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Backup & Recovery™ 2014 Free

User Manual

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Introduction

Paragon Backup & Recovery™ 2014 Free is a complex disaster recovery and system migration solution.

By implementing in this product modern technologies the company has offered rock-solid facilities to build a reliable shield against any disaster.

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 Backup & Recovery 2014

- **[uEFI support](#)**. The Linux-based recovery environment supports systems configured to the uEFI boot mode.
- **[Enhanced backup format](#)**. Paragon introduces a pVHD (Paragon Virtual Hard Drive) format – a special VHD, optimized for storing backups of virtual and physical machines. It's very efficient in handling incremental chains, data de-duplication and synchronization. pVHD allows obtaining backups that are up to four times smaller than original backup objects. What you get by using pVHD:
 - Incremental imaging works much faster and rock-stable in comparison with the old PBF;
 - Only pVHD images can be used to do immediate virtualization;
 - With the new backup technology, Paragon has also achieved easy support of any virtual containers (VMDK, VHD, etc.).



In the current version the pVHD support has a promotional goal. In future releases pVHD will gradually take the primary role.

- **Copy/Restore to dissimilar sector size**. Previously not allowed, now you can for instance copy or restore contents of a 512-byte hard disk to a 4k hard disk with no additional actions from your side.
- **New UIM (Universal Image Mounter)**. Apart from PBF images, Universal Image Mounter enables to mount (assign a drive letter to) pVHD backup images (full and incremental) to browse their contents and retrieve data both, in the program and directly under Windows OS.
- **Uplifted Recovery Media Builder**. Paragon's Recovery Media Builder, a simple alternative to Boot Media Builder, can help you prepare a Linux-based bootable environment on a USB thumb drive or in an ISO file.
- **Complete support of Windows Storage Spaces**. Windows 8 has come with a storage management feature called the storage spaces. It enables to easily manage large storage pools. In fact it's an expandable virtual container of defined data size, allowing users to add it as many physical drives as they want until the defined virtual disk's limit is reached. This makes it easy to include additional storage devices without having to set up and manage each attached physical storage drive.
- **Uplifted Linux Recovery Environment**. Started from HDM 14 the Linux-based recovery environment is based on SuSe 12.3 (more hardware devices supported) and includes:
 - uEFI fixup to clone, restore, migrate 64-bit Windows systems configured to the uEFI boot mode.

- **Separate x86 and x64 installation packages.** Please note that started from HDM 14 installation packages do not include Recovery Media Builder, thus customers can build Linux-based recovery media only through Recovery Media Builder obtained from Paragon's website.
- **Windows 8.1 support.** Our product has been tested to work fine on Windows 8.1 RTM.
- **[New user-friendly interface](#)** that is fully compatible with the Windows 8 streamlined, tile-oriented interface:
 - Metro-style Express Launcher;
 - Ribbon-based full scale launcher.
 GUI of the Linux recovery environment has also been uplifted.

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.

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.*

For PBF images:

- **[Sector backup](#)** to save not only all on-disk information but also the system service structures. It is ideal for making a backup image of an entire hard disk or system partitions to guarantee the operating system's working capability.
- **[Differential backup](#)** to a sector image to only archive changes since the last full sector-based image, thus considerably saving the backup storage space. To restore this kind of backup you will require a full image and one of its differentials.

For pVHD images:

- **[Backup to VD Wizard](#)** to protect separate partitions or entire hard disks.
- **[Incremental Backup to VD Wizard](#)** to create incremental backup chains based on the base pVHD image.

Restore Facilities

- **Restore an entire disk, separate partitions or only files you need** from the previously created backup image (for PBF and pVHD).
- **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.

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.).

Automatization Facilities

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



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

Auxiliary Facilities

- **File Transfer Wizard** to make such operations as transferring of files/directories or burning of them to CD/DVD as easy and convenient as possible. Providing access to Paragon backups as regular folders, it may also help to replace corrupted data from a previously created image in case of an operating system failure.
- **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.

Supported Technologies

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

- **Paragon Hot Backup™** technology to back up locked partitions and hard disks under Windows NT+ family operating systems providing both high operating efficiency as well as low hardware requirements.
- **Paragon Power Shield™** technology to provide data consistency in case of a hardware malfunction, power outages or an operating system failure.
- **Paragon UFSD™** technology to browse partitions of any file system including hidden and unmounted, modify and copy files and folders, etc.
- **Paragon 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 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.
- **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.
- **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 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.

