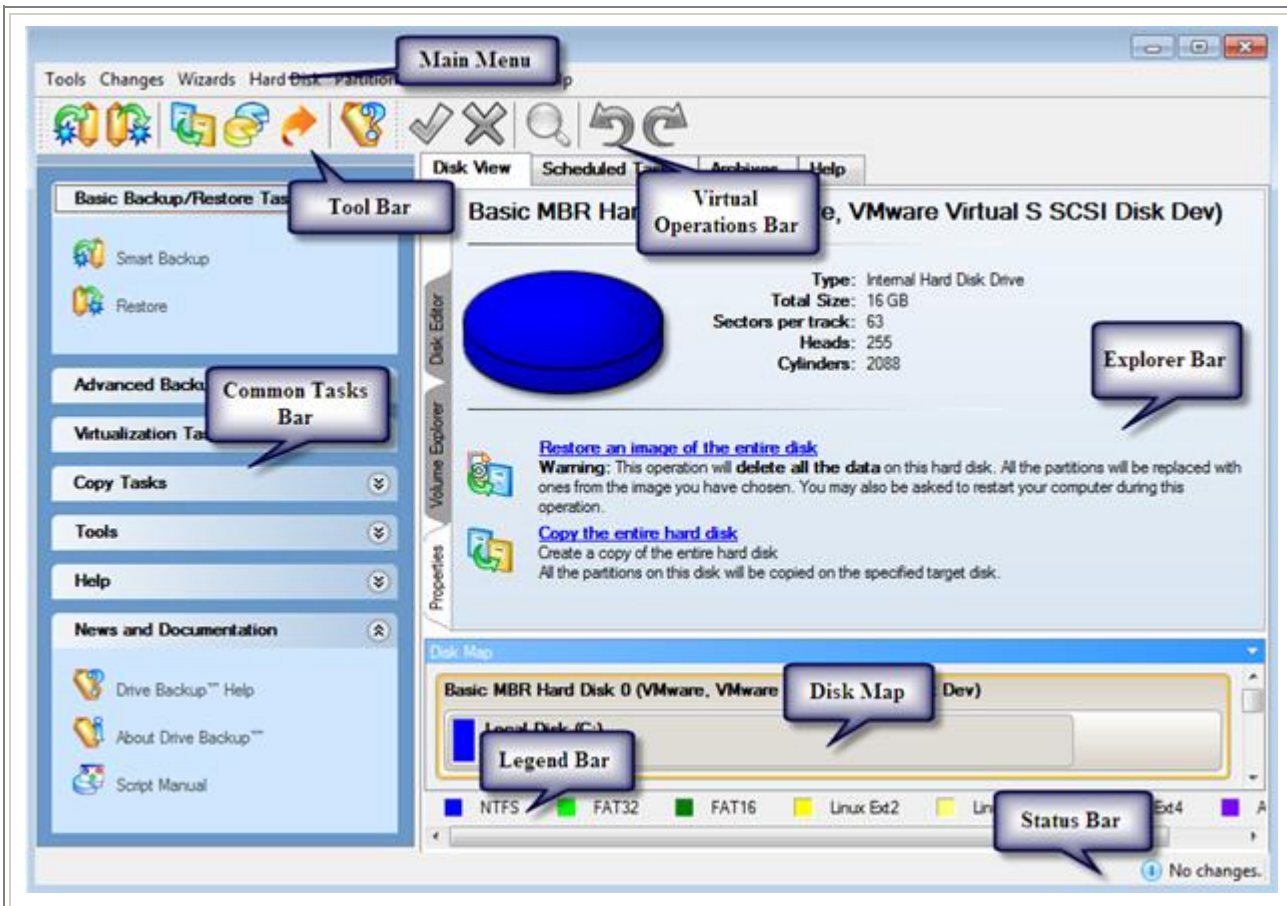
Interface Overview

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

General Layout

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

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



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

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

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

Main Menu

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

MENU ITEM	FUNCTIONALITY
Tools	
View Log Files	View logs on the carried out operations
Send Log Files	Compress and send the log to the Paragon Support Team

Log Saver	A wizard will help you collect and send logs to the Paragon Support Team
Recovery Media Builder...	Restore the system even when the current operating system cannot boot anymore
Check Recovery Discs...	Verify the recovery media for integrity and ability to boot from
File Transfer Wizard...	Transfer data from any media
Settings...	Edit the general settings of the program
Exit	Exit the program
Changes	
Generate Script...	Generate a script for the task
Save to Scheduler...	Schedule pending operations
Undo `the last virtual operation`	Cancel the last virtual operation on the List of Pending Operations
Redo `the last virtual operation`	Cancel the last undo virtual operation on the List of Pending Operations
View Changes...	Display the List of Pending Operations
Apply Changes	Launch the real execution of virtual operations
Discard All Changes	Cancel all virtual operations on the List of Pending Operations
Reload Disk Info	Refresh the current information about disks
Wizards	
Undelete Partitions...	Recover an accidentally deleted partition
Smart Backup...	Back up exactly what you need - the whole system, e-mail databases (MS Outlook, Express, Windows Mail) media files or office documents of the My Documents folder, or any other files and folders
Differential Backup...	Create a differential to a partition backup
Incremental Backup...	Create an increment to a full or incremental backup of a partition or hard disk
Create a File Complement...	Create a file increment to a full partition backup
Create a File Increment...	Create an increment to a file backup
Restore...	Restore an entire hard disk, separate partitions, or files from the backup image
P2P Adjust OS...	Make your system bootable on different hardware
Manage Backup Capsule...	Create and manage the backup capsule
Check Archive Integrity...	Perform integrity check for the required backup image

Cyclic Backup...	Automate a partition backup
Synthetic Backup...	Change any property of an existing archive (splitting, password protection, compression level, etc.) without accomplishing the backup operation
Create Virtual Disk...	Create an empty virtual disk or with specific data of one of the supported virtualization vendors
P2V Copy...	Migrate a live Windows physical system to a virtual environment
P2V Restore...	Migrate a Windows physical system backed up with a Paragon disaster recovery tool to a virtual environment
P2V Adjust OS...	Make Windows Vista/7 backups bootable on virtual hardware; recover the startup ability after unsuccessful virtualization with a 3 rd party tool
Copy Hard Disk...	Create a hard disk copy
Schedule Hard Disk Copy...	Set a timetable for a hard disk copy
Copy Partition...	Create a partition copy
Schedule Partition Copy...	Set a timetable for a partition copy
Hard Disk	
Back Up Hard Disk...	Create a backup archive of the selected hard disk
Burn Hard Disk to CD or DVD...	Back up the selected hard disk and burn the resulted image to CD/DVD
Restore Hard Disk...	Restore the selected hard disk from a backup image
Convert to Basic...	Convert a dynamic MBR disk containing simple volume(s) into a basic MBR disk
Convert to Basic MBR hard disk...	Convert a basic or a dynamic GPT disk containing simple volume(s) into a basic MBR disk
Convert to GPT hard disk	Convert a basic MBR disk into a basic GPT disk
Update MBR	Update MBR (Master Boot Record) of the selected hard disk
Change Primary Slots...	Modify the primary partitions enumeration for the selected hard disk
Copy Hard Disk...	Create a copy of the selected hard disk
Edit/View Sectors...	View/edit sectors of the selected hard disk
Connect a Virtual Disk	Connect a virtual disk to work with it as if it's a physical disk
Disconnect a Virtual Disk	Disconnect a virtual disk
Properties...	Get in-depth information on the properties of selected hard disk
Partition	

Create Partition...	Create a partition
Format Partition...	Format a partition
Delete Partition...	Delete a partition
Back Up Partition...	Create a backup archive of the selected partition
Burn Partition to CD or DVD...	Back up the selected partition and burn the resulted image to CD/DVD
Restore Partition...	Restore the selected partition from a backup image
Assign Drive Letter...	Assign drive letter to the selected partition
Remove Drive Letter...	Remove drive letter for the selected partition
Hide Partition...	Make the selected partition unavailable for the operating system
Unhide Partition...	Make the selected partition available for the operating system
Mark Partition as Active	Make the selected partition bootable by default
Mark Partition as Inactive	Make the selected partition non-bootable by default
Change Volume Label...	Change volume label of the selected partition
Change Serial Number...	Change serial number of the selected partition
Change Partition ID...	Change identifier of the selected partition
Test Surface...	Test surface of the selected partition/block of free space
Check File System Integrity...	Check the selected partition for possible file system errors
Edit/View Sectors...	View/edit sectors of the selected partition
Properties...	Get in-depth information on the properties of selected partition
View	
Layouts	Manage the Launcher layout with several predefined profiles
Toolbar	Manage the Tool Bar representation: show / hide standard and navigation buttons, text labels and large icons
Status Bar	Display the Status Bar
Common Tasks Bar	Display the Common Tasks Bar
Disk Map Legend	Display the Disk Map legend
Disk Map Location	Select whether the Disk Map will be located on the top of the main window or at the bottom







Help	
Help	Open the Help system (you can also do it by pressing F1)
About	Open the dialog with information about the program



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

Tool Bar





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

BUTTON	FUNCTIONALITY
	Back up exactly what you need with Smart Backup Wizard
	Restore a disk, partition, or files
	Copy a hard disk
	Copy a partition
	Collect and send logs to Support
	Open the Help system

Virtual Operations Bar

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

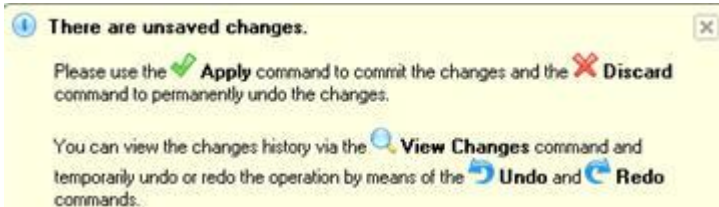
The Virtual Operations Bar enables to manage pending operations.

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



Cancel all virtual operations on the List of Pending Operations









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



Common Tasks Bar

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

The bar contains several tabs. Each tab includes a separate button bar which can be folded by clicking it.

Backup Tasks	
 Smart Backup	Starting the Smart Backup Wizard to back up exactly what you need - the whole system, e-mail databases (MS Outlook, Express, Windows Mail) media files or office documents of the My Documents folder, or any other files and folders.
 Restore	Starting the Restore Wizard to restore a hard disk, separate partition, or files from the backup image.
Advanced Backup Tasks	
 Differential Partition Backup	Starting the Differential Backup Wizard to create a differential to a partition backup.
 Incremental File Backup	Starting the Incremental Backup Wizard to create an increment to a file or partition backup.
Virtualization Tasks	
 Create Virtual Disk	Starting the Create Virtual Disk Wizard to create an empty virtual disk or with specific data of one of the supported virtualization vendors.
 P2V Copy	Starting the P2V Copy Wizard to migrate a Windows system to a virtual environment by converting all installed software and data into a virtual machine.
 P2V Restore	Starting the P2V Restore Wizard to restore a Windows physical system from a backup directly to a virtual environment.
 P2V Adjust OS	Starting the P2V Adjust OS Wizard to restore functionality of a virtual environment after unsuccessful virtualization with 3-rd party tools; prepare

	virtual machines out of supported virtual disks or Windows .vhd backup images.
Copy Tasks	
 Copy Disk	Starting the Copy Hard Disk Wizard to copy a hard disk.
 Copy Partition	Starting the Copy Partition Wizard to copy a partition.
Tools	
 Manage Backup Capsule	Starting the Manage Backup Capsule Wizard to create, resize or delete the backup capsule.
 Recovery Media Builder	Starting the Recovery Media Wizard to create a Linux/DOS bootable media which can be used to get access to your hard disk for maintenance or recovery purposes.
 Check Recovery Discs	Starting the Check Recovery Disk Wizard to verify recovery media for integrity and ability to boot from.
 Check Archive Integrity	Starting the Check Archive Integrity Wizard to verify backup archives for consistency.
 Synthetic Backup	Starting the Synthetic Backup Wizard to change any property of an existing archive (splitting, password protection, compression level, etc.) without accomplishing the backup operation.
 Transfer Files	Starting the File Transfer Wizard to transfer data from any media. Besides it provides access to Paragon backups as regular folders to browse through their contents or copy required files.
 Log Saver	Starting the Log Saver Wizard to collect and send logs to Support.
Help and Documentation	
 Drive Backup™ Help	Launching the help system (you can also do it by pressing F1).
 About Drive Backup™	Opening the page which contains information about the program. This page will be displayed in the Explorer Bar.
 Script Manual	Opening a brief review on the Paragon Scripting Language.

Disk Map

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

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



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

- Manufacturer,
- Model.

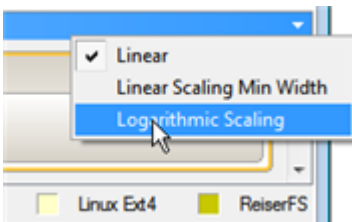
Small-sized bars display the following information about logical disks:

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

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

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

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



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



The drag-and-drop functionality is not available when the logarithmic type of the disk layout is selected.

Explorer Bar

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

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

- List of archives
- Volume Explorer utility
- Disk Editor utility

According to these categories the Explorer Bar has several tabs:

- **Disk View**, which offers the user the following options:
 - [Disk Editor](#) to view/edit sectors of the selected partition/hard disk
 - [Volume Explorer](#) to browse and export contents of the selected partition/hard disk
 - [Properties](#) to view detailed information on the selected partition/hard disk in the bright graphical form



You can switch between these components by clicking tabs on the left side of the Explorer Bar.





- [Scheduled Tasks](#), which gives the user the possibility of browsing and editing scheduled operations and the program scripts.
- [Archives](#), which enables to manage the Archive Database.
- **Help**, which contains the program help and general information on the product.

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

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

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

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

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

Legend Bar

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

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

- FAT16/32

- NTFS
- Linux Ext2/3/4
- Linux ReiserFS
- Apple HFS

Status Bar

This is the bottom part of the main window. The Status Bar displays menu hints, for each item the cursor points to. The user can hide (or show) the bar with the appropriate Main Menu item: View > Status Bar.

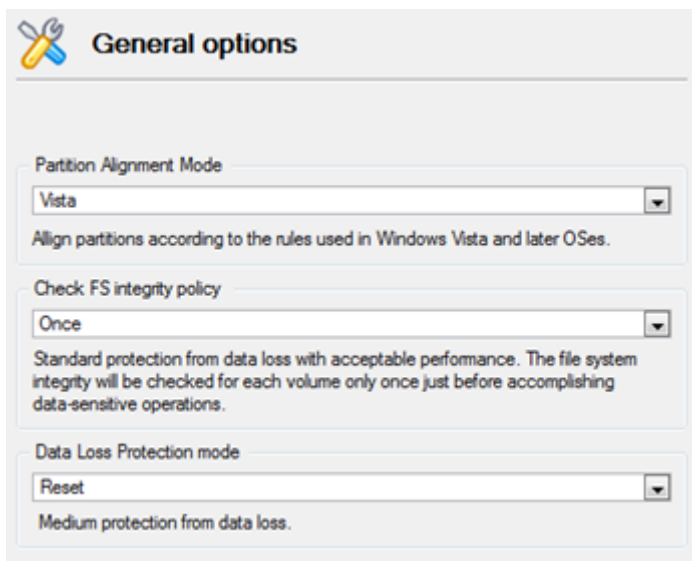
Settings Overview

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



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

General Options



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

- **Partition Alignment mode.** There are three options you can choose from:
 - **Legacy.** DOS and Windows OSes before Vista required that partitions had to be aligned to the “disk cylinder” or 63 sectors to address and access sectors correctly. It was OK, until 4K hard drives came into scene. When partitions are aligned this way on this type of disk, each logical cluster is linked to two physical 4K clusters, thus resulting in a double read-write operation.
 - **Vista.** Since Windows Vista, operating systems do not use the archaic CHS (cylinder/head/sector) addressing scheme, but the Logical Block Addressing (LBA), where sectors are addressed continuously over the whole disk drive. It is optimal for both, 512B and new 4K disk drivers.

- **Inheritance.** Select the option to disable automatic alignment of partitions.
- **Check FS integrity policy.** Accomplishment of any data-sensitive operation (resize, move, merge, redistribute, change cluster size, etc.) is potential with data loss. To minimize this risk, it's recommended to check integrity of your file system before this type of operations, despite the fact that it's quite time consuming. We offer you several options to let you choose, which is best for you:
 - **Always.** Maximum protection, but minimal performance. The file system integrity will be checked each time it's necessary to guarantee the maximum protection for the on-disk data.
 - **Once.** Standard protection with acceptable performance. The file system integrity will be checked for each volume only once just before accomplishing data-sensitive operations.
 - **Never.** No protection, but maximum performance. If you're not 100% sure your disk is rock solid, please do not use this option.
- **Data Loss Protection mode.** To guarantee safety for your information when a data-sensitive operation has been abruptly interrupted as a result of a computer reset, or a power outage, there are several techniques, that correspond to the options below:
 - **Do not protect.** No protection, but maximum performance. If you're not 100% sure you're completely safe from a power outage, or an accidental reset of your computer, please do not use this option.
 - **Reset.** Standard protection with acceptable performance. Maintaining a special journal, our program enables to automatically complete a data-sensitive operation interrupted by an accidental reset of your computer from our bootable recovery media, thus reviving the corrupted partition.
 - **Power loss.** Maximum protection, but minimal performance. Besides journaling, our program will also disable cache of your disk when accomplishing data-sensitive operations to avoid data loss even in case of a power outage.

Backup Image Options

Backup image options

Control archive integrity
Choose this option to allow writing of specific data that will later be used during restore to check the archive integrity. It can slow down the backup operation.

Set image file names automatically.
Choose this option to automatically name files in complex archive.

Compression level
Normal compression
Good compression. Provides average speed with the reasonable image size.

Image split
 Enable image splitting
Choose this option to enable splitting the archive to several files
Maximum split size: 4000 MB

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

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

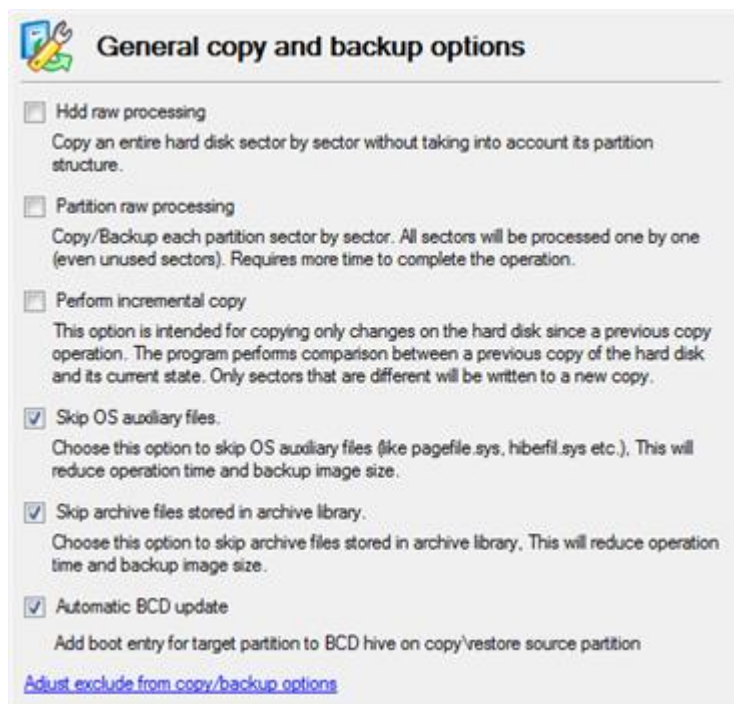
- **Set image file names automatically.** Mark the checkbox to make the program automatically set a file name for every volume of a complex backup image. Otherwise you will need to do it manually during the backup operation.
- **Compression level.** From the pull-down list you can select the desired compression level for backup images that will be used by default.
- **Enable image splitting.** Mark the checkbox to automatically split every backup image to volumes of a particular size.



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

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

General Copy and Backup Options



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

- **HDD raw processing.** Mark the checkbox to copy/back up a hard disk in the sector-by-sector mode, thus ignoring its information structure (e.g. unallocated space or unused sectors of existing partitions will be processed as well). This can help to avoid problems with hidden data created by certain applications or the system administrator. However, it will take more time to accomplish the operation.
- **Partition raw processing.** Mark the checkbox to copy a partition in the sector-by-sector mode to successfully process unknown file systems. However it is not recommended to enable this option when working with supported file systems as it takes more time to accomplish the operation.
- **Perform incremental copy.** Mark the checkbox to only copy changes on the hard disk from the moment of the last copy operation. The program will perform comparison between a previous copy of the hard disk and its current state. Only sectors that are different will be updated, thus considerably decreasing the amount of data to write.

- **Skip OS auxiliary files.** Mark the checkbox to skip OS auxiliary files (like pagefile.sys, hiberfil.sys, etc.), thus reducing the operation time and the resulted size of the backup image.
- **Skip archive files stored in archive library.** Mark the checkbox to skip backup images registered in the archive database, thus reducing the operation time and the resulted size of the backup image.
- **Automatic BCD Update.** Unmark the checkbox to suppress automatic update of BCD (Boot Configuration Data) after copy/restore operations.



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

CD/DVD/BD Recording Options

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

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

Hot Processing Options

Enable hot processing

Hot processing technology

Microsoft Volume Shadow Copy Service

Microsoft Volume Shadow Copy Service is a reliable technology designed to back up volumes being locked by numerous active transactions of VSS supporting applications. Microsoft VSS technology requires over 300 MB of free space on any mounted NTFS volume for temporary data. This technology is provided for Windows XP and newest Windows versions, but unavailable for old versions of Windows (98/ME/NT/2000).

Additional options

Always use hot processing

Use hot processing only when partition is locked

Hot processing temporary drive:

C:

Number of attempts to start VSS: 3

Timeout between attempts (in seconds): 120

Switch between Hot Processing technologies

In this section you may configure the hot processing mode:

- **Enable hot processing.** Mark the checkbox to enable the so called hot data processing mode that is specially designed to process data without restarting your operating system.
- **Hot processing technology.** From the pull-down list you can select the required hot processing technology.
- **Always use hot processing.** Select the option to process partitions without making them locked. Thus you will be able to keep working with them as usual.
- **Use hot processing only when partition is locked.** Select the option to use the hot processing only when partitions are locked and cannot be processed without restarting the computer. Please keep in mind, that once you start any operation on a partition in this mode, it will automatically be locked by the program, thus you won't be able to keep working with it as usual.
- **Hot processing temporary drive.** Here you can select a disk drive that will be used to store the temporary hot backup data (by default – C:).
- **Attempts to start VSS.** Here you can set how many attempts to start Microsoft VSS the program is to do before automatically rebooting the system and accomplishing the operation in a special boot-up mode.
- **Timeout between attempts (in seconds).** Here you can set a time period between different attempts to start Microsoft VSS.
- **Switch between hot processing technologies.** Mark the checkbox to automatically switch between Paragon Hot Processing and Microsoft VSS if one of them is unavailable at the moment.



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

Run during Backup Options

Run during backup options

For backup operations in the Paragon Hot Processing mode you have a possibility to run external programs and commands at different stages of the backup process. The key point to link such execution to is a short period of time when a snapshot is taken. (Snapshot is a map of used blocks; the system is totally frozen for writing when it is taken).

Please specify executable files for each stage if necessary:

Execute at the beginning of the backup process before taking a snapshot

Enter a file name here

Execute after taking a snapshot

Enter a file name here

Execute after finishing the backup process

Enter a file name here

[Change hot processing options](#)

In this section you can specify external applications to execute at various phases of the backup process. It can be particularly useful when imaging systems with high availability requirements (MS SQL, MS Exchange, etc.), since it enables to create a consistent snapshot even as the data is currently modified. The point is to provide a coherent state of all open files and databases involved in a backup, taking into account that applications may still keep writing to disks.

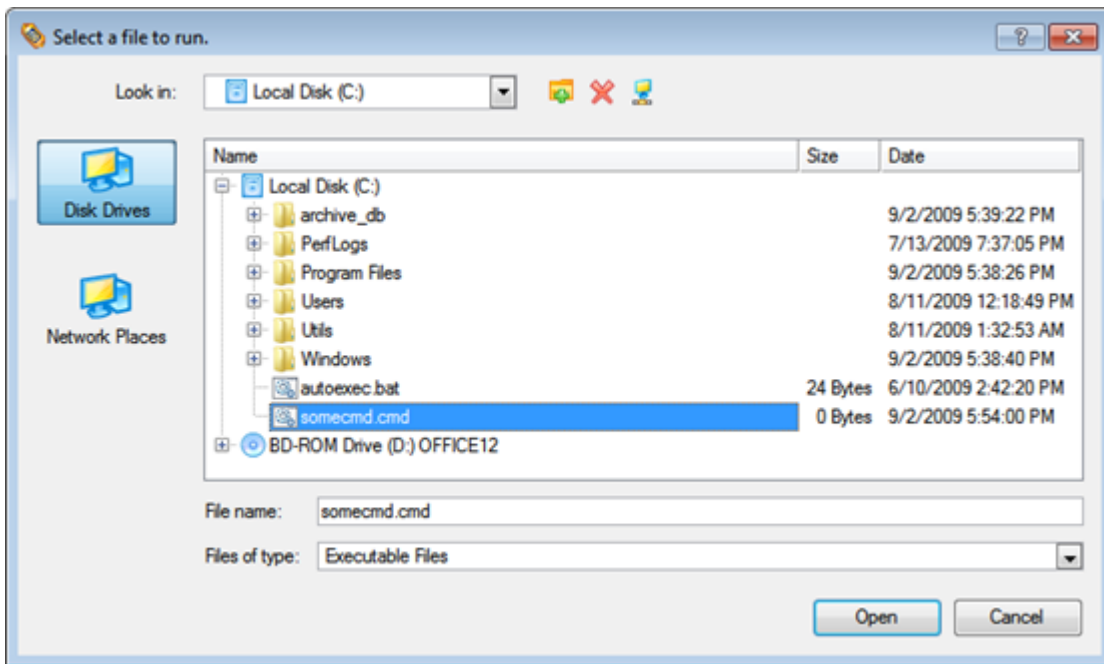
Actually the backup process consists of two phases: the preparation phase (snapshot) and the data-copying phase. There are three points of the backup when external commands/programs can be launched:

- **Execute at the beginning of the backup process before taking a snapshot.** Here you can specify an executable file that will help you to prepare running applications for taking a snapshot. It may contain specific commands/programs to delete unnecessary files, suspend services, flush transactions or caches, etc. Everything depends on the used applications.
- **Execute after taking a snapshot.** Here you can specify an executable file that will run just after taking a snapshot. It may contain specific commands/programs, e.g. to resume the previously suspended services, etc. Everything depends on the used applications.
- **Execute after finishing the backup process.** Here you can specify an executable file that will run after the backup process has been accomplished. It may include commands/ programs that will move the backup image to a particular location, etc.



By clicking the link at the bottom of the window you can jump to the [Hot Processing Options](#).

By clicking the Browse button you can get into the browser-like window to choose an executable file.



The program provides the ability to work with three types of executable files (.exe, .bat, .cmd). It is up to the user to write batch files to safely prepare applications for backup. There are some certain general requirements for that:

- All programs and commands must execute sequentially and finish before the .bat file completes its work.
- It is recommended to use external commands/programs in the following format - **Start/wait program.exe**. The **wait** option will help to start an application and wait until it completes its work. This will guarantee that all included commands/programs complete their execution before the batch file does.

This function is only available when the Hot Processing mode is enabled.

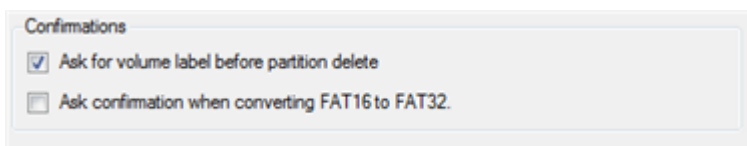


The program enables to set parameters for an executable file directly from the line.

However, if the file path contains word gaps it is necessary to enclose it in quotes in order to make the program distinguish between the path and the used parameters.

By clicking the link at the bottom of the window you can jump to the [Hot Processing Options](#).

Partitioning Options



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

- **Request confirmation before partition deletion.** Mark the checkbox to activate an additional security mechanism. Thus when going to delete a partition you will be automatically requested to enter its label.
- **Request confirmation when converting FAT16 to FAT32.** Mark the checkbox to automatically request confirmation before converting FAT16 to FAT32. There are a number of situations when this kind of conversion is the only way out to accomplish the operation. For instance, you are going to migrate your system to a larger hard disk with the proportional resize of existing partitions, what is very convenient. As a result you can get

original FAT16 partitions go beyond the 4GB limit. Thus without conversion to FAT32, this operation will in no way be possible to accomplish. The same goes for any copy hard disk/partition or restore hard disk/partition operation involving an extra upsizing.

E-Mail Options

Specify your e-mail account options:

Outgoing mail server (SMTP):

User e-mail address:

SMTP port number:

My outgoing server requires authentication

User name:

Password:

Click this button to test e-mail account options. The program will send generated e-mail message to the address you've specified in **User e-mail address** field.

Specify e-mail notification options:

Send E-Mail notification on apply

To:

Send mail in HTML format

Send complete report after applying operations

Send graphical view of the disk sub-system before and after apply

[Select the operations you would like to be notified about](#)

This section contains a set of options that will be taken into account during the Send log files and Send e-mail notification operations:

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

When you're ready with the settings, click on the **Send test e-mail** button to check if everything is OK.

- **Send e-mail notification on apply.** Specify an e-mail to send notifications on the carried out operations.
 - **Send mail in HTML format.** Activate the option to create messages in the HTML format instead of plain text.
 - **Send complete report after applying operations.** Activate the option to create an in-depth report on the carried out operations and send it after performing the last operation.
 - **Send graphical view of the disk sub-system before and after apply.** Activate the option to allow the program to attach two pictures of the disk layout made before and after the operation is completed.



By clicking the link at the bottom of the window you can jump to the [Operation Dependency Options](#).

Operation Dependency Options

Operation dependency options

Please select a task to be carried out when one or more of the following operations are committed.

Perform the task:

Operation	Selected
<input checked="" type="checkbox"/> Adjust OS to boot on new hardware	Yes
<input checked="" type="checkbox"/> Adjust OS to boot on virtual hardware	Yes
<input checked="" type="checkbox"/> Backup partition or disk	Yes
<input checked="" type="checkbox"/> Boot record correction	Yes
<input checked="" type="checkbox"/> Change NTFS version	Yes
<input checked="" type="checkbox"/> Change SID	Yes
<input checked="" type="checkbox"/> Check file system	Yes
<input checked="" type="checkbox"/> Compact \$MFT	Yes
<input checked="" type="checkbox"/> Convert Dynamic Disk to Basic	Yes
<input checked="" type="checkbox"/> Copy partition	Yes
<input checked="" type="checkbox"/> Copy partition with files exclusion	Yes

This section contains a set of options that will be taken into account when the Send e-mail notification on apply function is enabled. By marking/unmarking a checkbox opposite the required operation you can choose whether to receive an e-mail notification on its completion or not.



You won't be notified if an operation requires the system restart.

Virtual Mode Options

Operations mode

Allow virtual mode
Set this option on to carry out all the operations virtually. You will be able to commit the changes or rollback all of them or the last one. If you switch this option off, the operations will be carried out immediately.

Close progress dialog automatically
Set this option on to automatically close the progress dialog after committing the changes.

In this section you may configure the virtual mode:

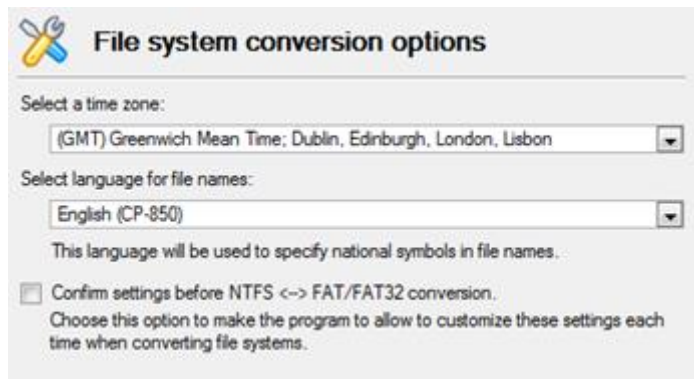
- **Allow virtual mode.** Mark the checkbox to enable the virtual mode. It is an effective way of protection from any troubles, since no operation will be executed until confirmation, thus giving you a second chance to weigh all pros and cons of this or that particular operation.



We strongly recommend you to enable this mode.

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

File System Conversion Options



This section contains a set of options that will be taken into account when converting FAT and NTFS file systems. By default, the program takes locale (regional) settings from the system. Problems might occur however because of different standards for file names and file time stamps (Created, Modified and Last Access Time) of NTFS and FATxx file systems.

To tackle problems of that kind you can manually set:

- **Time zone** to use during the convert operation. NTFS keeps file timestamps in GMT (Greenwich Mean Time) while FAT uses a fixed local date and time. The program takes proper account of these differences and enables to adjust timestamp values.



An incorrectly chosen time zone might lead to inability to launch certain software.

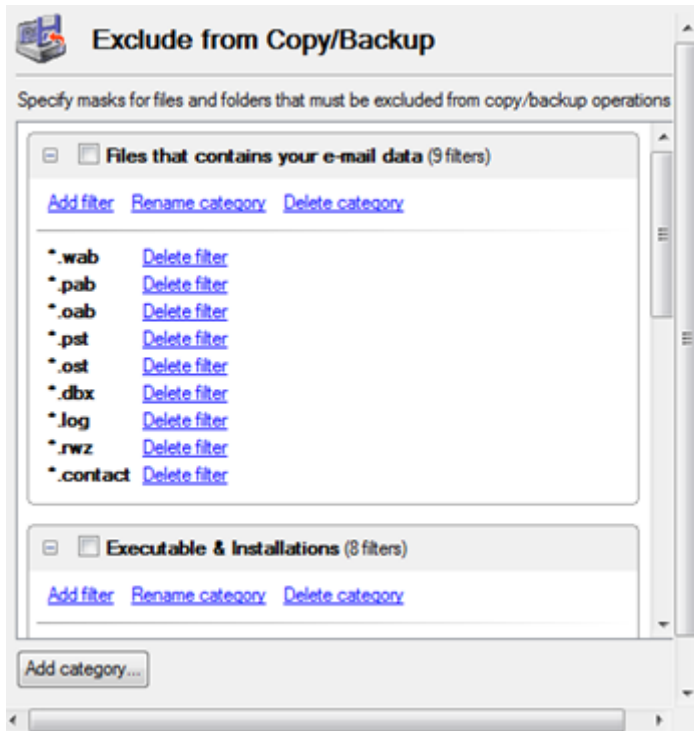
- **Language for file names** to use during the convert operation. NTFS stores file names in Unicode while FAT/FAT32 uses ANSI to save short file names (also called the DOS aliases). The codepage information is required for the correct conversion of non-English file names from Unicode to ANSI and vice versa.



An incorrectly chosen codepage will certainly result in corruption of non-English file names.

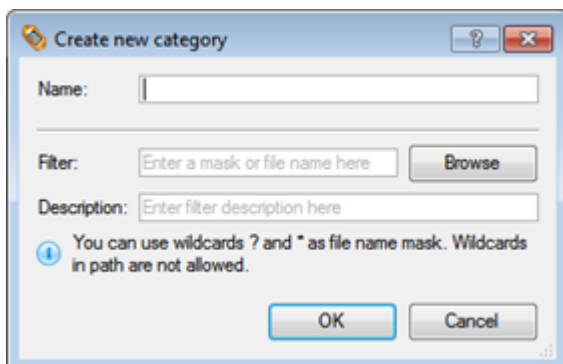
- **Request confirmation of settings before NTFS < - > FAT/FAT32 conversion.** Mark the checkbox to automatically display the local settings dialog to check and modify (if necessary) the default parameters before launching the convert file system operation.

Copy/Backup Exclude Options



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

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



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

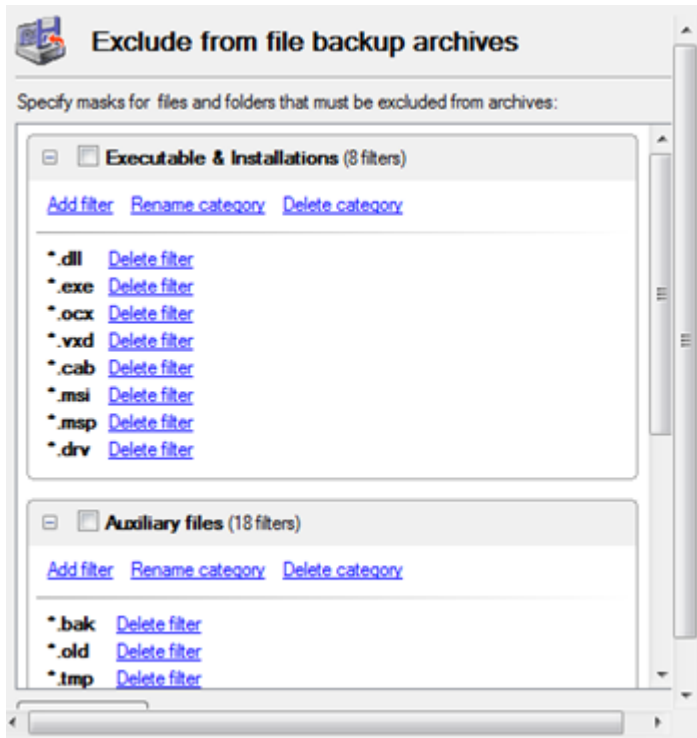
- **Name.** Give to the filter any name you like, but try to use an informative one;
- **Filter.** Press the Browse button to select files or folders you would like to be excluded or specify a filter mask by using * or ? wildcards;
- **Description.** Add a short description to the filter not to miss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

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



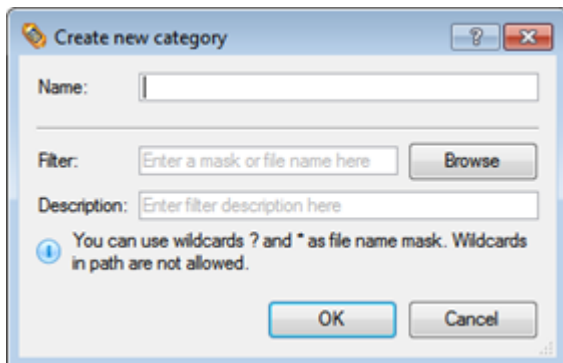
By clicking the link at the bottom of the window you can jump to the [General Copy and Backup Options](#).

File Backup Exclude Options



In this section you can find a lot of ready-made exclude filters to effectively control contents of your file-based backup images. Please note, by selecting certain filters you specify what data will be ignored during file-based backup operations, thus you specify the data you'd like not to be added to the resulted archives.

Anyway you've got the option to create your own filter by clicking the Add category... button.

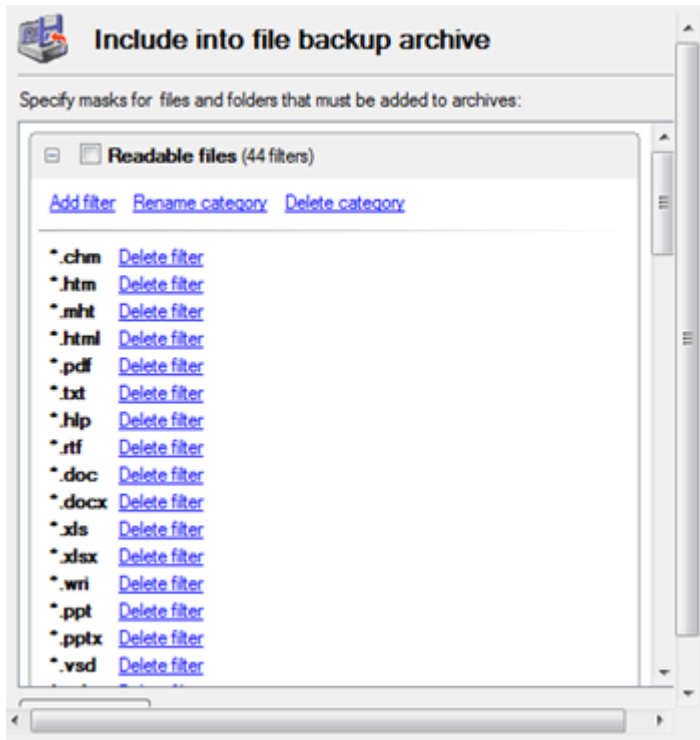


In the opened dialog the program allows the user to define the following parameters:

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

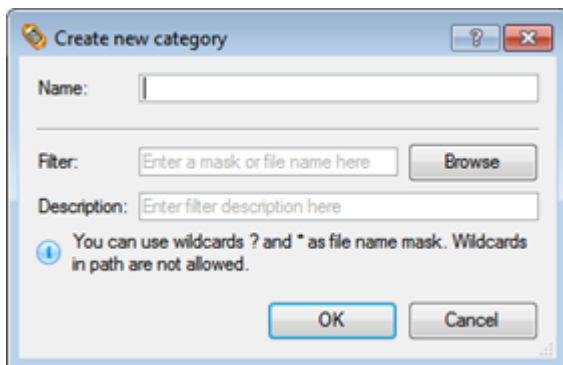
Click the OK button and you will get a new item on the list of filters. By marking/unmarking a checkbox opposite its name you can choose whether to use it or not.

File Backup Include Options



In this section you can find a lot of ready-made include filters to effectively control contents of your file-based backup images. Please note, by selecting certain filters you specify what data will be processed during file-based backup operations, thus you automatically ignore files that do not match, so they won't be added to the resulted archives.

Anyway you've got the option to create your own filter by clicking the Add category... button.



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

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

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

Log Files Options

In this section you can specify a storage life span for the stubact.log file:

- **Infinite** not to empty the file ever;
- **Minimal** to have the file emptied all the time;
- **Custom** to set a certain storage life span for the file. Please note, once the defined period has been expired, the file will be emptied.



We strongly recommend you not to choose the **Minimal** option, as in case of having problems with the program, our Support Team won't be able to study operation logs, thus help you out.

FTP Sites Options

In this section you can manage online backup storages located on FTP or SFTP servers. By clicking on available buttons, you can create, modify, delete an FTP/SFTP location, etc.

To create an FTP/SFTP location, you've got to specify a number of options:

- **Use SFTP connection.** Mark the option to connect to the desired SFTP server if necessary;
- **Address.** Type in an address to the desired server;
- **Port.** Specify the required port (21 for FTP and 22 for SFTP by default);
- **Anonymous login.** Mark the option to set up anonymous connection. Typical username for this type of login is “anonymous”;
- **Use Active Mode** (only for FTP). Mark the option if your provider requires this type of authentication;
- **Allow Open SSH key-based authentication** (only for SFTP). If your provider requires this type of authentication, mark the option to specify public and private keys and a passphrase;

Public key file:	<input type="text"/>	<input type="button" value="Browse"/>
Private key file:	<input type="text"/>	<input type="button" value="Browse"/>
Passphrase:	<input type="text"/>	


- **Login.** Enter a login;
- **Password.** Enter a password. Click **Remember password** to save it next time you back up to this location;
- **Name.** By default, the program uses the provided address as the connection name, which can be modified however.



You need to check out yourself Windows Firewall or programs of this kind let our program work with the required port (21 for FTP and 22 for SFTP by default).

By clicking the **Connect** button the provided location will be checked. If ok, you'll get a new item on the list named after this location. By clicking the + icon you can browse it to specify a more exact location for your backups.

Application-level Exclude Options

 **Excludes enterprise-level applications from backup**

Please specify applications or VSS writers which must be excluded from backup operations.

Supported applications

Exclude supported enterprise-level apps. There have been detected the following applications:

Display Name
<input type="checkbox"/> Microsoft Exchange Server 2003

VSS Writers

Specify writers which must be excluded from archives:

Display Name
<input type="checkbox"/> ASR Writer
<input type="checkbox"/> COM+ REGDB Writer
<input type="checkbox"/> MSSearch Service Writer
<input type="checkbox"/> Performance Counters Writer
<input type="checkbox"/> Registry Writer

In this section you can see all found enterprise-level applications supported by our program (if any installed). Please select those, which are protected with specially designed tools, thus excluding them from backup operations. It will help

you to significantly improve backup performance of your Windows server, minimize backup storage, and eliminate any interference.

Supported enterprise-level applications:

- MS Exchange 2003
- MS Exchange 2007
- MS Exchange 2010
- MS SQL 2005
- MS SQL 2008
- MS SQL 2008 R2
- MS SharePoint 2007
- MS SharePoint 2010
- MS Hyper-V
- VMware Server 2.x

Additionally the program displays all other VSS writers running in the system at the moment for you to decide those you don't need to back up.



By manually selecting a writer, you exclude the corresponding file or application from all disk imaging tasks (system writers included). Thus careless use of this functionality may cause corruption of your Windows OS after restore.

Viewing Disk Properties

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

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

Basic Hard Disk 1 (FUJITSU MPF3102AT)



Type: Basic Hard Disk Drive
Total size: 9.5 GB
Sectors per track: 63
Heads: 255
Cylinders: 1245

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

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


 **[Copy the entire hard disk](#)**
 Create a copy of the entire hard disk.
 All the partitions on this disk will be copied on the specified target disk.

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

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

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

Logical Disk (G:)



Volume letter: (G:)

Volume label: [FAT32-LINUX](#)

Type: Primary

File system: FAT32

Sectors per boot: 36

Sectors per cluster: 8

Serial number: [7493EA8F](#)

Partition ID: [0x0B FAT32](#)


Total size: 6.8 GB


Used space: 5.7 GB


Free space: 1 GB

Activity: Inactive

Hidden state: Not hidden

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

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

 [Copy the selected partition](#)
Create a copy of the partition. A new partition will be created and all the data will be copied there. You can create an exact copy, or copy only the area that is occupied by data.

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

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

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

Viewing Image Properties

General information on backup archives can be obtained with the following tools:

Using the Restore Wizard

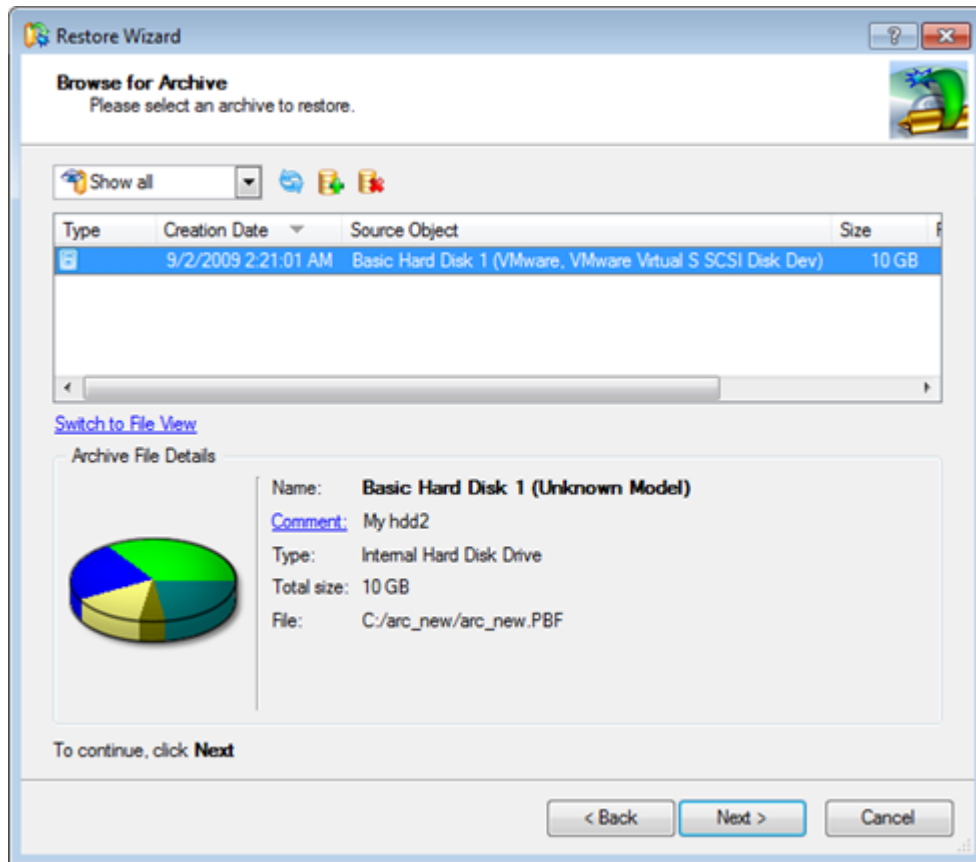
- In the Main menu: select **Wizards > Restore...**



There are other ways to start up this function, please consult the [Interface Overview](#) chapter to know more on the subject.

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







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









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





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

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

FLAG	FUNCTIONALITY
	Disk archive
	Partition archive
	File archive
	MBR archive
	System archive
	Encrypted archive

	Compressed archive
	Complex archive
	Filtered archive
	Differential archive
	Incremental archive
	File increment to a partition archive

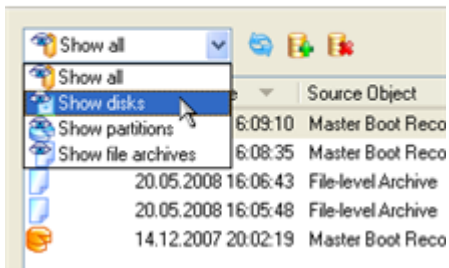
To easily manage images in the Archive Database, the program provides the following functionality:

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

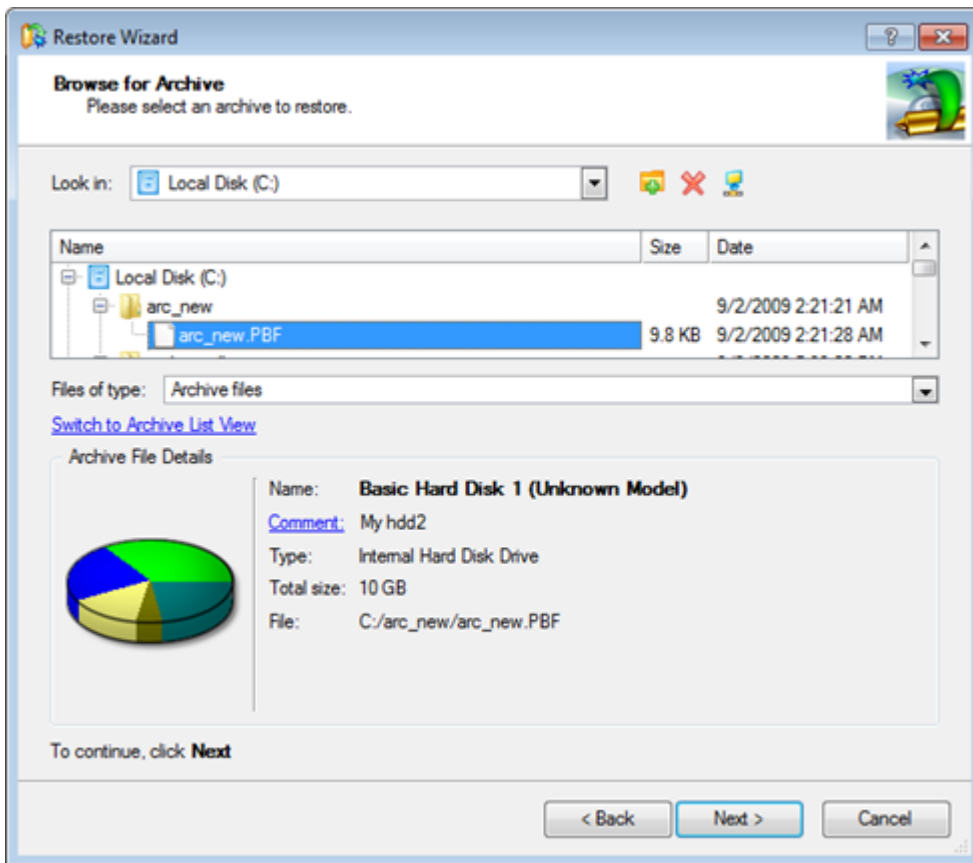
Besides you may filter backup archives to decide whether to show only file, partition or hard disk archives. To do that, please select the required filter in the left top corner of the page.

Browse for Archive

Please select an archive to restore.



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

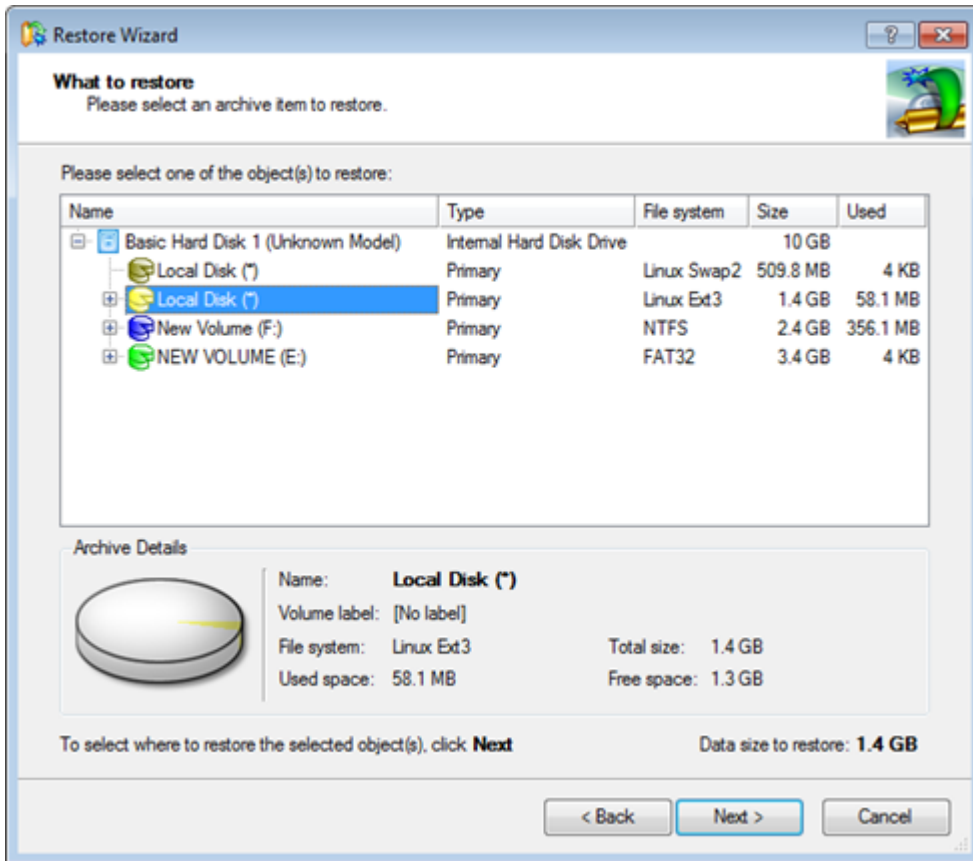


The section below (i.e. Archive File Details) displays a short description of the selected image, including:

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

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

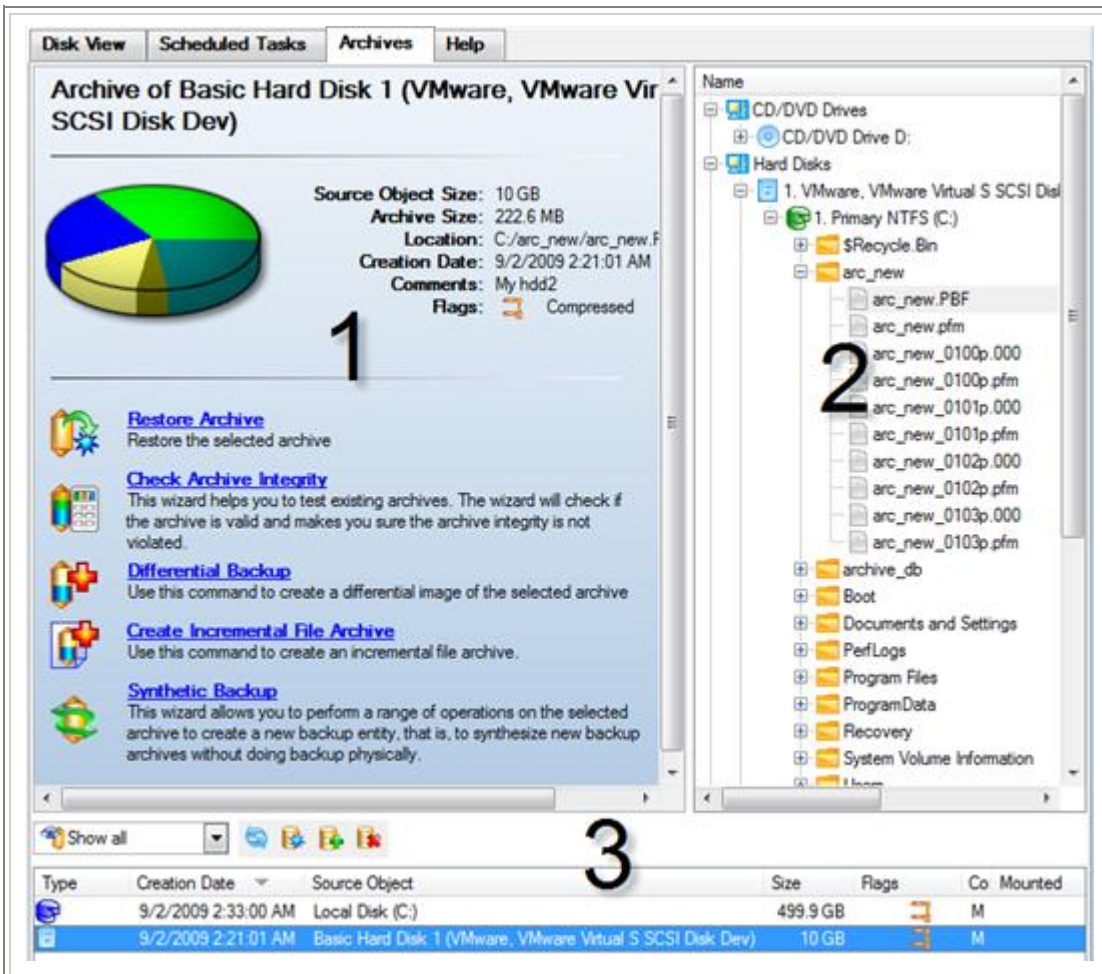
The next page (i.e. What to restore) displays detailed information about the contents of the archive.



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

Using the Archive Database

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



1. [Explorer Bar](#) that displays properties of the selected image.
2. [Volume Explorer](#) that enables to access the selected image as a regular folder to explorer its contents or to retrieve certain files.
3. **Archive List** that displays a list of images contained in the Archive Database (if any). Besides the program provides all the necessary functionality to manage backup images in the database (add, delete, mount, refresh, etc.)



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

Data Backup and Rescue

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

Creating Backup Images

Depending on a type of information you need to protect and the way this information should be processed, the program offers a number of handy backup wizards. To make your job with the program as easy and convenient as possible, all backup wizards share similar work algorithm. By going through steps of the wizard, you configure all the necessary settings to launch the backup operation. To minimize the possibility of making any mistake, the wizard provides auxiliary information on every single option. Moreover you can get an in-depth description to any setting, control, or field of the wizard just by clicking the hint button and then the object you need.

Smart Backup Wizard Startup

- In the Main Menu: select **Wizards > Smart Backup**



There are other ways to start up this function, please consult the [Interface Overview](#) chapter to know more on the subject.

Smart Backup Wizard Setup

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

- **The object to back up.** Click on a section you find answering to your task.

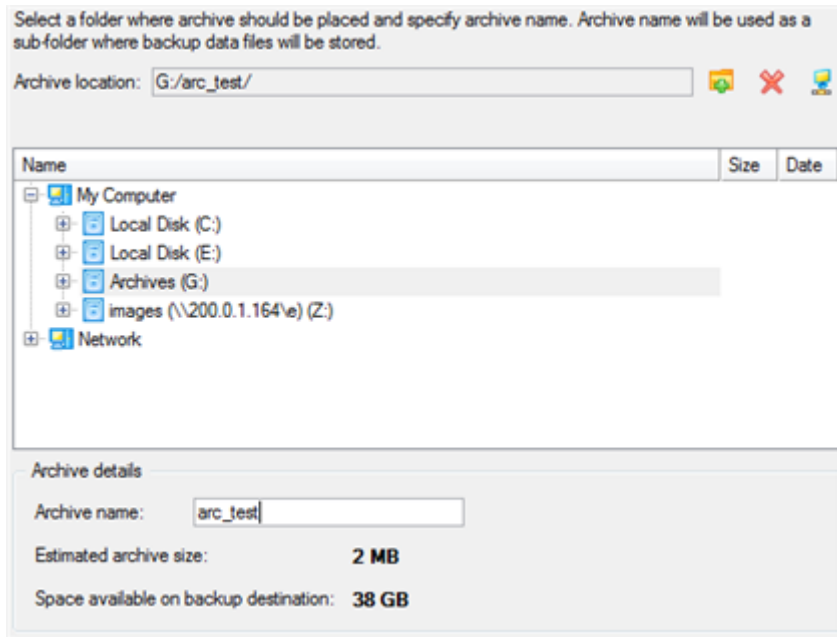


- **Disk or Partitions** to create a sector-based backup of the whole disk system, or only separate partitions;
- **E-mail** to create a file-based backup of e-mail databases, accounts and address books of MS Outlook, MS Express, and Windows Mail;
- **Media Files** to create a file-based backup of all media files (photo, video, music, etc) stored in the My Documents folder;
- **Documents** to create a file-based backup of all office documents stored in the My Documents folder;
- **Other Files and Folders** to create a file-based backup of any files and folders.



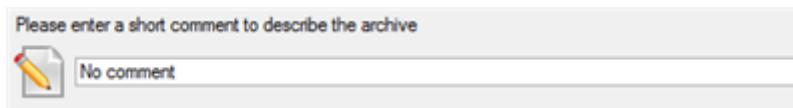
If selecting **Disk or Partitions** or **Other Files and Folders** you will need to specify more exactly the object of operation. To know more on the subject, please consult the [Backup Scenarios](#) chapter.

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



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

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



Result

After the backup operation is completed you receive an image of the selected object. This image is placed into the specified destination, its features defined by the wizard.

Available operation scenarios:

- [Backing up a hard disk or partition to the Backup Capsule](#)
- [Backing up a hard disk or partition to external media \(CD/DVD\)](#)
- [Backing up a hard disk or partition to a network drive](#)
- [Backing up files to an FTP/SFTP server](#)
- [Backing up a dual boot Mac to an external USB drive](#)
- [Backing up files to a local mounted/unmounted \(without drive letter assigned\) partition](#)
- [Creating a differential to a full partition backup](#)
- [Creating a sector increment to a full partition backup](#)
- [Creating a file increment to a full partition backup](#)
- [Creating an increment to a full file backup](#)
- [Creating a cyclic partition backup](#)

- [Merging a full partition backup with one of its differentials](#)

Restoring System and Data

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

Startup

- In the Main Menu: select **Wizards > Restore...**



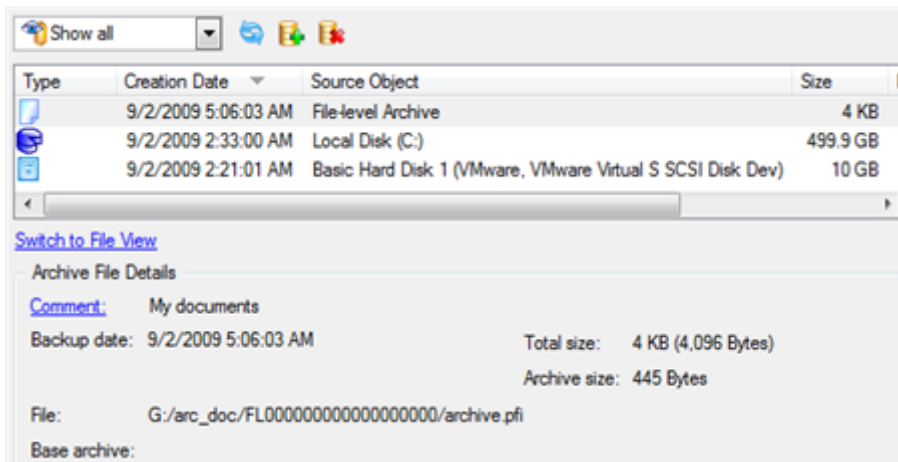
There are other ways to start up this function, please consult the [Interface Overview](#) chapter to know more on the subject.

Setup

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

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

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

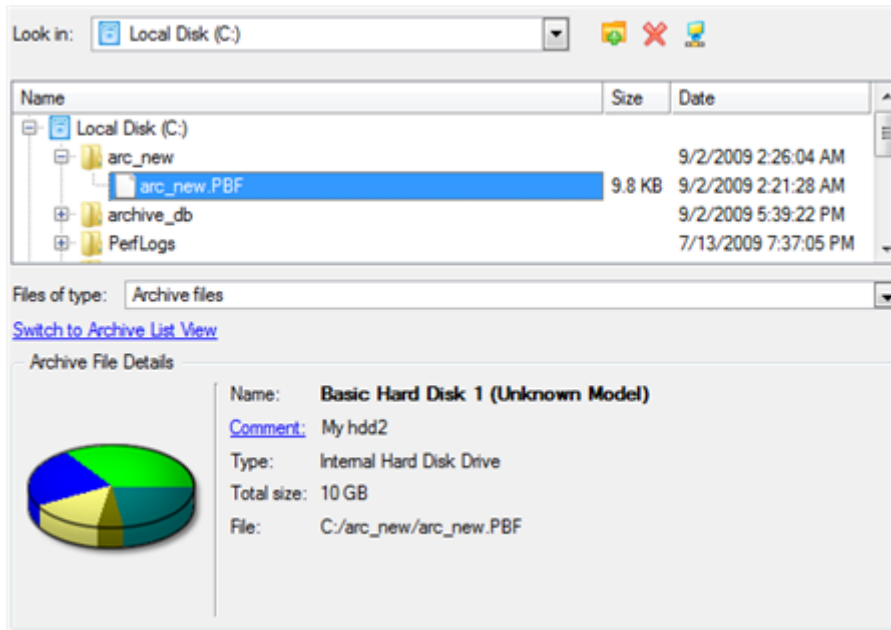


To get a clear-cut picture on properties of the required image, just click on it and the section below will (i.e. Archive File Details) display a short description.



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

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



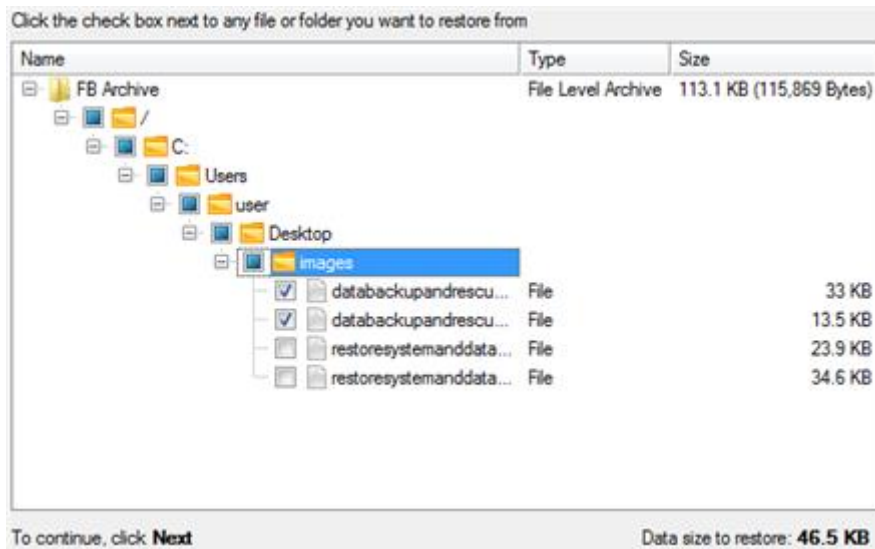
Moreover, on this page you've got the possibility to create new folders, delete existing files/folders or map network drives by clicking the appropriate buttons.



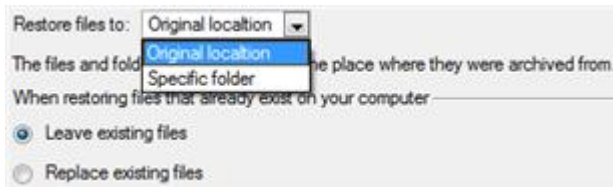
To know more on the subject, please consult the [Viewing Image Properties](#) chapter.

File Backup Restore

- **Data to restore.** You've got the option to restore not only the entire archive, but separate items of it (the so called selective restore functionality) by marking checkboxes next to the data items you need.



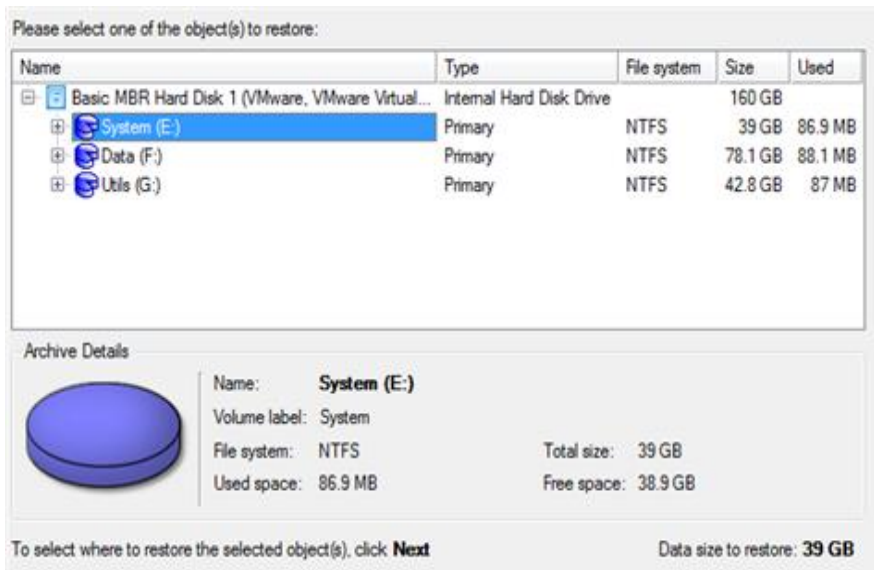
- **A place to restore.** From the pull-down list you can choose whether to restore contents of the backup image to its original location or specify some other one.



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

Sector Backup Restore

- **Data to restore.** You've got the option to restore not only the entire archive, but separate items of it (the so called selective restore functionality) by marking checkboxes next to the data items you need.



If you select separate files or folders to restore, the wizard will continue working as though you've got to do with a file backup.

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



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

Restoring Partition:

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

Geometry Restore Options

Please specify the size of the restored partition: 2470 36 MB - 2470 MB

Please specify size of free space before the partition: 0 0 MB - 2434 MB

Please specify size of free space after the partition: 0 0 MB - 2434 MB

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

Partition Restore Options

Assign the following drive letter: F: ▾

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.

Your hard disk after the changes:

Basic: Hard Disk 1 (VMware, VMware Virtual S SCSI Disk Dev)

Local Disk (*) 3.4 GB FAT32

Local Disk... 2.4 GB NTFS

1.4 G...

(Unalloc... 2.2 GB

Hard Disk Restore Options

Copy data and resize partitions proportionally

In this mode, the Wizard changes the size of partitions in the same proportion, with keeping intact their relative order. This option can be useful in restoring an image of hard disk to a larger one.

Perform surface test

Set this option if you want the Wizard to perform the surface test on the target hard disk. In this case, if the program finds bad and unreliable sectors it will mark them as unusable ones.



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

Result

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



To make Windows bootable on different hardware, please additionally complete the [P2P Adjust OS Wizard](#).

Available operation scenarios:

- [Restoring a hard disk from the bootable Backup Capsule](#)
- [Restoring a system partition from external media \(CD/DVD\)](#)
- [Restoring a system partition from a network drive](#)
- [Restoring a system partition from a local drive](#)
- [Restoring a dual boot Mac from an external USB drive](#)
- [Restoring a file increment](#)

- [Restoring a file increment to a partition backup](#)
- [Restoring separate files and folders from a backup](#)

Copy Tasks

In this chapter you will find all the information necessary to make a copy of a hard disk or a separate partition.

Cloning Hard Disks

You can clone a hard disk 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. That's why this operation cannot be substituted by simply copying all on-disk partitions.

Copy Hard Disk Wizard

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



You need at least two hard disks to carry out this operation.

Startup

- In the Main Menu: select **Wizards > Copy Hard Disk...**

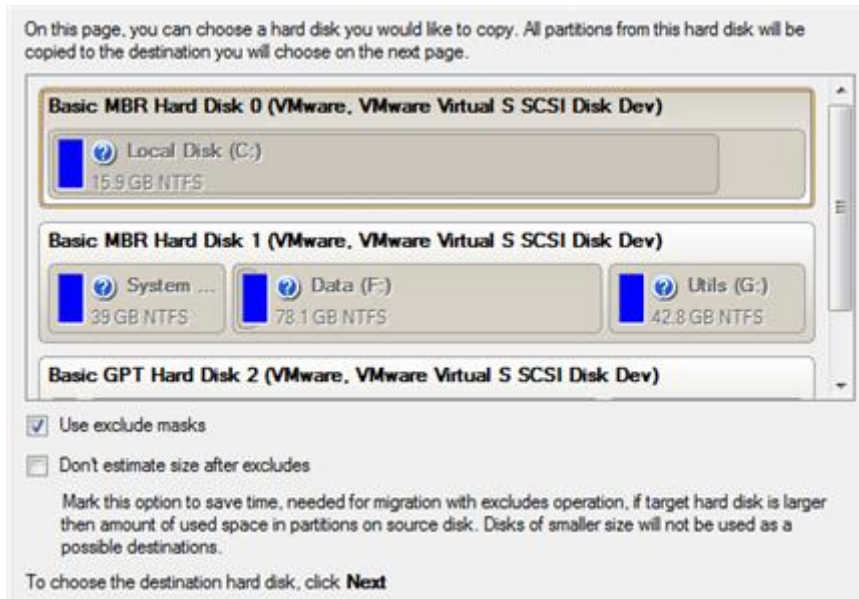


There are other ways to start up this function, please consult the [Interface Overview](#) chapter to know more on the subject.

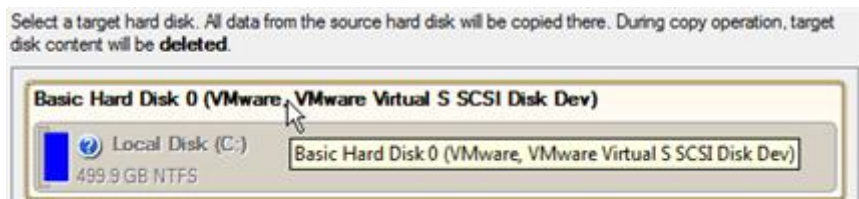
Setup

The wizard offers the following steps to accomplish the copy hard disk operation:

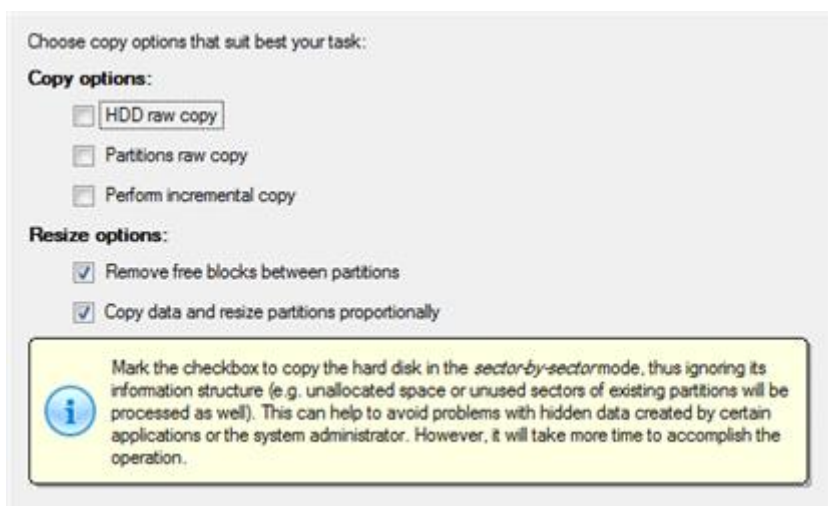
- **The hard disk to copy.** Select a hard disk you want to copy.



- **Use exclude masks.** By default the program doesn't take into account exclude filters set in the [Settings](#) dialog. If you need to use them, please mark the checkbox and see existing/specify additional filters on the next page of the wizard.
- **Don't estimate size after excludes.** You can save time by suppressing calculation of the resulted amount of data to copy after using excludes. Please note however, if you use this option, drives that smaller in size than the source disk will be unavailable to use as destination.
- **The target hard disk.** Select a hard disk (if several) where all data of the source disk will be copied to.



- **Copy parameters.** The wizard enables to specify the following options:



Copy options

- **HDD raw copy** to copy the hard disk in the sector-by-sector mode, thus ignoring its information structure (e.g. unallocated space or unused sectors of existing partitions will be processed as well). This can help to avoid

problems with hidden data created by certain applications or the system administrator. However, it will take more time to accomplish the operation.

- **Partition raw copy** to copy the on-disk partitions in the sector-by-sector mode to successfully process unknown file systems. However it is not recommended to enable this option when working with supported file systems as it takes more time to accomplish the operation.

- **Perform incremental copy** to only copy changes on the hard disk from the moment of the last copy operation. The program will perform comparison between a previous copy of the hard disk and its current state. Only sectors that are different will be updated, thus considerably decreasing the amount of data to write.

Resize options

- **Remove free blocks between partitions** not to keep blocks of free space between partitions on the targeted hard disk.

- **Copy data and resize partitions proportionally** to make the program proportionally change the size of partitions keeping their relative order intact. The option can be useful when upgrading the hard disk to a larger one.

Result

After the operation is completed, you receive a fully functional duplicate of the existing hard disk.



To make Windows bootable on different hardware, please additionally complete the [P2P Adjust OS Wizard](#).

Available operation scenarios:

- [Migrating system to a new HDD \(up to 2.2TB in size\)](#)

Cloning Partitions

You can duplicate partitions to protect oneself from downtime in case of a system malfunction or for cloning sample partitions. The program enables to duplicate all partition data including files, the exact structure of directories and file system metadata (location of files, security information, access quotas, etc.).

The Copy Partition Wizard will help you copy a partition of any file system. To minimize the possibility of making any mistake, the wizard provides auxiliary information on every single option. Moreover you can get an in-depth description to any setting, control, or field of the wizard just by clicking the hint button and then the object you need.

Startup

- In the Main Menu: select **Wizards > Copy Partition...**



There are other ways to start up this function, please consult the [Interface Overview](#) chapter to know more on the subject.

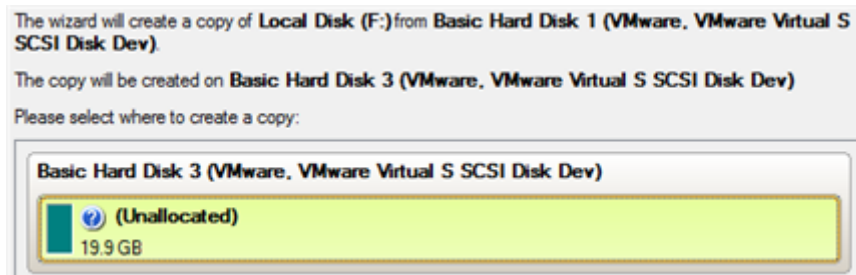
Setup

The wizard offers the following steps to accomplish the copy partition operation:

- **The partition to copy.** Select a partition you want to copy.

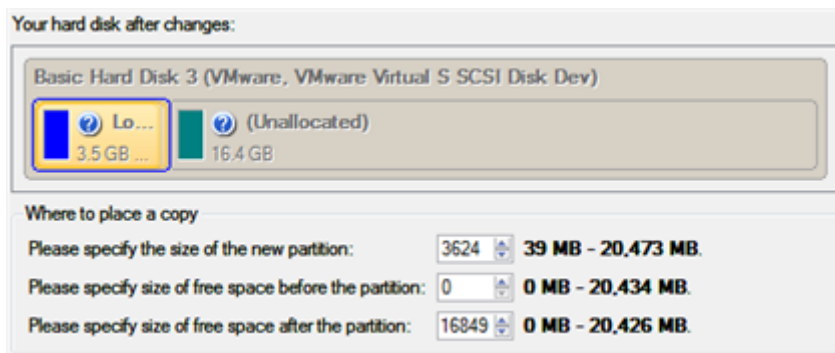


- **Destination disk.** Select a hard disk with enough unallocated space to perform the operation.



The program enables to copy a partition to a block of free space, which is smaller than the partition itself, taking into account only actual amount of data.

- **Copy parameters.** The wizard enables to specify the following options:



- **Partition size.** Define the size (in Mb) of the copied partition.
- **Free space before.** Define the position (in Mb) of the copied partition relative to the beginning of the available range of disk space.
- **Free space after.** Define the amount of trailing free space (in Mb) at the end of the available range of disk space.



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

Result

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



To make Windows bootable on different hardware, please additionally complete the [P2P Adjust OS Wizard](#).

Partition Management

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

Basic Partitioning Operations

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

Creating Partitions

The program provides the ability to create a new partition within a block of un-partitioned space.

Restrictions

1. Do not use the Create Partition function in order to undelete the last deleted partition.
2. The program allows creating new partitions only within blocks of un-partitioned space. It cannot convert a free space on an existing partition to a new partition.
3. The program cannot create new partitions on Dynamic Disks.

Dialog Startup

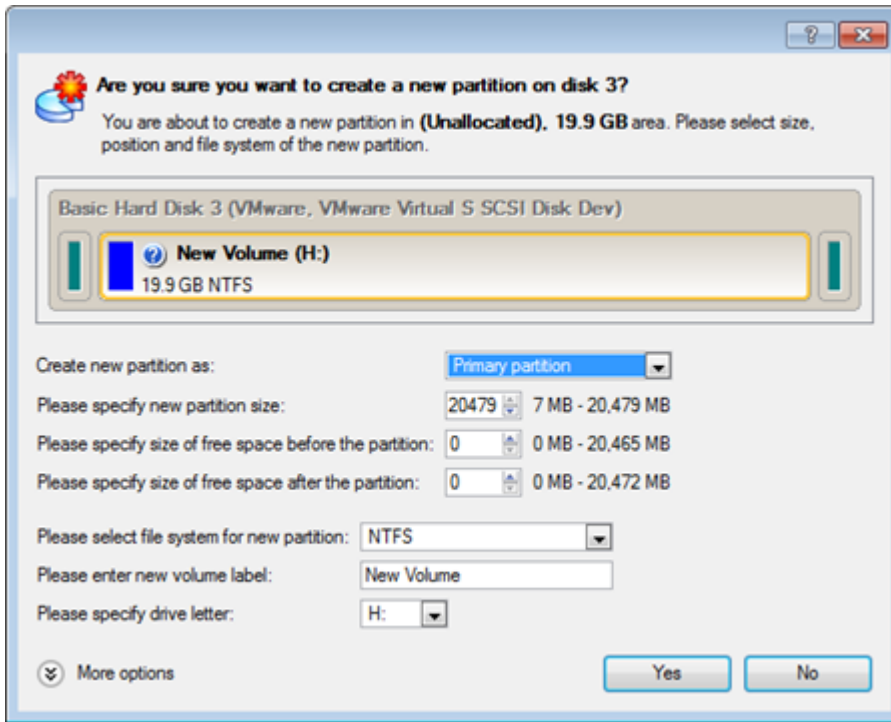
1. Select a block of free space on the Disk Map;
2. Select in the Main Menu: **Partition > Create Partition**.



There are other ways to start up this function, please consult the [Interface Overview](#) chapter to know more on the subject.

Dialog Setup

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



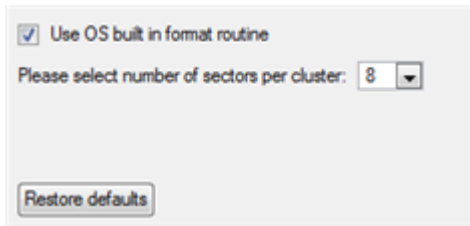
- **Define whether the partition will be Primary, Extended or Logical.** You can choose the desired partition type from the pull-down list. As a matter of fact, the available alternatives fundamentally depend on the selected block of free space - within the Logical free space, only Logical partitions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



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

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

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



- **Use OS built-in routine.** Mark the option to restrict the available values according to the used OS.
- **The amount of sectors per cluster.** Define the Cluster Size for the formatted partition with this spinner control.



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

Result

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

Formatting Partitions

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

Supported File Systems

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

- FAT12 & FAT16
- FAT32
- HFS+
- NTFS
- Ext2
- Ext3
- Ext4
- Linux Swap v. 2

Dialog Startup

1. Select a partition on the Disk Map;
2. Select in the Main Menu: **Partition > Format Partition.**



There are other ways to start up this function, please consult the [Interface Overview](#) chapter to know more on the subject.

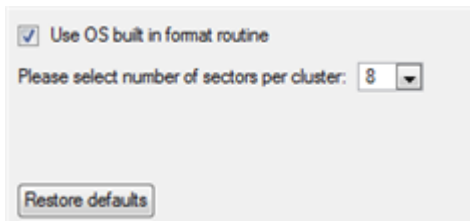
Dialog Setup

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



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

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



- **Use OS built-in routine.** Mark the checkbox to restrict the available values according to the used OS.
- **The amount of sectors per cluster.** Define the Cluster Size for the formatted partition with this spinner control.



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

Result

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

Deleting Partitions

Dialog Startup

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

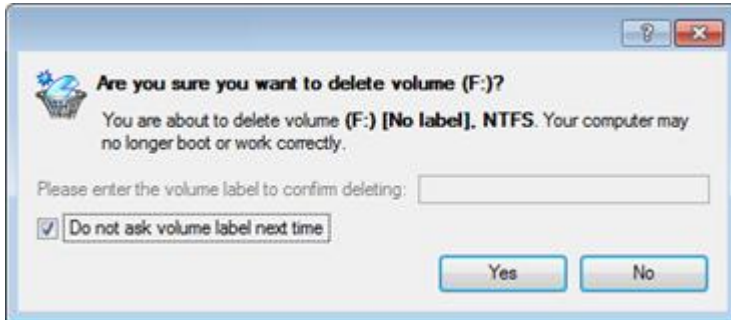
1. Select a partition on the Disk Map;
2. Select in the Main Menu: **Partition > Delete Partition.**



There are other ways to start up this function, please consult the [Interface Overview](#) chapter to know more on the subject.

Dialog Setup

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



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

Result

By default, the operation takes only a fraction of a second. However, the program waits until Windows completes the modification of the disk layout.

Advanced Partitioning Operations

Here you can learn how to accomplish advanced partitioning operations.

Undeleting Partitions

When simply deleting a partition (without additional wiping) disk management software only removes references to it in the Partition Table, thus leaving the possibility to recover it later.

The program enables to find and recover these partitions. A restored partition will be fully functional, as long as other partitions were not created, moved or exceeded the disk space occupied by that partition. That is why the program offers this function only for blocks of free space.

The operation can be accomplished with the Undelete Partition Wizard.

Startup

- In the Main Menu: select **Wizards > Undelete Partitions...**

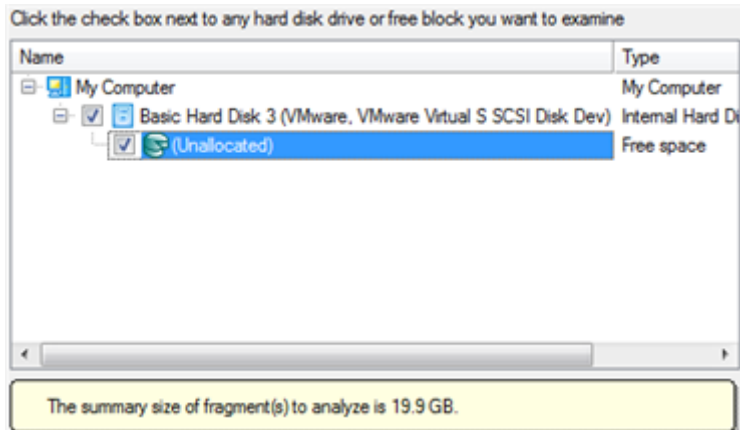


There are other ways to start up this function, please consult the [Interface Overview](#) chapter to know more on the subject.

Setup

The wizard offers the following steps to accomplish the undelete partition operation:

- **Free blocks to scan for lost partitions.** Choose a free block from a tree-like list of available hard disks.



- **Search method.** By default, the wizard selects the fastest search method for your operating system. In most cases that will do to find any accidentally deleted partition. However if you're under Windows XP for instance (the Conventional Search option is selected), but the deleted partition you're looking for has been created with the Disk Management utility under Vista, the wizard won't be able to find this partition, unless you manually select the appropriate option (Quick Search for Partitions Created by Vista or Later OS). Moreover if the wizard still fails to find the partition you need, you can select the Thorough Search option to scan every single sector in the specified search area to get the most accurate results.

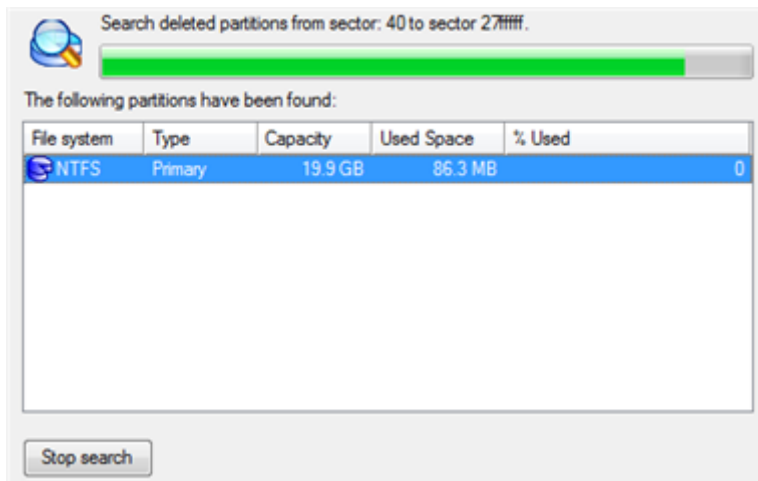


To know more on the available search methods, please use the context sensitive hint system.

- **File system filter.** By default, the wizard will search for all known file systems. However, by clicking on the appropriate option on the second page of the wizard, you can specify only those file systems you need.



- **A partition to undelete (if several).** By default, the program searches records of any deleted partition ever existed on the selected block of free space. So you can get several partitions to choose from.



Most likely the required partition will be found first. If so, you may abort the search operation by pressing the Stop search button.

Result

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

Changing Partition Attributes

This chapter explains how you can change partition attributes (Active flag, Hidden flag, Volume Label, etc.).

Mark Partition Active/Inactive

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

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

1. Select a primary partition on the Disk Map.
2. Select in the Main Menu: **Partition > Mark Partition as Active/Inactive**.



There are other ways to start up this function, please consult the [Interface Overview](#) chapter to know more on the subject.



3. The operation will be performed immediately after confirmation.



There can only be one active partition on a hard disk, otherwise your operating system will fail to boot.

Hide/Unhide Partition

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

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

1. Select a partition on the Disk Map.
2. Select in the Main Menu: **Partition > Hide/Unhide Partition**.



There are other ways to start up this function, please consult the [Interface Overview](#) chapter to know more on the subject.

3. The operation will be performed immediately after confirmation.



It is strongly recommended not to hide the system partition. Otherwise your operating system will fail to boot.

Set Label of a Partition

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

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

1. Select a partition on the Disk Map.
2. Select in the Main Menu: **Partition > Modify > Change Volume Label**.



There are other ways to start up this function, please consult the [Interface Overview](#) chapter to know more on the subject.

3. Enter a label for the selected partition.



4. The operation will be performed immediately after confirmation.

Change Partition ID

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

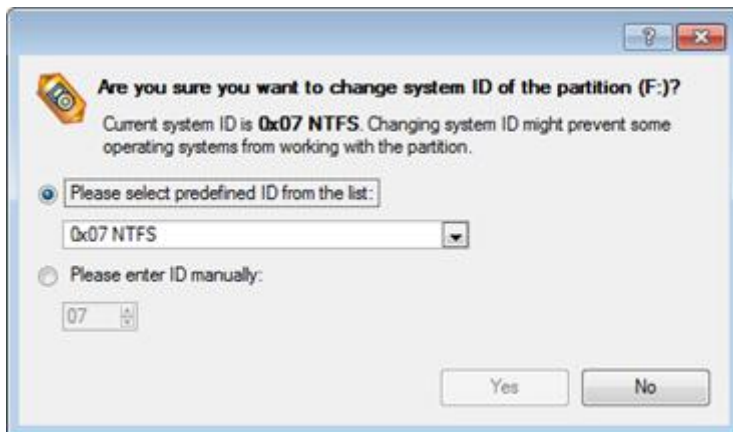
In order to change a partition ID you should take the following steps:

1. Select a partition on the Disk Map.
2. Select in the Main Menu: **Partition > Modify > Change Partition ID...**



There are other ways to start up this function, please consult the [Interface Overview](#) chapter to know more on the subject.

3. Set a new ID for the selected partition.



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

4. The operation will be performed immediately after confirmation.

Change Serial Number of a Partition

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

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

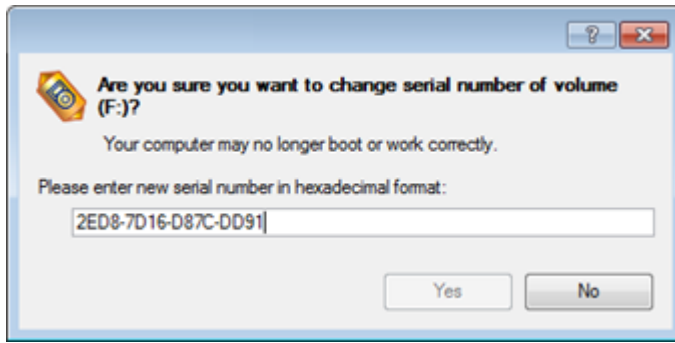
In order to change a serial number you should take the following steps:

1. Select a partition on the Disk Map.
2. Select in the Main Menu: **Partition > Modify > Change Serial Number.**



There are other ways to start up this function, please consult the [Interface Overview](#) chapter to know more on the subject.

3. Enter a new serial number for the selected partition. It should contain 8 hexadecimal figures (0..9 or A..F). The operation cannot proceed until you enter all 8 symbols.



4. The operation will be performed immediately after confirmation.

Hard Disk Management

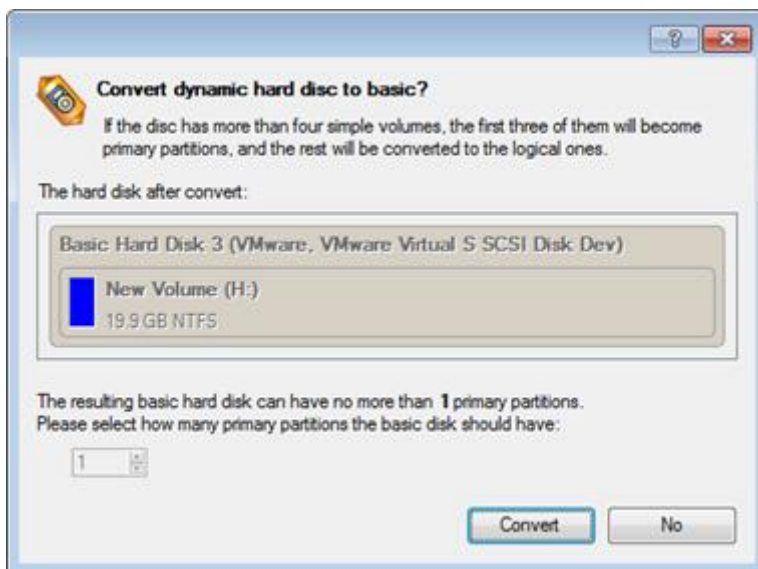
In this chapter you will find all the information necessary to carry hard disk operations supported by the program.

Converting Dynamic MBR to Basic

The program allows you to convert a dynamic MBR disk containing simple volumes into a basic one while keeping its contents intact.

In order to convert a dynamic MBR disk into basic you should take the following steps:

1. Select a dynamic MBR disk containing simple volumes on the Disk Map.
2. Select in the Main Menu: **Hard Disk > Convert to Basic...**
3. Set the required number of primary partitions if necessary. According to the DOS partitioning scheme a hard disk can have up to four Primary partitions. If there is an Extended partition on the disk, only three primary partitions are allowed. That is why if a dynamic disk contains several simple volumes the program enables to choose the number of primary partitions. The rest of them if any will automatically be converted to logical disks within the Extended partition.



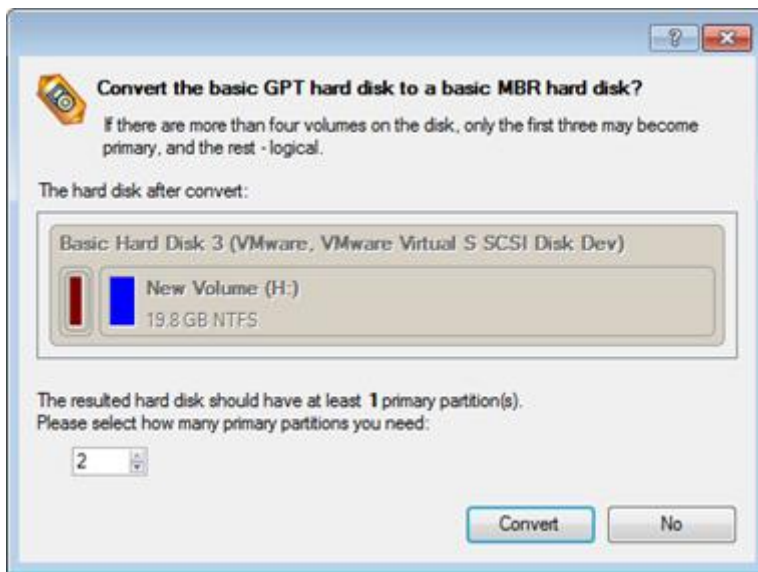
The program can only process dynamic disks containing solid simple volumes (without extension).

Converting GPT to Basic MBR

The program allows you to convert a basic or a dynamic GPT disk containing simple volumes into a basic MBR disk while keeping its contents intact.

In order to convert a basic or a dynamic GPT disk into a basic MBR disk you should take the following steps:

1. Select a basic or a dynamic GPT disk containing simple volumes on the Disk Map.
2. Select in the Main Menu: **Hard Disk > Convert to Basic MBR Hard Disk...**
3. Set the required number of primary partitions if necessary. According to the DOS partitioning scheme a hard disk can have up to four Primary partitions. If there is an Extended partition on the disk, only three primary partitions are allowed. That is why if a GPT disk contains several volumes the program enables to choose the number of primary partitions. The rest of them if any will automatically be converted to logical disks within the Extended partition.



The program can only process dynamic GPT disks containing solid simple volumes (without extension).

Converting Basic MBR to GPT

The program allows you to easily convert a basic MBR disk into a basic GPT disk while keeping its contents intact. The operation is quite safe for the on-disk data, but you should know that only 64-bit Windows OSes since Vista are able to boot from this type of disks. So if you've got a 32-bit Windows OS accommodated on a disk you'd like to convert to GPT, it won't start up after the operation is over.

In order to convert a basic MBR disk to a basic GPT you should take the following steps:

1. Select a basic MBR hard disk on the Disk Map.
2. Select in the Main Menu: **Hard Disk > Convert to GPT hard disk.**



3. The operation will be performed immediately after confirmation.



The program can only convert basic MBR disks.

Updating MBR

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

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

1. Select a hard disk on the Disk Map.
2. Select in the Main Menu: **Hard Disk > Update MBR.**



There are other ways to start up this function, please consult the [Interface Overview](#) chapter to know more on the subject.



3. The operation will be performed immediately after confirmation.

Changing Primary Slot

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

In Linux:

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

In DOS:

The last versions of MS-DOS use a rather sophisticated algorithm for a drive letter assignment. A drive letter, which is assigned to a partition, depends on the order of records in the Partition Table. Thus changing enumeration of the

primary partitions affects the drive letters assignment. In early versions of MS-DOS, it could even lead to the unavailability of a partition.