System Requirements

For the Windows installation package

- Windows XP SP3
- Windows Vista
- Windows 7
- Windows 8
- Windows 8.1

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).



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

Additional requirements

- Network card to send/retrieve data to/from a network computer

- Recordable CD/DVD drive to burn data to compact discs
- External USB hard drive to store data.

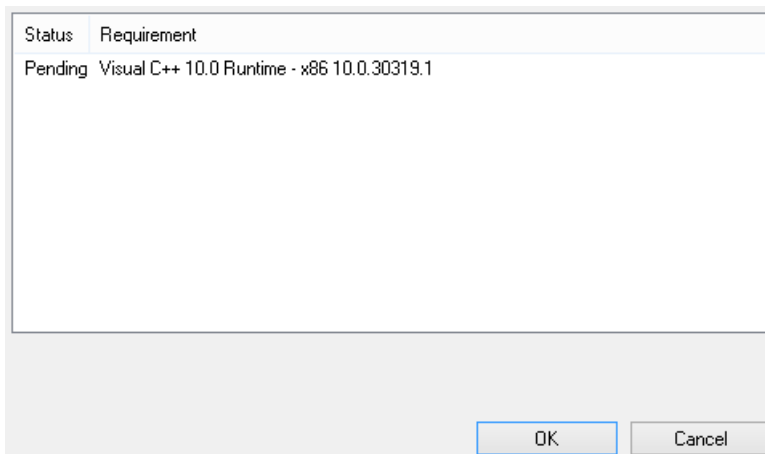
Installation

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. The Welcome page will inform that the application is being installed. Click **Next** to continue.
3. 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.
4. 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.
5. On the next page, click **Change** to install the utility to a different location (by default **C:\Program Files\Paragon Software\Paragon Backup & Recovery 2014 Free Edition**). 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.

6. 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.
7. The Final page reports the end of the setup process. Click **Finish** to complete the wizard.

First Start

To start Paragon Backup & Recovery 2014 under Windows, please click the Windows Start button and then select **Programs > Paragon Backup & Recovery™ 2014 > Paragon Backup & Recovery™**.



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

The first component that will be displayed is called the Express Launcher. Thanks to a well thought-out categorization and hint system, it provides quick and easy access to wizards and utilities that we consider worth using on a regular basis. With its help you can also start up the traditional launcher, the help system or 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

Linux-based recovery environments should be prepared on-site with Paragon's Recovery Media Builder, which you can download from Paragon's web site, the My Account section (www.paragon-software.com/my-account/). To know more on the subject, please consult documentation that comes with this utility.

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.

Please use Recovery Media Builder to prepare Paragon's recovery environments on CD/DVD, flash, or in an ISO-image. You can get it 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.

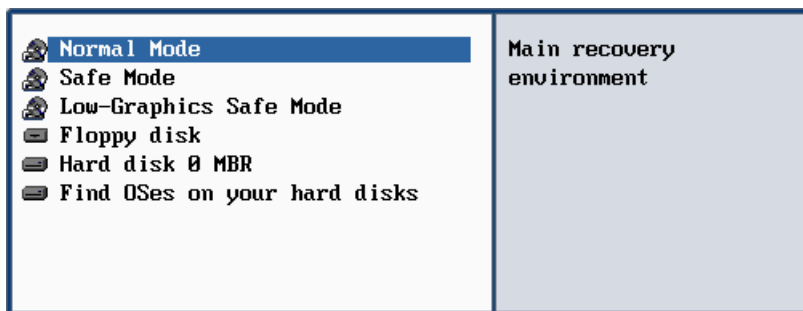
2. Launch a boot mode you need (Normal, Safe, Low-Graphics Safe) in the Boot menu.