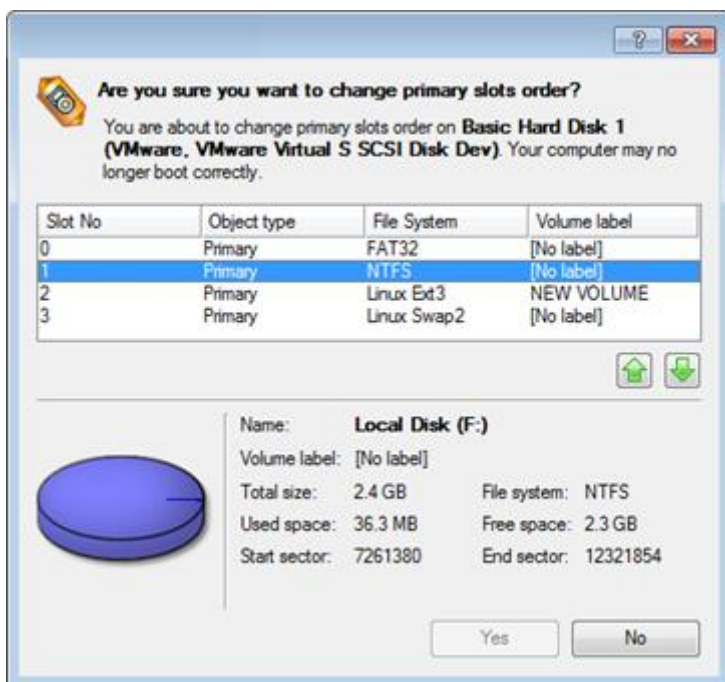
The program provides the ability to change enumeration of the primary partitions. This feature will allow you to fix problems concerning an inappropriate order of partitions.

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

1. Select a hard disk on the Disk Map.
2. Select in the Main Menu: **Hard Disk > Change Primary Slot.**



There are other ways to start up this function, please consult the [Interface Overview](#) chapter to know more on the subject.



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

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

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

4. The operation will be performed immediately after confirmation.

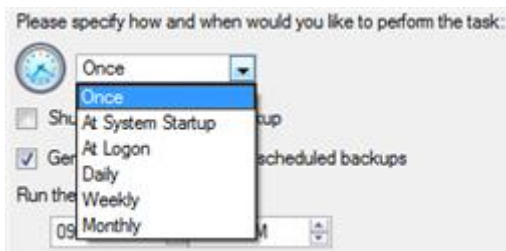
Task Scheduling

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

Setting a Timetable

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

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



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

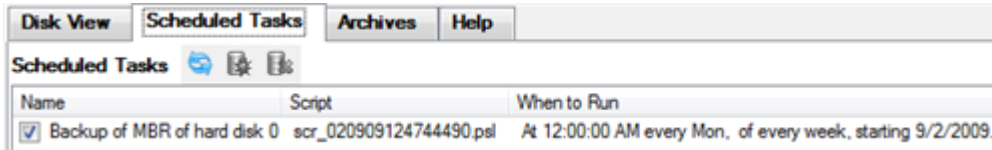


To run the task in the log-off mode, please specify administering login info by following the appropriate link in the left lower corner of the page.

The Shutdown System on Complete option enables to automatically switch off the computer on the successful accomplishment of the operation.

Managing Tasks

All scheduled tasks are placed in a separate list, which can be retrieved by clicking the Scheduled Tasks tab in the Explorer Bar:



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

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

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



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

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

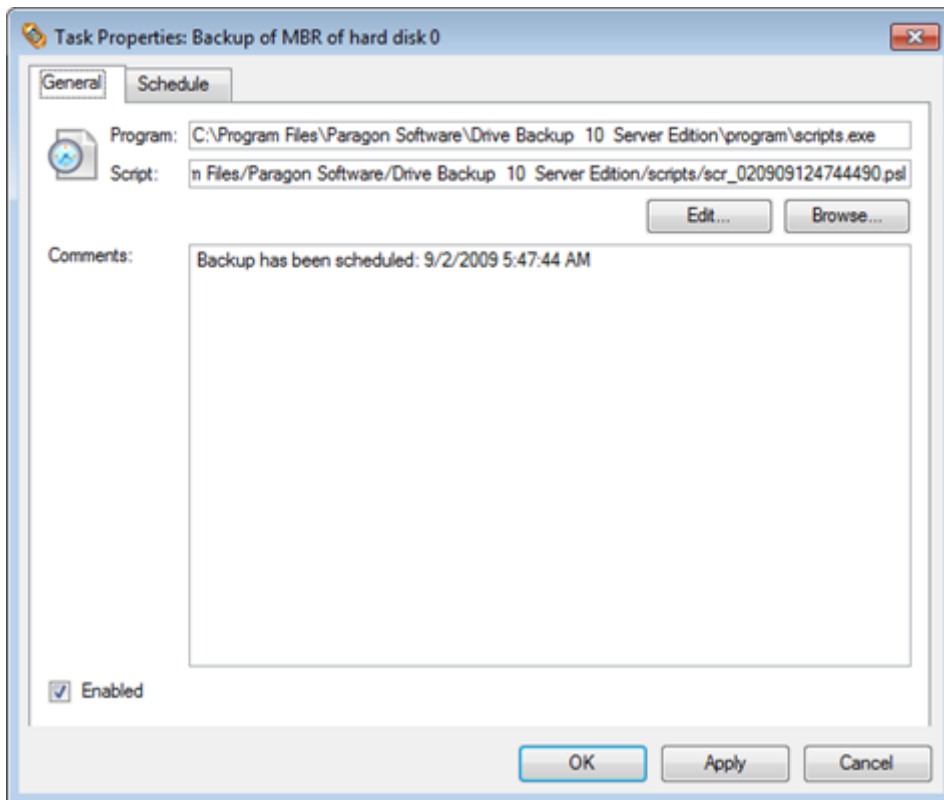
Task Editor

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

1. Select a task on the Scheduled Tasks list.
2. Click the **Properties** button on the Scheduled Tasks list.



There are other ways to start up this function, please consult the [Interface Overview](#) chapter to know more on the subject.



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

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

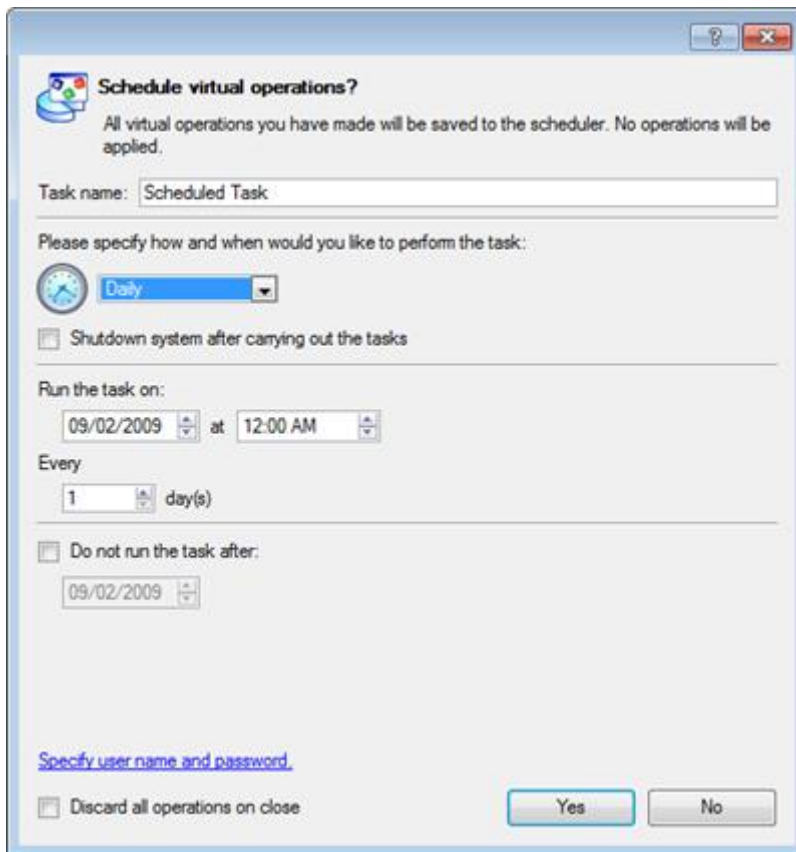
In order to apply the changes, you need to click the Apply button at the foot of the dialog.

Creating a Scheduled Task

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

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

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



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



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

Scripting

The program actions can also be represented in form of a script. The script describes the appropriate operation with macro-language commands. There is an interpreter utility - SCRIPTS.exe, which is included in the program installation package. This utility works in the unattended mode, which enables to automate operations.

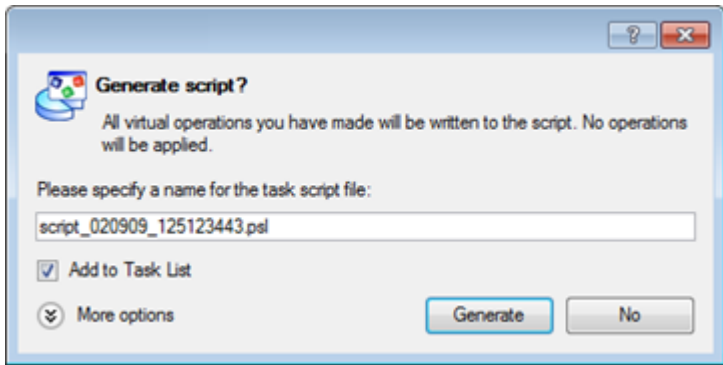
Startup

You have no need to write a script since the program has a convenient interface for such a task. In order to generate a script on the base of the entered parameters of the required operation, you should take the following steps:

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

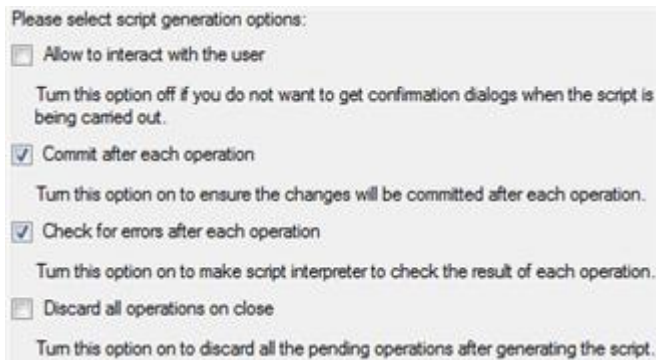
Setup

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



- **Script file name and location.** By default, the program offers to add the script to the Task List with a name containing its creation date and time. Unmark the Add to Task List checkbox to define an exact location and a filename for the script file. The default file extension that is reserved for scripting files is .psl, which however can be modified.

In addition, there is the possibility to make further detailed settings (although the default values will do in most cases). To activate the advance mode, you need to click the More options button at the foot of the dialog page, so you will be able to define:



- **Interaction with the user.** Mark the option to pause the script interpreter during the execution to prompt the user's confirmation or other input. Otherwise the program will not stop using default values for parameters if needed.
- **Commit after each operation.** Mark the option to commit changes after each operation.
- **Check for errors after each operation.** Mark the option to insert a special code in script, which checks the status of the last executed operation and stops the script processing if there are errors of any kind.
- **Discard all operations on close.** Mark the option to empty the List of Pending Operations after generating the script.

Result

After the operation is completed you receive a new script file. It is placed into the specified destination, its features defined in the dialog.



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

To learn more about scripts please consult the Paragon Scripting Language manual.

Extra Functionality

This chapter describes the supplementary functionality available in the program.

View Partition/Hard Disk Properties

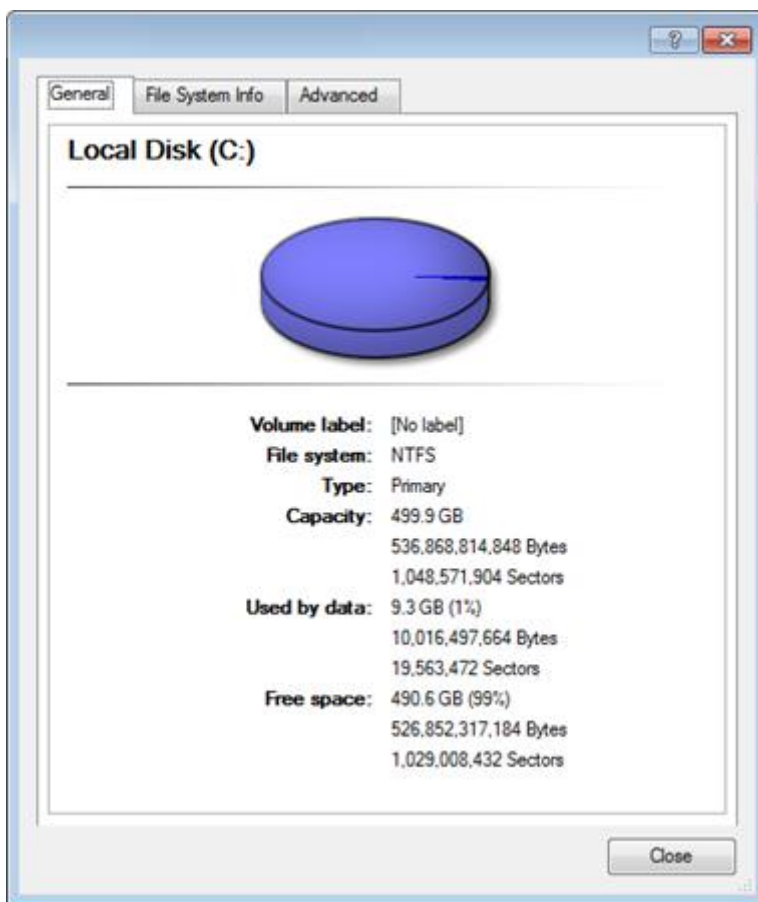
The program enables to obtain in-depth information on the properties of hard disks and partitions. Besides the general information, such as capacity, used space or file system type it provides the possibility to get info on hard disk geometry, cluster size, exact partition location, etc.

To get properties on a partition/hard disk, please do the following:

1. Choose a partition/hard disk on the Disk Map.
2. Select in the Main Menu: **Partition/Hard Disk > Properties...**



There are other ways to start up this function, please consult the [Interface Overview](#) chapter to know more on the subject.

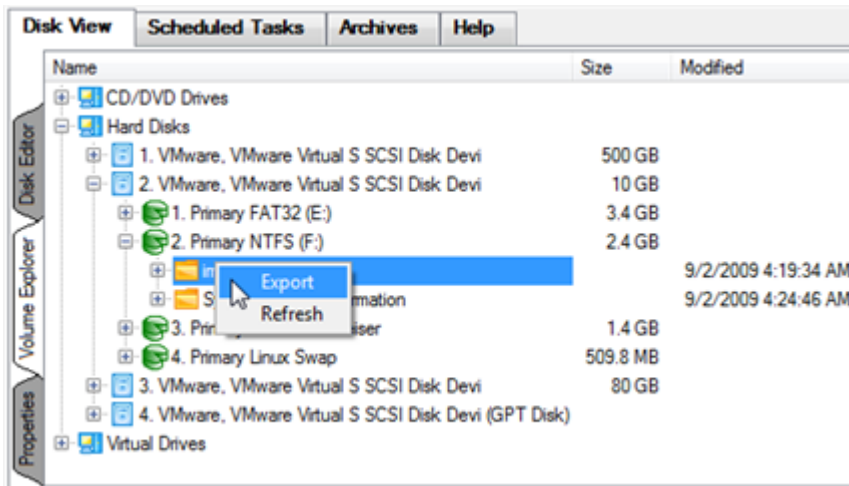


In the opened dialog information will be grouped according to its properties, thus by clicking tabs you can get information you need.

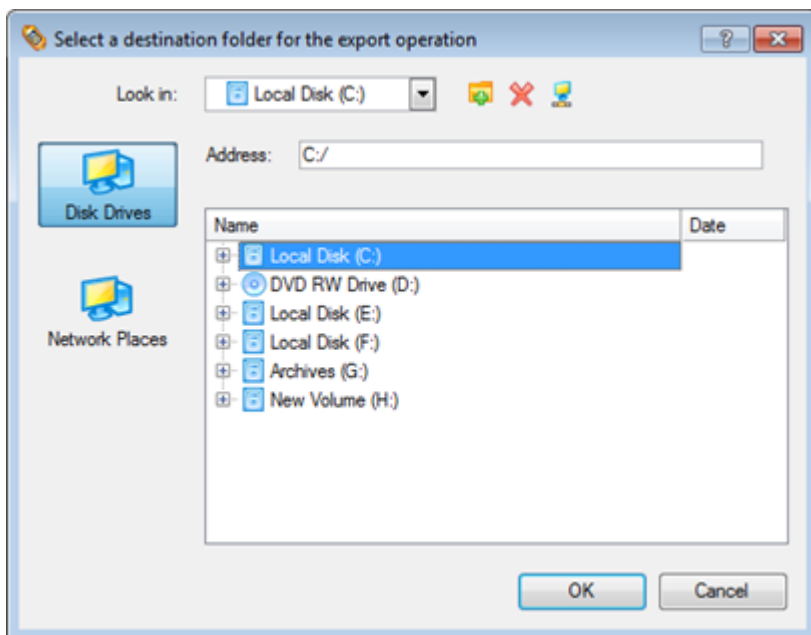
Volume Explorer

Volume Explorer is a special tool to browse and export contents of the local mounted/unmounted volumes formatted to FAT16, FAT32, NTFS, Ext2FS, Ext3FS, Ext4FS file systems. Besides it enables to access Paragon backups as regular folders to explorer their contents or to retrieve certain files.

To launch the Volume Explorer you should click **Disk View** tab in the Explorer Bar and then choose **Volume Explorer**:



Call the popup menu for the selected file/folder (right click of the mouse button) to export it to some other location (local or network drive, etc.).



Available operation scenarios:

- [Restoring separate files and folders from a backup](#)

File Transfer Wizard

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

Startup

- Select in the Main Menu: **Tools > File Transfer Wizard**.

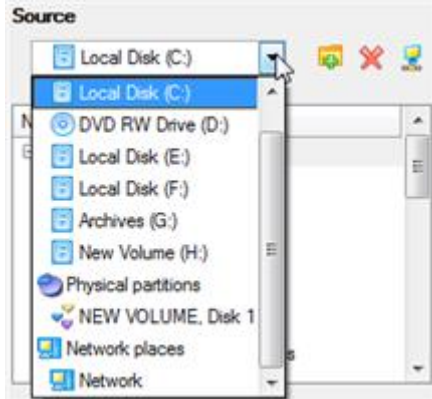


There are other ways to start up this function, please consult the [Interface Overview](#) chapter to know more on the subject.

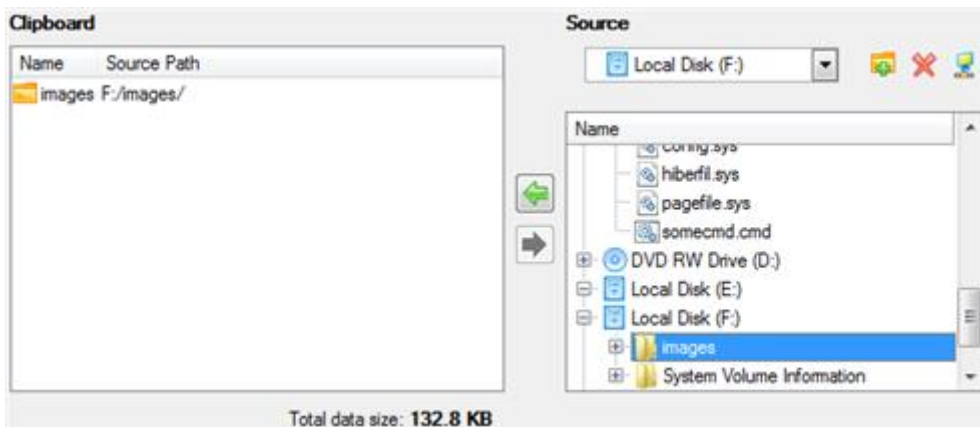
Setup

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

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



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

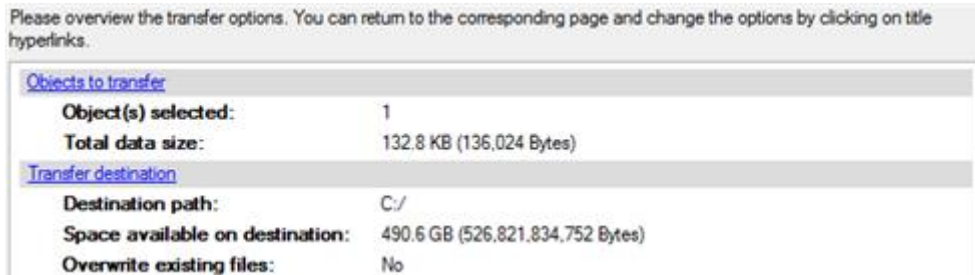


Files/directories deleted from the Clipboard remain intact on source disks.

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



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



Result

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

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](#)
- [Restoring separate files and folders from a backup](#)

Mount Partition

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

Assign Drive Letter

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

1. Select a partition on the Disk Map.
2. Select in the Main Menu: **Partition > Assign Drive Letter...**



There are other ways to start up this function, please consult the [Interface Overview](#) chapter to know more on the subject.

3. Specify a drive letter for the selected partition. Initially the program suggests some consistent value for this parameter. So you may just press the Yes button to confirm the operation.



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

4. The operation will be performed immediately after confirmation.

Remove Drive Letter

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

1. Select a partition on the Disk Map.
2. Select in the Main Menu: **Partition > Remove Drive Letter**.



There are other ways to start up this function, please consult the [Interface Overview](#) chapter to know more on the subject.

3. The operation will be performed immediately after confirmation.



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

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

Mount Archive

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

Assign Drive Letter

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

1. Select a backup image in the Archive Database.
2. Select in the Main Menu: **Archives > Mount the Selected Archive**.



There are other ways to start up this function, please consult the [Interface Overview](#) chapter to know more on the subject.

3. Specify a drive letter for the selected backup image. Initially the program suggests some consistent value for this parameter. So you may just press the Yes button to confirm the operation.



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

- The operation will be performed immediately after confirmation.

The current version of the program allows the user to mount archives of separate partitions only.



There is no possibility to mount archives located on physical (unmounted) partitions or in the bootable capsule.

Archives will only be mounted for the current session and won't be available after the system restart.

It is strongly recommended not to un-mount backup images with Windows Disk Manager or other third side software.

Remove Drive Letter

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

- Select a backup image in the Archive Database.
- Select in the Main Menu: **Archives > Unmount the Selected Archive.**



There are other ways to start up this function, please consult the [Interface Overview](#) chapter to know more on the subject.

- The operation will be performed immediately after confirmation.

Test Surface

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

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

- Select a partition or a block of free space on the Disk Map.
- Select in the Main Menu: **Partition > Test Surface...**



There are other ways to start up this function, please consult the [Interface Overview](#) chapter to know more on the subject.

- From the pull-down list choose the level of the surface check.



- The operation will be performed immediately after confirmation.

Check File System Integrity

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

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

1. Select a partition on the Disk Map.
2. Select in the Main Menu: **Partition > Check File System Integrity**



There are other ways to start up this function, please consult the [Interface Overview](#) chapter to know more on the subject.



3. The operation will be performed immediately after confirmation.

Check Archive Integrity

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

Startup

- In the Main Menu: select **Wizards > Backup Utilities > Check Archive Integrity...**

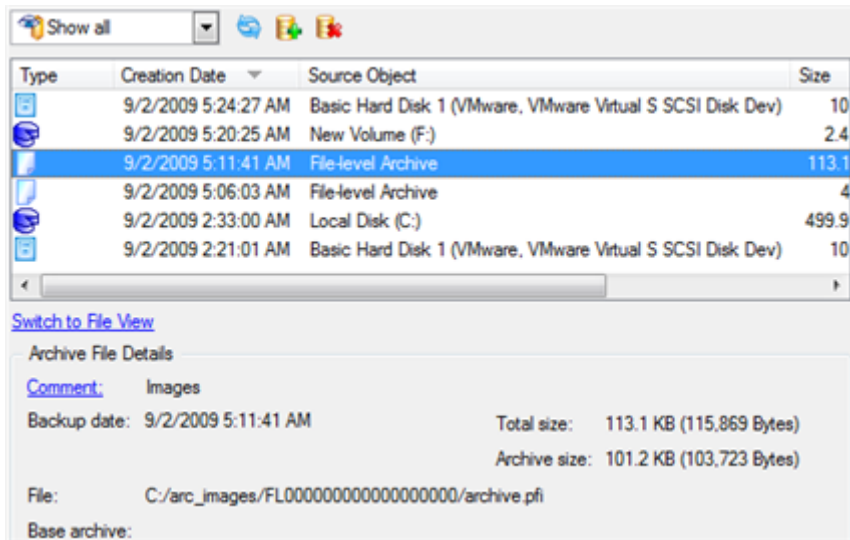


There are other ways to start up this function, please consult the [Interface Overview](#) chapter to know more on the subject.

Setup

The wizard offers the following steps to accomplish the operation:

- **An archive to verify.** The Browse for Archive page enables to find a backup image you need. By clicking the Switch to Archive List View link, you can see a list of images contained in the Archive Database (if any).

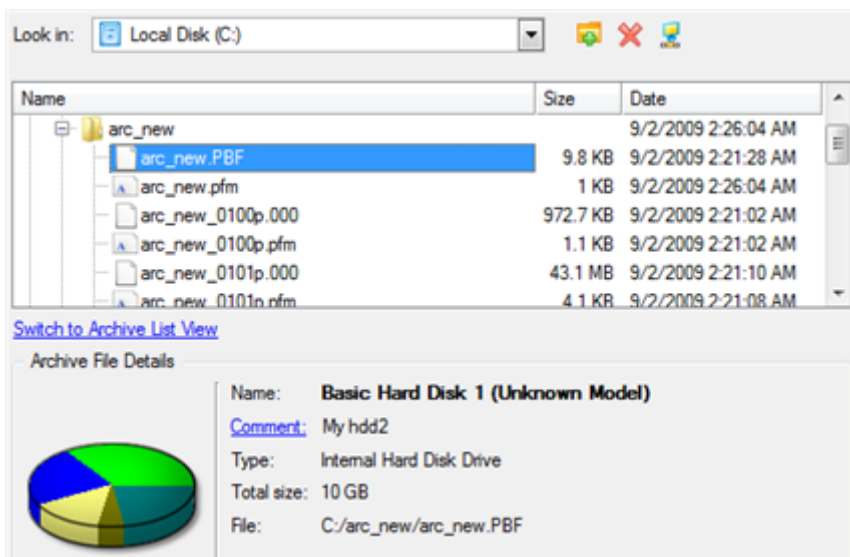


To get a clear-cut picture on properties of the required image, just click on it and the section below will (i.e. Archive File Details) display a short description.



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

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



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



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

Result

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

Check Recovery Discs

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

Startup

- In the Main Menu: select **Tools > Check Recovery Discs...**

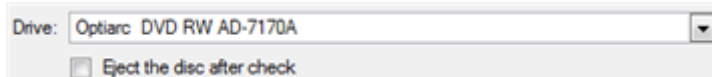


There are other ways to start up this function, please consult the [Interface Overview](#) chapter to know more on the subject.

Startup

The wizard offers the following steps to accomplish the operation:

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



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

Result

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

Edit/View Sectors

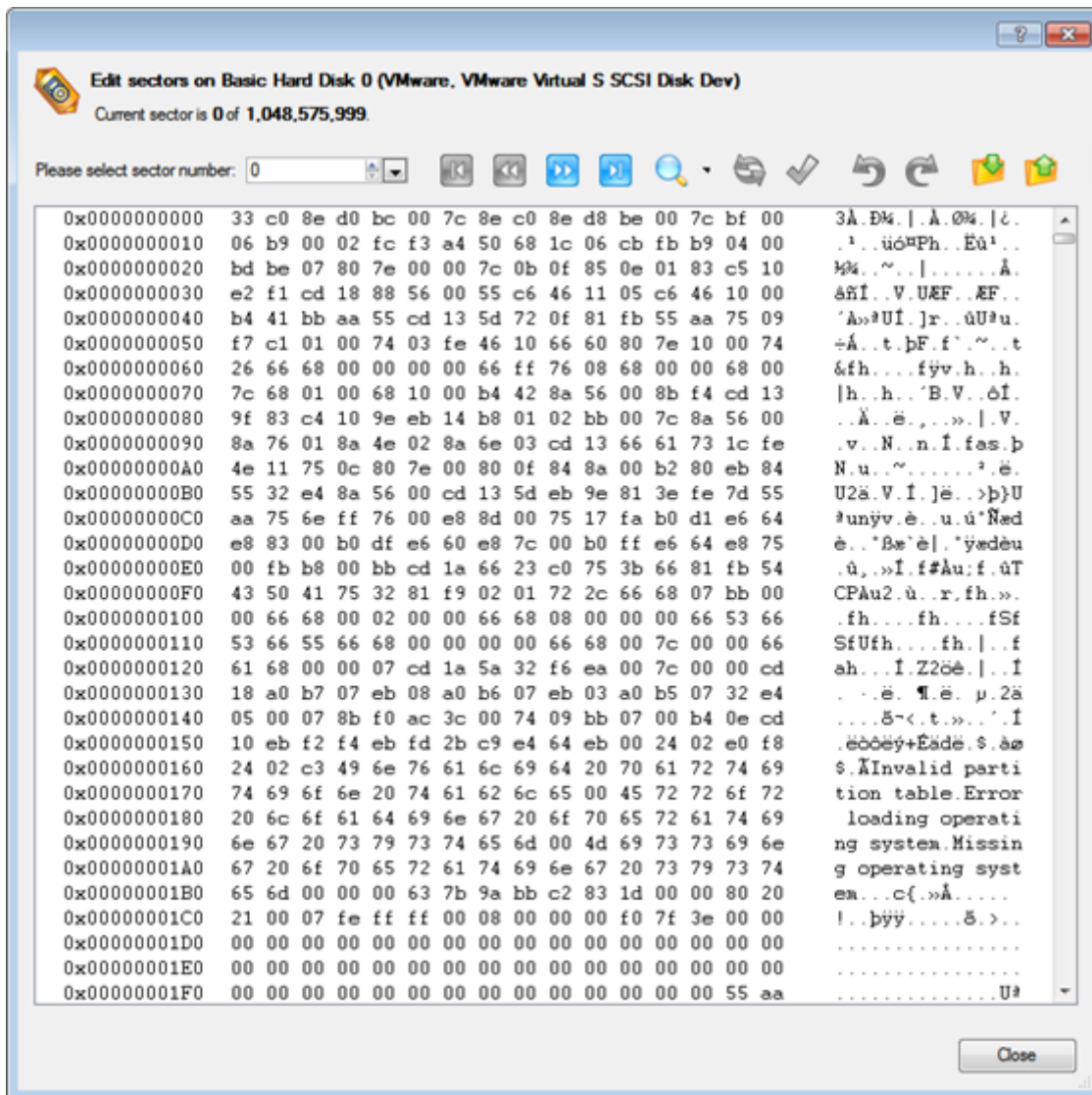
With the built-in Edit/View Sectors tool the program enables to view/edit sectors on existing partitions/hard disks providing the possibility to directly access and modify sectors, save and restore sectors from specified files, navigate through the system metadata, etc.

In order to edit/view sectors of a hard disk/partition you should take the following steps:

1. Select a hard disk/partition on the Disk Map.
2. Select in the Main Menu: **Partition/Hard Disk > Edit/View Sectors.**



There are other ways to start up this function, please consult the [Interface Overview](#) chapter to know more on the subject.



Careless use of the Edit Sectors function may result in the irreversible data corruption.

Send Log Files

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

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

1. Call the Send Log Files dialog in the Main Menu: **Tools > Send Log Files**;



There are other ways to start up this function, please consult the [Interface Overview](#) chapter to know more on the subject.

2. Provide a customer name and a product serial number;

3. Give a detailed description on the encountered problem.

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

Log files do not contain any confidential information on the operating system settings or the user documents.

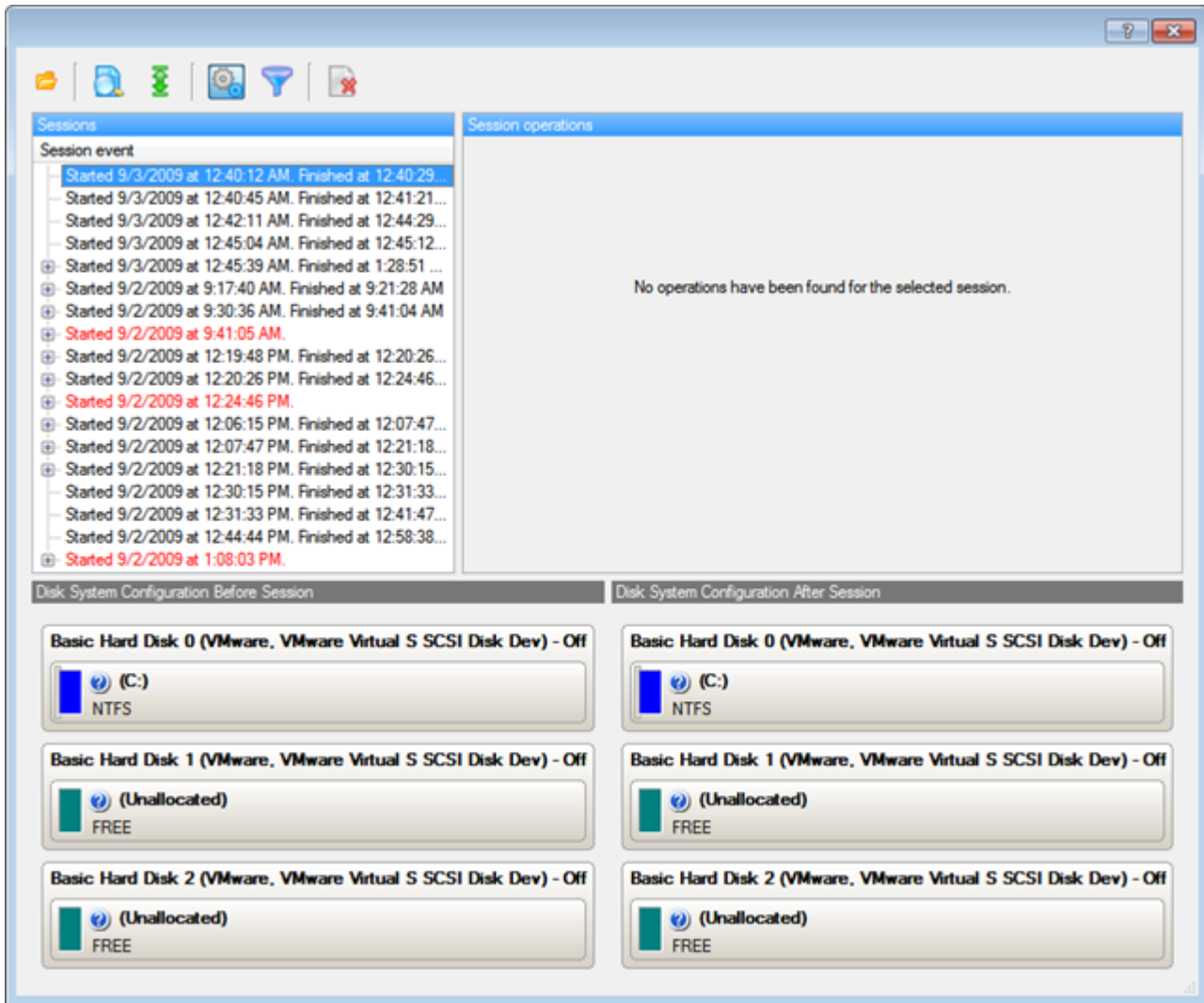


The Send Log Files function is only available when outgoing mail server (SMTP) and the user e-mail address are properly set. To learn more about it please consult the [Settings Overview chapter](#).

View Logs

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

In order to view logs on carried out operations select in the Main Menu: **Tools > View Log Files**



Typical Scenarios

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

Backup Scenarios

Creating the Backup Capsule

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

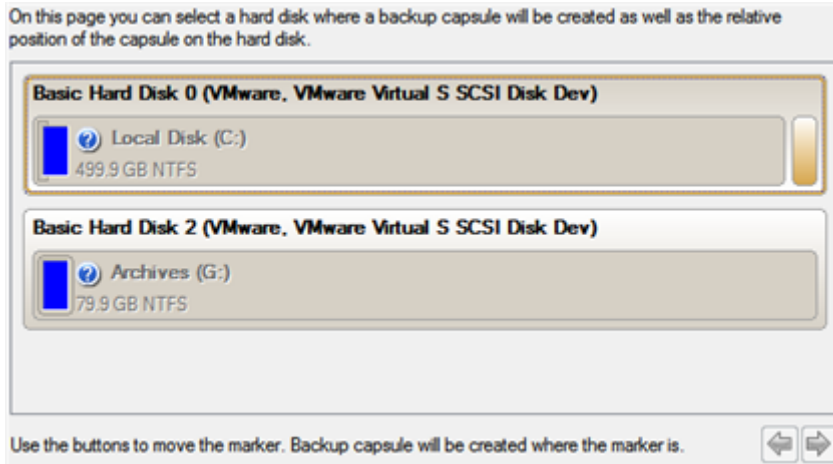
1. Click the **Manage Backup Capsule** item of the Wizards menu.



There are other ways to start up this function, please consult the [Interface Overview](#) chapter to know more on the subject.

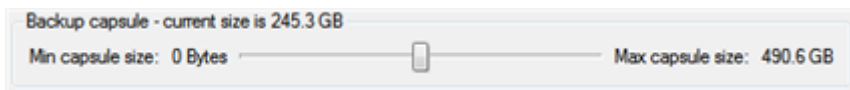
2. On the Wizard's Welcome page, click the Next button.

3. Select a place on the disk where the backup capsule will be created. It can be created as a primary partition or as a logical drive within an extended partition. It can be inserted into any place on the hard disk: at the end (preferable), at the beginning or somewhere in the middle between other partitions.



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

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



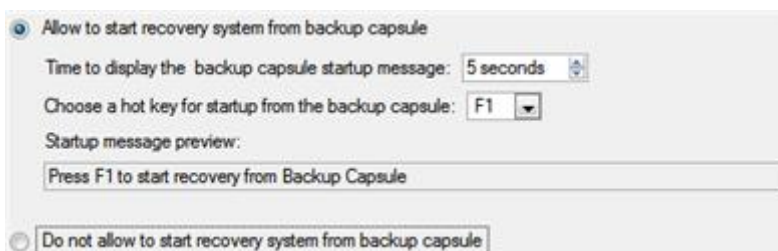
There is no restriction on the size of the backup capsule, merely depending on the available space of the hard disk and the capacity needed for the backup.

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



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

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





This operation will result in overwriting of the current MBR, thus in case of having a third side boot manager, it will be removed. To avoid that you can save the current MBR with the help of the [Edit/View Sectors](#) tool.

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

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

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



This operation can also be accomplished with our recovery media.

Backing up a hard disk or partition to the Backup Capsule

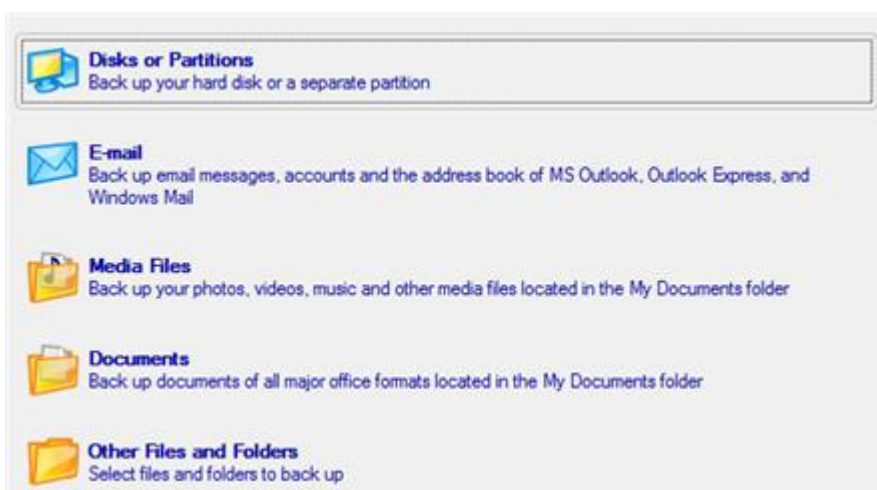
To back up an entire hard disk or a separate partition and then place the resulted image into the backup capsule, please do the following:

1. [Create the backup capsule](#) with the Manage Backup Capsule Wizard.
2. Click the **Smart Backup** item of the Wizards menu.

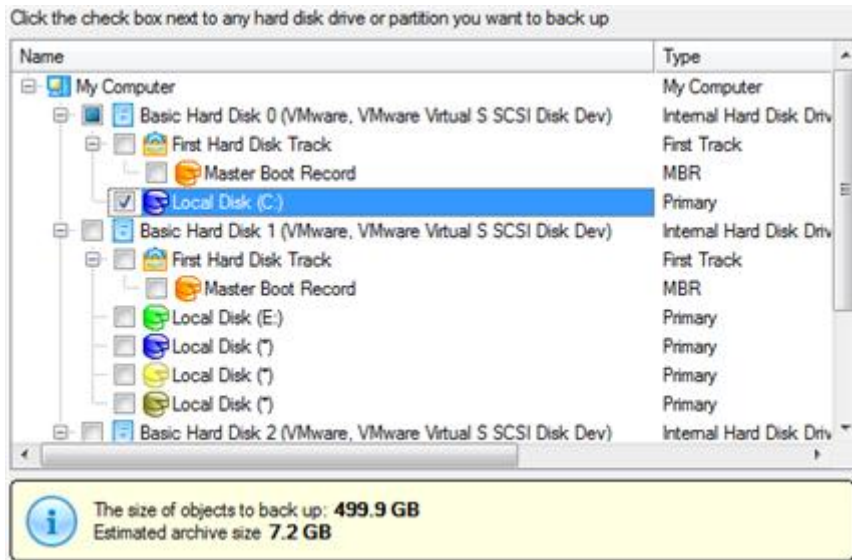


There are other ways to start up this function, please consult the [Interface Overview](#) chapter to know more on the subject.

3. On the Wizard's Welcome page, click the Next button.
4. On the What to back up page, select **Disk or Partitions** to create a sector-based backup of the whole disk system, or only separate partitions.



5. On the next page, mark the appropriate option opposite a hard disk's name or a partition's name depending on the chosen task.



You've got the option to modify the default backup settings by marking the appropriate checkbox on this page.

By default the program will take into account exclude filters set in the [Settings](#) dialog.

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

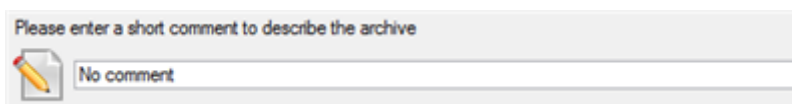


- Edit the archive name if necessary.



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

- Add comments to your backup describing its contents.



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



This operation can also be accomplished with our recovery media.

Backing up a hard disk or partition to external media (CD/DVD)

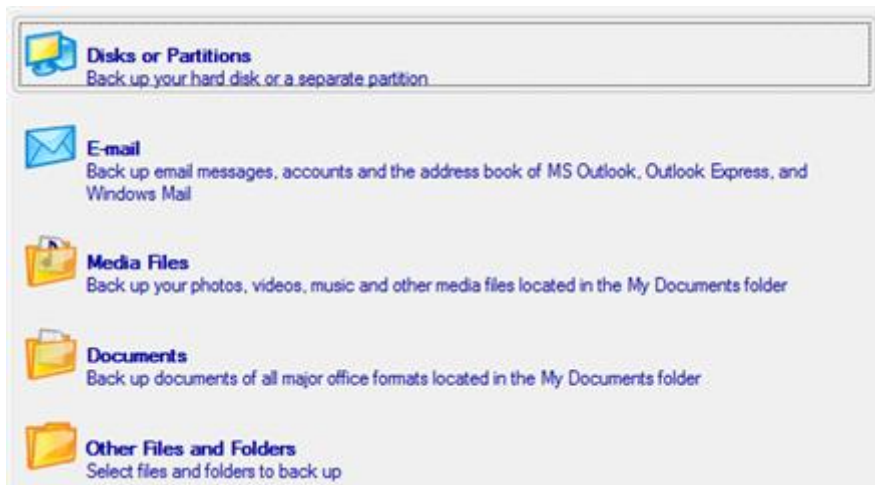
To back up an entire hard disk or a separate partition and then burn the resulted image to CD/DVD, please do the following:

1. Click the **Smart Backup** item of the Wizards menu.

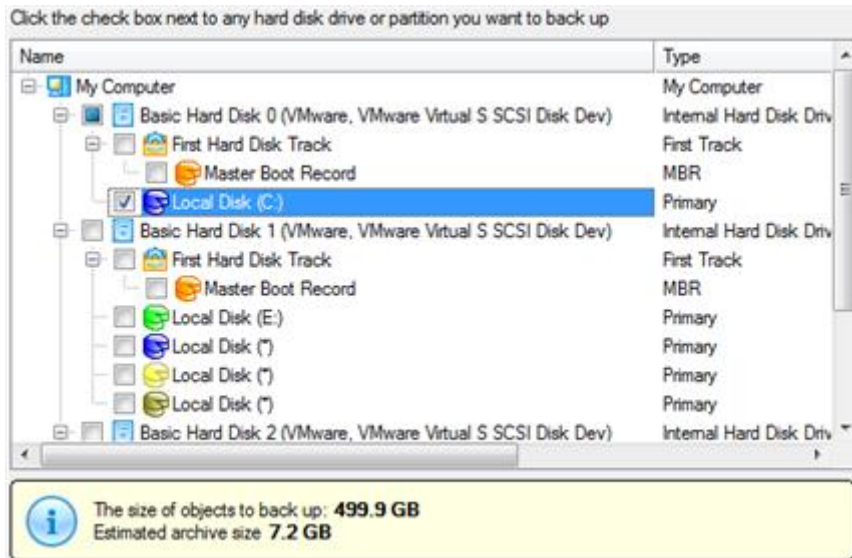


There are other ways to start up this function, please consult the [Interface Overview](#) chapter to know more on the subject.

2. On the Wizard's Welcome page, click the Next button.
3. On the What to back up page, select **Disk or Partitions** to create a sector-based backup of the whole disk system, or only separate partitions.



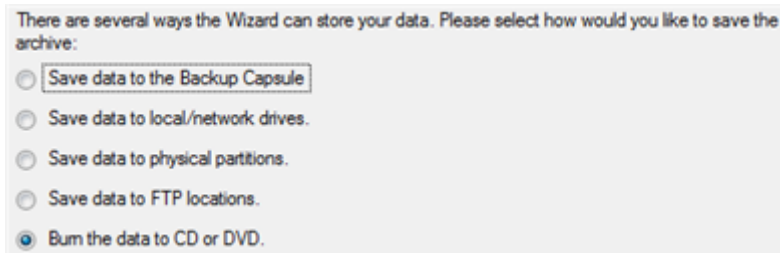
4. On the next page, mark the appropriate option opposite a hard disk's name or a partition's name depending on the chosen task.



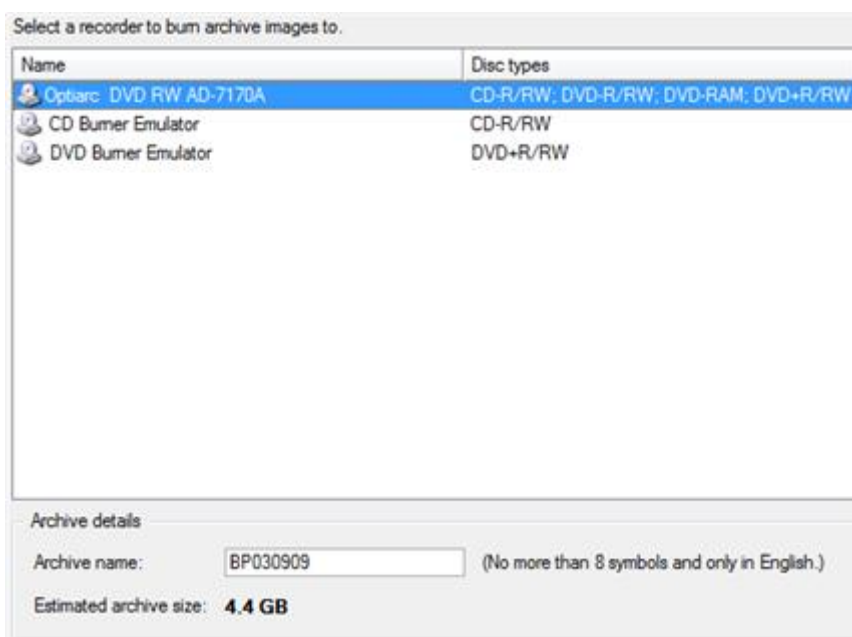
You've got the option to modify the default backup settings by marking the appropriate checkbox on this page.

By default the program will take into account exclude filters set in the [Settings](#) dialog.

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



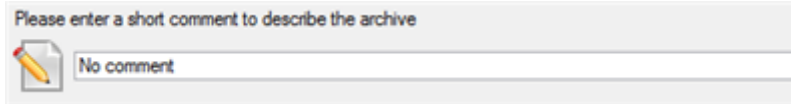
- Select a recordable device on the list of available CD/DVD devices and edit the archive name, if necessary.





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

7. Add comments to your backup describing its contents.



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.



This operation can also be accomplished with our recovery media.

Backing up a hard disk or partition to a network drive

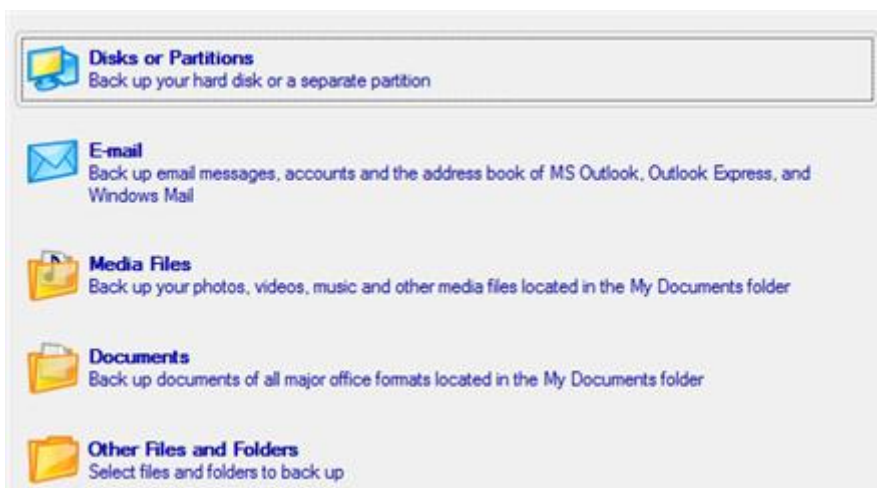
To back up an entire hard disk or a separate partition and then place the resulted image to a network share, please do the following:

1. Click the **Smart Backup** item of the Wizards menu.

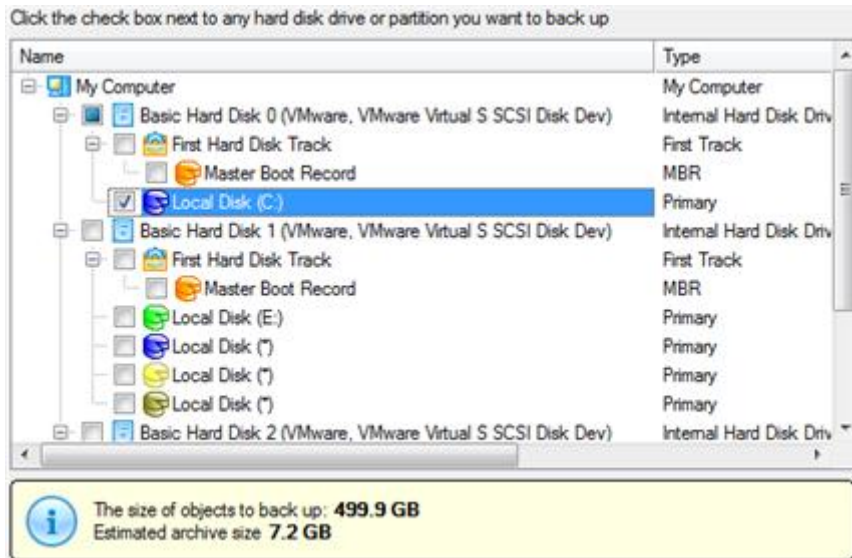


There are other ways to start up this function, please consult the [Interface Overview](#) chapter to know more on the subject.

2. On the Wizard's Welcome page, click the Next button.
3. On the What to back up page, select **Disk or Partitions** to create a sector-based backup of the whole disk system, or only separate partitions.



4. On the next page, mark the appropriate option opposite a hard disk's name or a partition's name depending on the chosen task.



You've got the option to modify the default backup settings by marking the appropriate checkbox on this page.

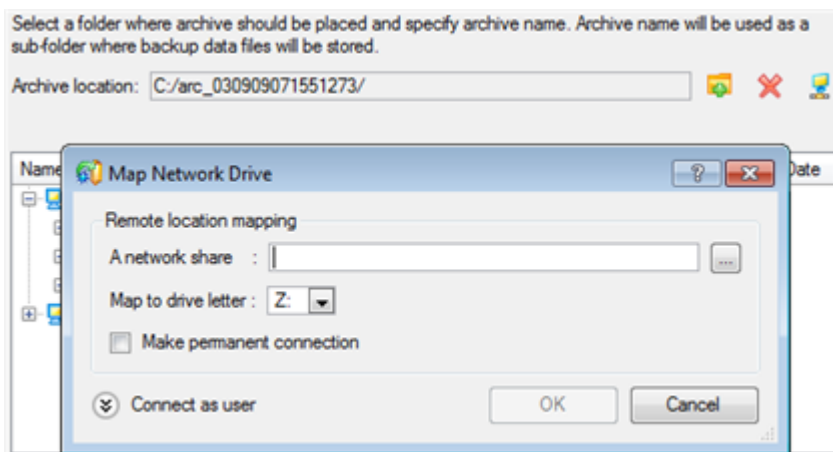
By default the program will take into account exclude filters set in the [Settings](#) dialog.

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



- Map a network disk to place your backup image to:

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



- Click the standard browse button [...] to browse for the required network share or manually enter a path to it;
- Define a letter from the pull-down list of available drive letters;

- Mark the checkbox to make this connection permanent. Otherwise it will only be available for the current Windows session;
- Click the Connect as user button at the foot of the dialog page to specify a user name and password to access the selected network share if necessary.

7. Edit the archive name if necessary.

Please specify the archive name. Archive name will be used as a sub-folder where backup data files will be stored.

Archive details

Archive name:

Estimated archive size: **4.4 GB**


Space available on backup destination: **38 GB**



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.

8. Add comments to your backup describing its contents.

Please enter a short comment to describe the archive



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



This operation can also be accomplished with our recovery media.

Backing up files to an FTP/SFTP server

With our program you can protect the entire system, separate partitions, or particular files by backing up directly to online storages located on FTP or SFTP servers. Please note however, that due to certain limitations of the network bandwidth, the use of FTP/SFTP locations for storing many GBs of data (OS together with all on-disk data) isn't the best choice, but it's great for personal data, like your documents, email databases, photos, etc.

So let's see how to back up all office documents of the My Documents folder to an SFTP server:

1. Click the **Smart Backup** item of the Wizards menu.



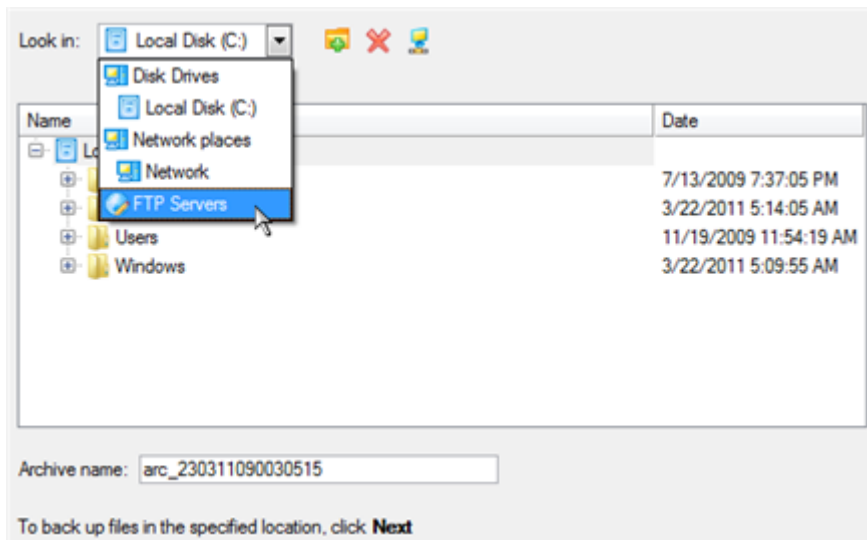
There are other ways to start up this function, please consult the [Interface Overview](#) chapter to know more on the subject.

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

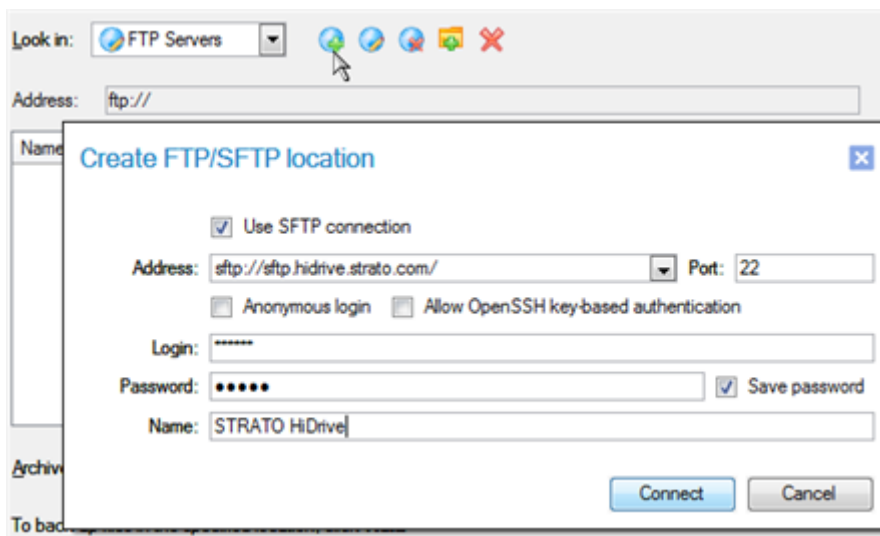
3. On the What to back up page, select **Documents** to protect all office documents inside the My Documents folder.



4. On the next page, choose **FTP Servers** as backup storage.



5. Click on the **Create an FPT Location** button to set up parameters for the required SFTP location.



- **Use SFTP connection.** Mark the option to connect to the desired SFTP server;
- **Address.** Type in its address;
- **Port.** Specify the required port (22 by default);

- **Anonymous login.** Mark the option to set up anonymous connection. Typical username for this type of login is “anonymous”;

- **Allow Open SSH key-based authentication.** If your SFTP provider requires this type of authentication, mark the option to specify public and private keys and a passphrase;

Public key file:	<input type="text"/>	<input type="button" value="Browse"/>
Private key file:	<input type="text"/>	<input type="button" value="Browse"/>
Passphrase:	<input type="text"/>	

- **Login.** Enter a login;

- **Password.** Enter a password. Click **Remember password** to save it next time you back up to this location;

- **Name.** By default, the program uses the provided address as the connection name, which can be modified however.



You need to check out yourself Windows Firewall or programs of this kind let our program work with the required port (21 for FTP and 22 for SFTP by default).

6. When ready, click the **Connect** button to check out you’ve got access to the provided location. If yes, you’ll get a new item on the list named after this location. By clicking the + icon you can browse it to specify a more exact location for your backup. At this stage you can also edit the default archive name if necessary.

7. Add comments to your backup describing its contents.

Please enter a short comment to describe the archive

8. To prevent unauthorized access to your personal data, we strongly recommend you to password protect your backup.

Protect archive with password

Please enter a password...

Password:

Confirm password:

ENU

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



This operation can also be accomplished with our recovery media.

Backing up a dual boot Mac to an external USB drive

To back up a dual boot Mac (Mac OS X and Windows XP/Vista/7) and then place the resulted image to an external USB drive, please do the following:

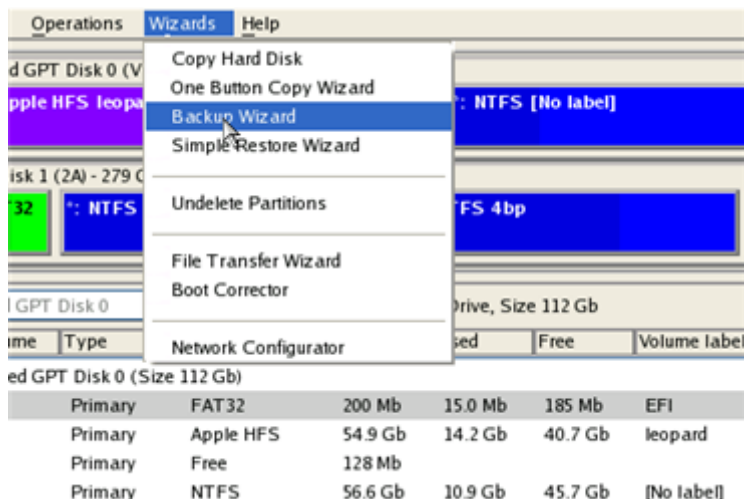
- Start up the computer from our Linux/DOS recovery media.



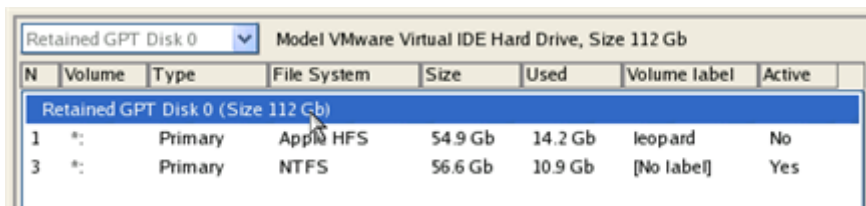
[Recovery Media Builder](#) can help you prepare our recovery environment either on a CD/DVD disc or a thumb drive.

To automatically boot from the recovery media please make sure the on-board BIOS is set up to boot from CD/USB first.

- Connect an external USB drive to the computer.
- Restart the computer. It will be automatically started up into the Linux recovery environment (**Normal Mode**), since it's the only mode that provides support for Mac computers.
- In the Linux launch menu select **Drive Backup**.
- Launch the Backup Wizard by selecting in the Main Menu of the program: **Wizards > Backup Wizard**.



- On the Wizard's Welcome page, click the Next button.
- On the What to back up page, select your Mac hard disk.

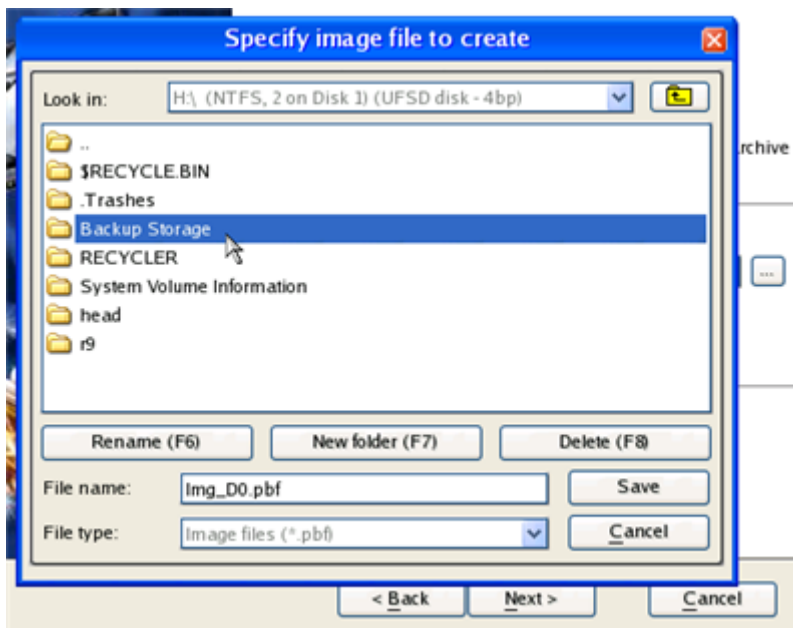


8. On the Backup Destination page, select the **Save data to any local drive or a network share** option.

Please select how would you like to save the archive:

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

9. Select an external USB drive as a backup destination.



10. Edit the archive name if necessary.

Backup destination

Archive name:
 ...

Space available on destination: **34.8 Gb**

Approximate archive size: **17.5 Gb**



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.

11. Add comments to your backup describing its contents.

Archive text comment

Please enter backup comments to describe the archive:

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



This operation can also be accomplished under Windows.

Backing up files to a local mounted/unmounted (without drive letter assigned) partition

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

1. Click the **Smart Backup** item of the Wizards menu.

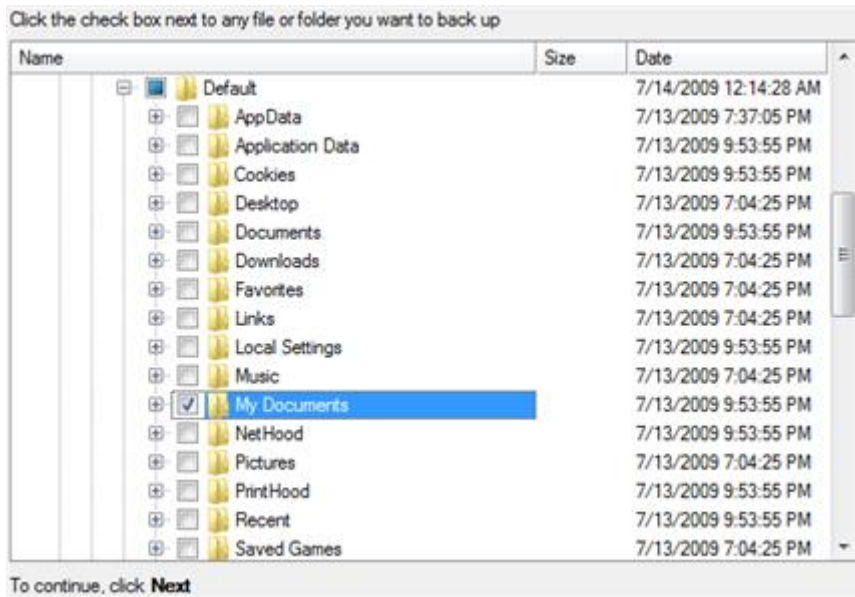


There are other ways to start up this function, please consult the [Interface Overview](#) chapter to know more on the subject.

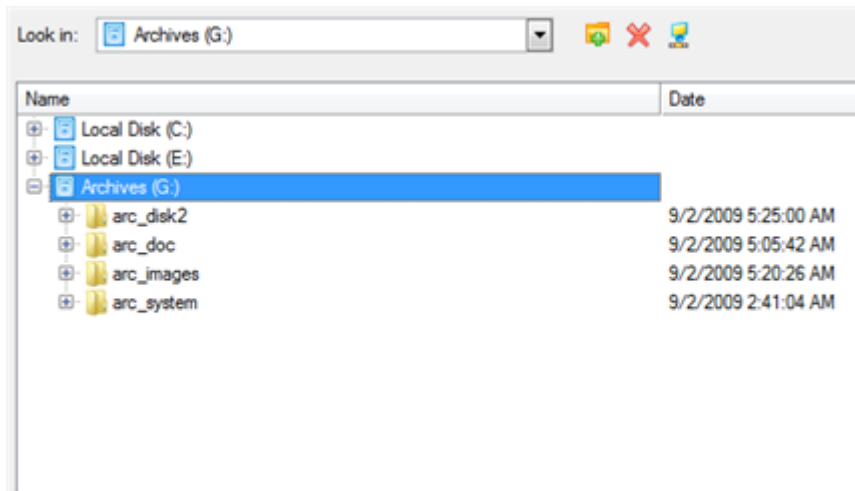
2. On the Wizard's Welcome page, click the Next button.
3. On the What to back up page, first take a look at the ready-made backup templates. If none of the options meets your needs (just our case), then select **Other Files and Folders** to create a file-based backup of certain data.



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



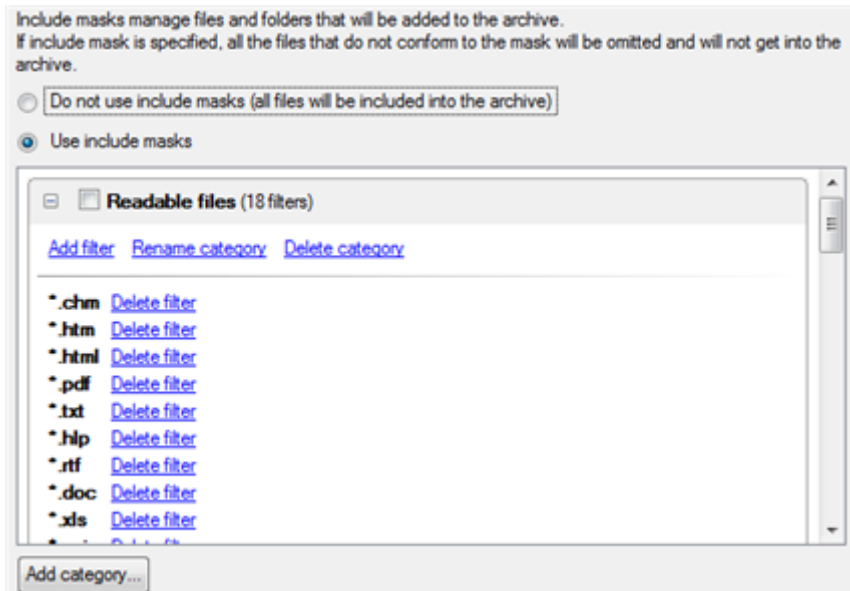
- On the Backup Destination page, select a local mounted/unmounted (without drive letter assigned) disk as a backup destination.



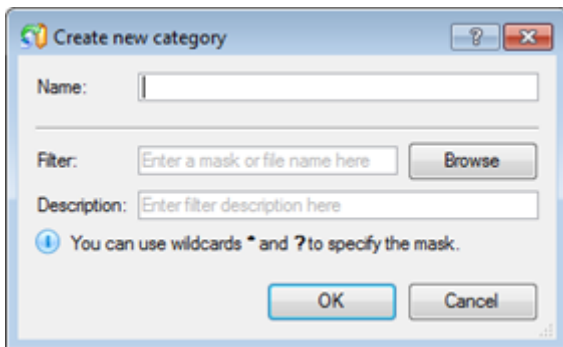
- Edit the archive name if necessary.

Archive name:

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



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



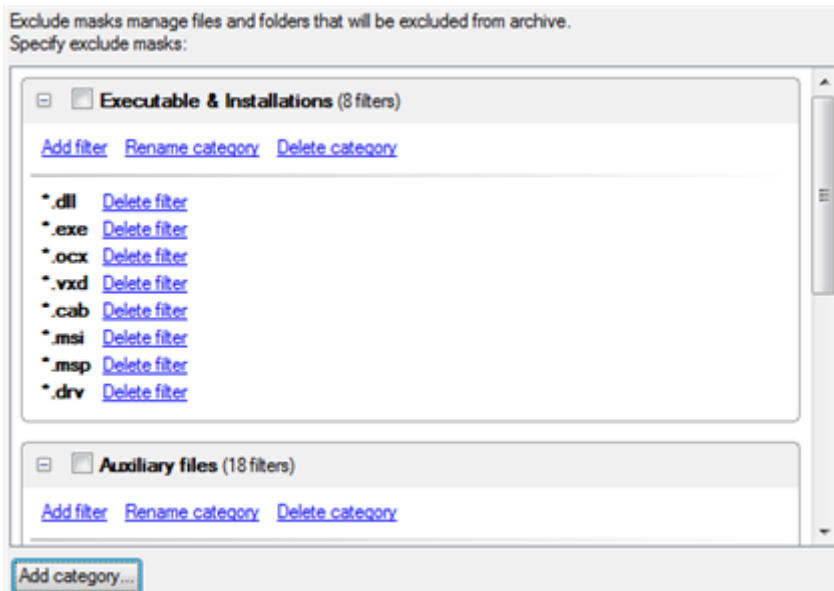
- **Name.** Give to the filter any name you like, but try to use an informative one;
- **Filter.** Press the Browse button to select files or folders you would like to be included or specify a filter mask by using * or ? wildcards;
- **Description.** Add a short description to the filter not to miss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

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

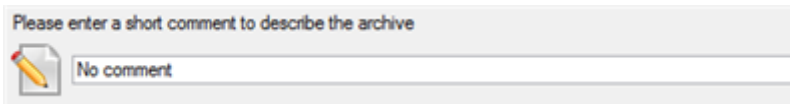


By setting an include mask, you automatically ignore files that do not match to it, thus they won't be added to the backup image.

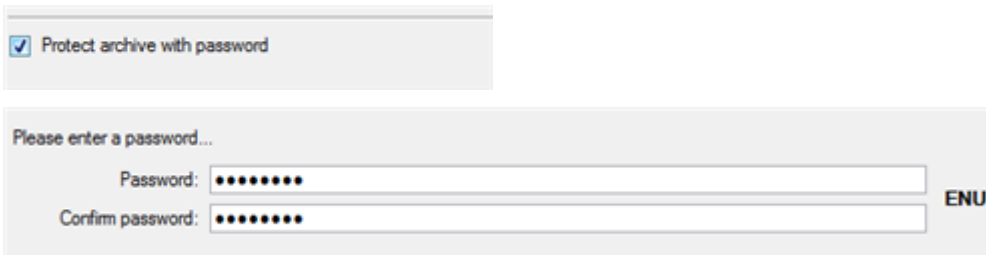
8. **Specify exclude masks.** The program includes a lot of ready-made filters to effectively control contents of your backup images.



9. Add comments to your backup describing its contents.



10. To prevent unauthorized access to your personal data, we strongly recommend you to password protect your backup.



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

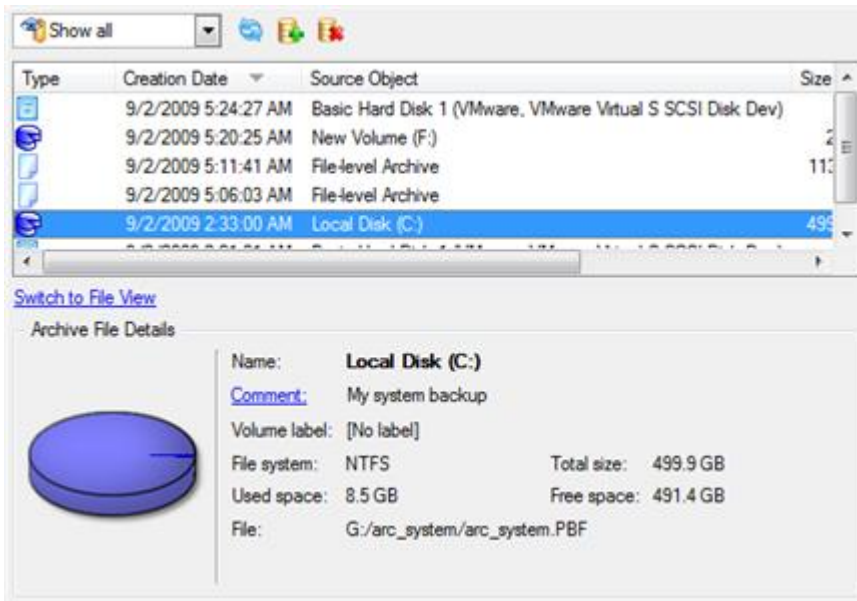


This operation can also be accomplished with our recovery media.

Creating a differential to a full partition backup

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

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

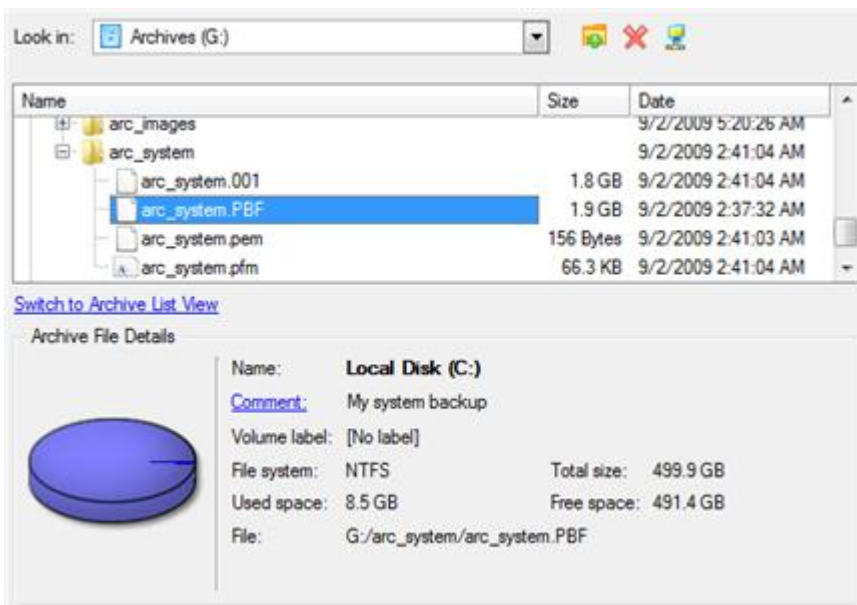


To get a clear-cut picture on properties of the required image, just click on it and the section below will (i.e. Archive File Details) display a short description.



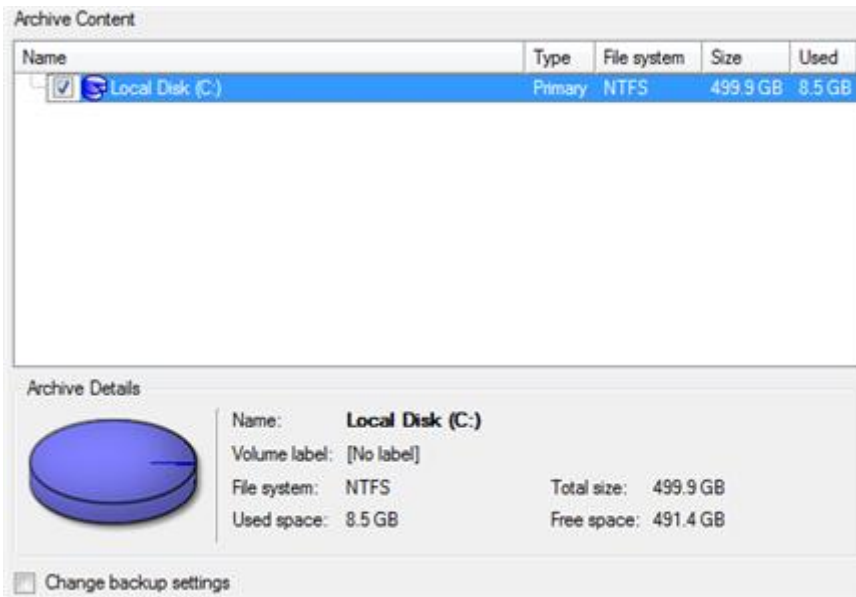
To know more on the subject, please consult the [Viewing Image Properties](#) chapter.

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

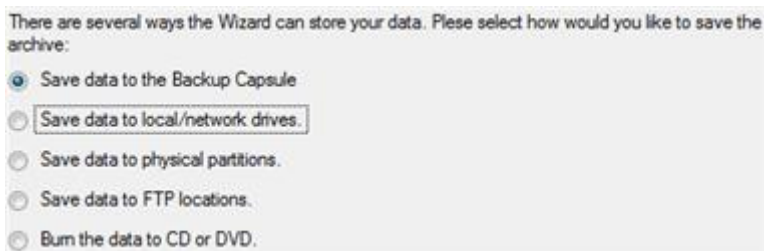


To know more on the subject, please consult the [Viewing Image Properties](#) chapter.

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



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

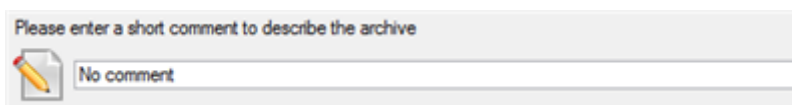


6. Edit the archive name if necessary.



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

7. Add comments to your backup describing its contents;



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

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



This operation can also be accomplished with our recovery media.

Creating a sector increment to a full partition backup

Before you start, please take into account the following issues:

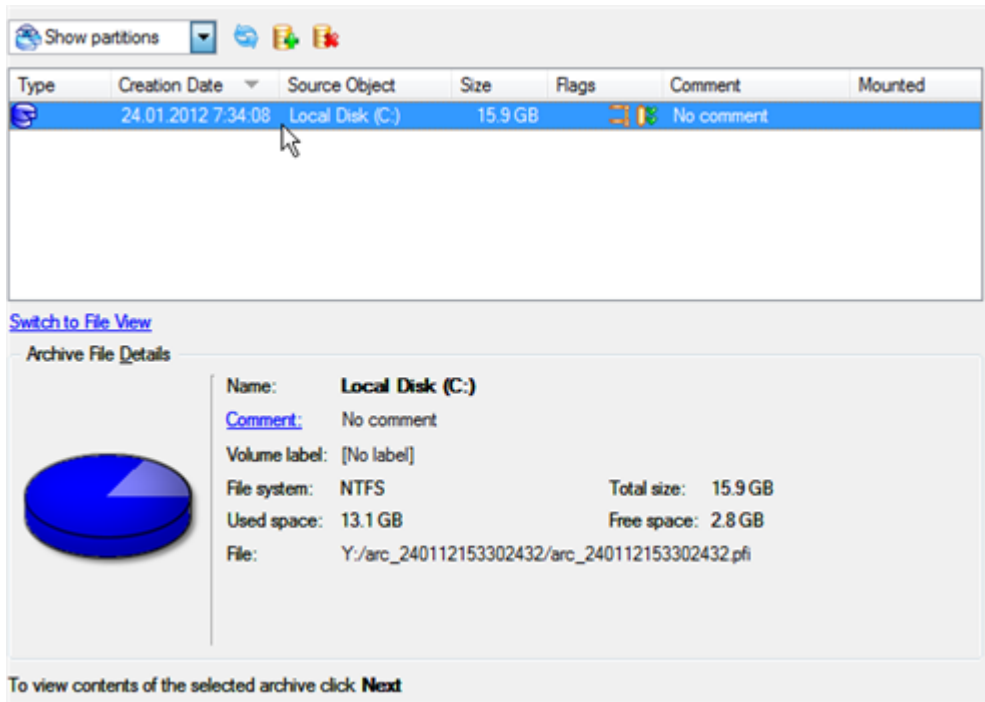
- You should have a full backup of the new type (with a .pfi index file). Any of our flagship products since Hard Disk Manager 12 supports this functionality;
- Increments can only be created for full archives stored on a local mounted drive or a network share;
- Increments will be stored together with the corresponding full archive;
- Increments cannot be created for archives of entire GPT disks;
- Increments can only be restored under Windows or WinPE;
- Increments can only be used with our software;
- Increment cannot be encrypted, compressed, or splitted;
- Increments cannot be browsed in Volume Explorer.



To know more on the subject, please consult the [Basic Concepts](#) section.

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

1. Click the **Incremental Backup...** item of the Wizards menu.
2. On the Wizard's Welcome page, click the Next button.
3. On the Browse for Archive page, specify the required full (base) partition archive:
 - By clicking the **Switch to Archive List View** link, you can see a list of images contained in the Archive Database (if any). Please note that only sector-based images of the new type (with a .pfi index file) are available to work with.

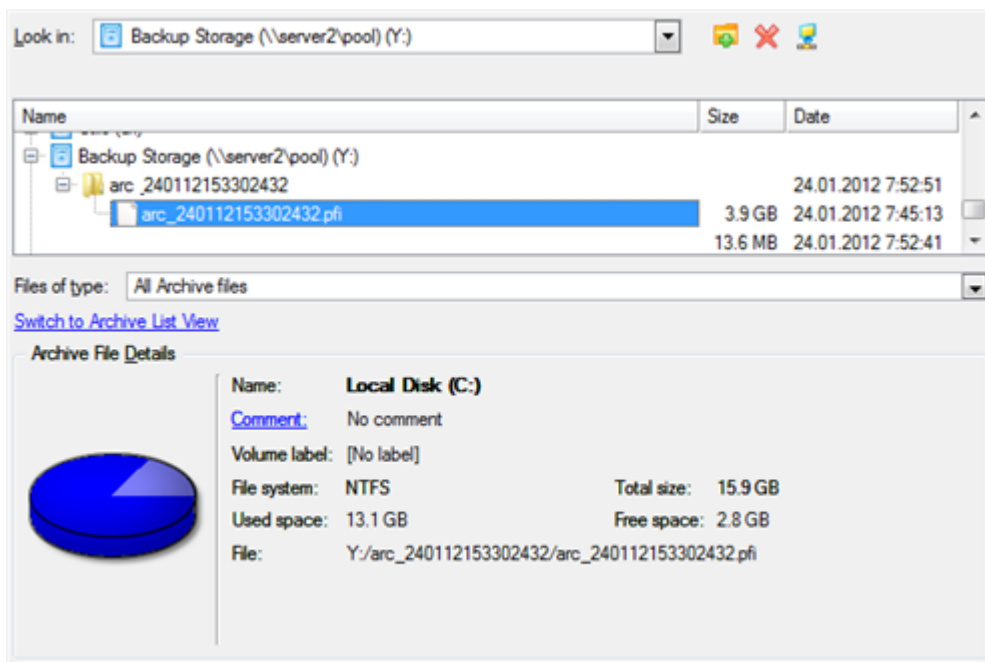


To get a clear-cut picture on properties of the required image, just click on it and the section below will (i.e. Archive File Details) display a short description.



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

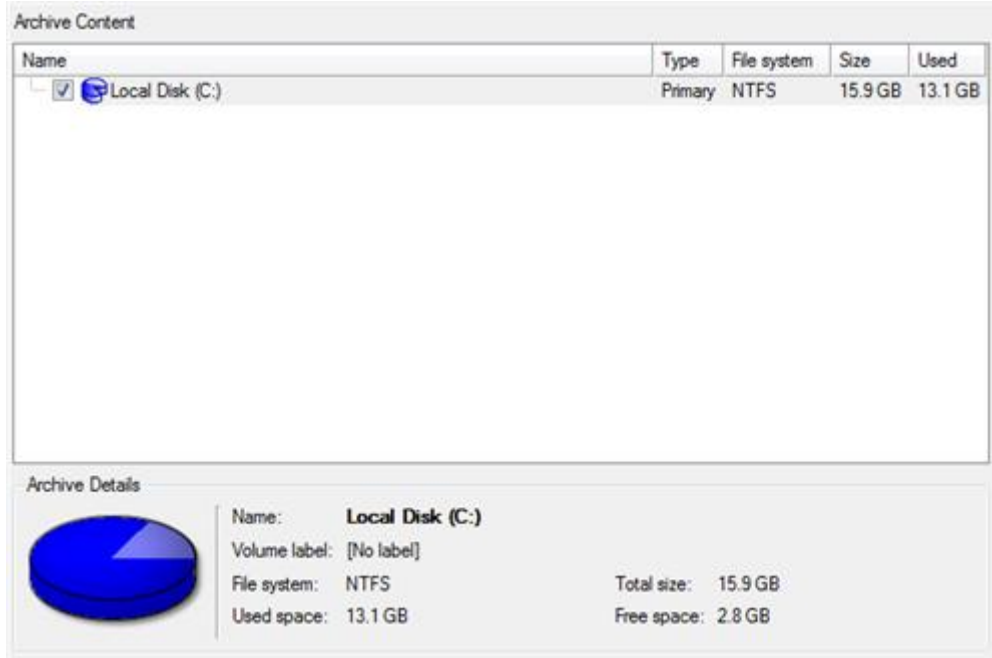
- By clicking the **Switch to File View** link, you can find the required image in the browser-like window. The section below (i.e. Archive File Details) will also display a short description of the selected image. Please note that only sector-based images of the new type (with a .pfi index file) are available to work with.





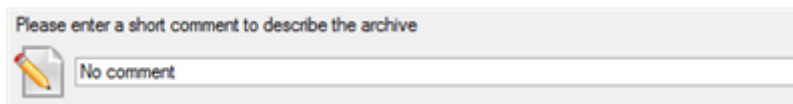
To know more on the subject, please consult the [Viewing Image Properties](#) chapter.

- The Archive Content page displays detailed information about the contents of the archive.



Advanced backup settings are unavailable for sector-based increments due to the usage of the new image container (.vhd).

- Add comments to your backup describing its contents;



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

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



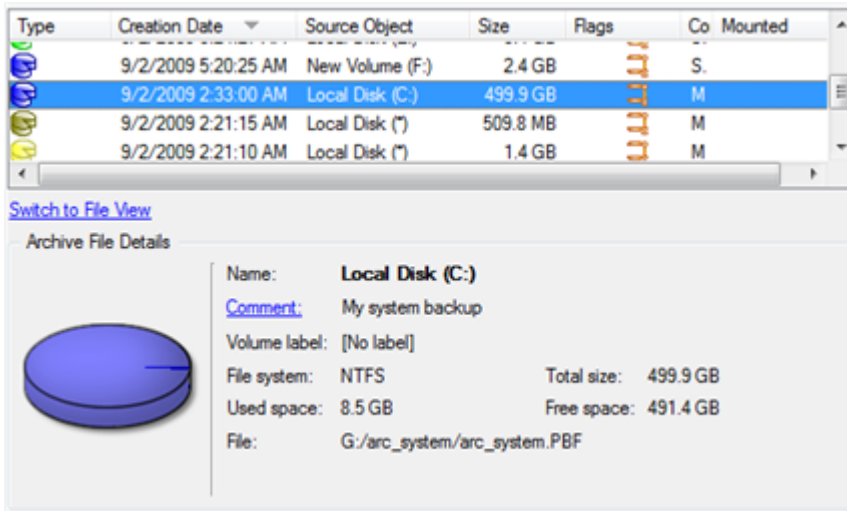
This operation can also be accomplished with the WinPE recovery media.

Creating a file increment to a full partition backup

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

- Click the **Create File Complement** item of the Wizards menu.
- On the Wizard's Welcome page, click the Next button.
- On the Browse for Archive page, specify the required full (base) partition archive:

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

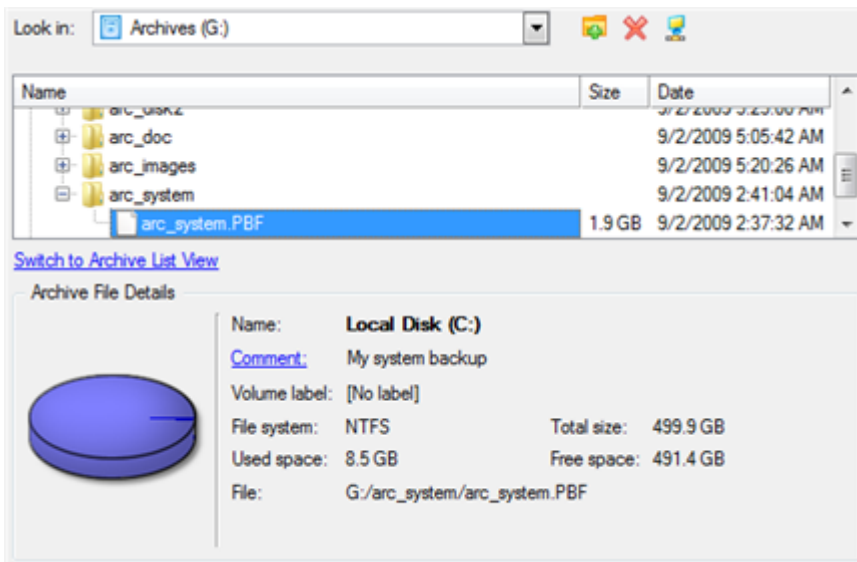


To get a clear-cut picture on properties of the required image, just click on it and the section below will (i.e. Archive File Details) display a short description.



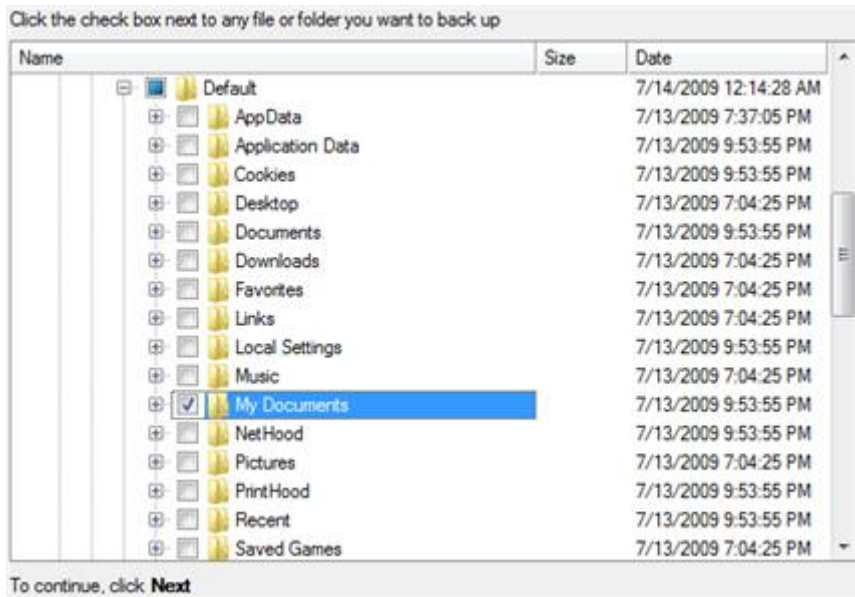
To know more on the subject, please consult the [Viewing Image Properties](#) chapter.

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

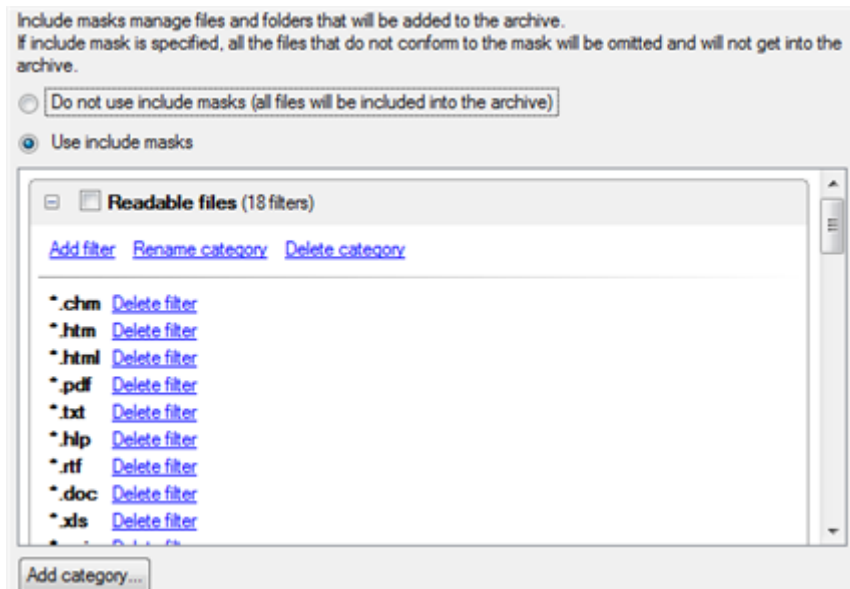


To know more on the subject, please consult the [Viewing Image Properties](#) chapter.

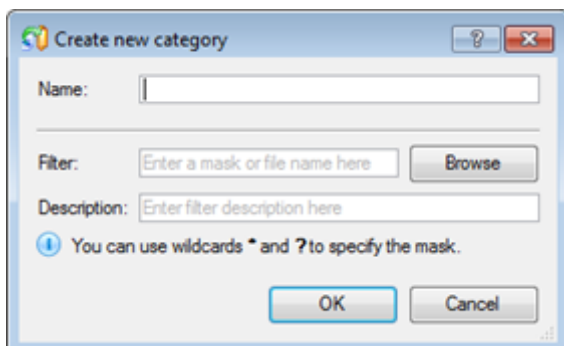
4. On the What folders and files to back up page you can see contents of the selected partition archive. Mark a checkbox opposite a file or folder to build up contents of the future incremental image.



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



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



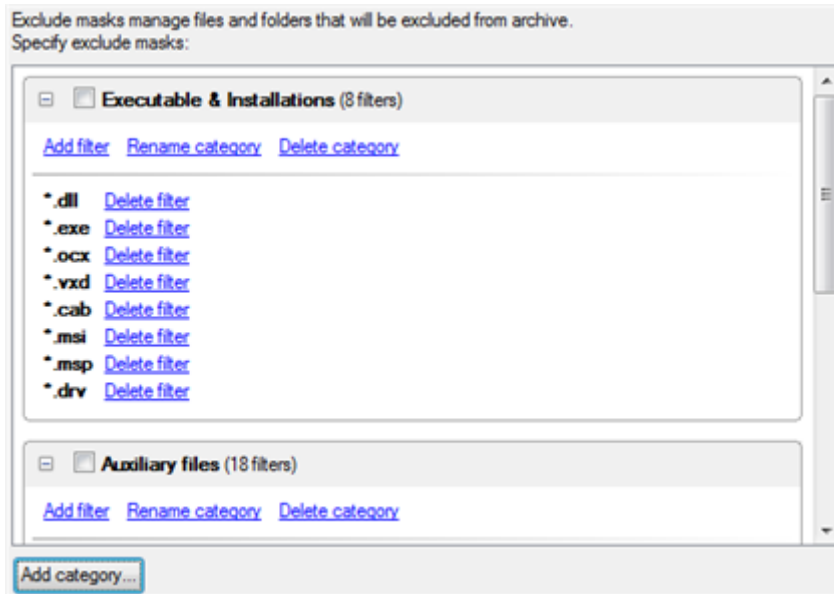
- **Name.** Give to the filter any name you like, but try to use an informative one;
- **Filter.** Press the Browse button to select files or folders you would like to be included or specify a filter mask by using * or ? wildcards;
- **Description.** Add a short description to the filter not to miss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

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

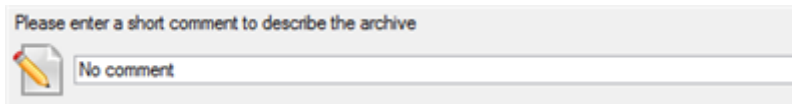


By setting an include mask, you automatically ignore files that do not match to it, thus they won't be added to the backup image.

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



7. Add comments to your backup describing its contents.



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.

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



This operation can also be accomplished with our recovery media.

Creating an increment to a full file backup

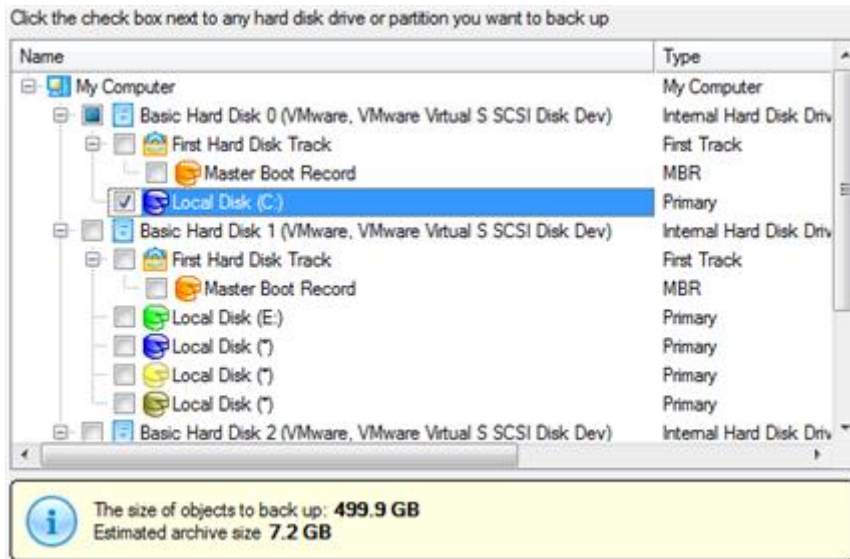
To update a file backup, please do the following:

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

Creating a cyclic partition backup

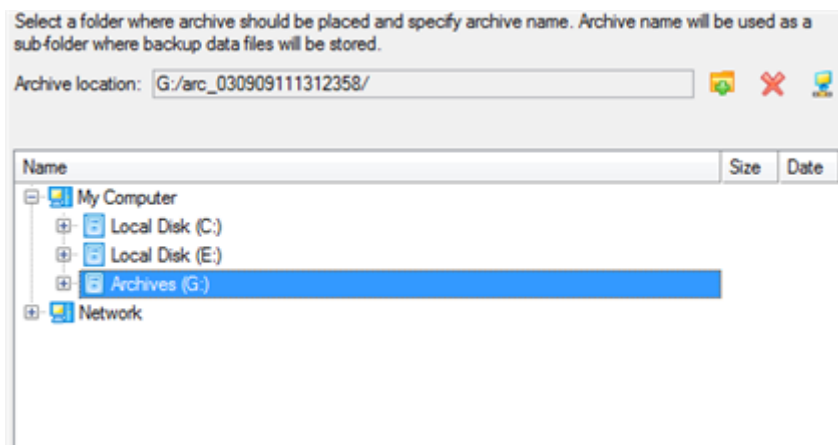
To automate the partition backup process, please do the following:

1. Select in the Main Menu: **Wizards > Backup Utilities > Cyclic Backup...**
2. On the Wizard's Welcome page, click the Next button;
3. On the What to back up page, select a partition you want to make a cyclic backup of;



The current version of the program enables to make a cyclic backup of only one partition at a time.

4. On the Backup Destination page, select a mounted/unmounted partition, a network share, or an FTP server to place backup images to.