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

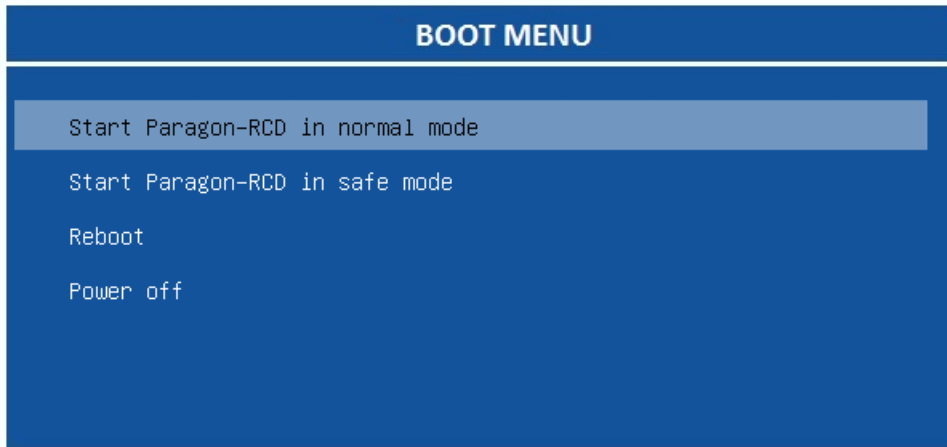
32-bit environment



- **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.

64-bit environment



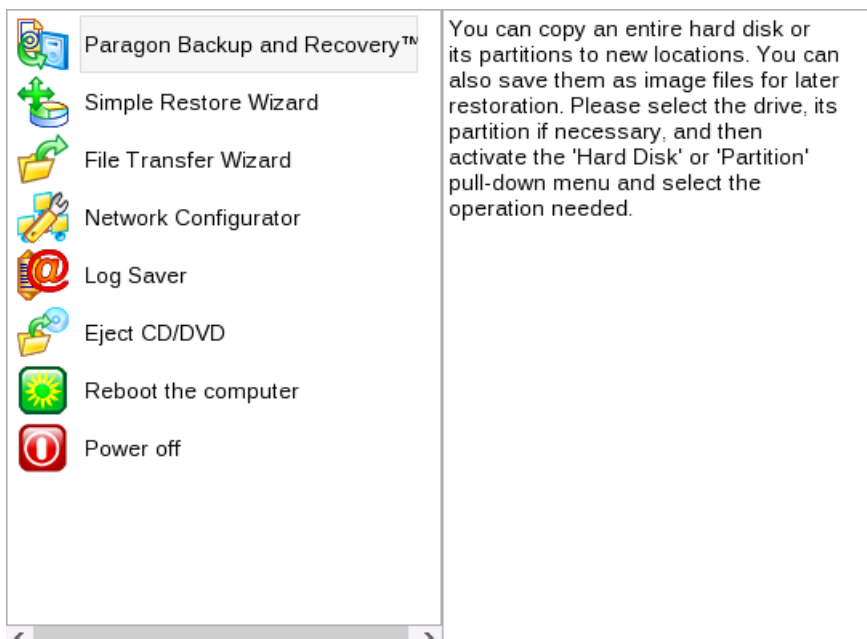
- **Normal Mode.** Boot into the Linux normal mode. This mode uses the full set of drivers (recommended);
- **Safe Mode.** Boot into the PTS DOS mode. This mode can be used as an alternative of the Linux normal mode if it fails to work properly;
- **Reboot.** Restart the computer.
- **Power off.** Shut down the computer.



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:



- **Backup & Recovery** (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);
- **File Transfer Wizard** (allows copying files/folders to another disk or a partition as well as recording them to CD/DVD);
- **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);
- **Eject CD/DVD**;
- **Reboot the computer**;
- **Power off the computer.**

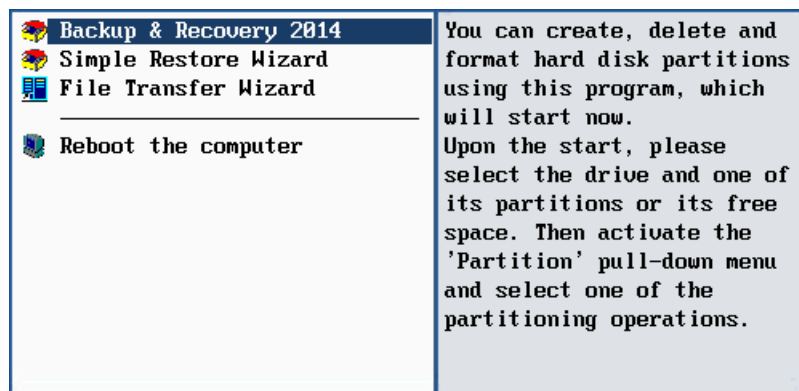
To move within the menu, please use the arrow keys of the computer keyboard.