5. Edit the archive name if necessary.

Please specify the archive name. Archive name will be used as a sub-folder where backup data files will be stored.

Archive details

Archive name:

Estimated archive size: **4.4 GB**

Space available on backup destination: **38 GB**



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.

- Add comments to your backup describing its contents.

Please enter a short comment to describe the archive

- Set a timetable for the operation.

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

Shutdown system after backup

Generate unique names for scheduled backups

Run the task on:

at

Every

week(s) on:

Monday Friday

Tuesday Saturday

Wednesday Sunday

Thursday

Do not run the task after:

[Specify user name and password.](#)



To know more on the subject, please consult the [Task Scheduling](#) chapter.

- On the Cyclic backup type page, choose the way of creating a cyclic backup:

There are several types of the cyclic backup the Wizard can perform. Please choose the one you would like to carry out:

Cyclic Backup Type

Basic type

Every image made during the operation will be created as a complete base image.

Differential type

Every first image will be made as a complete base image, all the others will be differentiated from it. A differential backup only contains changes in the partition's contents with respect to a complete image.

- **Base type.** Every image created during the operation will be made as a full archive.
- **Differential type.** Every first image will be made as a full (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 the **Maximum disk space to store images** and the **Maximum number of images to store** parameters you may define when the operation will be cycled. That means that on exceeding these two parameters the oldest archives will be automatically overwritten (if choosing the Differential type only differential images will be overwritten).

Maximum disk space to store images: 10000 MB.
Maximum number of images to store: 2

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

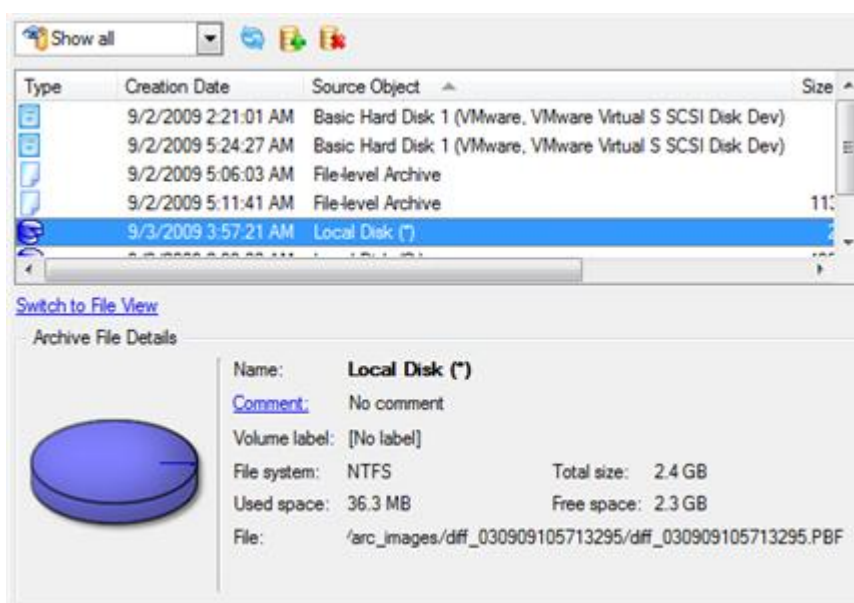
The operation will run according to the set timetable. The resulted backup images will be placed into the specified destination (a local or a network disk), its features defined by the wizard.

Merging a full partition backup with one of its differentials

To merge a full partition backup with one of its differentials, thus getting a new full partition archive, please do the following:

1. Click the **Synthetic Backup** item of the Wizards menu.
2. On the Wizard's Welcome page, click the Next button.
3. On the Browse for Archive page, you only need to specify the required differential archive. The program then will automatically find its base image:

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

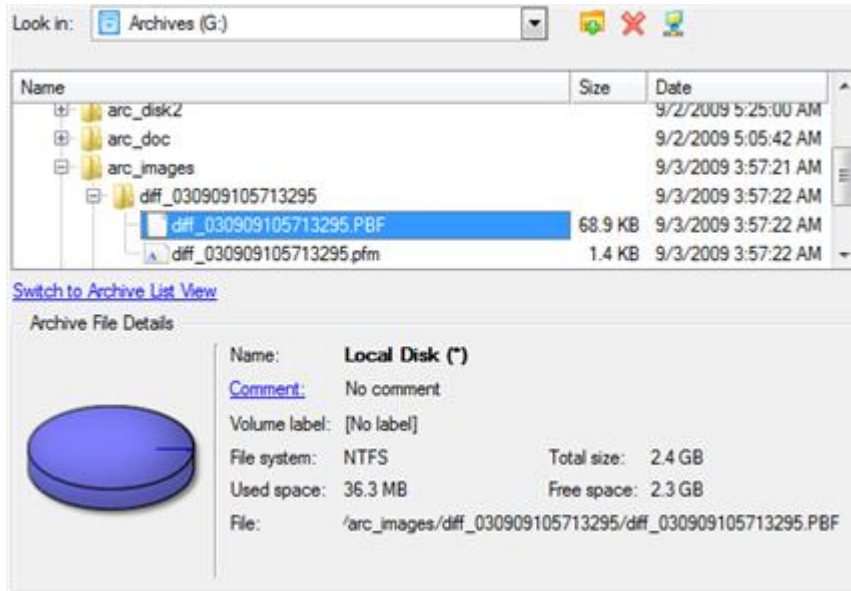


To get a clear-cut picture on properties of the required image, just click on it and the section below will (i.e. Archive File Details) display a short description.



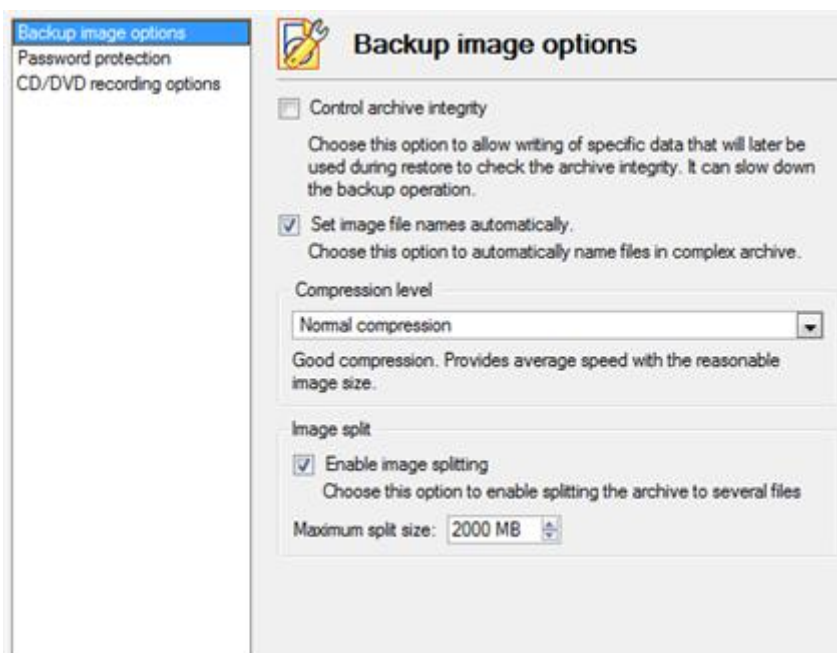
To know more on the subject, please consult the [Viewing Image Properties](#) chapter.

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



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

- On the Synthesis Settings page you can additionally modify any property of the selected backup image if necessary. To accomplish our task we have no need to change anything at all.



- On the Synthetic Archive Destination page, select where you want to place the resulted backup image.

There are several ways the Wizard can store your data. Please select how you would like to save the archive:

Save data to the Backup Capsule

Save data to local/network drives.

Save data to physical partitions.

Save data to FTP locations.

Burn the data to CD or DVD.

6. Edit the archive name if necessary.

Archive details

Archive name:

Estimated archive size: **31 MB**


Space available on backup destination: **490.3 GB**



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

7. Add comments to your backup describing its contents;

Please enter a short comment to describe the archive



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

After the operation is completed you receive a new full partition archive. 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.
This operation can also be accomplished with our recovery media.**

Recovery Scenarios

Fixing MBR after a boot virus attack

Let's assume that the MBR (Master Boot Record) of your hard disk has been corrupted as a result of a boot virus attack, thus your system fails to boot.

To fix the MBR of your hard disk, please do the following:

1. Start up the computer from our Linux/DOS recovery media.



[Recovery Media Builder](#) can help you prepare our recovery environment either on a CD/DVD disc or a thumb drive.

To automatically boot from the recovery media please make sure the on-board BIOS is set

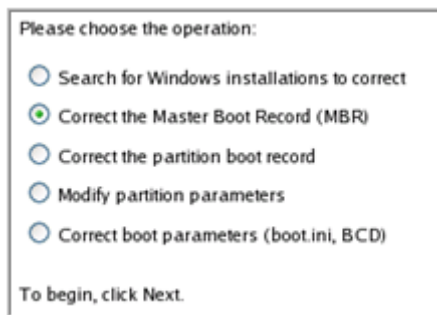
up to boot from CD/USB first.

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

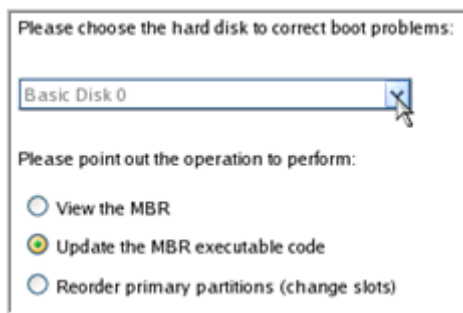


By default the Normal Mode will be automatically initiated after a 10 second idle period.

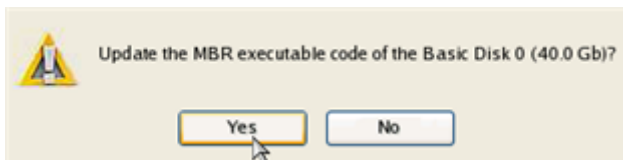
- In the Linux launch menu select Boot Corrector. You can find it in PTS DOS as well.
- On the Wizard's Welcome page, select the **Correct the Master Boot Record (MBR)** option.



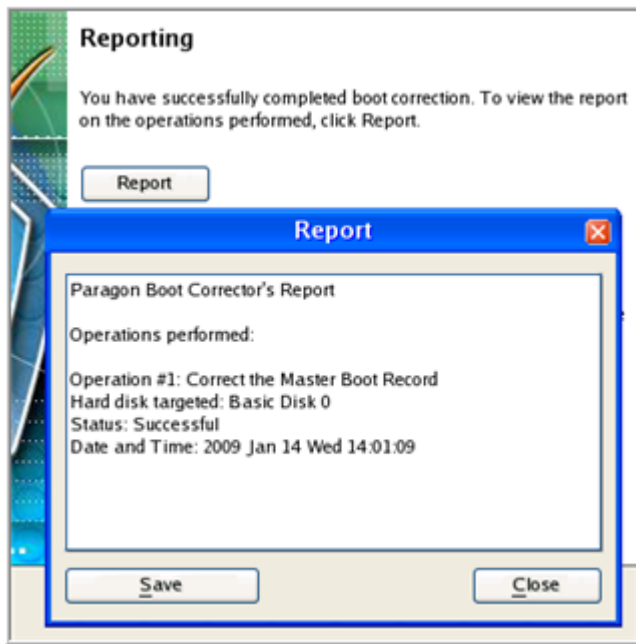
- On the next page choose the required hard disk from the pull-down list (if several) and then select the **Update the MBR executable code** option.



- Confirm the operation.



- After the operation is completed click the Report button to see a well informative summary page. 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.



8. Click the Finish button to close Boot Corrector.
9. Reboot the computer.

Correcting BCD (Boot Configuration Data)

To automatically correct Windows BCD, please do the following:

1. Start up the computer from the WinPE recovery media.



Please use **Boot Media Builder** to prepare the WinPE recovery environment, which you can get here: www.paragon-software.com/my-account/.

To automatically boot from the recovery media please make sure the on-board BIOS is set up to boot from CD/USB first.

2. Launch **Boot Corrector**.
3. On the Wizard's Welcome page, click the Next button.
4. Select **Correct boot parameters...** to let the wizard fix BCD in all found Windows installations.



5. The wizard will ask you to confirm the operation. Apply the changes to complete.



After completing the operation close the wizard, and then reboot the computer.

Fixing Windows startup ability

Let's assume that due to an unknown reason your Windows fails to complete the startup procedure. At first everything seems quite OK, you can see the standard startup messages on the screen, but at some moment it hangs up.

To fix your Windows startup ability, please do the following:

1. Start up the computer from our Linux/DOS recovery media.



[Recovery Media Builder](#) can help you prepare our recovery environment either on a CD/DVD disc or a thumb drive.

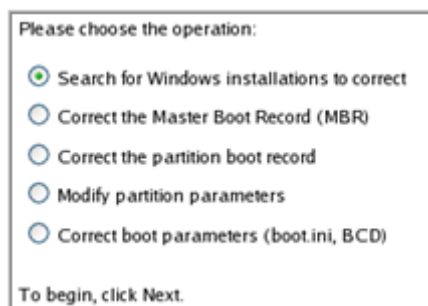
To automatically boot from the recovery media please make sure the on-board BIOS is set up to boot from CD/USB first.

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

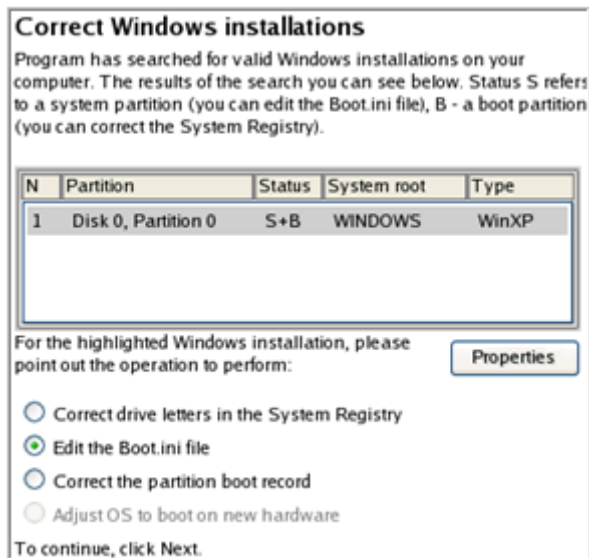


By default the **Normal Mode** will be automatically initiated after a 10 second idle period.

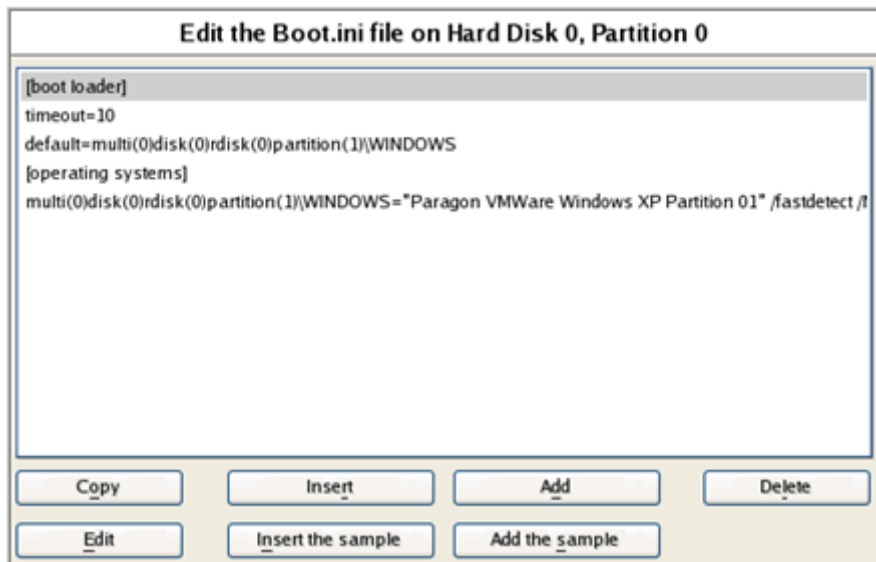
3. In the Linux launch menu select Boot Corrector. You can find it in PTS DOS as well.
4. On the Wizard's Welcome page, select the **Search for Windows installations to correct** option.



5. On the next page choose the required Windows installation from the list of found installations (if several), then select the **Edit the Boot.ini file** option. If you're not sure which installation you need, please use the Properties button to get more info on the selected item.



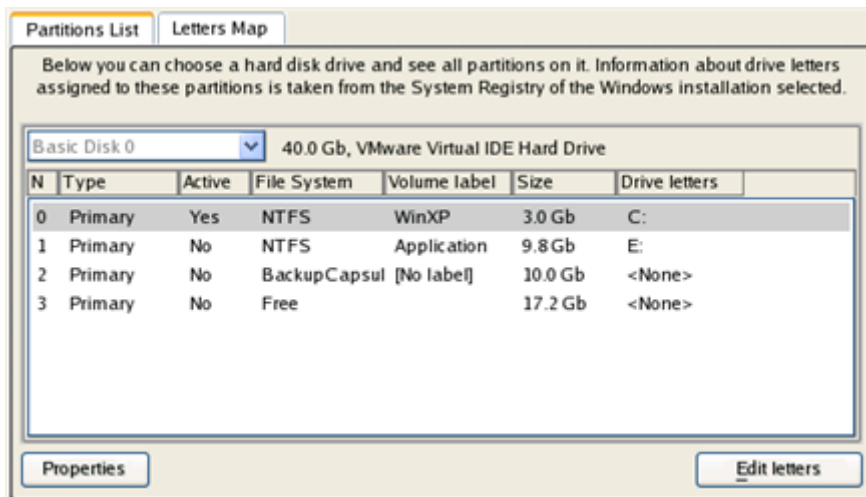
6. Examine the file – maybe that's where the problem is. If it contains a mistake, correct it by using the appropriate buttons.



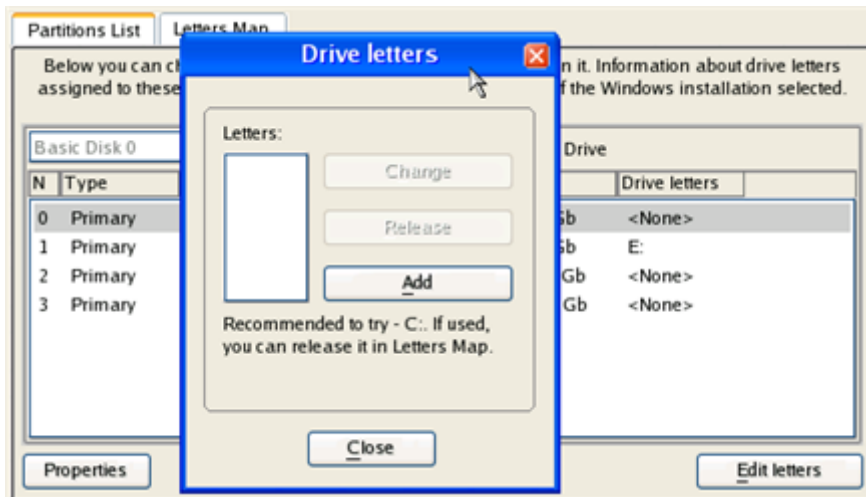
7. If the Boot.ini file does not contain any mistake, please return to the Correct Windows Installations page to correct drive letters in the Windows System Registry.



8. On the next page choose a hard disk from the pull-down list (if several), then the required partition. If you're not sure which installation you need, please use the Properties button to get more info on the selected item.



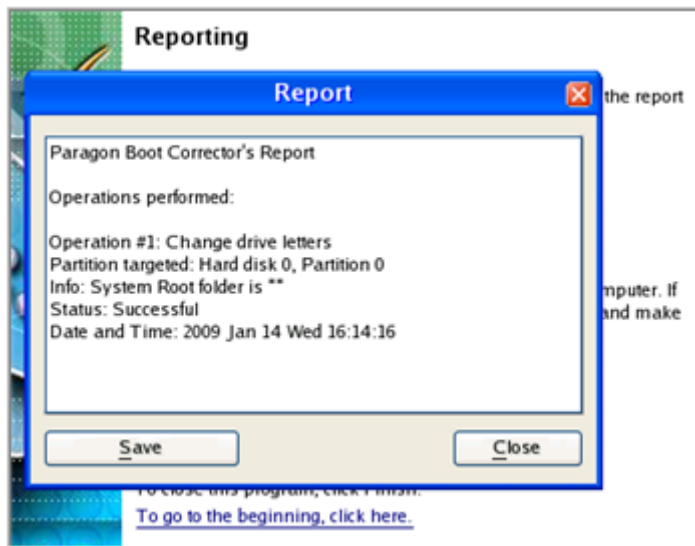
9. Click the Edit Letters button to correct an existing drive letter or assign a new one in the Windows System Registry.



10. Once you've assigned the appropriate drive letter, close the dialog, then click the Apply button.
11. Confirm the operation.



12. After the operation is completed click the Report button to see a well informative summary page. 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.



13. Click the Finish button to close Boot Corrector.
14. Reboot the computer.

Restoring a hard disk from the bootable Backup Capsule

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

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

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



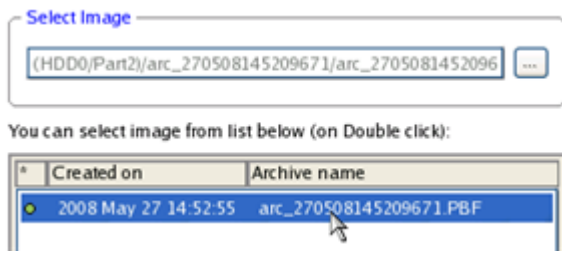
This scenario implies that the backup capsule is bootable.

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

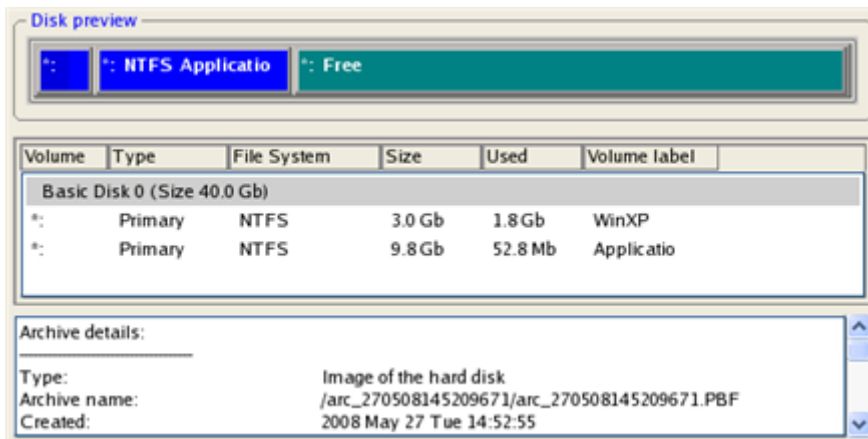


By default the Normal Mode will be automatically initiated after a 10 second idle period.

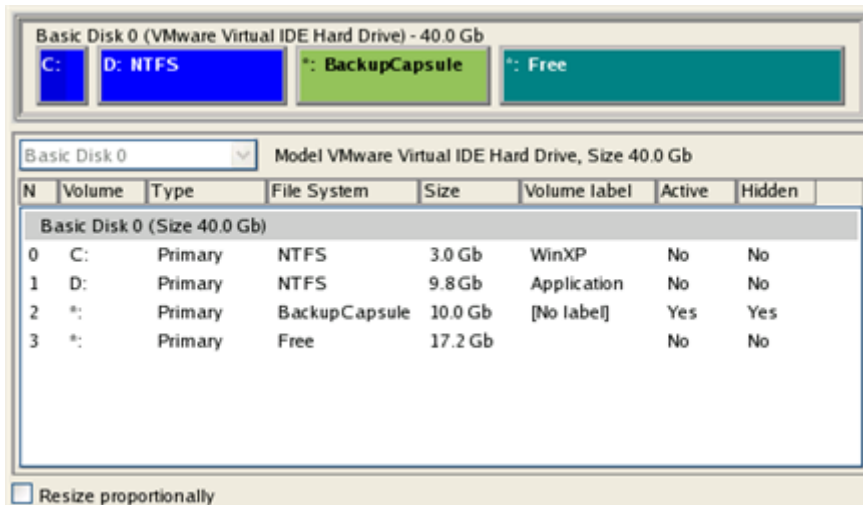
3. In the Linux launch menu select the Simple Restore Wizard. You can find the same wizard in PTS DOS as well.
4. On the Wizard's Welcome page, click the Next button.
5. On the What to Restore page, you can see a list of available images (if several). Most likely the required archive will be there too. If not, click the standard browse button [...] to find it. When you find your image, double click on it to proceed.



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



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

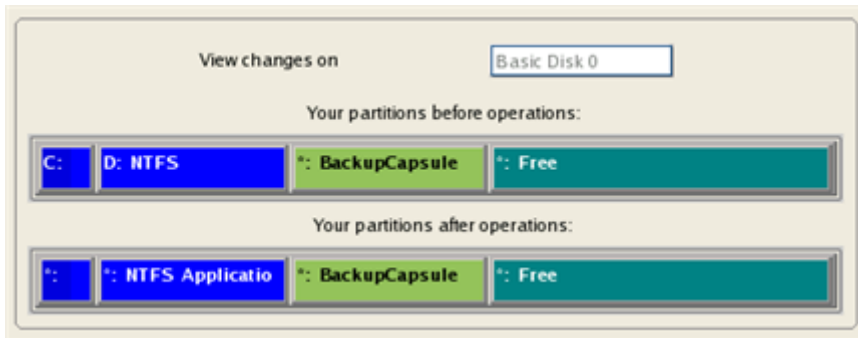


You can also make the program resize the on-disk partitions proportionally if necessary by marking the appropriate checkbox.

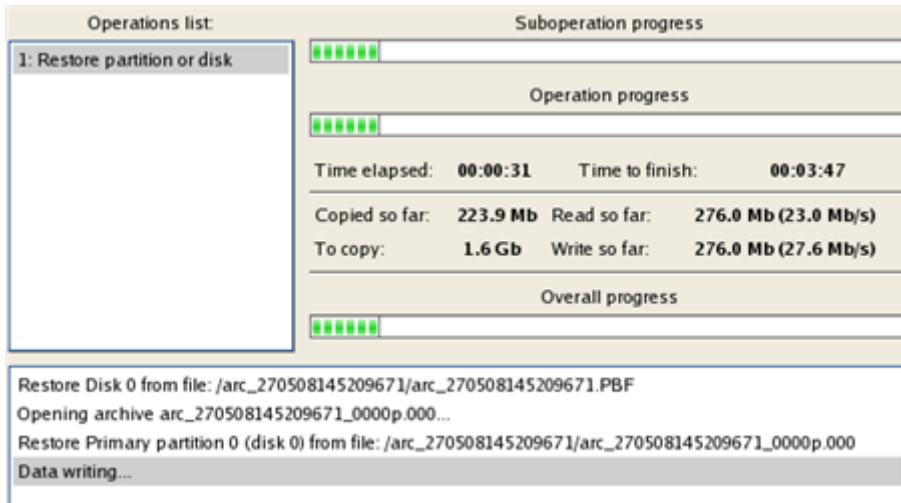


All contents on the disk selected for restoring purposes will be deleted during the operation.

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



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



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



To make Windows bootable on different hardware, please additionally complete the [P2P Adjust OS Wizard](#).

Restoring a system partition from external media (CD/DVD)

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

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

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



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

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

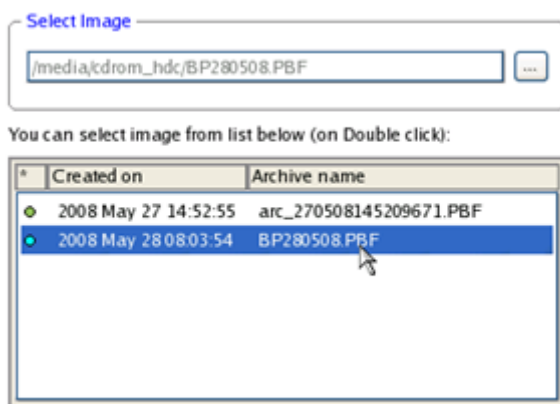
2. Restart the computer.
3. In the boot menu select **Normal Mode** to use the Linux recovery environment (more preferable) or **Safe Mode** to use the PTS DOS recovery environment (in case you've got problems with Linux). Moreover you've got the

option to boot into the **Low-Graphics Safe Mode** (PTS DOS safe mode) to cope with a serious hardware incompatibility. In this case, only the minimal set of drivers will be included, like hard disk, monitor, and keyboard drivers. This mode has simple graphics and a simple menu.

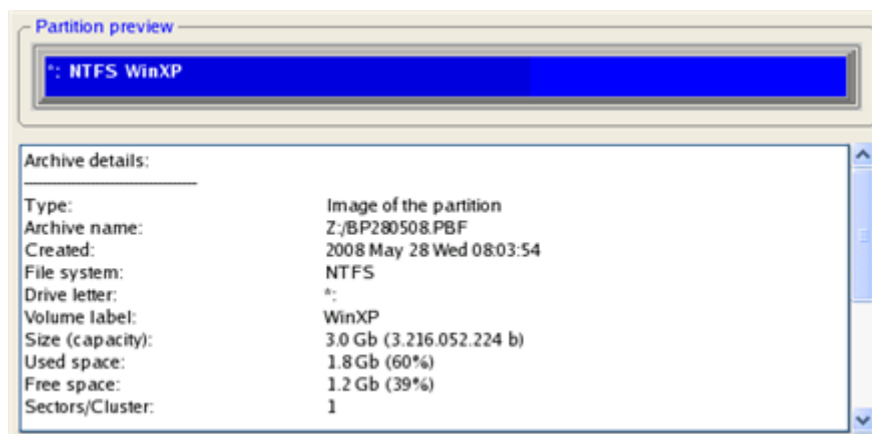


By default the Normal Mode will be automatically initiated after a 10 second idle period.

4. In the PTS DOS launch menu select the Simple Restore Wizard. You can find the same wizard in Linux as well.
5. On the Wizard's Welcome page, click the Next button.
6. On the What to Restore page, you can see a list of available images (if several). Most likely the required archive will be there too. If not, click the standard browse button [...] to find it. When you find your image, double click on it to proceed.



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



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

Basic Disk 0 - 40.0 Gb

N	Volume	Type	File System	Size	Volume label	Active	Hidden
0	*:	Primary	NTFS	3.0 Gb	WinXP	Yes	No
1	*:	Primary	NTFS	9.8 Gb	Application	No	No
2	*:	Primary	BackupCapsule	10.0 Gb	[No label]	No	Yes
3	*:	Primary	Free	17.2 Gb		No	No



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

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

Partition preview

*: NTFS WinXP

New size: (1859 - 3067) Mb

Free space before: (0 - 1208) Mb

Free space after: (0 - 1208) Mb

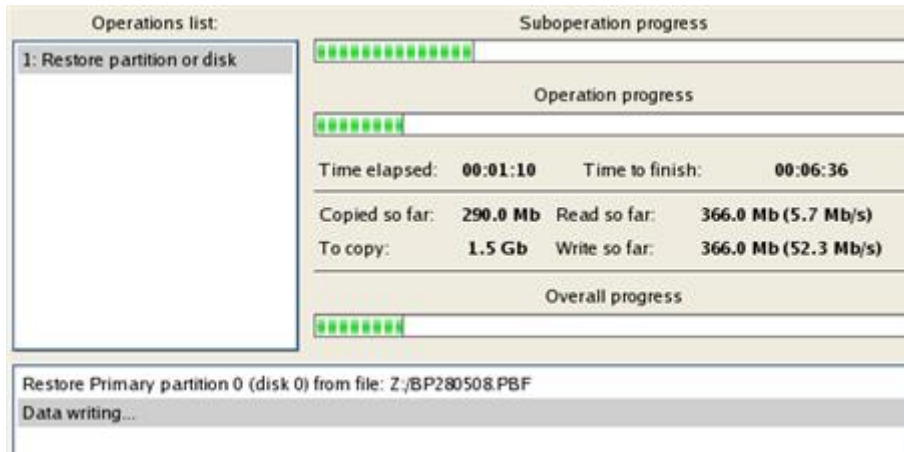
10. On the Restore Summary page you can see your hard disk layout before and after the operation. Click the Next button to initiate the restore process.

View changes on Basic Disk 0

Your partitions before operations:

Your partitions after operations:

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



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



To make Windows bootable on different hardware, please additionally complete the [P2P Adjust OS Wizard](#).

Restoring a system partition from a network drive

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

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

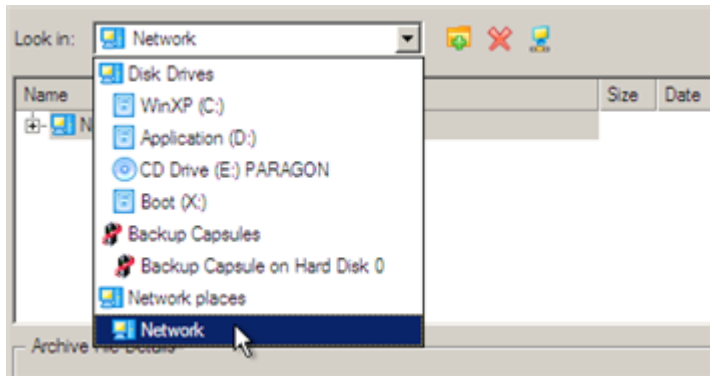
1. Start up the computer from the WinPE recovery media.



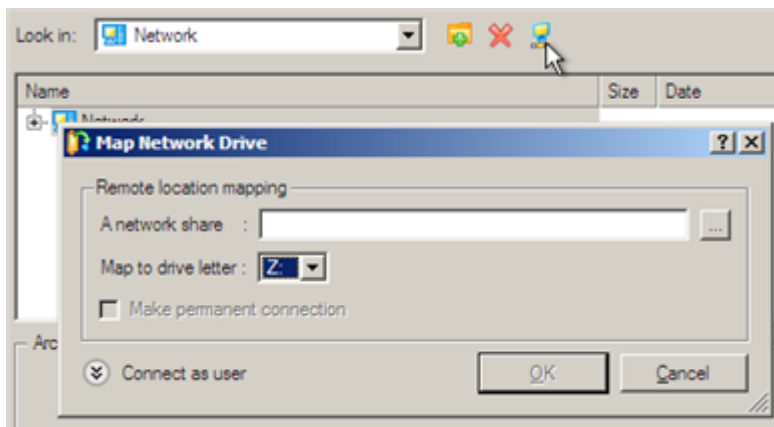
Please use **Boot Media Builder** to prepare the WinPE recovery environment, which you can get here: www.paragon-software.com/my-account/.

To automatically boot from the recovery media please make sure the on-board BIOS is set up to boot from CD/USB first.

2. Launch **Restore Wizard**.
3. On the Restore Wizard's Welcome page, click the Next button.
4. On the Browse for Archive page you need to specify the required backup image. So you should take the following steps to do that:
 - Select **Network** as a backup destination;



- Map a network disk where your archives are placed:
 - Call the Map Network Drive dialog by clicking the appropriate button;

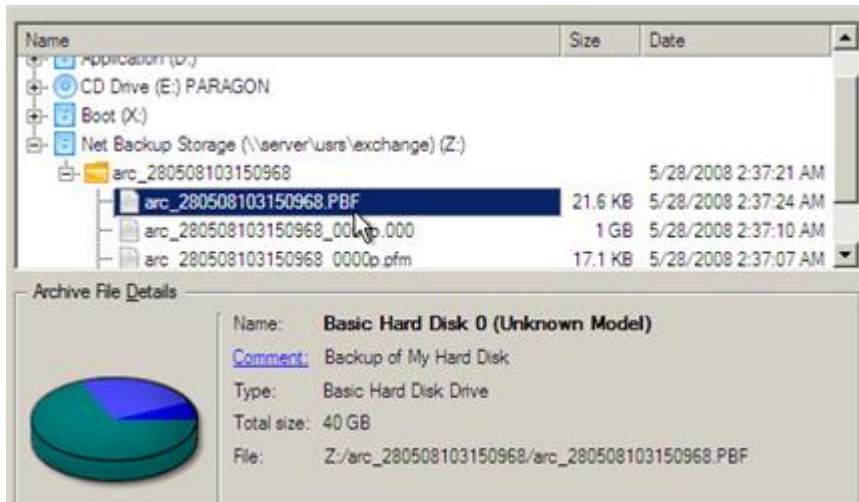


- Click the standard browse button [...] to browse for the required network share or manually enter a path to it;
- Define a letter from the pull-down list of available drive letters;
- Click the Connect as user button at the foot of the dialog page to specify a user name and password to access the selected network share if necessary.

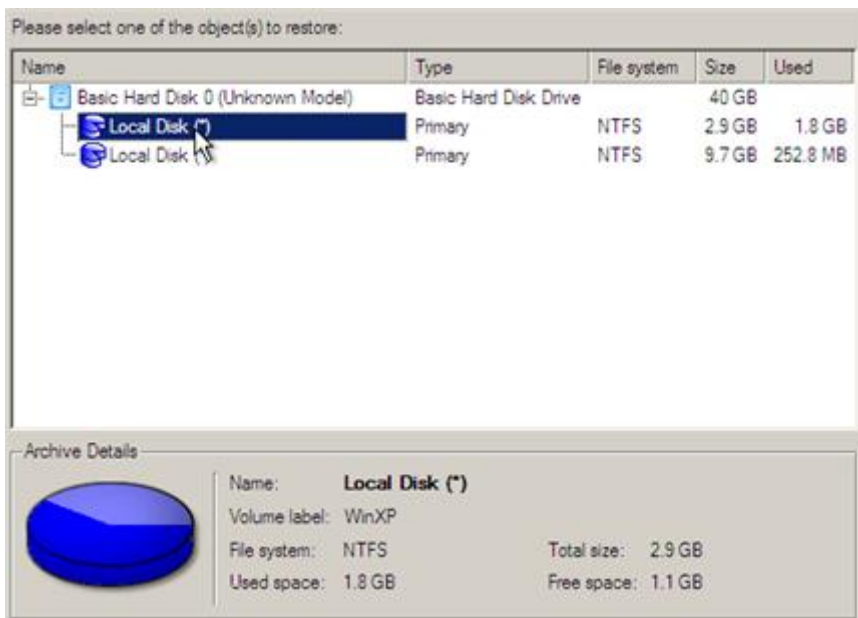


You can also map a network disk with Network Configurator.

- Choose the required archive in the browser-like window. The Archive File Details section displays a short description of the selected image.



5. The What to Restore page displays detailed information about the contents of the archive. Select the required item to restore. In our case it is the first partition of the disk.

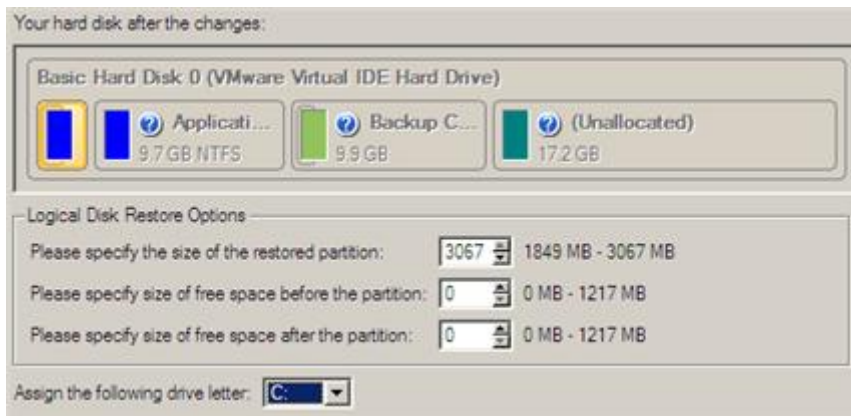


6. On the Where to Restore page specify a hard disk, then one of its partitions to restore the image to (if several in your computer). By default, the program offers to restore the archive exactly where it belongs. That's what we actually need.

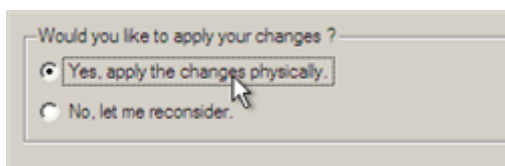


All contents on the partition selected for restoring purposes will be deleted during the operation.

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



8. On the next page of the wizard confirm the operation by selecting the appropriate option.



9. In the Progress window you can see in real-time a detailed report on all actions carried out by the program. Mark the checkbox at the bottom of the window to automatically switch off the computer on the successful accomplishment of the restore operation.
10. After completing the operation close the wizard, and then reboot the computer.



To make Windows bootable on different hardware, please additionally complete the [P2P Adjust OS Wizard](#).

Restoring a system partition from a local drive

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

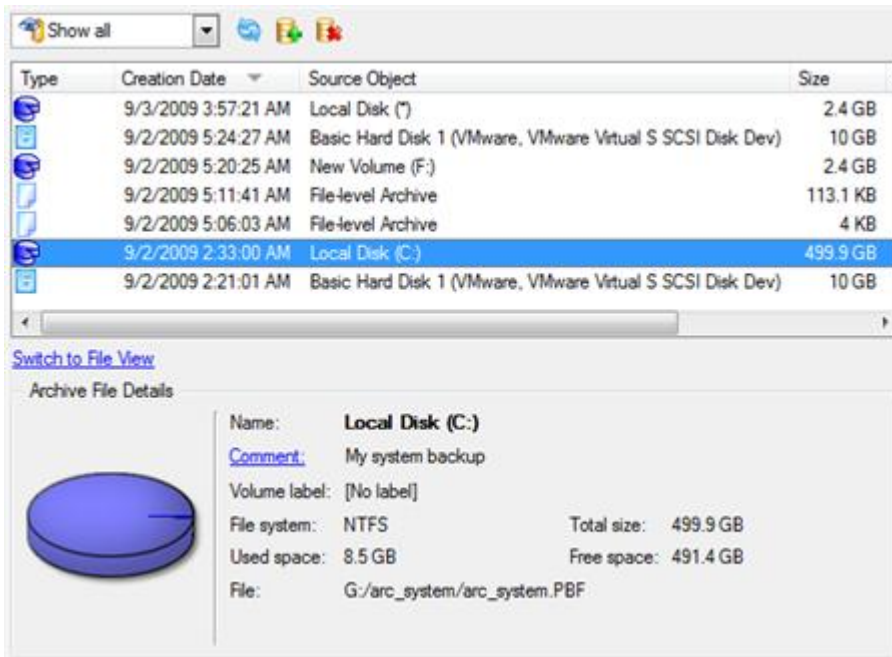
To restore your system partition from a backup image located on a local disk, please do the following:

1. Click the **Restore** item of the Wizards menu.



There are other ways to start up this function, please consult the [Interface Overview](#) chapter to know more on the subject.

2. On the Restore Wizard's Welcome page, click the Next button.
3. On the Browse for Archive page, specify the required archive:
 - By clicking the **Switch to Archive List View** link, you can see a list of images contained in the Archive Database (if any).

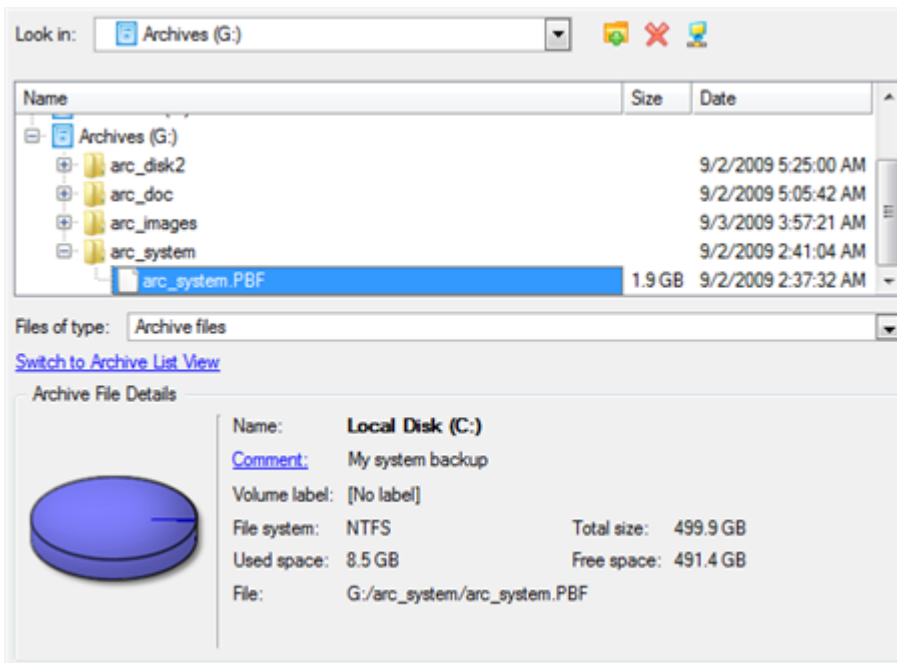


To get a clear-cut picture on properties of the required image, just click on it and the section below will (i.e. Archive File Details) display a short description.



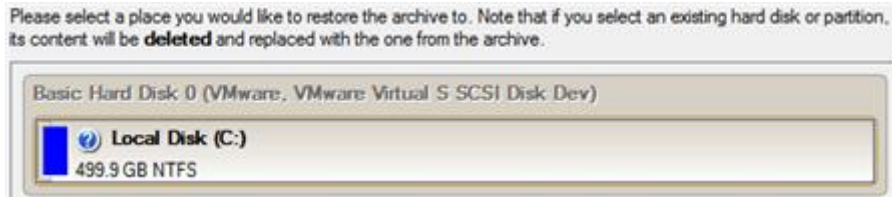
To know more on the subject, please consult the [Viewing Image Properties](#) chapter.

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



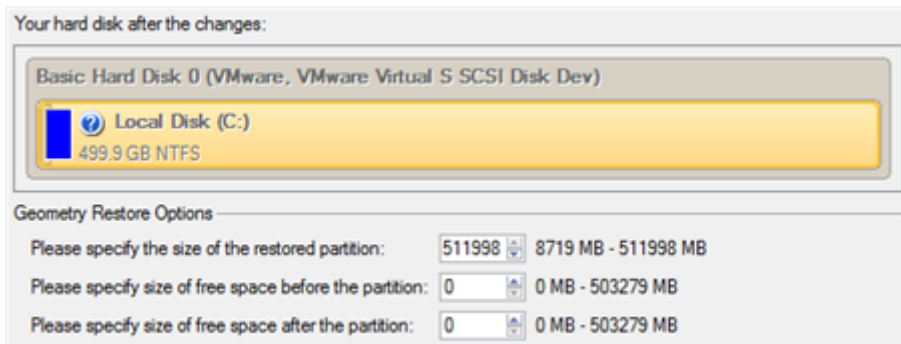
To know more on the subject, please consult the [Viewing Image Properties](#) chapter.

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

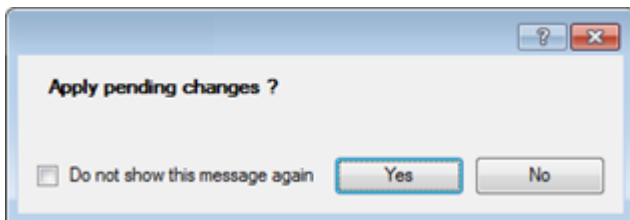


All contents on the partition selected for restoring purposes will be deleted during the operation.

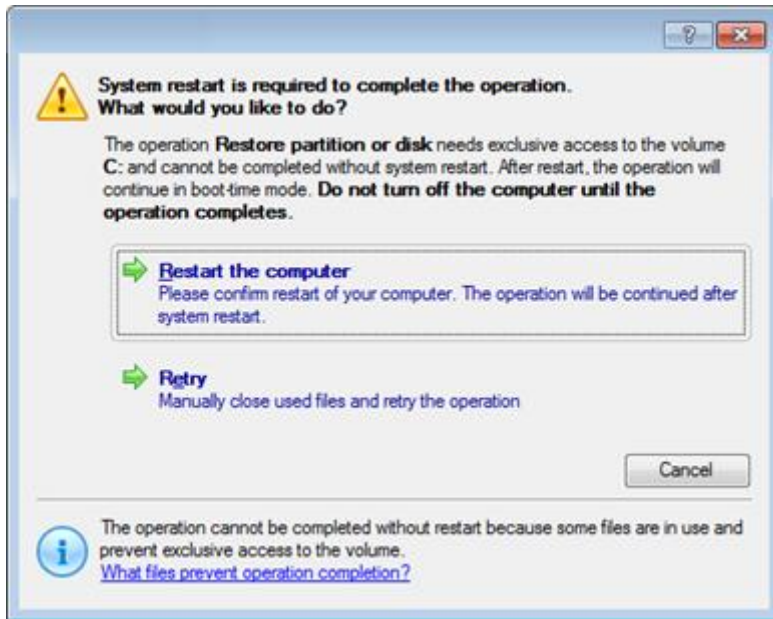
5. On the Restore Results page you can see the resulted disk layout. Besides there's the possibility to change size of the partition and its location if necessary as well as assign a particular drive letter.




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



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



8. In the Progress window you can see in real-time a detailed report on all actions carried out by the program. After completing the operation the program will automatically reboot the computer.


 **This operation can also be accomplished with our recovery media.**
 To make Windows bootable on different hardware, please additionally complete the [P2P Adjust OS Wizard](#).

Restoring a dual boot Mac from an external USB drive

Let's assume that your Mac fails to boot because of a hard disk malfunction. But you've got a backup of your hard disk on an external USB drive. Just replace the failed disk with a new one and carry out a bare metal restore.

To restore a dual boot Mac from a backup image located on an external USB drive, please do the following:

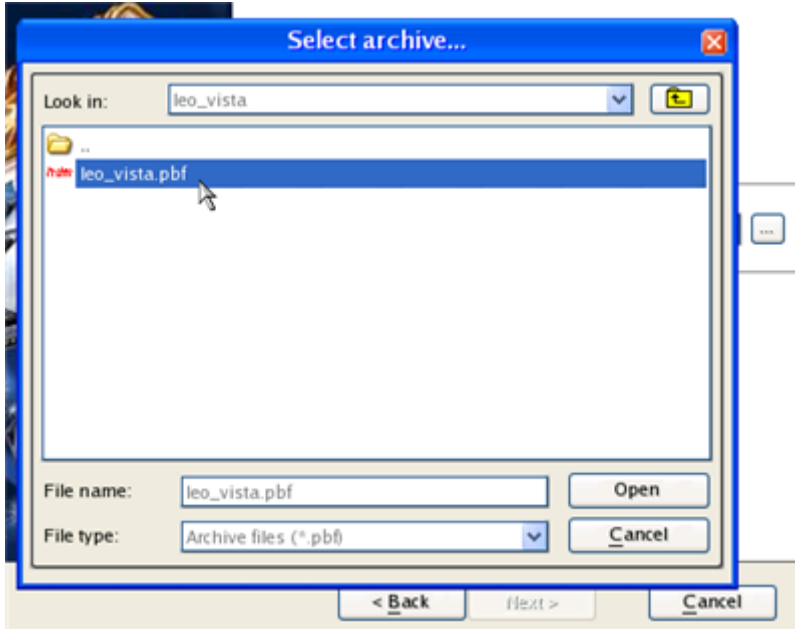
1. Start up the computer from our Linux/DOS recovery media.

 **[Recovery Media Builder](#) can help you prepare our recovery environment either on a CD/DVD disc or a thumb drive.**
 To automatically boot from the recovery media please make sure the on-board BIOS is set up to boot from CD/USB first.

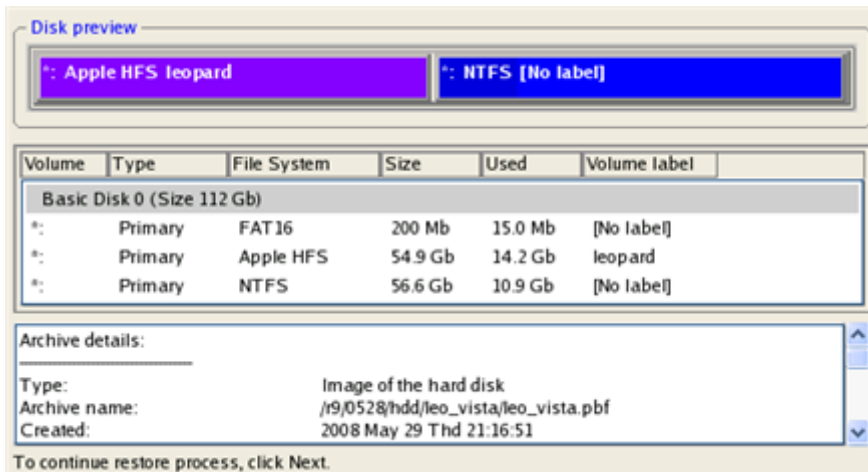
2. Connect an external USB drive to the computer.
3. Restart the computer.
4. In the boot menu select **Normal Mode** to use the Linux recovery environment, since it's the only mode that enables to work with USB devices.

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

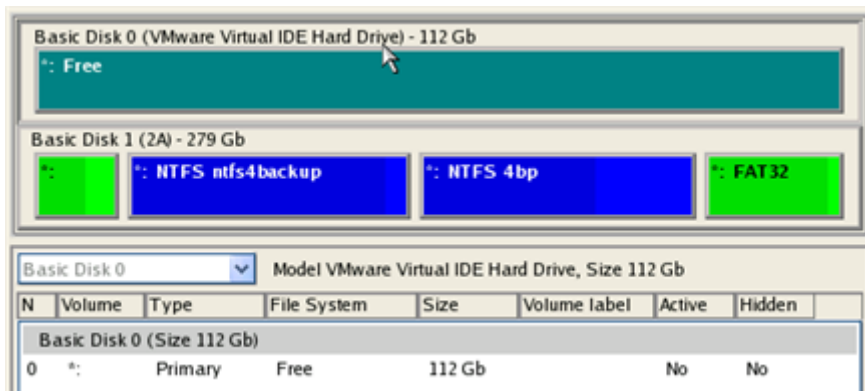
5. In the Linux launch menu select the Simple Restore Wizard.
6. On the Wizard's Welcome page, click the Next button.
7. On the What to Restore page, click the standard browse button [...] to find the required archive. When done, double click on it to select.



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



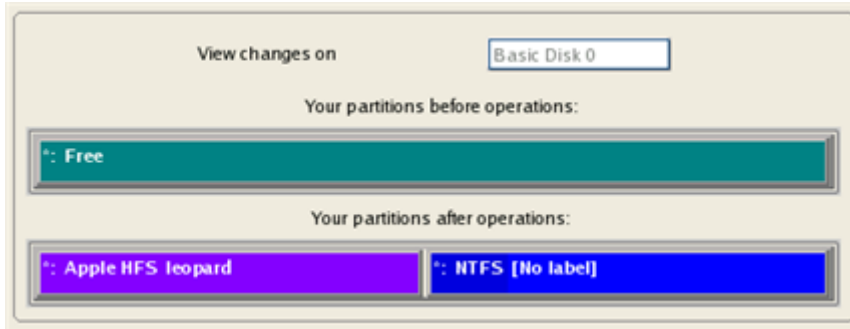
9. On the next page specify a hard disk to restore the image to.



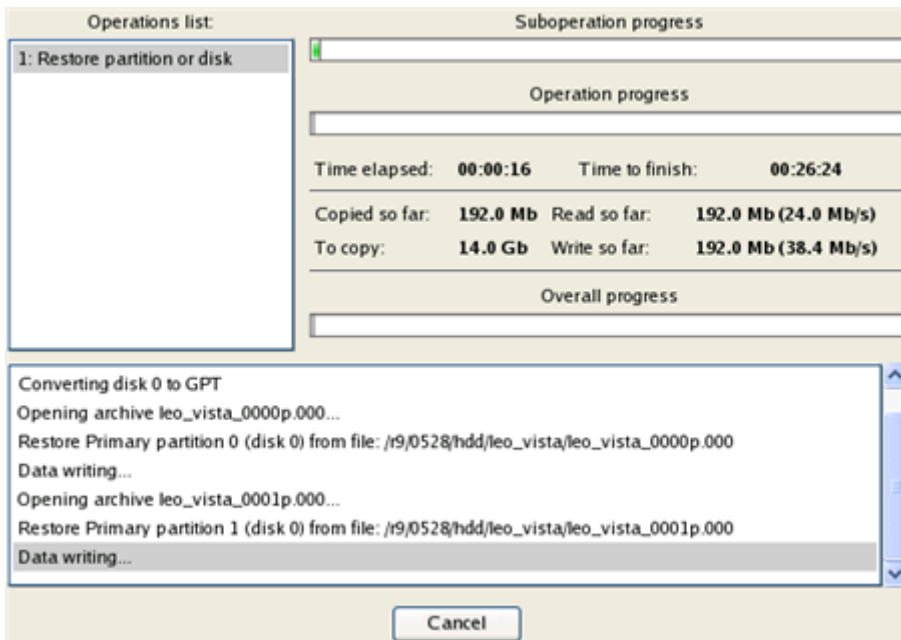


All contents on disk selected for restoring purposes will be deleted during the operation.

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



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



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

Restoring a file increment

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

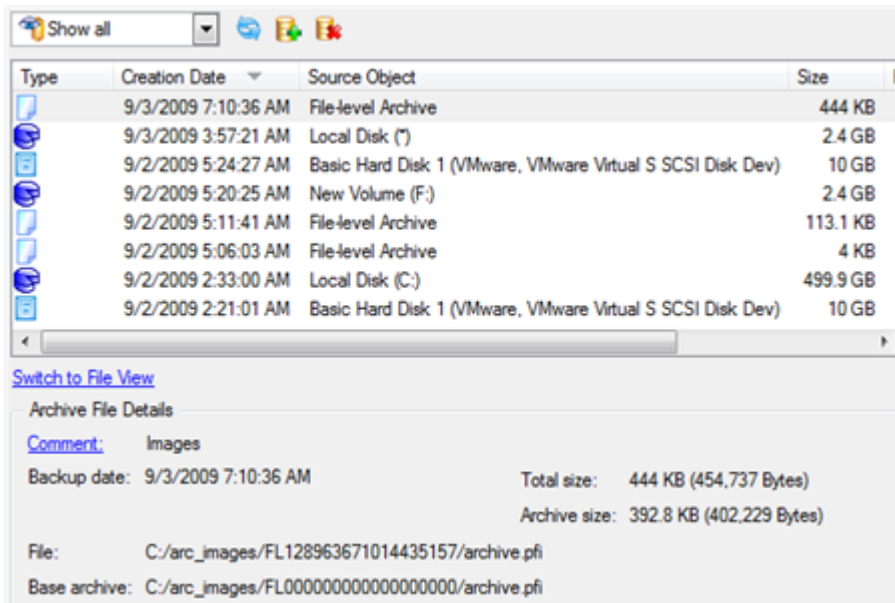
To restore a file increment, please do the following:

1. Click the **Restore** item of the Wizards menu.



There are other ways to start up this function, please consult the [Interface Overview](#) chapter to know more on the subject.

2. On the Restore Wizard's Welcome page, click the Next button.
3. On the Browse for Archive page, specify the required file increment:
 - By clicking the **Switch to Archive List View** link, you can see a list of images contained in the Archive Database (if any).

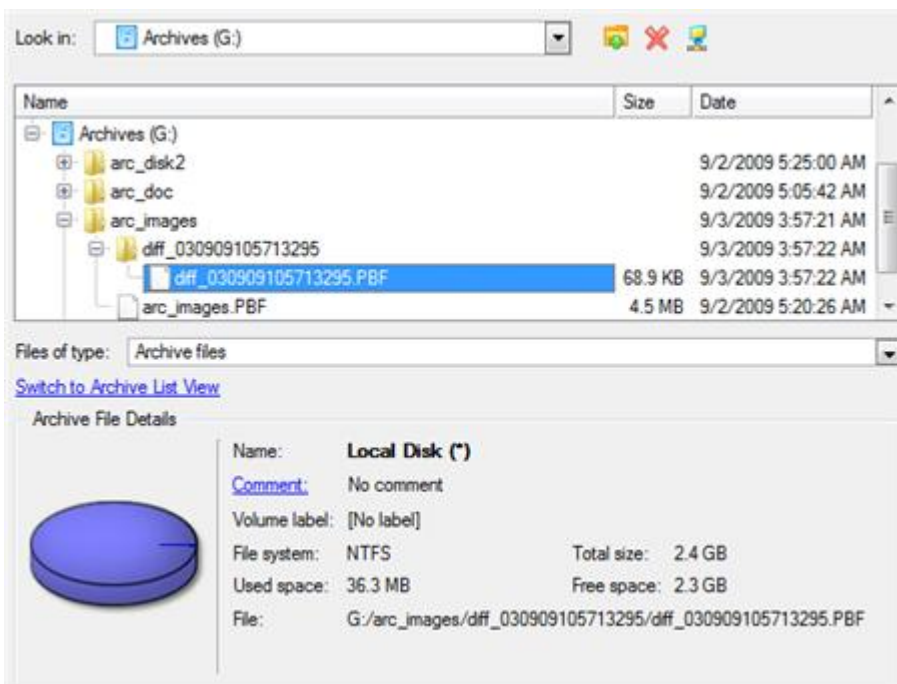


To get a clear-cut picture on properties of the required image, just click on it and the section below will (i.e. Archive File Details) display a short description.



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

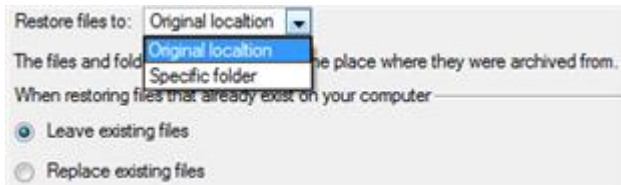
- By clicking the **Switch to File View** link, you can find the required image in the browser-like window. The section below (i.e. Archive File Details) will also display a short description of the selected image.



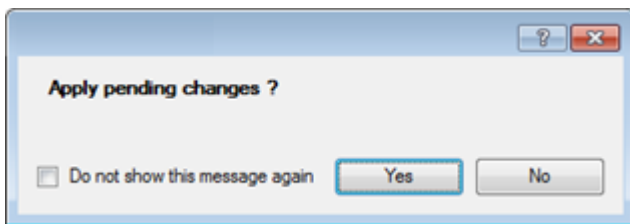


To know more on the subject, please consult the [Viewing Image Properties](#) chapter.

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



- Complete the wizard and then apply the pending changes.



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



This operation can also be accomplished with our recovery media.

Restoring a file increment to a partition backup

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

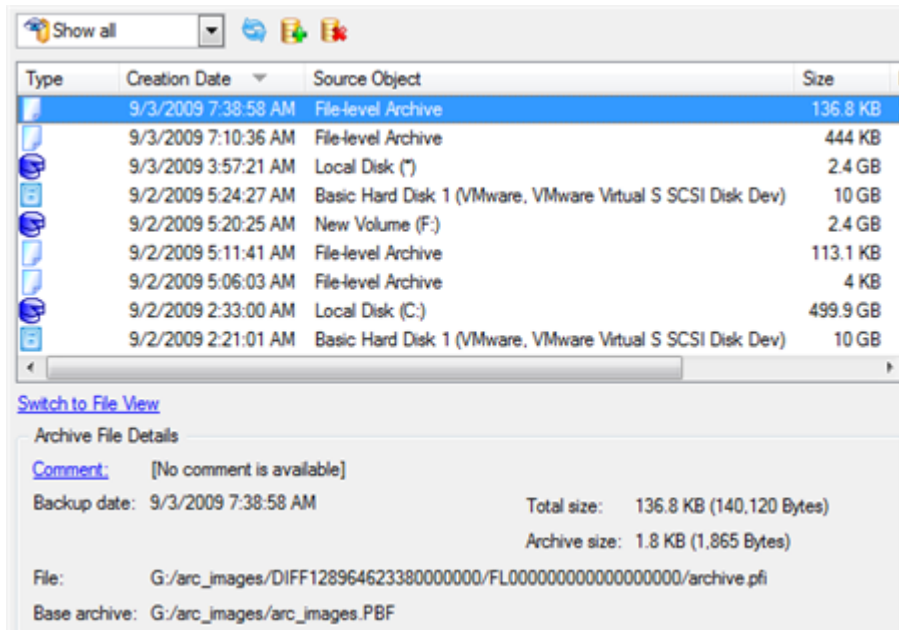
To restore your system partition with a file increment from a backup image located on a local disk, please do the following:

- Click the **Restore** item of the Wizards menu.



There are other ways to start up this function, please consult the [Interface Overview](#) chapter to know more on the subject.

- On the Restore Wizard's Welcome page, click the Next button.
- On the Browse for Archive page, specify the required file increment archive to your system partition backup:
 - By clicking the **Switch to Archive List View** link, you can see a list of images contained in the Archive Database (if any).

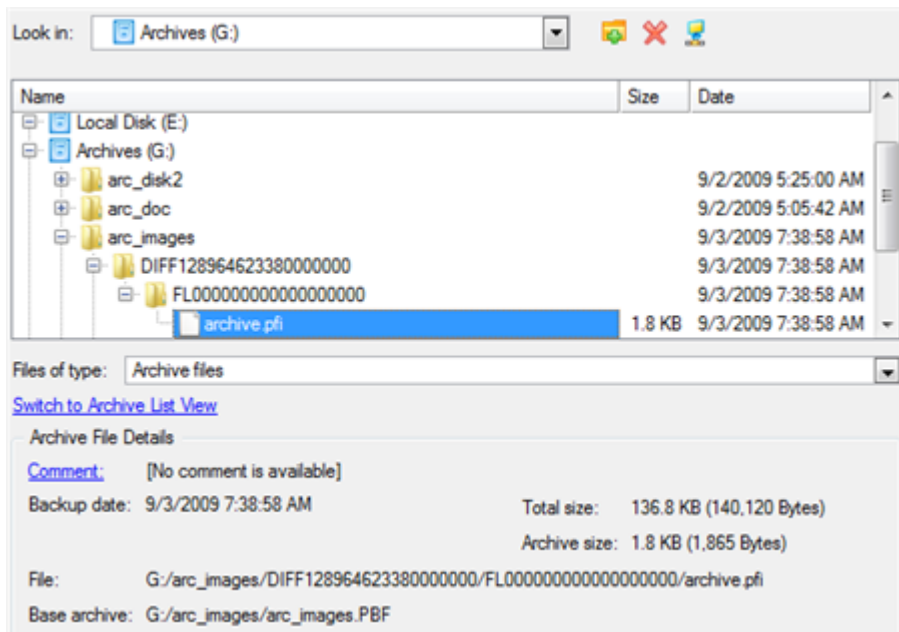


To get a clear-cut picture on properties of the required image, just click on it and the section below will (i.e. Archive File Details) display a short description.



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

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



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

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

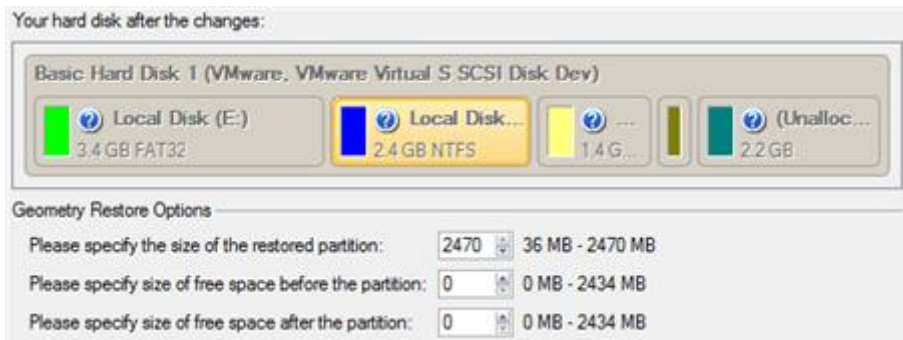


5. On the Where to Restore page specify a hard disk, then one of its partitions to restore the image to (if several in your computer). By default, the program offers to restore the archive exactly where it belongs. That's what we actually need.

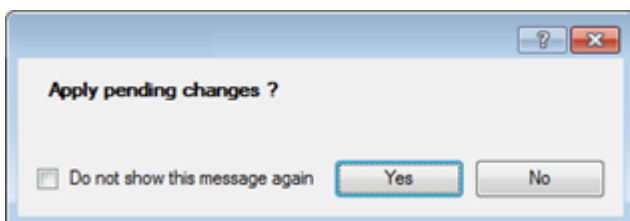


All contents on the partition selected for restoring purposes will be deleted during the operation.

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



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



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



9. In the Progress window you can see in real-time a detailed report on all actions carried out by the program. After completing the operation the program will automatically reboot the computer.



This operation can also be accomplished with our recovery media.

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

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

1. Connect the second hard disk to the computer.
2. Start up the computer from our Linux/DOS recovery media.



[Recovery Media Builder](#) can help you prepare our recovery environment either on a CD/DVD disc or a thumb drive.

To automatically boot from the recovery media please make sure the on-board BIOS is set up to boot from CD/USB first.

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

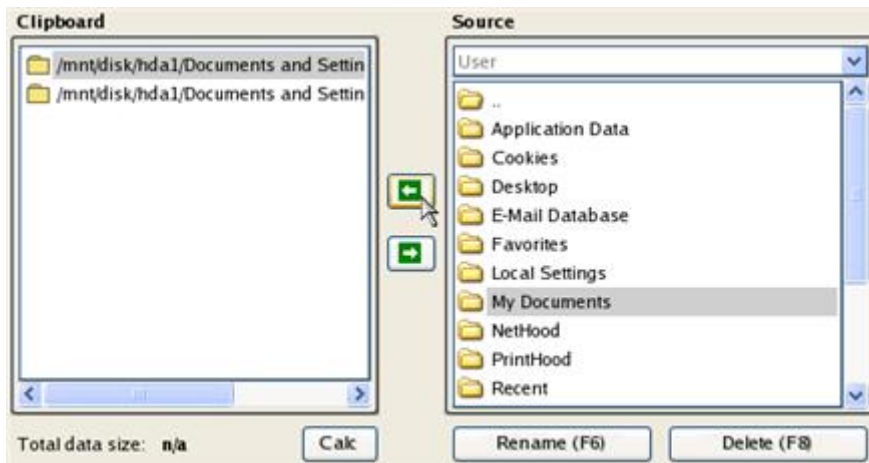


By default the Normal Mode will be automatically initiated after a 10 second idle period.

4. In the Linux launch menu select the File Transfer Wizard. You can find the same wizard in PTS DOS as well.
5. On the Wizard's Welcome page, click the Next button.
6. Select a disk where the files you need are stored from the pull-down list in the right pane of the page.



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



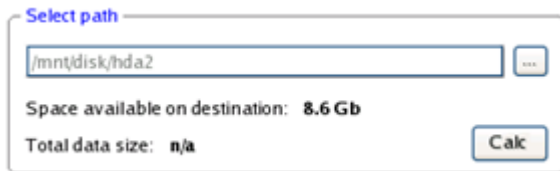
Click the Calc button to estimate the resulted data size.

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

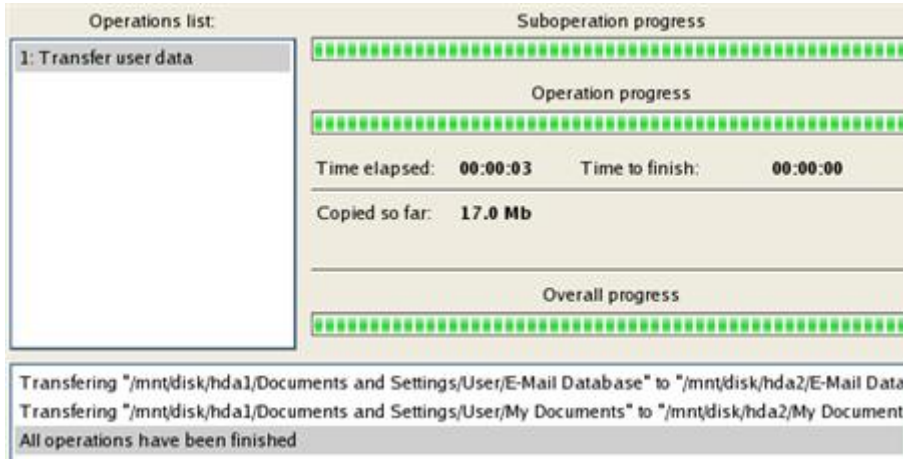
Please select how would you like to save the data:

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

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



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



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



This operation can also be accomplished with our recovery media.

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

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

1. Start up the computer from our Linux/DOS recovery media.



[Recovery Media Builder](#) can help you prepare our recovery environment either on a CD/DVD disc or a thumb drive.

To automatically boot from the recovery media please make sure the on-board BIOS is set up to boot from CD/USB first.

2. In the boot menu select **Normal Mode** to use the Linux recovery environment, since it's the only mode that enables to burn CD/DVD discs.

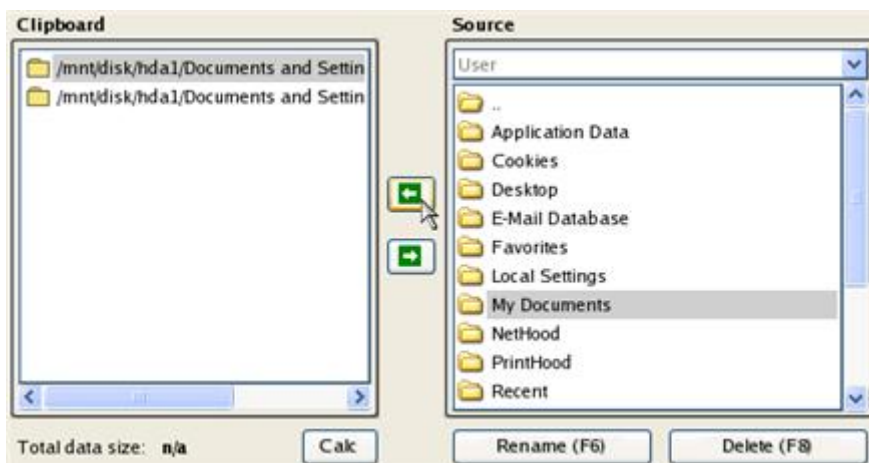


By default the Normal Mode will be automatically initiated after a 10 second idle period.

3. In the Linux launch menu select the File Transfer Wizard. You can find the same wizard in PTS DOS as well.
4. On the Wizard's Welcome page, click the Next button.
5. Select a disk where the files you need are stored from the pull-down list in the right pane of the page.



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



Click the Calc button to estimate the resulted data size.

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

Please select how would you like to save the data:

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

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

Select a recorder to burn data to:

Vendor	Product	Type
Optiarc	DVD RWAD-7170A	CD-R; CD-RW; DVD-R

Volume label:

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

Operations list:	Suboperation progress
1: Transfer user data	<input type="text"/>
	Operation progress
	<input type="text"/>
	Time elapsed: 00:00:07 Time to finish: 00:00:16
	Copied so far: 5.0 Mb
	To copy: 12.0 Mb
	Overall progress
	<input type="text"/>
Creating compilation image... Used burner: DVD RWAD-7170A Vendor: Optiarc Session opening... Data burning...	

11. After the operation is completed, close the wizard by pressing the appropriate button.
12. Turn off the computer.



This operation can also be accomplished with our recovery media.

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. Start up the computer from our Linux/DOS recovery media.



[Recovery Media Builder](#) can help you prepare our recovery environment either on a CD/DVD disc or a thumb drive.

To automatically boot from the recovery media please make sure the on-board BIOS is set up to boot from CD/USB first.

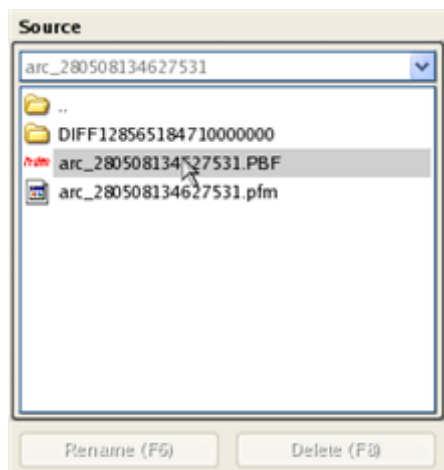
2. In the boot menu select **Normal Mode** to use the Linux recovery environment (more preferable) or **Safe Mode** to use the PTS DOS recovery environment (in case you've got problems with Linux). Moreover you've got the option to boot into the **Low-Graphics Safe Mode** (PTS DOS safe mode) to cope with a serious hardware

incompatibility. In this case, only the minimal set of drivers will be included, like hard disk, monitor, and keyboard drivers. This mode has simple graphics and a simple menu.

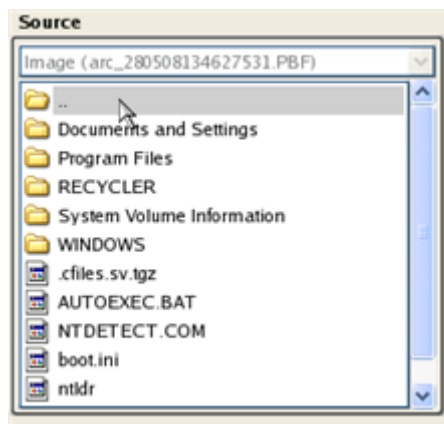


By default the Normal Mode will be automatically initiated after a 10 second idle period.

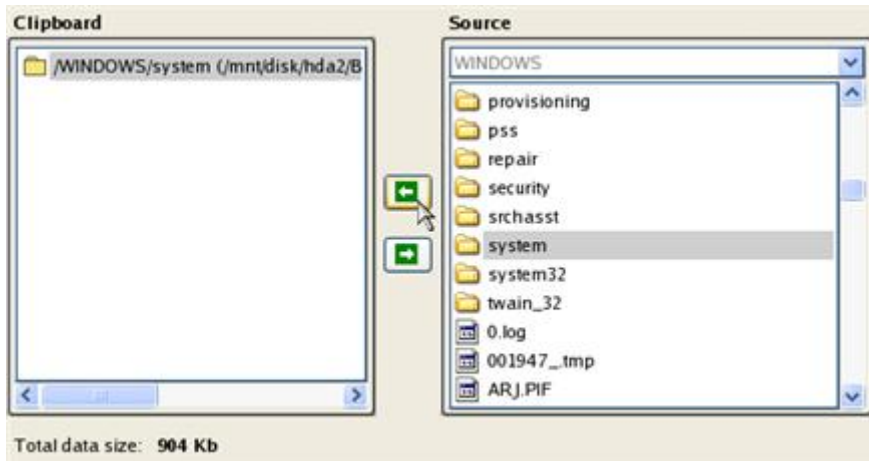
3. In the Linux launch menu select the File Transfer Wizard. You can find the same wizard in PTS DOS as well.
4. On the Wizard's Welcome page, click the Next button.
5. Select a disk where the system backup is stored from the pull-down list in the right pane of the page.



6. Double click on the required backup to open.



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



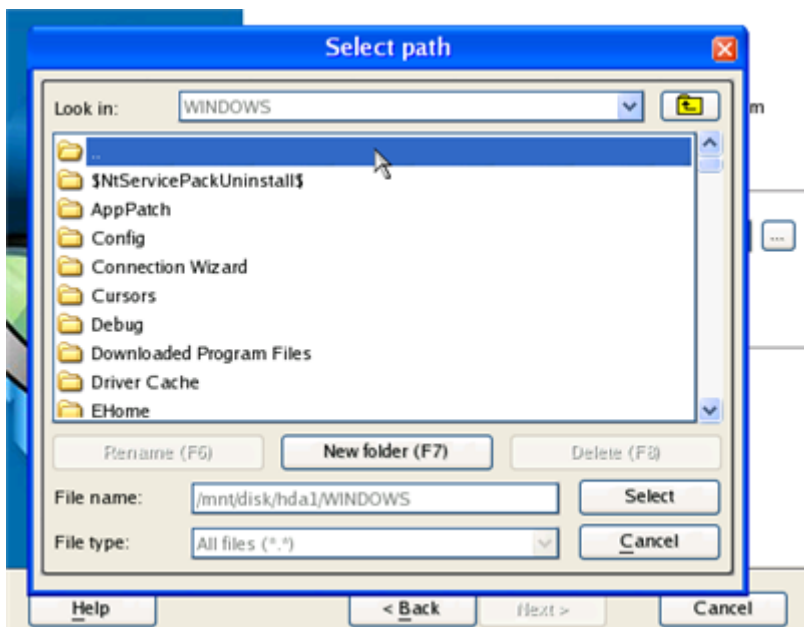
Click the Calc button to estimate the resulted data size.

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

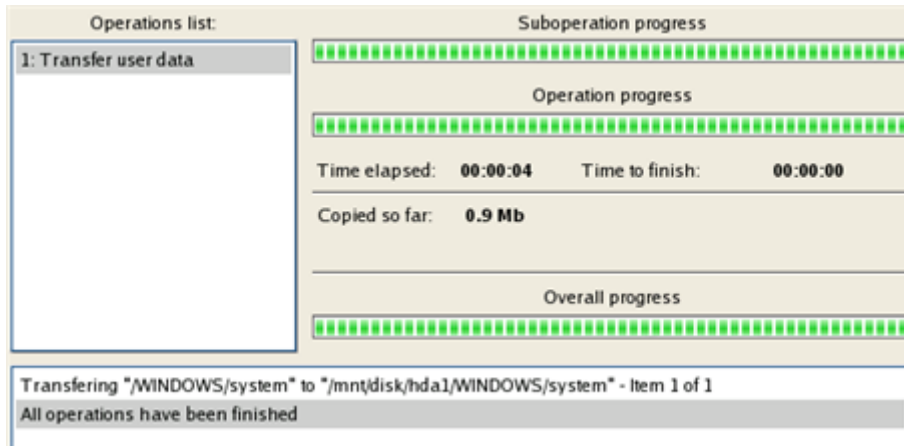
Please select how would you like to save the data:

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

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



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



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



This operation can also be accomplished with our recovery media.

Restoring separate files and folders from a backup

The program provides a very convenient option to access backup archives and restore only data you need (the so called selective restore functionality).

Restore Wizard

To restore separate files and folders from a backup image with the Restore Wizard, please do the following:

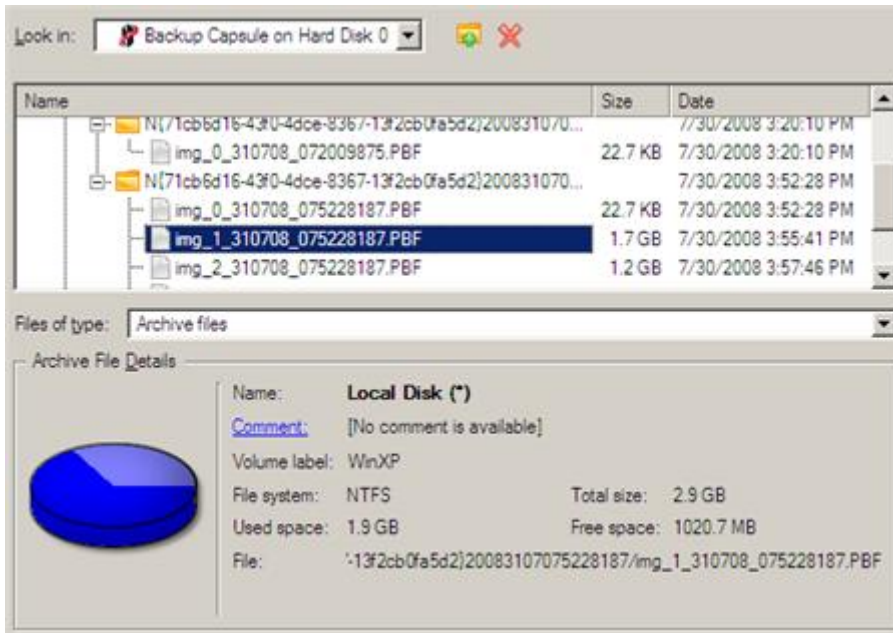
1. Start up the computer from the WinPE recovery media.



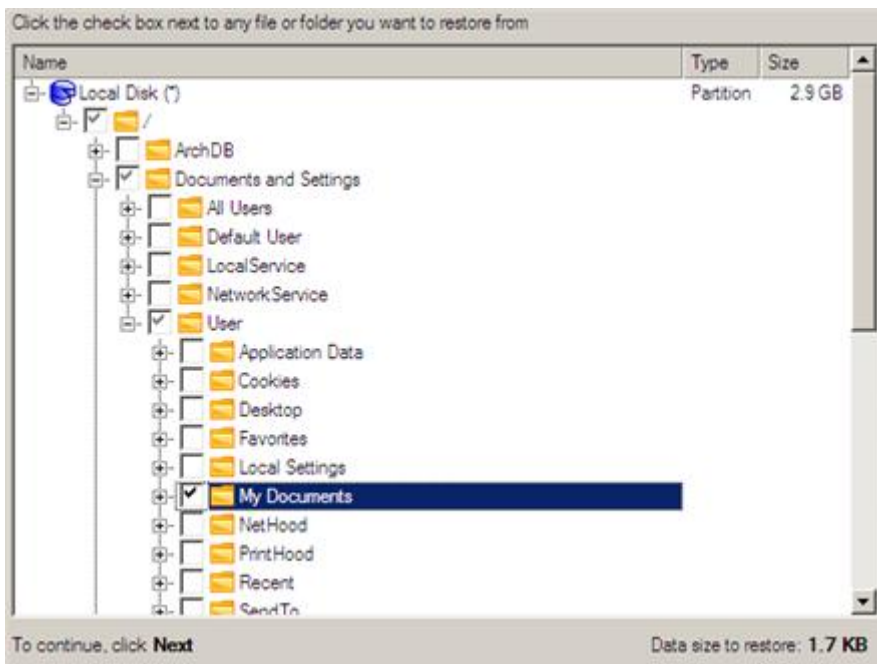
Please use Boot Media Builder to prepare the WinPE recovery environment, which you can get here: www.paragon-software.com/my-account/.

To automatically boot from the recovery media please make sure the on-board BIOS is set up to boot from CD/USB first.

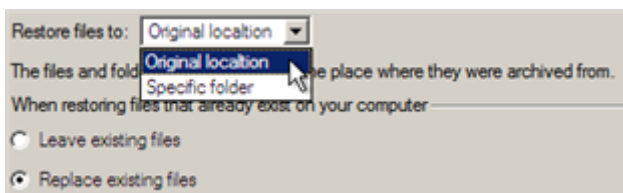
2. Launch **Restore Wizard**.
3. On the Restore Wizard's Welcome page, click the Next button.
4. On the Browse for Archive page choose the required archive in the browser-like window. The Archive File Details section displays a short description of the selected image.



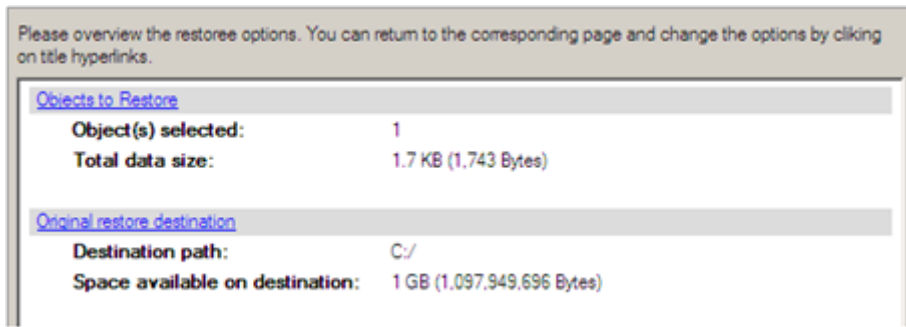
- On the next page specify what you need to extract from the backup by marking checkboxes next to the required data items. At the right lower corner of the window you can see the resulted amount of the selected data.



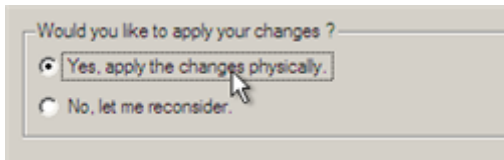
- On the How to Restore page specify the way the selected data will be restored. In our case we'd rather restore contents of the backup to its original location with replacing existing files as well.



- On the Restore Summary page review all parameters of the operation and modify them if necessary.



8. On the next page of the wizard confirm the operation by selecting the appropriate option.



9. In the Progress window you can see in real-time a detailed report on all actions carried out by the program.
10. After completing the operation close the wizard, and then reboot the computer.

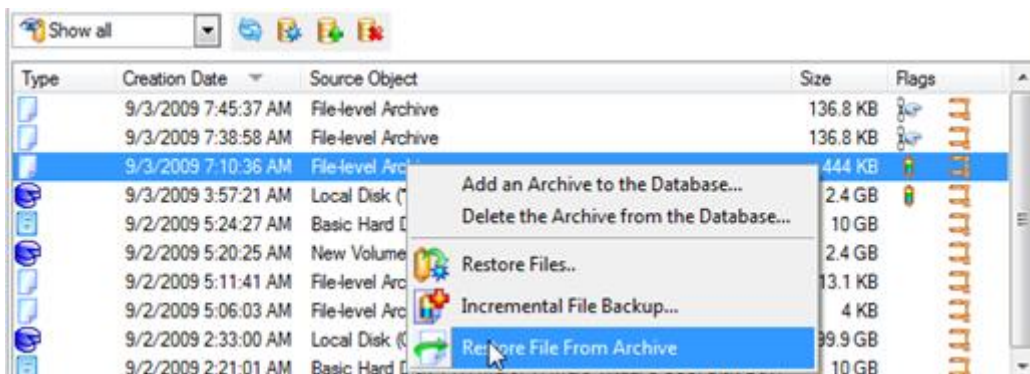


This operation can also be accomplished under Windows.

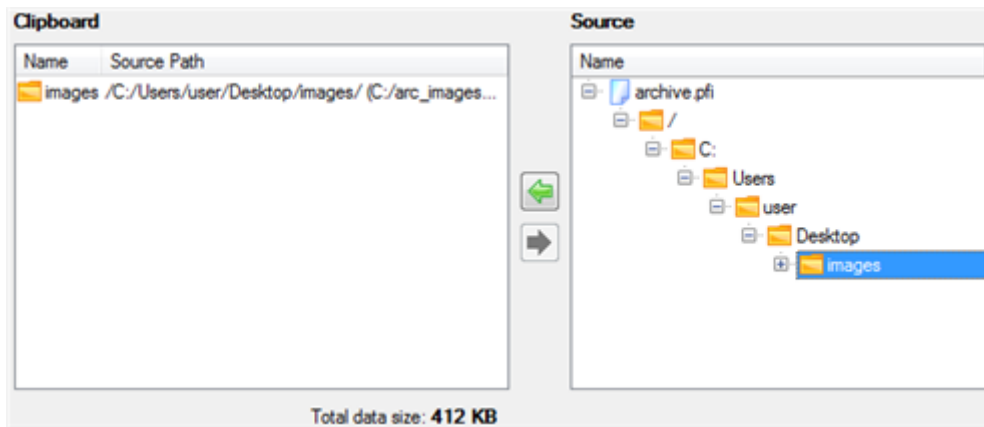
File Transfer Wizard

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

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



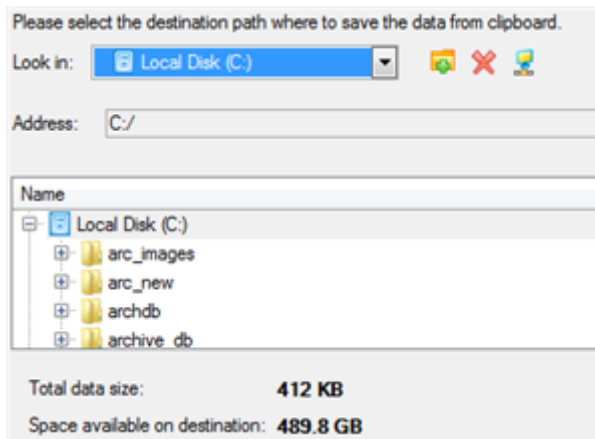
2. Select files you want to copy and place them to Clipboard by pressing the left arrow-button.



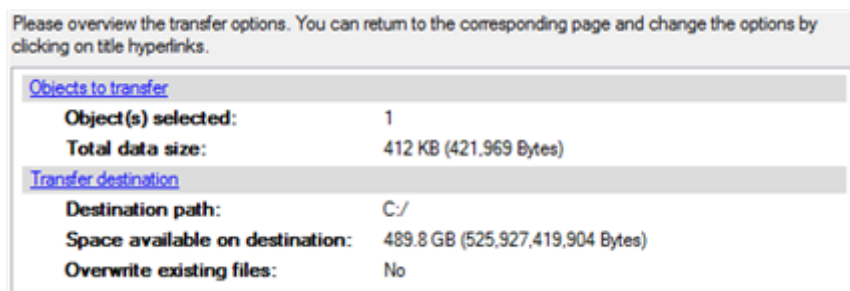
3. On the Select Destination Type, choose the way the data will be stored. Select the **Save data to any local drive or a network share** item.



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



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

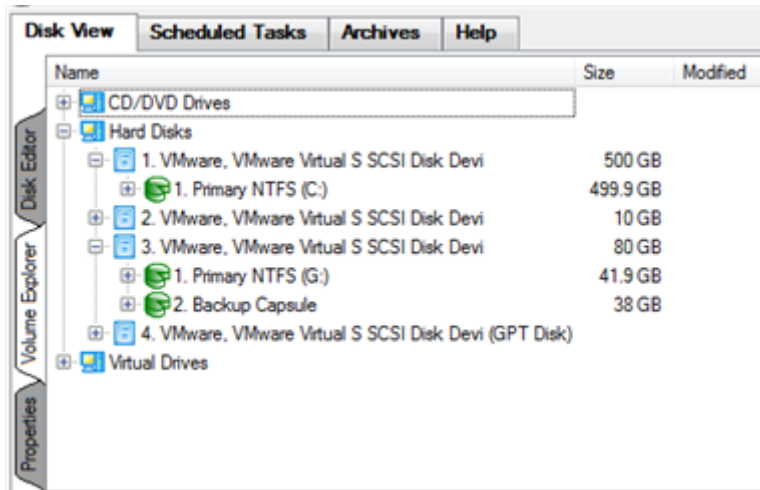


6. After the operation is completed, close the wizard by pressing the appropriate button.

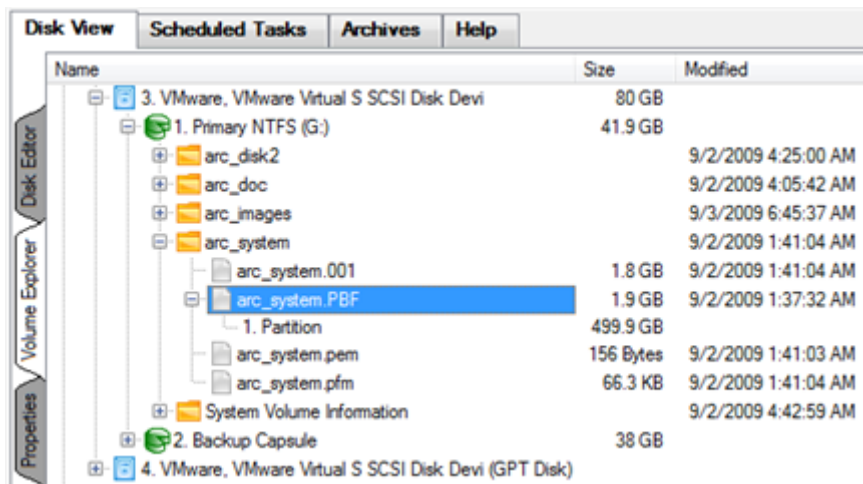
Volume Explorer

To restore separate files and folders from a backup image with Volume Explorer, please do the following:

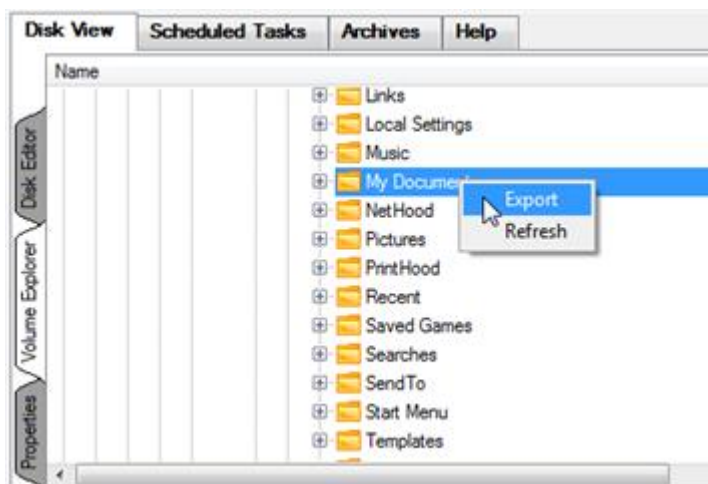
1. Click the **Disk View** tab and then choose **Volume Explorer**;



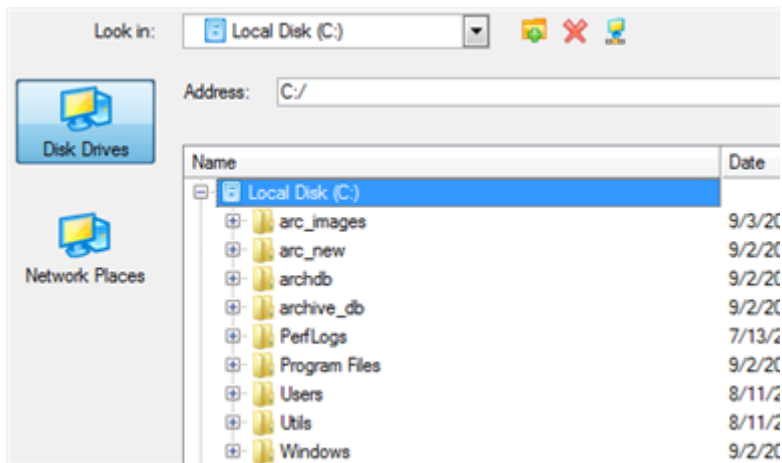
2. Browse for the required archive and then open it by double click of the left mouse button.



3. Call the popup menu (right click of the mouse button) for a file/folder you need and then select the Export item.



4. Select a place on the disk where the file/folder will be extracted to.



5. Click the OK button to accomplish the operation.



The current version of the program does not enable to access file archives with Volume Explorer.

System Migration Scenarios

Migrating system to a new HDD (up to 2.2TB in size)

Let's assume that you've bought a new hard disk that is up to 2.2TB in capacity. It's faster and of much higher capacity than your current system disk, so it's quite natural you start thinking about system migration. We can help you do that.

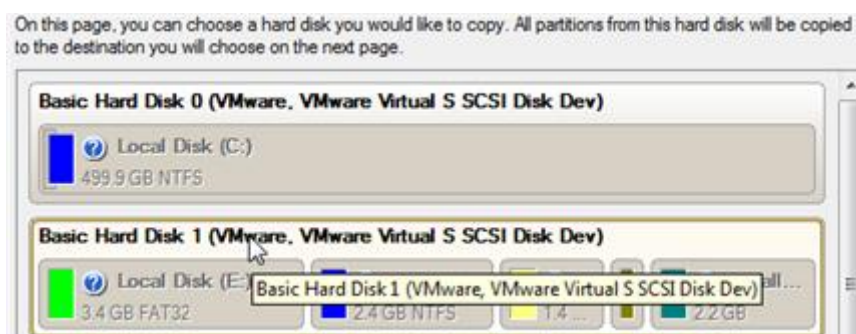
To migrate your system to a hard disk that doesn't exceed the 2.2TB capacity limit, please do the following:

1. Connect both source and destination disks to the computer.
2. Turn on the computer.
3. Click the **Copy Disk** item of the Wizards menu.



There are other ways to start up this function, please consult the [Interface Overview](#) chapter to know more on the subject.

4. On the Wizard's Welcome page, click the Next button.
5. On the Select Hard Disk to Copy page, select a source disk (a hard disk you want to copy).



6. On the Select Target Hard Disk page, select a destination disk (a hard disk to copy contents of the source disk).

Select a target hard disk. All data from the source hard disk will be copied there. During copy operation, target disk content will be **deleted**.

Basic Hard Disk 0 (VMware, VMware Virtual S SCSI Disk Dev)

Local Disk (C:)
499.9 GB NTFS

Basic Hard Disk 2 (VMware, VMware Virtual S SCSI Disk Dev)

Archives (G:)
41.9 GB NTFS

Backup Capsule
38 GB

Basic Hard Disk 3 (VMware, VMware Virtual S SCSI Disk Dev)

(Unallocated)
499.9 GB



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

- On the next page of the wizard, define the copy options. In our case we'd rather copy data with a proportional resize to occupy the entire disk.

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

Mark the checkbox to copy the hard disk in the *sector-by-sector* mode, thus ignoring its information structure (e.g. unallocated space or unused sectors of existing partitions will be processed as well). This can help to avoid problems with hidden data created by certain applications or the system administrator. However, it will take more time to accomplish the operation.

- On the Revise Copy Results page review all parameters of the operation.