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.



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?

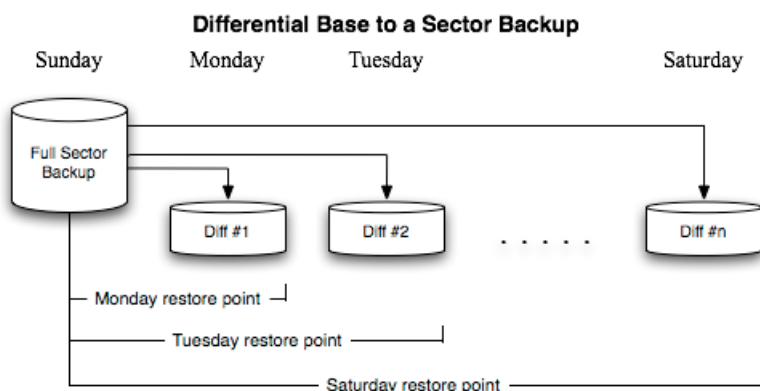
Backup Types

At the present moment the market is offering various types of backup imaging to meet the needs of any user.

Full and Differential Sector Backups

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

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.

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.

pVHD Support

Paragon introduces a pVHD (Paragon Virtual Hard Drive) format – a special VHD, optimized for storing backups of virtual and physical machines. It's very efficient in handling incremental chains, data de-duplication and synchronization. pVHD allows obtaining backups that are up to four times smaller than original backup objects.

In the current version of the product backup images can be made either in the old PBF or the new pVHD. Please note that the pVHD support has a promotional goal. In future releases pVHD will gradually take the primary role.

Below is the list of wizards that allow working with pVHD:

- [Backup to VD Wizard](#) (Linux, Windows);
- [Incremental Backup to VD Wizard](#) (Linux, Windows);
- [Restore from VD Wizard](#) (Linux, Windows).

What you get by using pVHD:

- Incremental imaging works much faster and rock-stable in comparison with the old PBF;
- Only pVHD images can be used to do immediate virtualization;
- With the new backup technology, available for customers as a new backup image format pVHD, Paragon has also achieved easy support of any virtual containers (VMDK, VHD, etc.).

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)

uEFI Boot Challenges

Introduced back in 2005 by Intel to lift restrictions of the old MBR (Master Boot Record) and PC BIOS (Basic Input/Output System), uEFI (Unified Extensible Firmware Interface) is now a recommended platform for new 64-bit Windows 8 computers. And the reason is easy to catch – besides other unique features impossible for the traditional tandem of BIOS+MBR, only a uEFI-based platform enables to accommodate Windows OS on a partition larger than 2.2TB.

Despite all uEFI advantages however, it has one quite naughty issue: a pretty standard operation with a bootable device for instance involving its connection to another SATA port results in unbootable Windows. You'll get the same result if trying to boot from a cloned system hard disk or from a restored hard disk. All these problems originate from the way uEFI+GPT bundle is organized.

Microsoft provides how-to guides to tackle this type of problems, but they demand a great deal of experience from the user, involving the use of the **cmd**, **diskpart** and **bcdedit** tools.

Paragon has a better way! Introducing an elegant technology, realized at the user side as one simple option, you can define a system GPT volume you're willing to boot from.



For Backup & Recovery 2014 Free the uEFI boot fixup option is available on the Linux recovery environment only.

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.