Original hard disk:

Basic Hard Disk 1 (VMware, VMware Virtual S SCSI Disk Dev)

Local Disk (E:) 3.4 GB FAT32

Local Disk (C:) 2.4 GB NTFS

Local Disk (D:) 1.4 GB FAT32

(Unallocated) 2.2 GB

Hard disk copy:

Basic Hard Disk 3 (VMware, VMware Virtual S SCSI Disk Dev)

Local Disk (F:) 173 GB FAT32

Local Disk (C:) 120.5 GB NTFS

Local Disk (D:) 71.2 GB FAT32

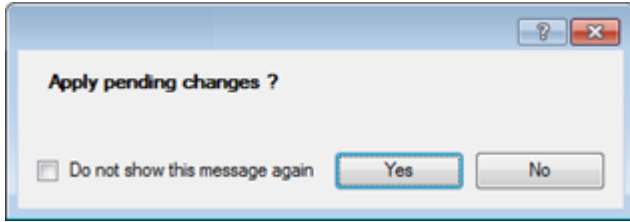
(Unallocated) 134.6 GB

Proportional resize - the copy will take 500 GB (100 % of target disk space)

Min Copy Size: 627.5 MB Max Copy Size: 500 GB

Select the range of the disk space that will be occupied on the destination disk with copied partitions.

- Complete the wizard and then apply the pending changes.



- When copying is completed, shut down the computer.
- Disconnect (physically) the source hard disk.
- Boot the computer from the destination hard disk.



To make Windows bootable on different hardware, please additionally complete the [P2P Adjust OS Wizard](#).

Making system bootable on different hardware (P2P Adjust OS)

Let's assume you had to migrate to a new hardware platform. You connected your system hard disk to the brand new PC and tried to start up the operating system - you do know for sure now that this operation had been doomed to failure from the very beginning. With our program you can easily tackle this naughty problem.

Before you start, please make sure the following conditions are met:

- You've got drivers for the new hardware ready to use, not zipped or in .exe files.
- Your OS is unrolled on the new computer, not in a backup image.

To make a Windows physical system bootable on different hardware, please do the following:

- Start up the computer from the WinPE recovery media.
-



Please use **Boot Media Builder** to prepare the WinPE recovery environment, which you can get here: www.paragon-software.com/my-account/.

To automatically boot from the recovery media please make sure the on-board BIOS is set up to boot from CD/USB first.

- Launch the **P2P Adjust OS Wizard**.
-



The WinPE based environment offers excellent hardware support. However in case it doesn't have a driver for your disk controller, your hard disks will be unavailable. Please consult the [Adding specific drivers](#) scenario to know how to tackle this issue.

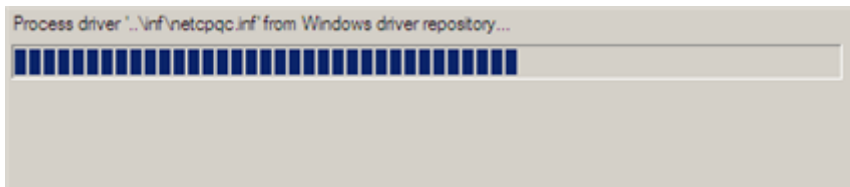
- On the Wizard's Welcome page, click the Next button.
- From the list of all found Windows systems (if several) select one you need to adjust to the new hardware. If you're willing to adjust them all, just re-launch this wizard for each.



5. There are two execution modes to choose from: **fully automatic** and **advance**. Below we will go set-by-step through the automatic scenario to show the whole process, and then take a closer look at [specifics of the advance scenario](#).



6. Select **Adjust the OS to the new hardware automatically**.
7. The wizard will automatically accomplish all the necessary actions.

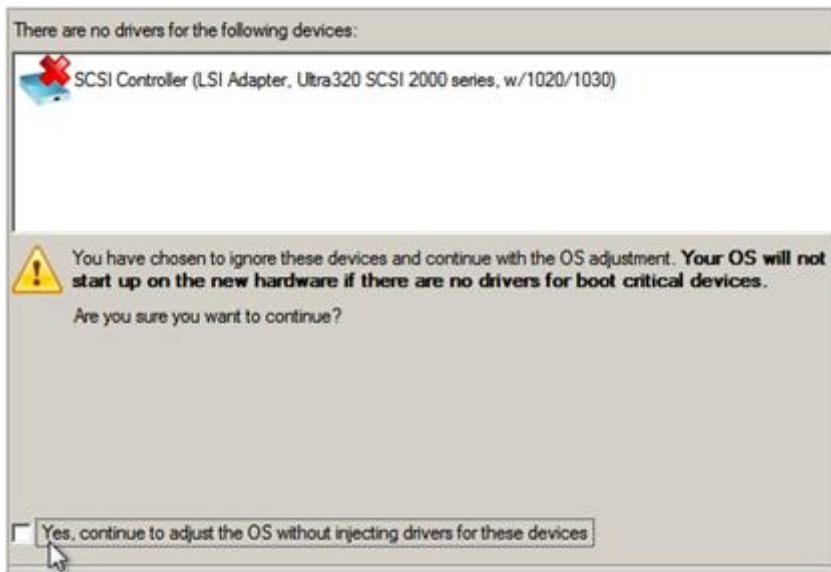


8. The only action that might be required from your side is to set a path to an additional driver repository in case the wizard has failed to find drivers for some boot critical devices in the built-in Windows repository. Generally together with new hardware you get its drivers for different operating systems on removable media (mostly CD or DVD). By collecting all these drivers in one folder you can let the wizard automatically pick and install only those required for your OS. Select **Search for drivers in a specific folder**.

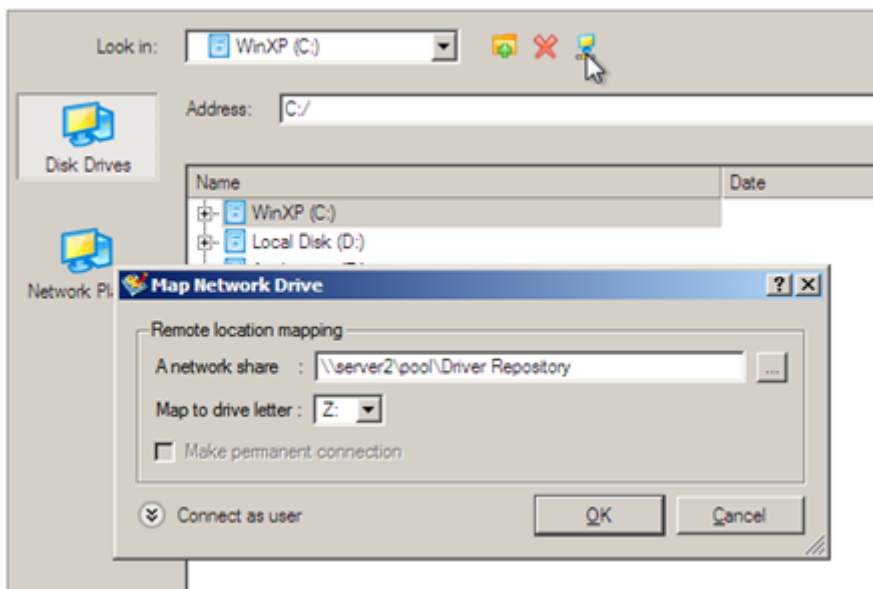
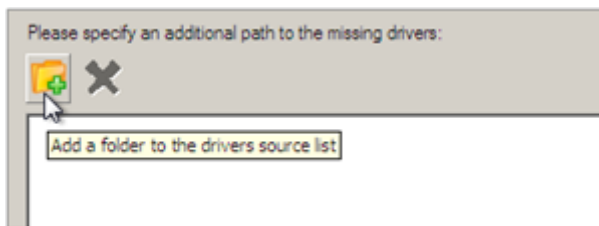


Click on the link at the bottom of the page to see what boot critical devices have no drivers. The wizard names all devices according to their model description, not some alphanumeric code, which is very convenient.

9. Though you've got the option to continue without injecting missing drivers for boot critical devices (The **Ignore all missing drivers** option), we strongly recommend you not to do it. Otherwise we cannot guarantee your Windows will start up on the new hardware.

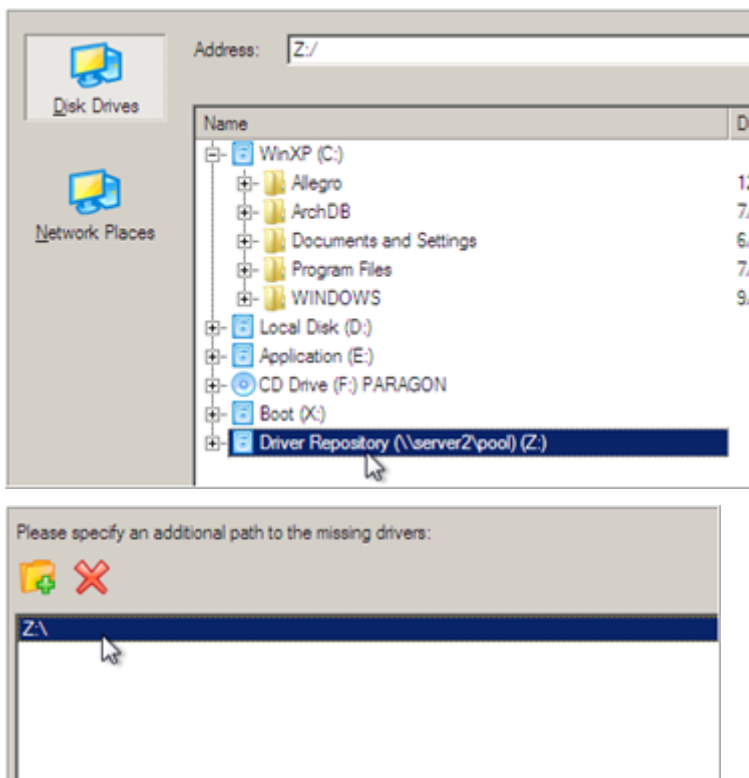


10. The wizard can search for drivers on a local disk or a mapped network share. In our case it's on a network share, this is why we need to map it first.



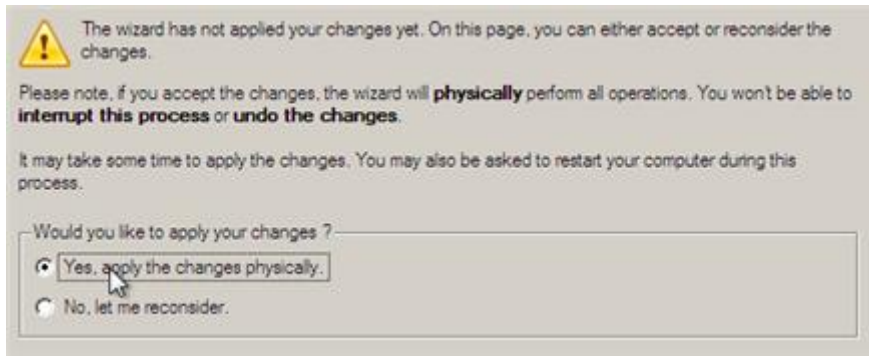


11. When done, we can select it as target.



The wizard enables to specify several driver repositories.

12. If the wizard has found all missing drivers, it will ask you to confirm the operation. Apply the changes to complete.



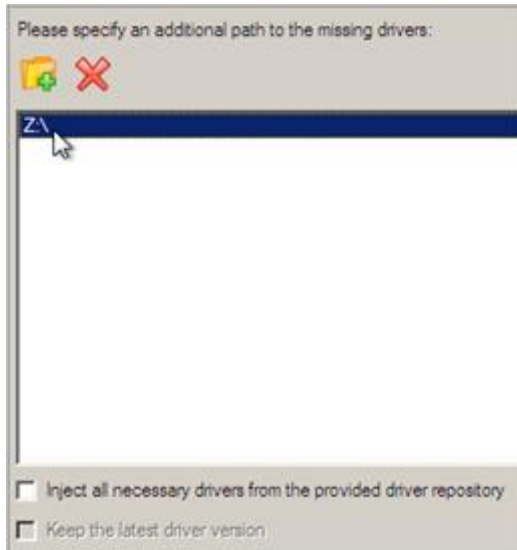
After the operation is completed the system will be bootable on the new hardware. After the startup, Windows will initiate reconfiguration of all Plug'n'Play devices. It's a standard procedure, so please don't worry and prepare the latest drivers at this step to get the most out of the system.


Advance scenario specifics

1. To launch the advance mode, select **Set parameters for the OS adjustment**.

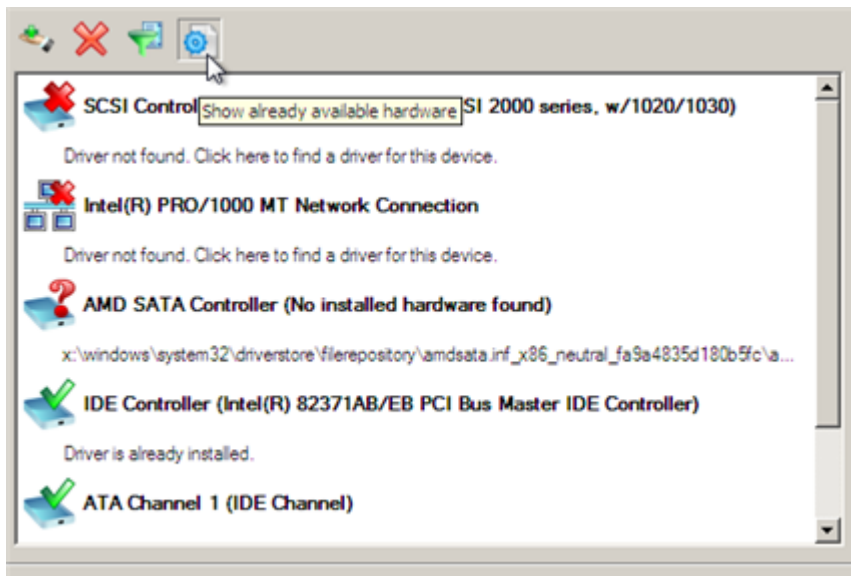



2. When setting additional driver repositories, you can specify how to process drivers for found hardware.



- **Inject all necessary drivers...** Mark the checkbox to force injection of all drivers for your devices from the given driver repository(s), even if there are already installed drivers for some hardware. Please use this option if you suspect any of the installed drivers of not matching your hardware.
 - **Keep the latest driver version.** Mark the checkbox to keep the latest version of drivers during the forced re-injection. You can use this option only when the above option is active.
3. Just before the OS adjustment, you can additionally:
 - View all found hardware devices and their driver status by clicking . The wizard names all devices according to their model description, not some alphanumeric code, which is very convenient. So you can

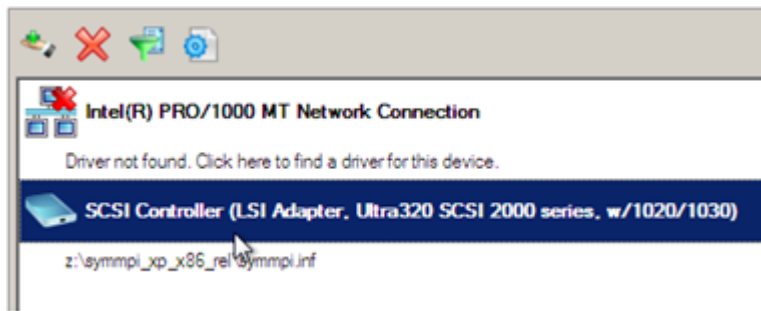
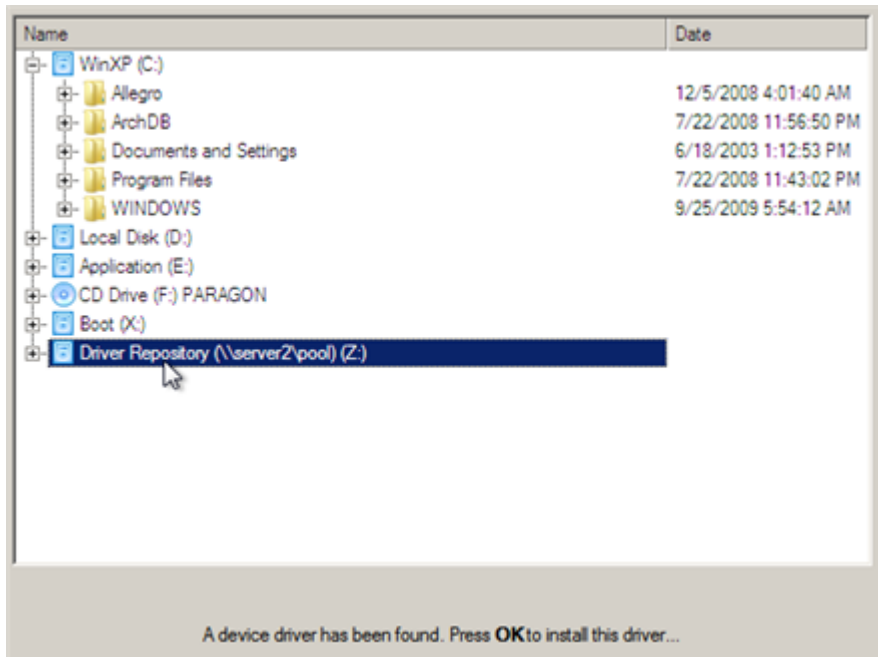
compare the listed devices with the given hardware to make sure the wizard has analyzed your system correctly.




- Filter devices without drivers by clicking . Unlike the automatic mode, where only boot critical devices (storage controllers) without drivers are being reported, here you can view and inject drivers for network cards as well.

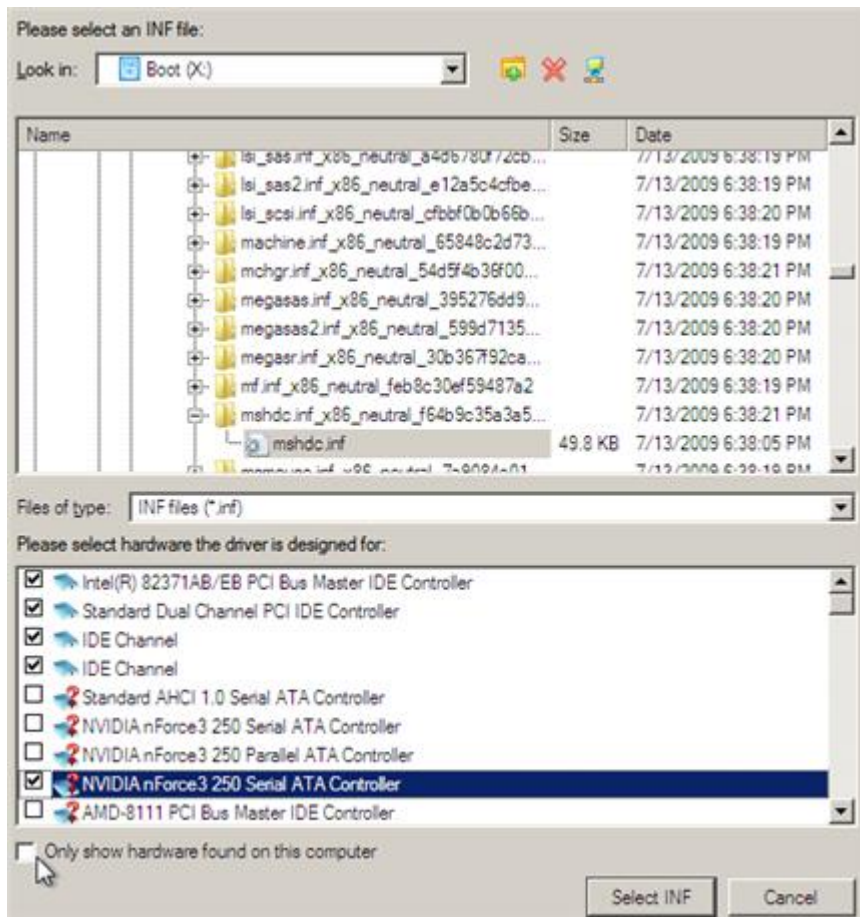


- Add a driver for each device that lacks it by clicking on the device, then browsing for the required location. The wizard will then match the device with drivers inside the given location and pick the right one.



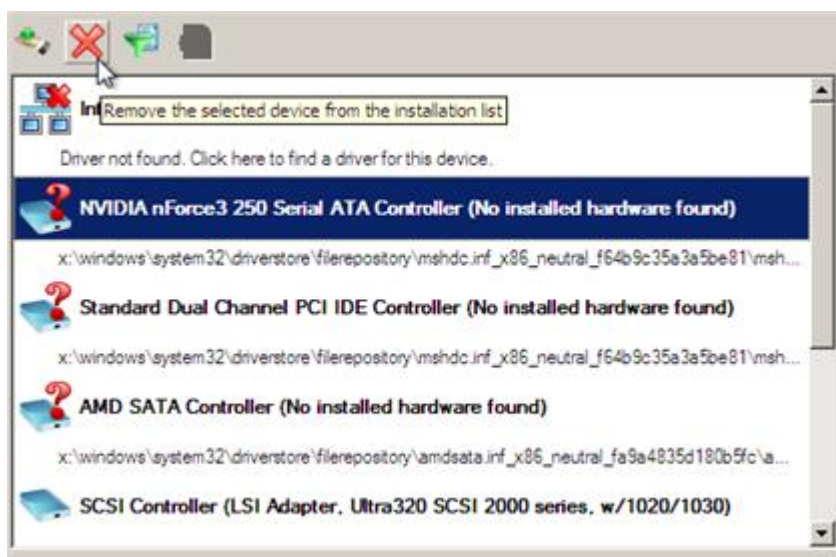
- Manually add a driver for a device that has not been found by our wizard by clicking , then specifying the required .INF file.





When selecting an .INF file that contains several driver records for hardware you both, have in the system and don't have, you can filter the list by marking the appropriate checkbox.

- Remove a driver for a device, which has not been found in the system.



Virtualizing the current system (P2V Copy)

Let's assume that you're about to migrate to a brand-new hardware platform with the latest operating system available for it. Your current system is quite obsolete, but you still need access to some of its software. You don't want to waste

time re-installing the old software to the new system, and you do know for sure that the bulk of it won't work anyway. The best way out is to virtualize your old system.

But before you start, please make sure the following conditions are met:

- Your hard disk has enough free space to store a virtual image of your Windows (depends on the system).
- [You've got one of the supported virtualization software.](#)

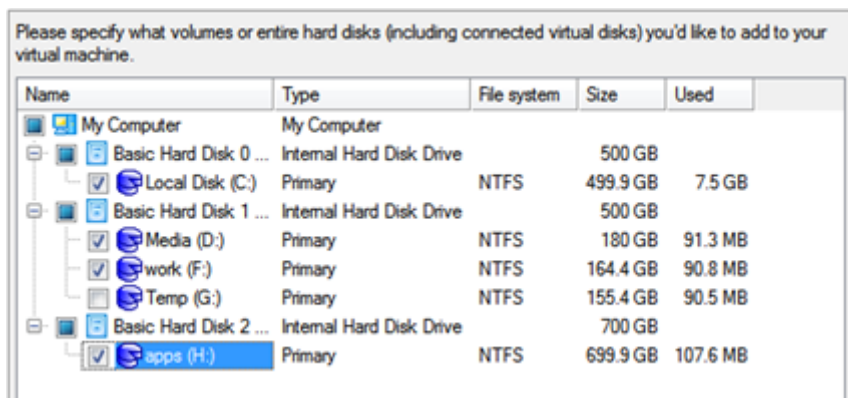
To make a virtual disk out of your current system, please do the following:

1. Click the **P2V Copy** item of the Wizards menu.

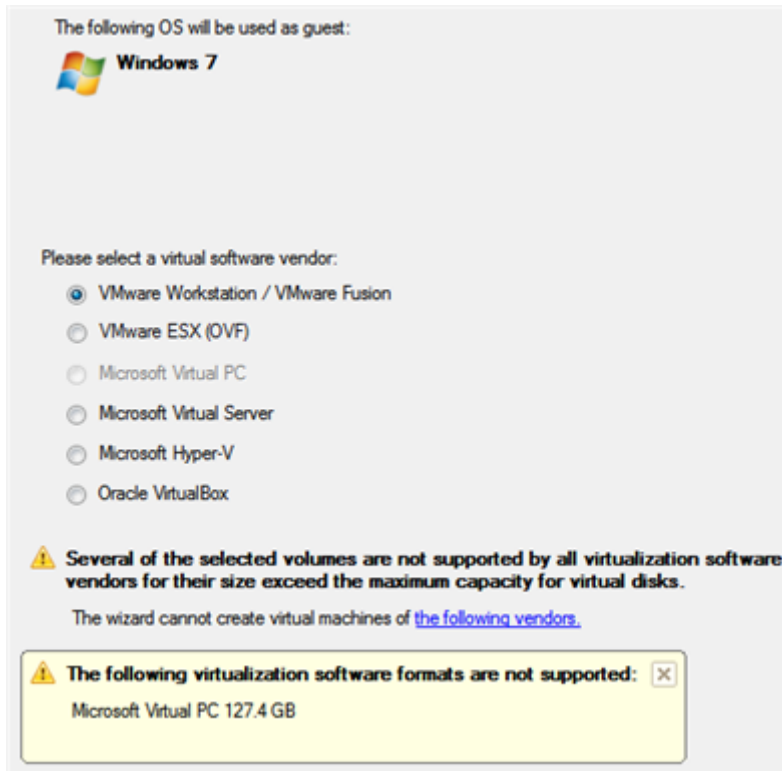


There are other ways to start up this function, please consult the [Interface Overview](#) chapter to know more on the subject.

2. On the Wizard's Welcome page, click the Next button.
3. Select objects you need to virtualize. You're allowed to select any combination of hard disks and partitions, but don't forget to choose your system partition (**Local Disk C:** in our case) to use it as guest. Otherwise the resulted virtual machine won't start up.



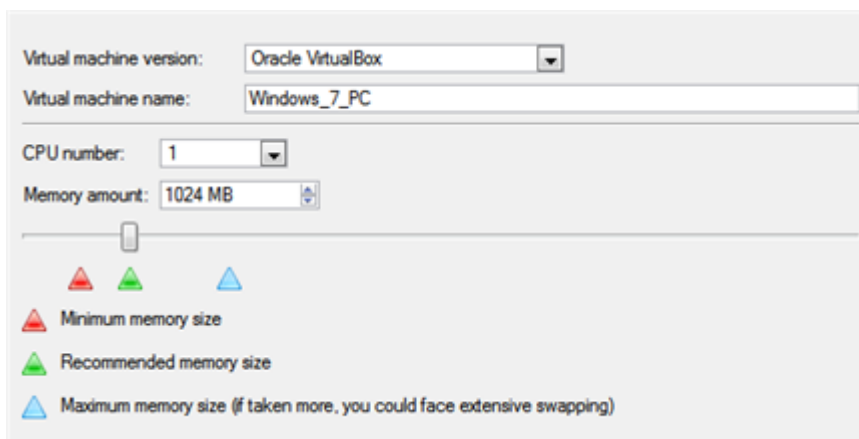
4. Specify the guest OS and a virtualization software vendor. If your system hosts several Windows OSes, our wizard will find them all and automatically patch to run in a virtual environment. However we cannot guarantee smooth startup of all found Windows systems for their configuration parameters may be incompatible with each other. This is why we additionally prompt you to specify what operating system you'd like to use as guest to configure the virtual machine for that particular system.



Not all vendors may be available to choose. If capacity of one of the selected objects exceeds the maximum virtual disk capacity of any vendor, this vendor will be shadowed.

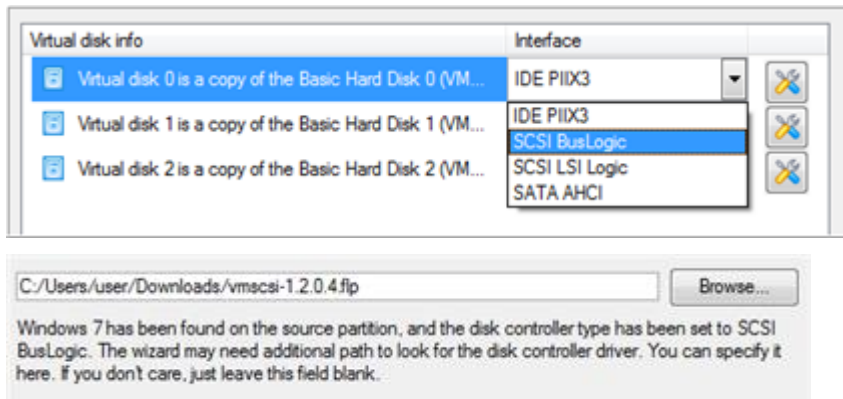
5. Set properties of the future virtual machine:

- **Virtual machine version.** Please make sure you choose a version which is supported by your virtualization software, otherwise you won't be able to work with the newly created machine.
- **Virtual machine name.** By default the wizard picks the name of your guest OS, which can be modified however.
- **CPU number.** If your computer supports multiprocessing, select how many CPUs you'd like to allocate for the virtual machine.
- **Memory amount.** Depending on the guest OS the wizard calculates the recommended size of RAM, which can be modified however.



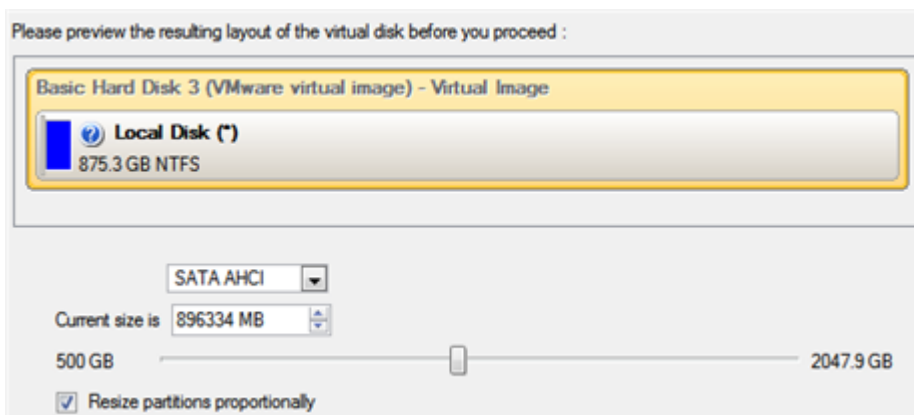
6. Set properties of the resulted virtual disk(s):

- **Virtual disk interface.** By default the wizard sets the most appropriate interface for each disk. Anyway you've got the option to change it to one of the supported by your guest OS. Just click on a disk, and then select the required interface from the pull-down list. But be ready to provide drivers for it on the next page.



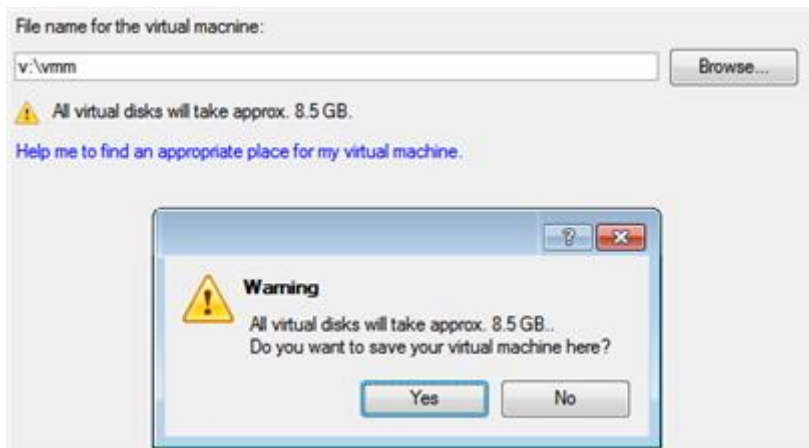
Our program supports injection of drivers delivered in .iso or .flp images, so you can for instance download and inject drivers for the BusLogic controller from the VMware website.

- **Additional properties** that depending on the selected virtualization vendor may include:
 - Size of the virtual disk. By default the wizard offers to create a virtual disk exactly the size of the selected object(s), which you can resize however (available for all);
 - Resize partitions proportionally. If you upsize the resulted virtual disk, you can make the wizard proportionally change the size of partitions keeping their relative order intact (available for all);
 - Create a split disk. You can choose whether to automatically cut the resulted virtual image to files of 2 GBs or not (available for VMware only);
 - Pre-allocate all disk space. You can choose whether to pre-allocate all space of the future virtual disk, or do it dynamically (not available for VMware ESX and Oracle VirtualBox).

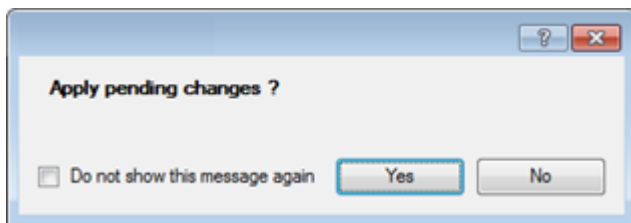


The maximum limit you can downsize the virtual disk is the capacity of its first partition.

- Specify a file name for the virtual machine and its location. By default the wizard scans all your local disks for available free space and picks the most appropriate location taking into account the total capacity of all virtual disks inside the virtual machine.



- Complete the wizard and then apply the pending changes.



Virtualizing system from its backup image (P2V Restore)

Let's assume that your system has been corrupted as a result of a hardware failure. You realize it's quite obsolete and it's next to impossible to replace the damaged hardware devices. Migration to a new hardware platform seems the best way out, if not for one thing – you still need access to your software, but you do know for sure that the bulk of it won't work on the new platform. Luckily you've got a backup image of your old system made with Paragon software – that's just enough for its virtualization.

Before you start, please make sure the following conditions are met:

- You've got a backup image of your old system.
- You've got enough free space to store a virtual image of your old system (depends on the system).
- [You've got one of the supported virtualization software.](#)

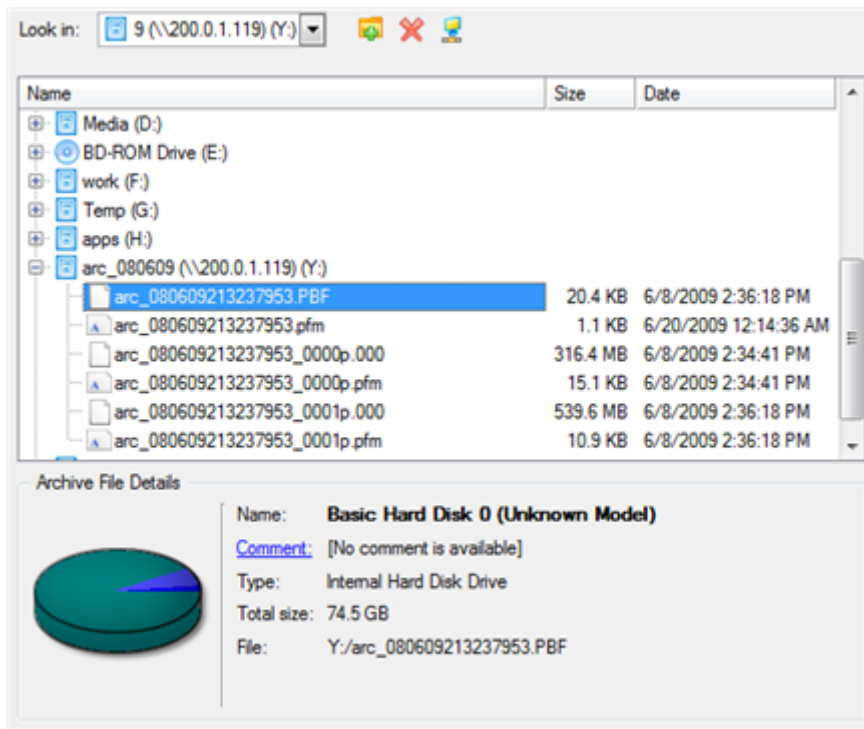
To restore a Windows system from a Paragon's backup directly to a virtual environment, please do the following:

- Click the **P2V Restore** item of the Wizards menu.

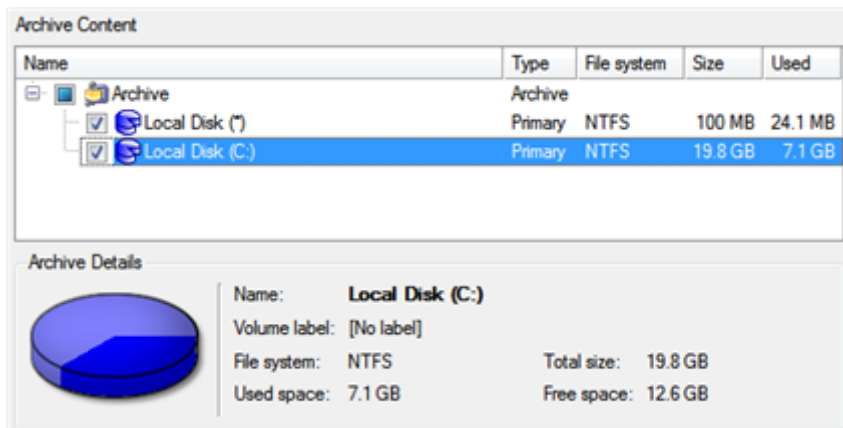


There are other ways to start up this function, please consult the [Interface Overview](#) chapter to know more on the subject.

- On the Wizard's Welcome page, click the Next button.
- Browse for the required backup image. The section below (i.e. Archive File Details) will also display a short description of the selected image.



- Select objects you need to virtualize. You're allowed to select any combination of hard disks and partitions, but don't forget to choose your system partition (**Local Disk C:** in our case) to use it as guest. Otherwise the resulted virtual machine won't start up.



- Specify the guest OS and a virtualization software vendor. If the selected backup contains several Windows OSes, our wizard will find them all and automatically patch to run in a virtual environment. However we cannot guarantee smooth startup of all found Windows systems for their configuration parameters may be incompatible with each other. This is why we additionally prompt you to specify what operating system you'd like to use as guest to configure the virtual machine for that particular system.



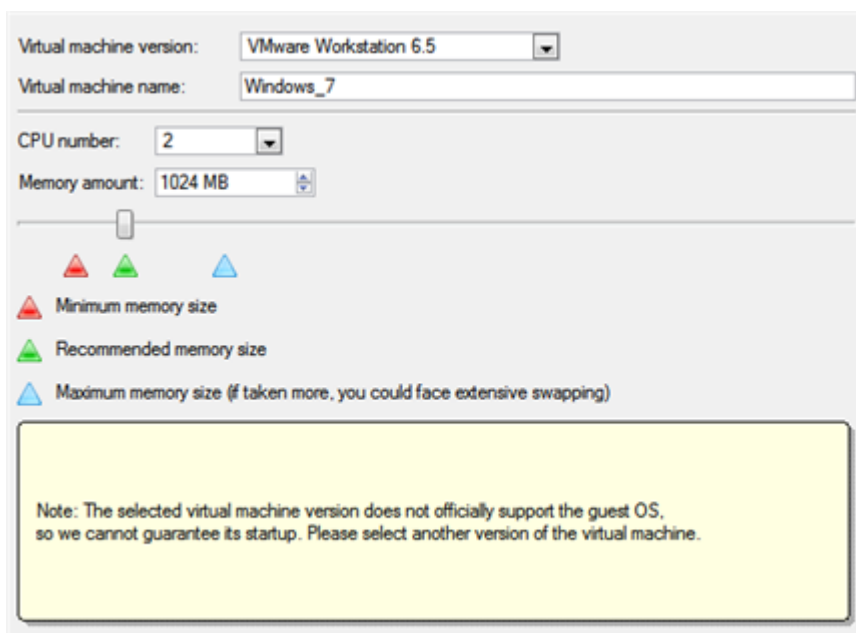
When using old Paragon's backup images (prior to Backup & Recovery 10), please be ready to manually specify the guest OS.



Not all vendors may be available to choose. If capacity of one of the selected objects exceeds the maximum virtual disk capacity of any vendor, this vendor will be shadowed.

6. Set properties of the future virtual machine:

- **Virtual machine version.** Please make sure you choose a version which is supported by your virtualization software, otherwise you won't be able to work with the newly created machine.
- **Virtual machine name.** By default the wizard picks the name of your guest OS, which can be modified however.
- **CPU number.** If your computer supports multiprocessing, select how many CPUs you'd like to allocate for the virtual machine.
- **Memory amount.** Depending on the guest OS the wizard calculates the recommended size of RAM, which can be modified however.

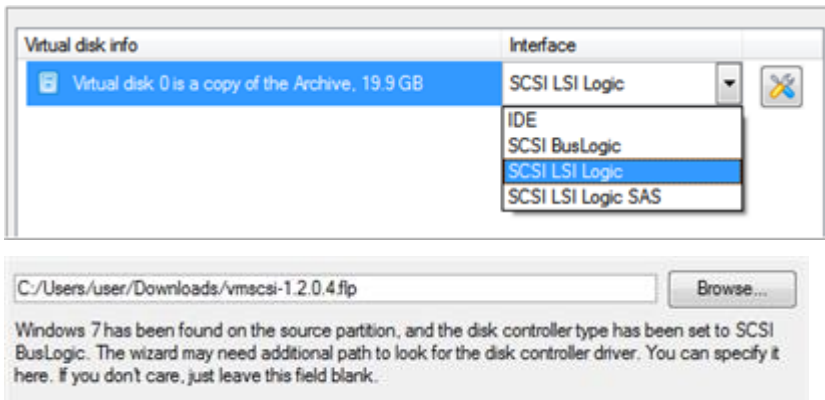




If the selected version does not officially support the guest OS, you will be notified and prompted to select another one.

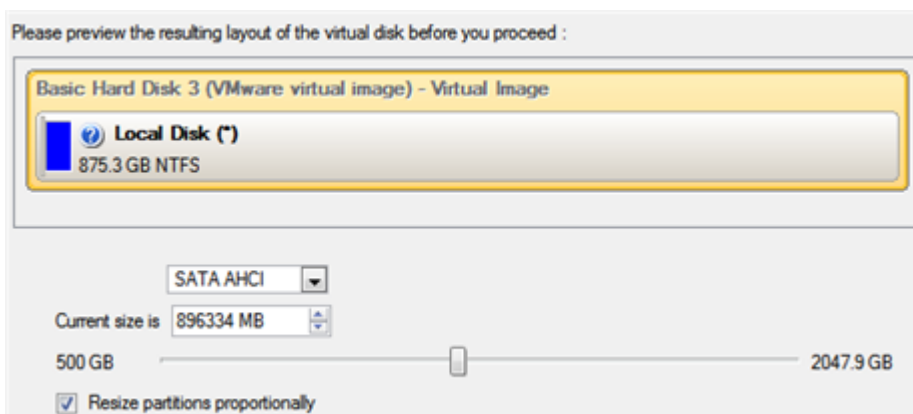
7. Set properties of the resulted virtual disk(s):

- **Virtual disk interface.** By default the wizard sets the most appropriate interface for each disk. Anyway you've got the option to change it to one of the supported by your guest OS. Just click on a disk, and then select the required interface from the pull-down list. But be ready to provide drivers for it on the next page.



Our program supports injection of drivers delivered in .iso or .flp images, so you can for instance download and inject drivers for the BusLogic controller from the VMware website.

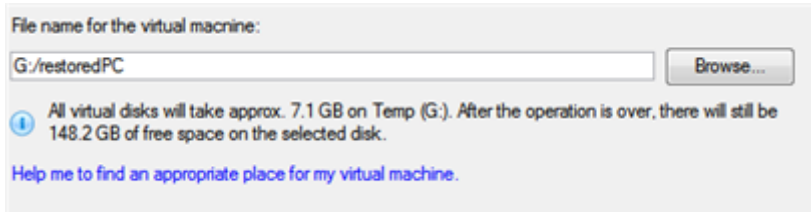
- **Additional properties** that depending on the selected virtualization vendor may include:
 - Size of the virtual disk. By default the wizard offers to create a virtual disk exactly the size of the selected object(s), which you can resize however (available for all);
 - Resize partitions proportionally. If you upsize the resulted virtual disk, you can make the wizard proportionally change the size of partitions keeping their relative order intact (available for all);
 - Create a split disk. You can choose whether to automatically cut the resulted virtual image to files of 2 GBs or not (available for VMware only);
 - Pre-allocate all disk space. You can choose whether to pre-allocate all space of the future virtual disk, or do it dynamically (not available for VMware ESX and Oracle VirtualBox).



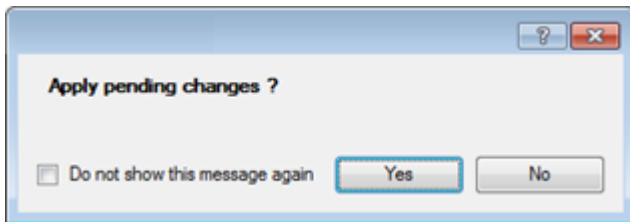


The maximum limit you can downsize the virtual disk is the capacity of its first partition.

- Specify a file name for the virtual machine and its location. By default the wizard scans all your local disks for available free space and picks the most appropriate location taking into account the total capacity of all virtual disks inside the virtual machine.



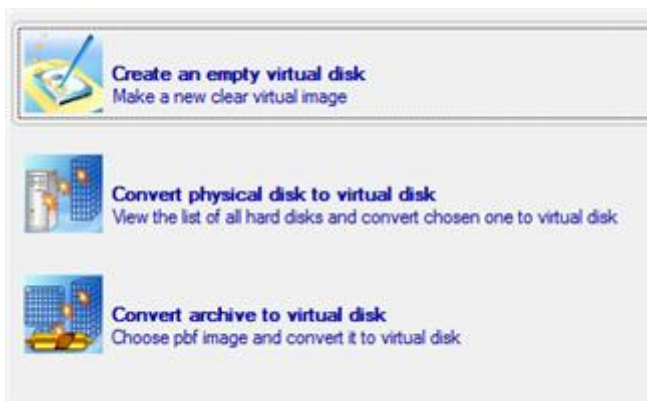
- Complete the wizard and then apply the pending changes.



Creating an empty virtual disk (Create VD)

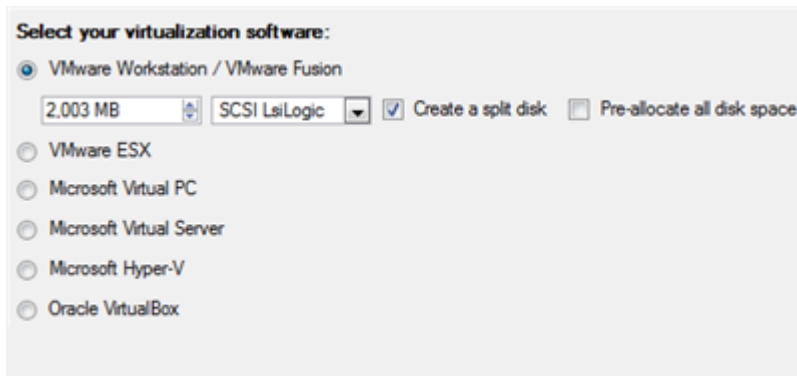
To create an empty virtual disk, please do the following:

- Click the **Create Virtual Disk** item of the Wizards menu.
- On the Wizard's Welcome page, click the Next button.
- Select **Create an empty virtual disk**.

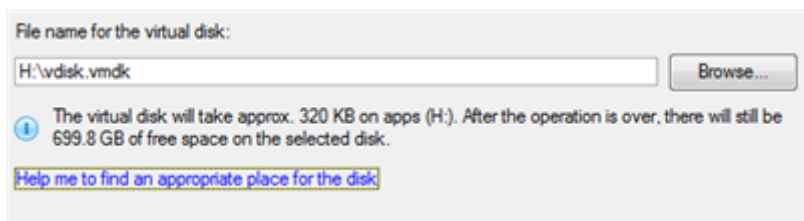


- Specify a virtualization software vendor and a number of additional parameters, including:
 - Type of the virtual disk.** You can either create an IDE or a SCSI virtual disk (relevant for VMware only);
 - Create a split disk.** You can choose whether to automatically cut the resulted virtual image to files of 2 GBs or not (available for VMware only);

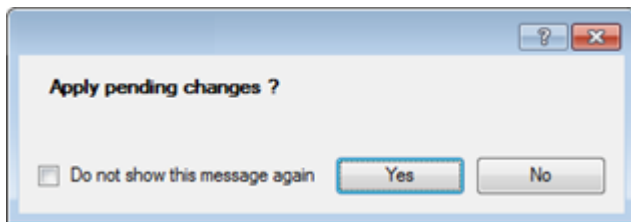
- **Pre-allocate all disk space.** You can choose whether to pre-allocate all space of the future virtual disk, or do it dynamically (not available for VMware ESX and Oracle VirtualBox);



5. Specify a file name for the resulted virtual disk and its location.



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



Making Windows Vista/7 backup bootable on virtual hardware (P2V Adjust OS)

As you probably know, Windows Vista and later operating systems from Microsoft include a built-in disaster recovery tool, which enables to create backup images of Windows OS in a .vhd (Virtual Hard Disk) format, used now by Microsoft Virtual PC/Server/Hyper-V, and Oracle VirtualBox. Unfortunately you cannot just take this type of backup to run Windows OS in a virtual environment – it won't start up. We can help you out with this naughty problem. Our P2V Adjust OS Wizard can patch Windows OS inside a .vhd backup image according to the specified virtualization vendor to let you start up and work with your Windows on virtual hardware.

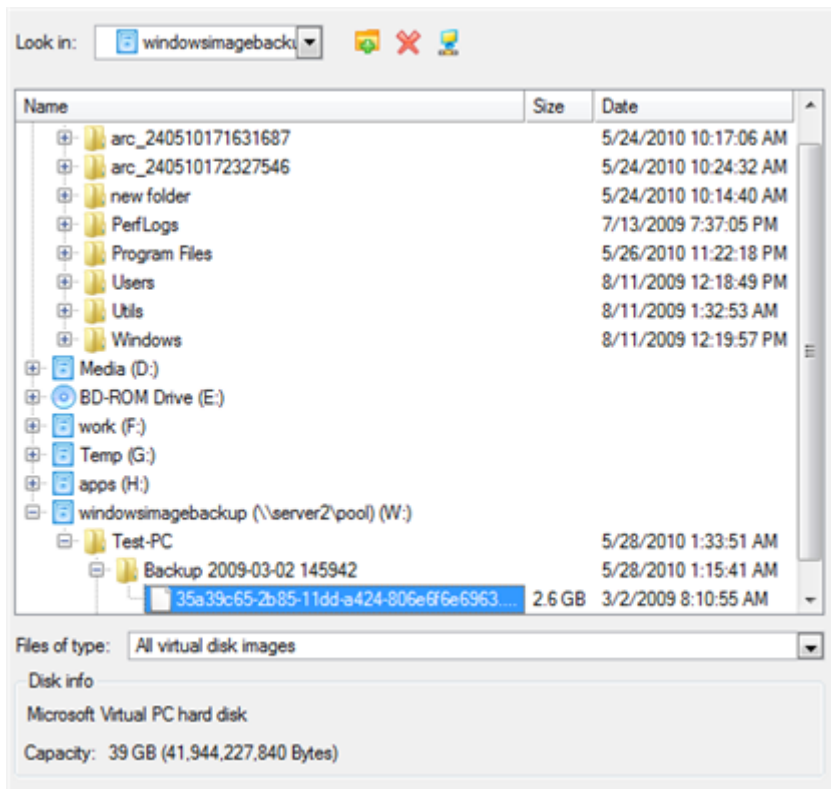
To make a Windows .vhd backup image start up in a virtual environment, please do the following:

1. Click the **P2V Adjust OS** item of the Wizards menu.



There are other ways to start up this function, please consult the [Interface Overview](#) chapter to know more on the subject.

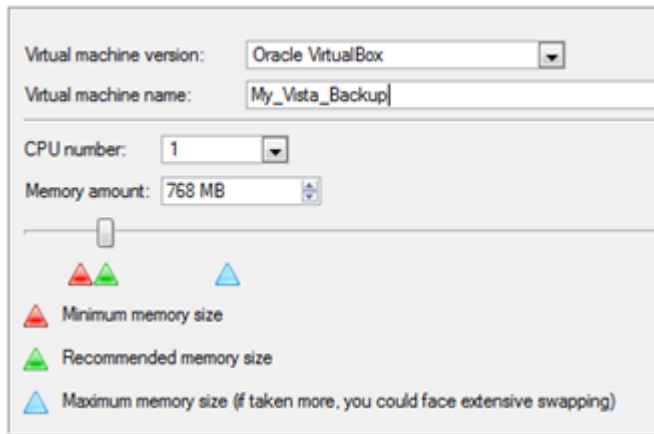
2. On the Wizard's Welcome page, click the Next button.
3. Browse for the required .vhd backup image of your Windows.



4. Our wizard will detect a version of Windows OS inside the image and offer to specify a virtualization software vendor. At the present moment the .vhd format is supported by Microsoft Virtual PC/Server/Hyper-V, and Oracle VirtualBox. We choose the last one.

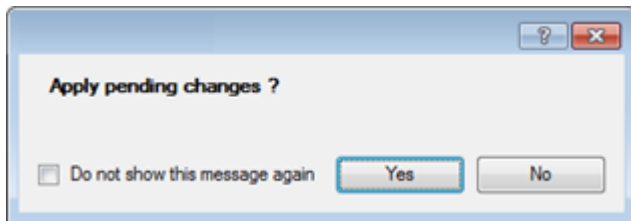


5. Set properties of the future virtual machine:
- **Virtual machine version.** Please make sure you choose a version which is supported by your virtualization software, otherwise you won't be able to work with the newly created machine.
 - **Virtual machine name.** By default the wizard picks the name of your guest OS, which can be modified however.
 - **CPU number.** If your computer supports multiprocessing, select how many CPUs you'd like to allocate for the virtual machine.
 - **Memory amount.** Depending on the guest OS the wizard calculates the recommended size of RAM, which can be modified however.



If the selected version does not officially support the guest OS, you will be notified and prompted to select another one.

- Complete the wizard and then apply the pending changes.



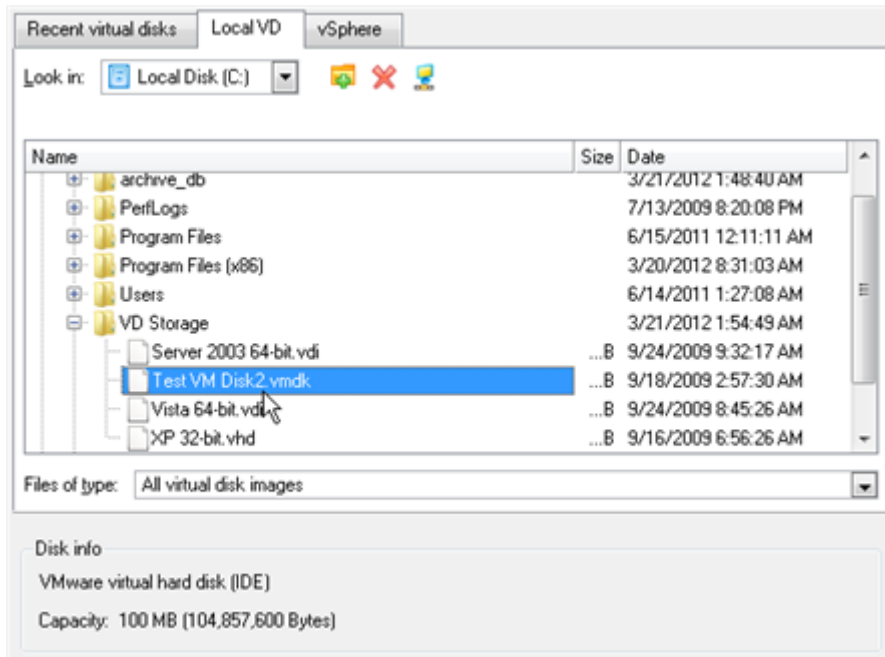
Connecting a virtual disk (Connect VD)

You've got the option to connect a virtual disk of [one of the supported types](#) directly to our program as if it's an ordinary physical disk, so opening up enormous possibilities:

- Exchange data between your physical environment and the virtual one through Volume Explorer (data import only) or File Transfer Wizard (data import and export). The way we offer is much easier and faster, as you don't need a VM shared folder, the network, or the slow-goer drag-and-drop;
- Import data from a parent virtual disk to one of its snapshots;
- Accomplish drive partitioning (create, format, delete, move, resize, etc.);
- Modify partition attributes (Active flag, Hidden flag, Volume Label, etc.);
- Clone a partition or an entire hard disk;
- Edit/View sectors, and many more.

Direct connection

- Click the **Connect a Virtual Disk** item of the Hard Disk menu.
- In the opened dialog click on the **Local VD** tab, then browse for the required virtual disk. You can connect a virtual disk from a local disk, a flash stick, a mapped network share, or CD/DVD/BD. When selecting one of the supported virtual disks, you will see detailed information on it below.



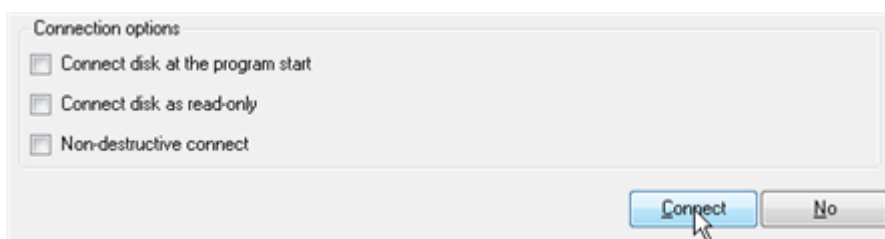
Although you're allowed to map a network share for connecting a virtual disk, we do not recommend it due to modest performance, especially when you need to accomplish drive partitioning.



Virtual disks VM connected from CD/DVD/BD will be available for reading only.

All earlier connected virtual disks get on a special list, which can be seen by clicking the "Recent virtual disks" tab (inactive initially). Just select a disk you've already worked with, and then click "Connect" for the fast connection.

- By default the selected virtual disk will be connected in the read/write mode until you disconnect it or exit the program. There are several auxiliary options however that can help in particular situations:



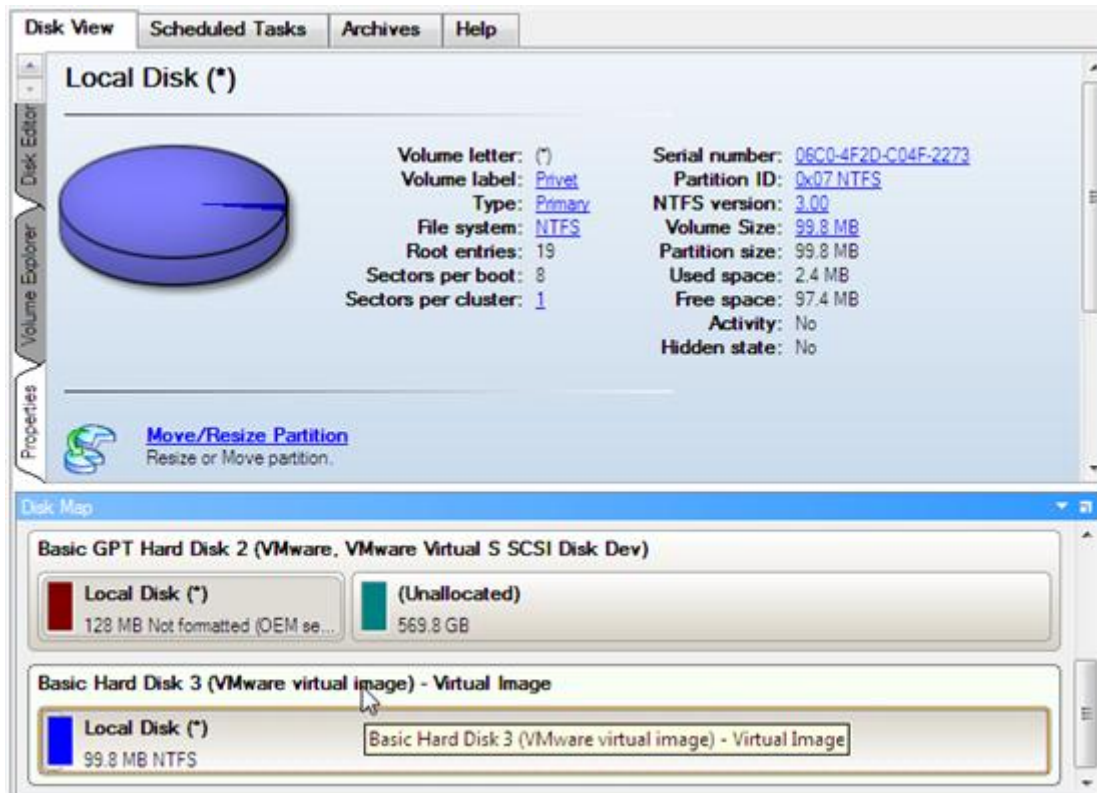
- **Connect disk at the program start** to have the virtual disk connected automatically at every program start.
- **Connect disk as read-only** to prohibit modification of data on the virtual disk.
- **Non-destructive connect.** It's a special read/write mode, when all changes on the connected disk are being saved to a snapshot, thus providing complete safety for the original disk's contents. If needed, this snapshot can later be merged with its parental disk by using standard tools of virtualization software vendor.



If choosing connection in the read-only mode, the non-destructive connection will be disabled and vice versa.

Since snapshots of Oracle VirtualBox are not supported, the non-destructive connection is unavailable for .vdi disks.

4. Click **Connect** to accomplish the operation. The selected virtual disk will be available on the disk map, as if it's an ordinary physical disk.



Limitations:

- A virtual disk opened for writing with a 3rd party tool (e.g. being used by a virtual machine) won't be connected, as asynchronous parallel writing to the disk file will most likely result in data corruption;
- A virtual disk opened for reading with a 3rd party tool (e.g. it's a parent VMware disk, which snapshot is being used by a virtual machine) will be opened for reading only with the corresponding notification;
- A double disk connection is prohibited.

Remote connection through VSphere

You've got the choice to connect to VMware ESX either from one of its Windows OS guests (highly recommended since it ensures the maximum performance possible) or from the outside (dependent on the network throughput), both ways through the VMware ESX infrastructure.

Before you start please take the following information into account:

- If you're going to accomplish drive partitioning operations, create a snapshot or backup of every target environment just in case
- Only disks of offline virtual machines are allowed to connect through the VSphere interface, thus shut down all target environments

The maximum number of simultaneously connected virtual disks is limited:

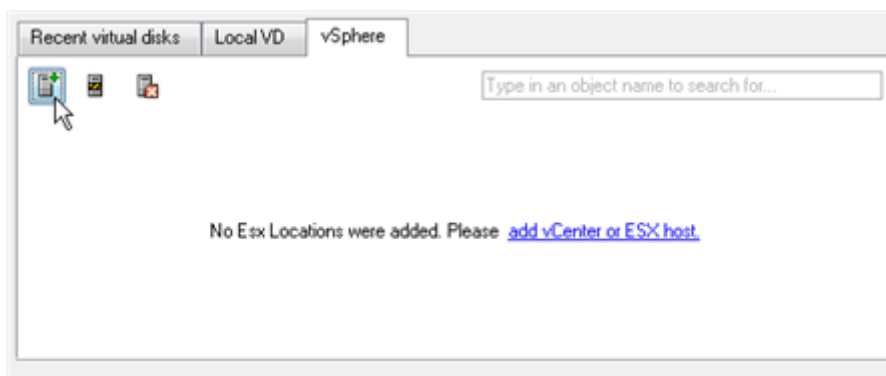


For ESX 4.x – 9 direct connections or 27 through vCenter Server;

For ESXi 4.x – 11 direct connections or 23 through vCenter Server.

For ESXi 5.x – depends on the workload of the host's hardware resources.

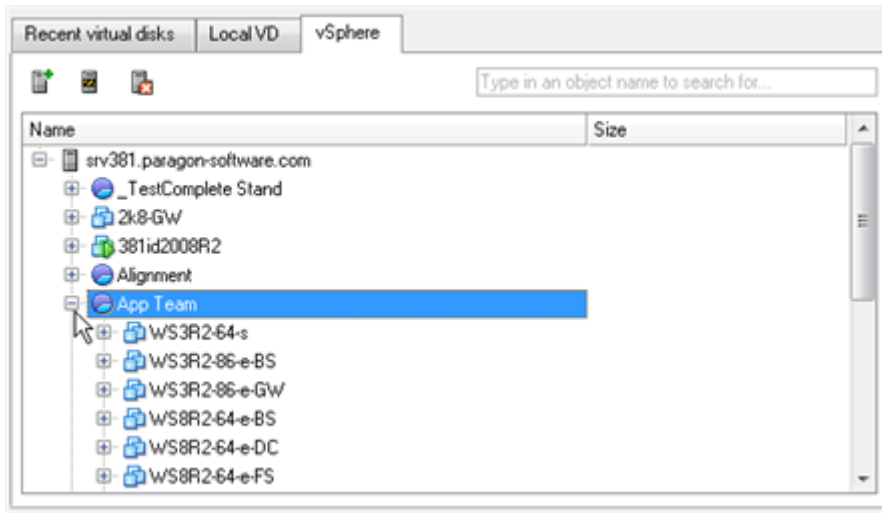
1. Choose a guest environment hosted by VMware ESX (recommended) or a physical computer based on Windows XP SP3 or later.
2. [Install the product.](#)
3. Launch the product.
4. Click the **Connect a Virtual Disk** item of the Hard Disk menu.
5. In the opened dialog click on the **VSphere** tab, then click either on the **add vCenter or ESX host** hyperlink or the **Create ESX connection** icon.



6. In the opened dialog provide an IP address or name of your ESX Server and access credentials. To save this information next time you launch the dialog, please mark the corresponding option. Click **Create** when ready.

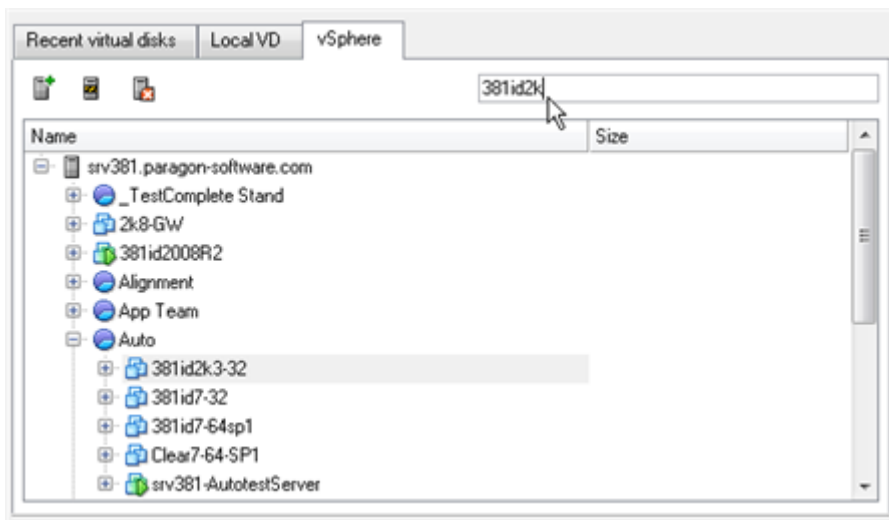


7. If a success, a new item will be added to the list named after the IP address or name of your server. By clicking on the + icon you can see all its guest environments.

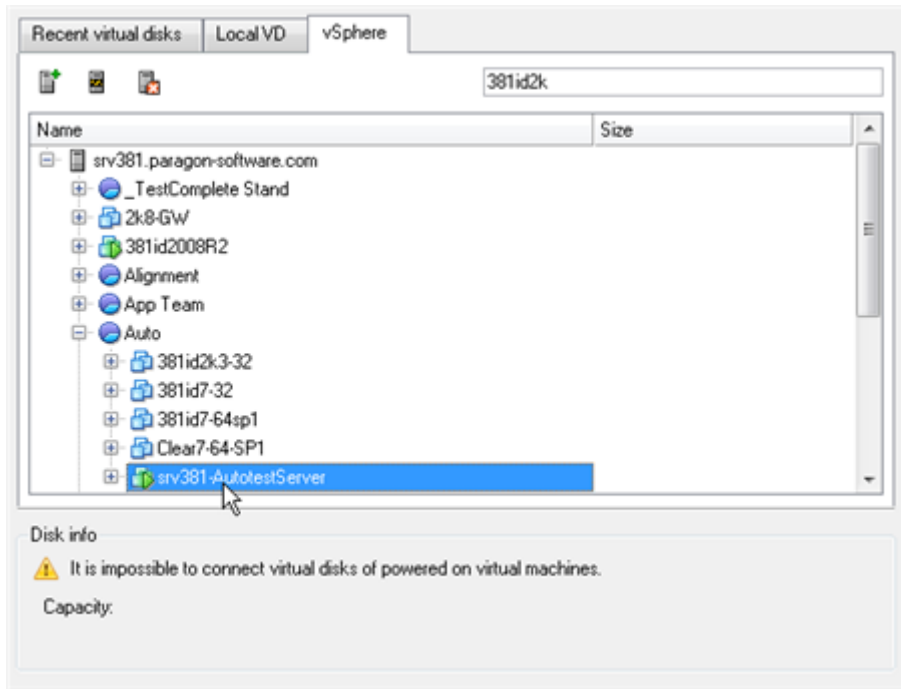


Initial scanning of the ESX infrastructure requires time, so please be patient.

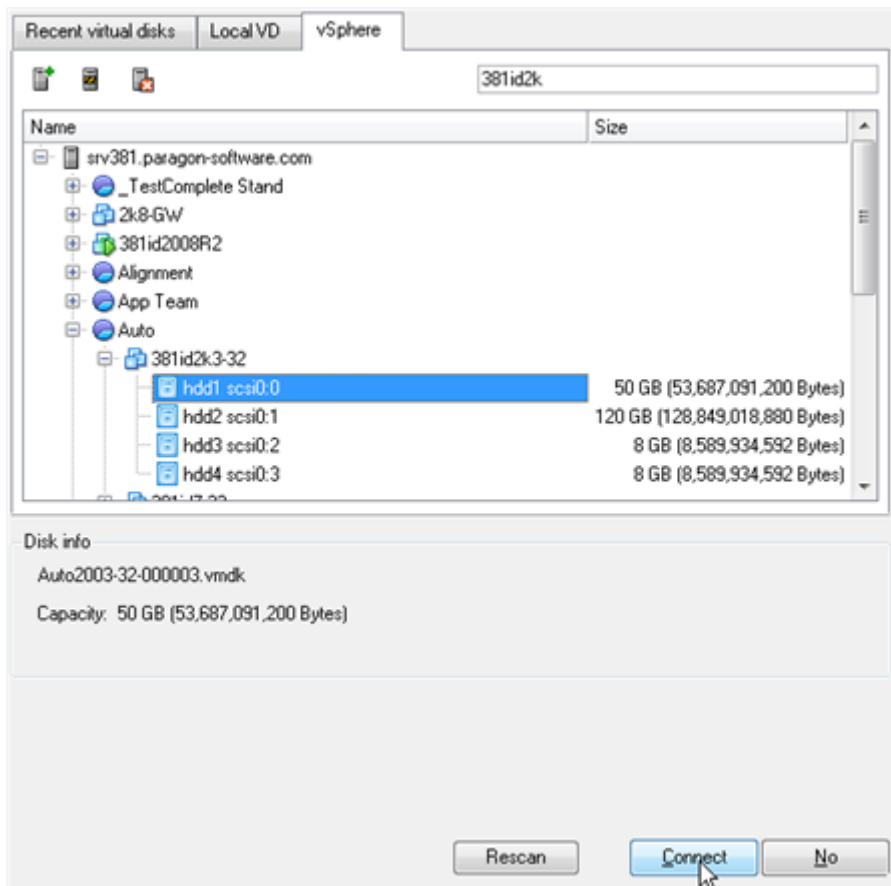
8. Browse for a guest machine or enter its name in a text field for the fast search.



Only disks of offline virtual machines can be connected, so please power off guest environments you'd like to work with.

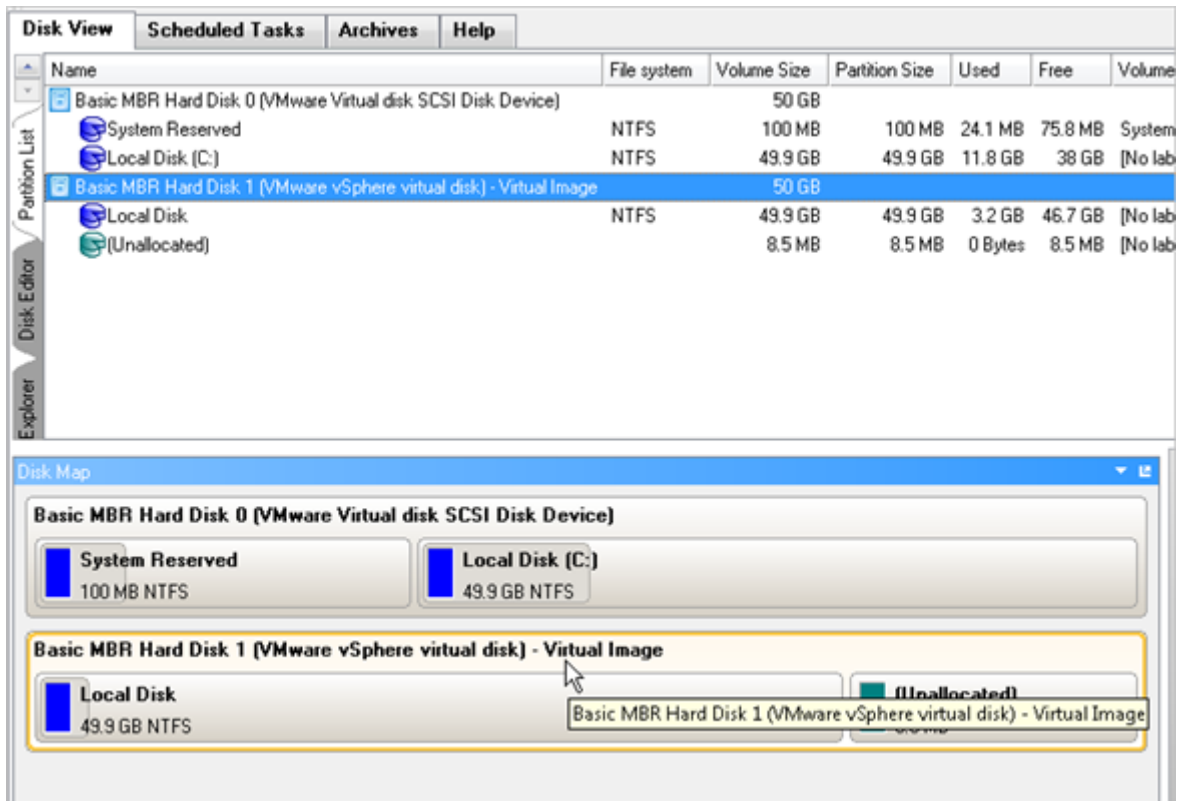


9. Click on the + icon to see hard disks (if several) of that machine. Choose a disk and then click **Connect** to proceed.



When selecting a disk the program displays more detailed information on it.

10. The selected virtual disk will be available on the disk map, as if it's an ordinary physical disk.

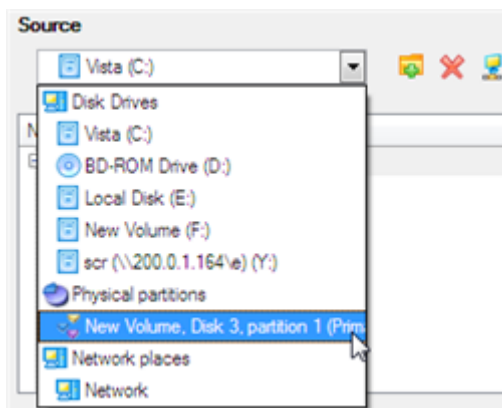


Exchanging data between physical and virtual environments

Let's assume you need to import a lot of data from one of your virtual disks. The best way out is to use our program, as it can help you do that without starting up the virtual environment and the other actions typical for this task.

To import data from a virtual environment, please do the following:

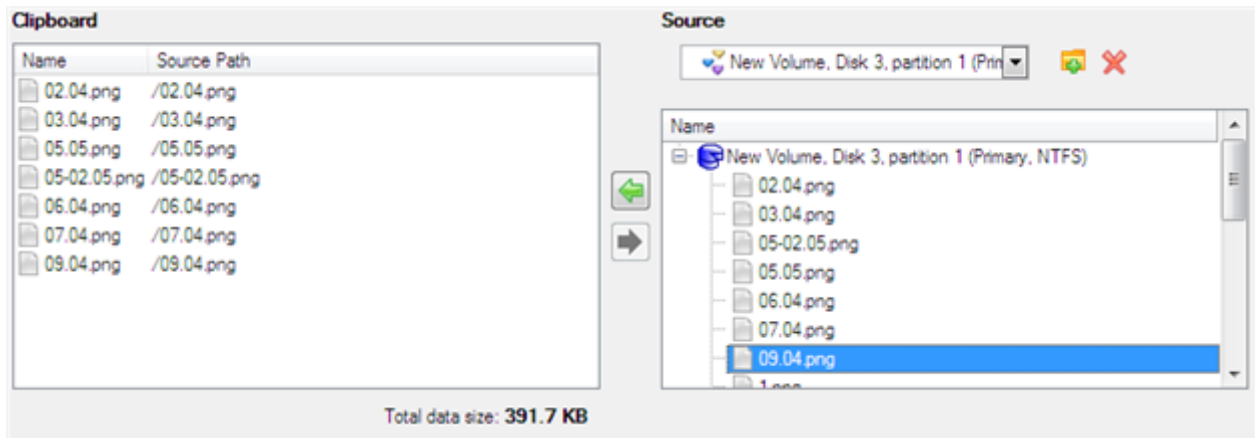
1. [Connect the required virtual disk to our program.](#)
2. Select in the Main Menu: **Tools > File Transfer Wizard** (any of the ways described earlier can also be used here).
3. On the Wizard's Welcome page, click the Next button.
4. Select a disk where the required data is stored from the pull-down list in the right pane of the window. You can find it among physical partitions, as a connected virtual disk cannot have an assigned drive letter either.



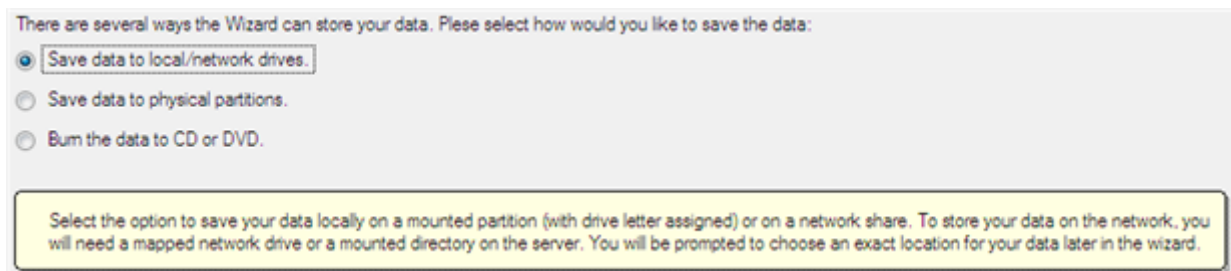


To easily find the required disk, please use its volume label or sequence number as a check point.

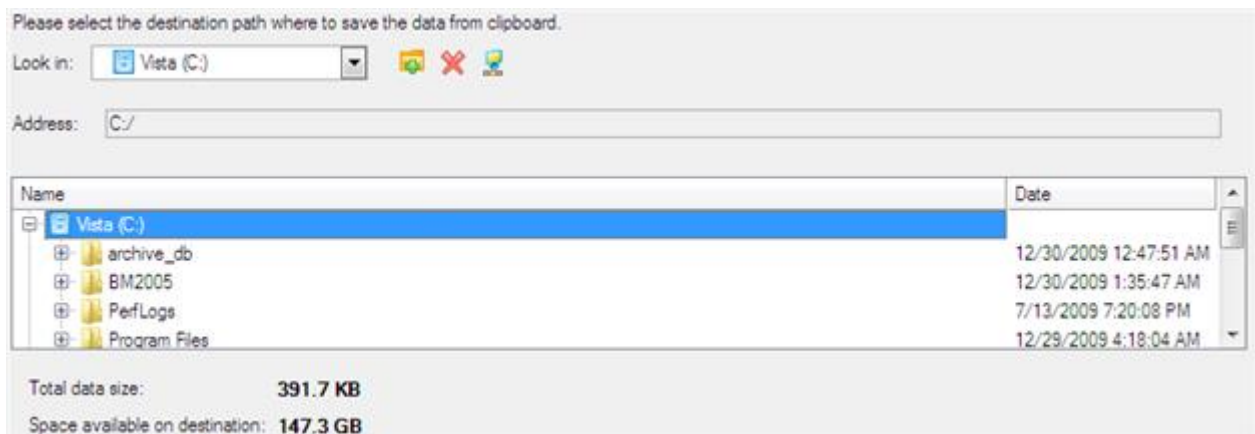
- Select files you want to copy and place them to Clipboard by pressing the left arrow-button. Click **Next** to continue.



- Select the **Save data to local/network drives** item. Click **Next** to continue.



- Specify the exact place to copy the data to.



- Finish the wizard to accomplish the operation.

Copying data from a parent virtual disk to one of its snapshots

Let's assume you've got a virtual machine with several snapshots. You need to copy some data from a parent image to one of its snapshots. You can't just roll back to the parent image, as you don't want to lose the latest data of the snapshot, so the best way out is to copy the required data from the parent image to the snapshot.

To copy data from a parent image to one of its snapshots, please do the following:

- [Connect the required snapshot disk to our program.](#)

2. [Connect its parent disk to our program](#). It'll be connected for reading only.
3. [Copy the required data from the parent disk to the snapshot](#).
4. Disconnect the virtual disks or close the program.

Migrating from one virtual environment to another (V2V)

Let's assume you're willing to shift to another virtualization software vendor (e.g. from Microsoft Virtual PC to VMware Workstation). The only thing that holds you back from it is a lot of virtual machines of MS Virtual PC, which are not fully compatible with VMware Workstation. Don't worry, we can help you out.



Before you start, please make sure you've got enough free space to accomplish the operation.

To make a virtual machine of one vendor out of an existing virtual machine of another vendor, please do the following:

1. [Connect all virtual disks](#) of the required virtual machine to our program.
2. [Complete the P2V Copy Wizard](#). Do not forget to select all virtual disks as objects of virtualization.

As a result you'll get two virtual machines containing the same virtual environment, but of different vendors. You can now delete the original to release some free space.

Migrating from a virtual environment to physical (V2P)

Let's assume your desktop PC was damaged a couple of months ago. Luckily you had had its system virtualized just before the tragedy. Having a laptop at the disposal, you kept working with the desktop system in a virtual environment for a while, while scanning the market for a replace. To cut it short, you've got a brand-new desktop PC just delivered to your door – it's time for a little V2P operation. Our program can help you do that.

Before you start, please make sure the following conditions are met:

- You've got drivers for the new hardware ready to use, not zipped or in .exe files.
- You've got access to the virtual disk from your desktop PC. You can have it locally, on external storage, or a network share.

To migrate from a virtual environment to physical, please do the following:

1. [Start up the computer from the WinPE media](#).
2. [Connect the required virtual disk to our program](#).
3. [Copy the connected virtual disk to your physical disk](#) just the way it's done with physical disks.
4. Right click on the virtual disk, then select **Disconnect Virtual Disk**.
5. [Complete the P2P Adjust OS Wizard](#).

Migrating a Windows 7 vhd

Let's assume you need to make your Windows 7 contained in a .vhd file start up on another computer. You've copied the virtual disk, added info on it to the BCD boot menu, then tried to start up the OS, but to no avail - your Windows goes BSOD with the 0x000007B error code. We can help you out with this naughty problem.

To make a .vhd image of Windows 7 start up on different hardware, please do the following:

1. [Start up the computer from the WinPE media.](#)
2. [Connect the required virtual disk to our program.](#)
3. [Complete the P2P Adjust OS Wizard.](#)

Extra Scenarios for WinPE



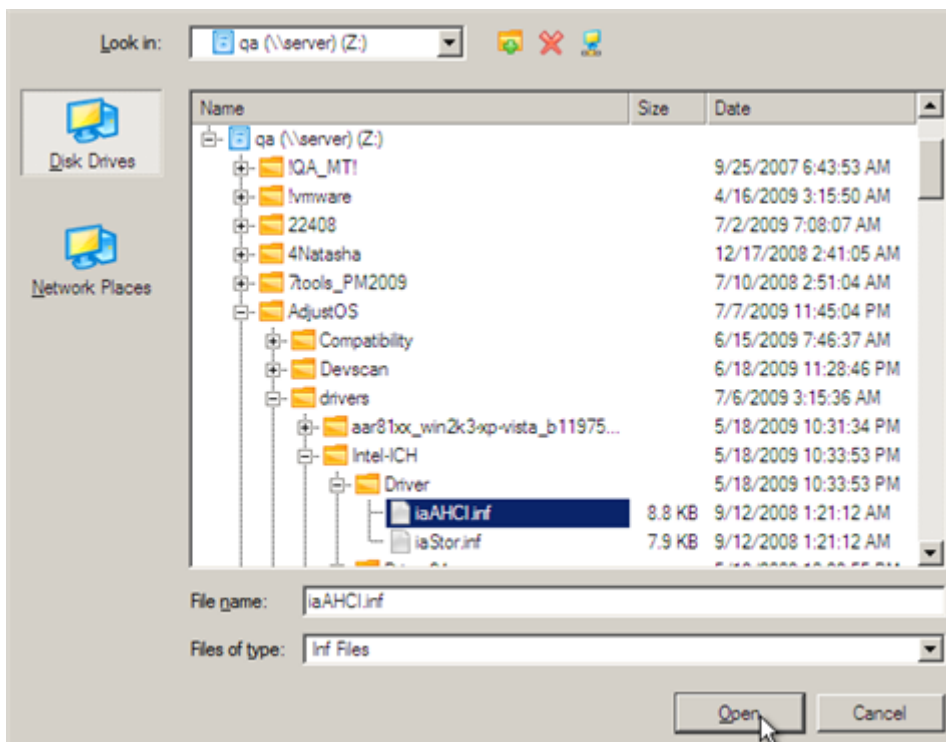
Please use **Boot Media Builder** to prepare the WinPE recovery environment, which you can get here: www.paragon-software.com/my-account/.

Adding specific drivers

The WinPE based recovery environment offers excellent hardware support. Anyway you've got the option to add drivers for specific hardware with a handy dialog.

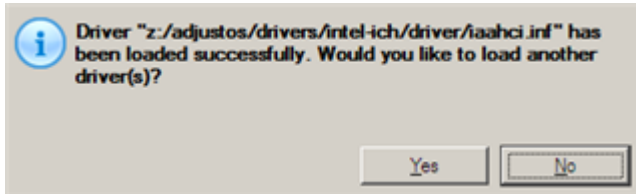
To add drivers for specific hardware, please do the following:

1. Click **Load Drivers**.
2. In the opened dialog browse for an .INF file of the required driver package located on a floppy disk, local disk, CD/DVD or a network share. Then click the **Open** button to initiate the operation



To know how to map a network share, please consult the [Configuring network](#) scenario.

3. You will be notified on the successful accomplishment of the operation. Click **Yes** to load another driver or **No** to close the dialog.



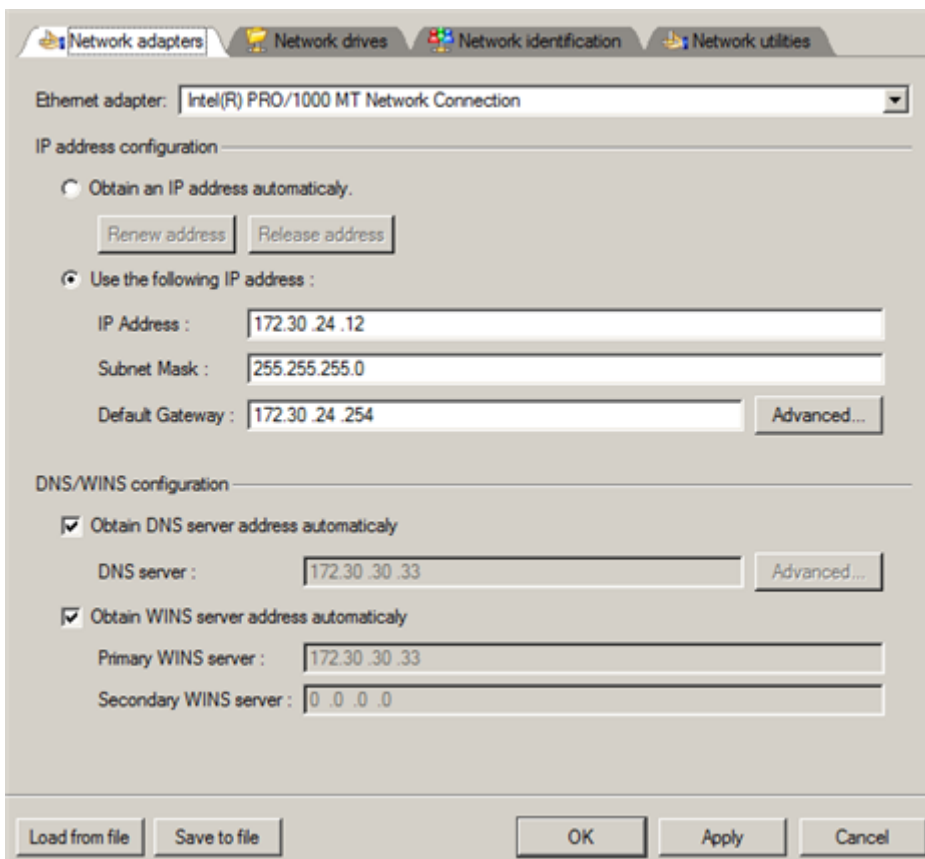
The WinPE recovery environment is 32-based, thus you need to use 32-bit drivers for injection.

Configuring network

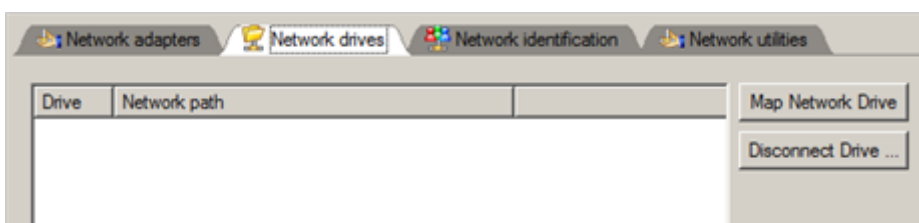
If your local network has a DHCP server, a network connection will be automatically configured once the WinPE recovery environment has been started up. Otherwise you will need to do it manually with a handy dialog by providing an IP address, a network mask, default gateway, etc. Besides with its help you can easily map network shares.

To manually set up a network connection and map a network share, please do the following:

1. Click **Configure Network**.
2. In the opened dialog provide an IP address, a network mask, default gateway, etc. for your network device.



3. Click the **Network drivers** tab to map a network share.



4. Click **Map Network Drive** and provide all the necessary information to map a network share in the opened dialog:



- Click the standard browse button [...] to browse for the required network share or manually enter a path to it;
- Define a letter from the pull-down list of available drive letters;
- Click the **Connect as user** button at the foot of the dialog page to specify a user name and password to access the selected network share if necessary.

By clicking **Disconnect Drive...** you can delete an existing network share if necessary.

5. Click the **Network identification** tab to change a network name of your computer (generated automatically) and a workgroup name.

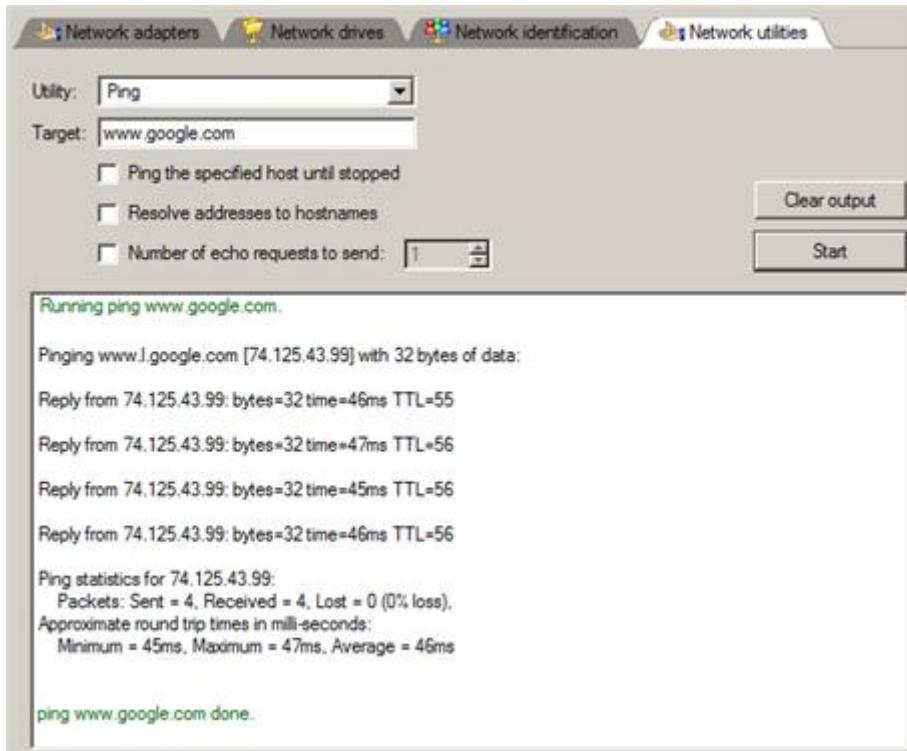


6. By default, the wizard saves all network settings in the netconf.ini file located on the WinPE RAM drive, thus it will only be available until you restart the computer. However, you can just once configure your network device and then save this file to some other destination, for instance a local drive, and this way avoid constant re-configuration, just by providing a path to it. So Click **Save to file** to save the netconfig.ini file to the required destination.

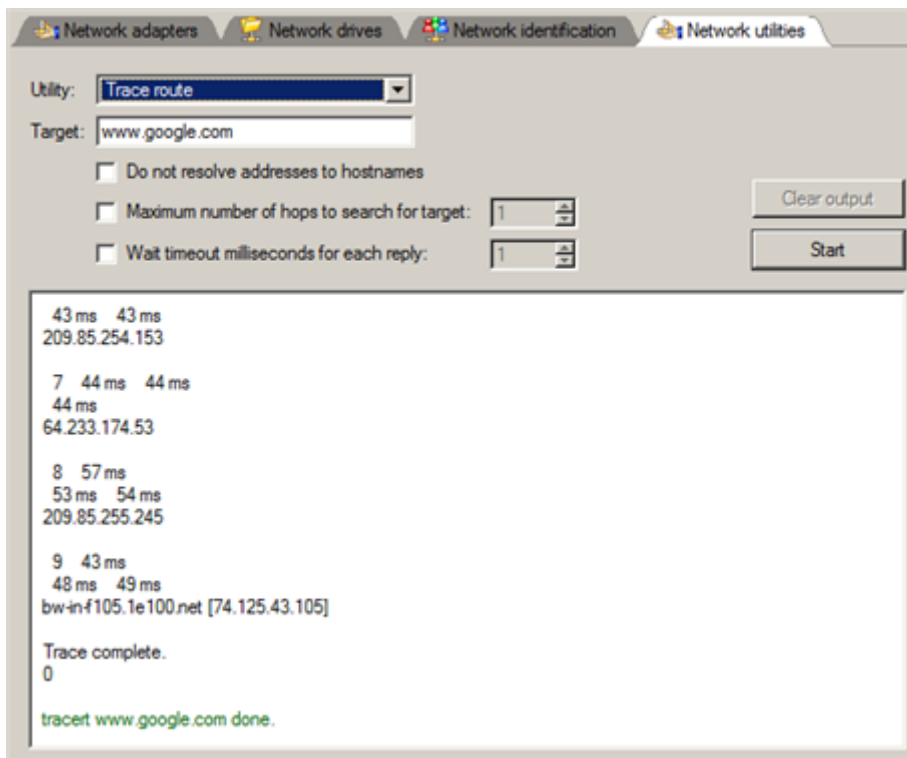
Network troubleshooter

Network Configurator includes a traceroute/ping utility that enables to get detailed information on particular routes and measure transit delays of packets across an Internet Protocol (IP) network. So with its help you can easily track down problematic nodes.

1. If you need to ping some network host, please select **Ping**, then type in the required IP address or its name. Click **Start** when ready.



- **Ping the specified host until stopped.** Mark the option to ping the chosen host for indefinite time;
 - **Resolve addresses to hostnames.** Mark the option to display hostnames instead of IP addresses.
 - **Number of echo requests to send.** By default the utility sends 4 echo requests, which you can modify however.
2. If you need to trace a route to some network host, please select **Trace route**, then type in the required IP address or its name. Click **Start** when ready.



- **Do not resolve addresses to hostnames.** Mark the option to display IP addresses instead of hostnames.

- **Maximum number of hops to search for target.** By default the utility goes through maximum 30 hops when searching for the target host, which you can modify however.
- **Wait timeout milliseconds for each reply.** By default the utility waits 4 seconds for each echo reply message. If not received within the timeout, an asterisk (*) is displayed.

Saving log files

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

To prepare a log files package, please do the following:

1. Click **Log Saver**.
2. Provide an e-mail address used for registering the product, then give a detailed description on the encountered problem in the corresponding text fields. Please don't worry - we respect your privacy, so none of your confidential data will be exposed. This utility only collects the program's operation logs to help our Support Team find and tackle your problem. Click **Next** to continue.

online request system.' Below this is a text input field containing 'TEST_USER@gmail.com'. The next section is labeled 'Please enter description of encountered issue:' and contains a text area with the text 'The system doesn't start up after migration. Please help...'. At the bottom, there is a 'Privacy statement' dialog box with a yellow background, containing the text: 'Please note, this process collects only Paragon created log data. Paragon Software respects your privacy and does not touch personal data. All the collected information will be used for problem research and fix only in our support team.' Below the privacy statement is a 'Show privacy statement' link. At the bottom right of the main dialog are 'Next >' and 'Cancel' buttons."/>


Log files do not contain any confidential information on the operating system settings or the user documents.

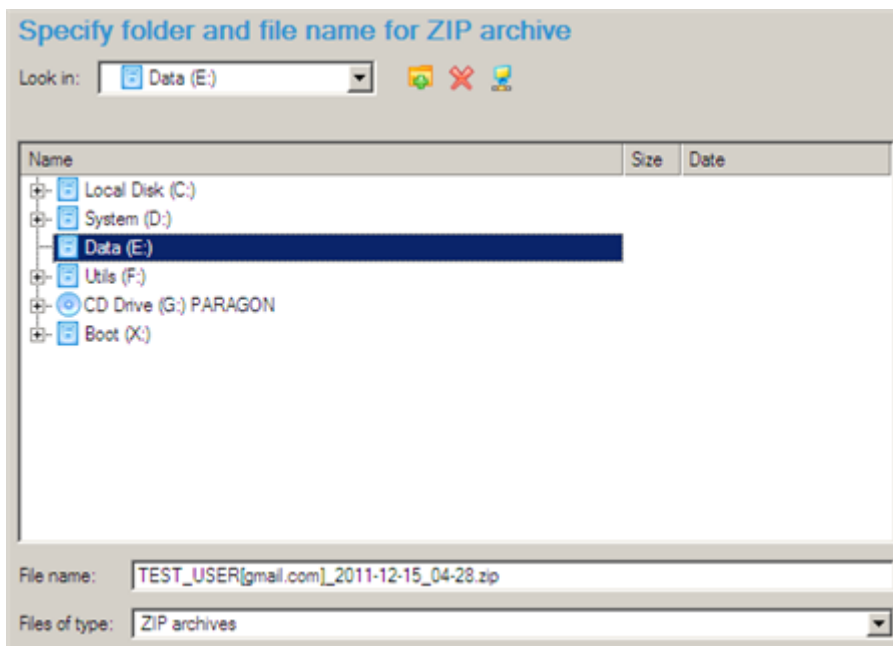
3. On the next page choose how you'd like to send the logs, either immediately to Paragon's FTP Server in the automatic mode (recommended), or later by manually sending an e-mail to our support engineers with the collected logs attached.



Automatic mode:



Manual mode:



Our Support Team will get in touch with you and help to resolve all problems.



This function is also available under Windows.

Troubleshooter

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

1. I try to run an operation, but the program claims my partition is in use and suggests restarting the computer.
There are a number of operations that cannot be performed while your partition is in use (or locked in other words). Please agree to reboot your machine to make the program accomplish the operation in a special boot-up mode.
2. I run an operation and restart the machine as required, but it just boots back into Windows without accomplishing the operation.

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

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

There can be a number of reasons for that:

- The program cannot create a new partition on a dynamic disk.
- The program allows creating new partitions only within blocks of un-partitioned space. It cannot convert a free space on an existing partition to a new partition.

4. I cannot copy a partition.

There can be a number of reasons for that:

- The source or target disk you select is a dynamic disk;
- 4 primary partitions (or three primary partitions and an extended one) already exist on the target disk.

5. I need to copy a partition. But when selecting a place where to make a copy, I always get a crossed circle sign no matter which partition is selected.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

There can be a number of reasons for that:

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

Glossary

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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