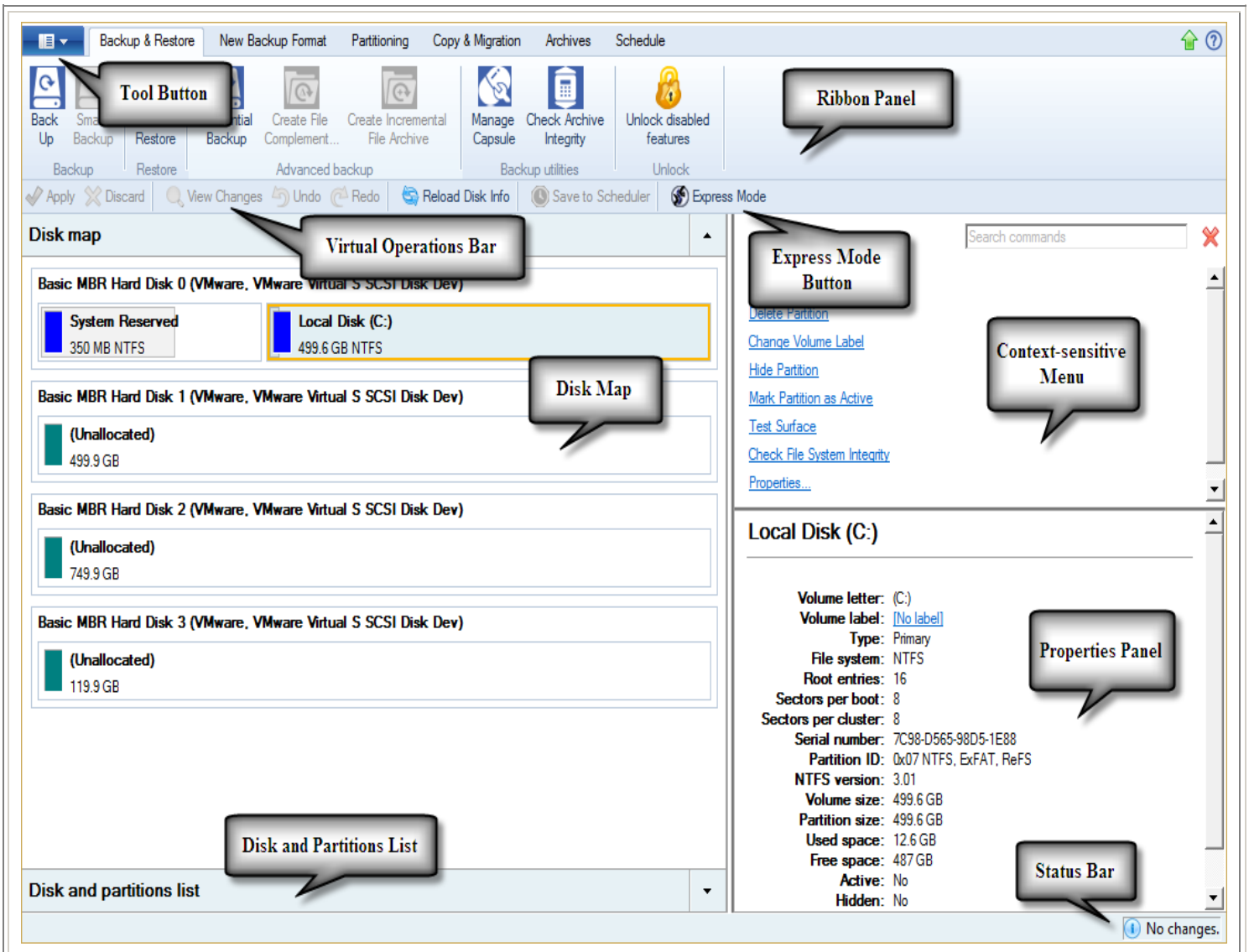
Interface Overview

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. [Tool Button](#)
2. [Ribbon Panel](#)
3. [Virtual Operations Bar](#)
4. [Express Mode Button](#)
5. [Disk Map](#)
6. [Disk and Partitions List](#)
7. [Context-sensitive Menu](#)
8. [Properties Panel](#)
9. [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.

Tool Button

By clicking on this button the user can:

- Launch auxiliary wizards,

- Get access to the program settings,
- Collect and send a log files package to the Support Team,
- Go to Paragon's website to download a free update, register the product, visit Paragon's Knowledge Base, etc.

Ribbon Panel

An area across the top of the program's window is called the Ribbon Panel. It makes almost all the product capabilities available to the user in a single place. A Ribbon Tab is an area on the panel that contains buttons organized in groups by functionality. Each button corresponds to a certain program wizard or dialog.









If you'd like to hide all ribbon tabs, click on the arrow button at the right top corner of the program window.

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
	Generate a script out of all pending operations
	Schedule 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:

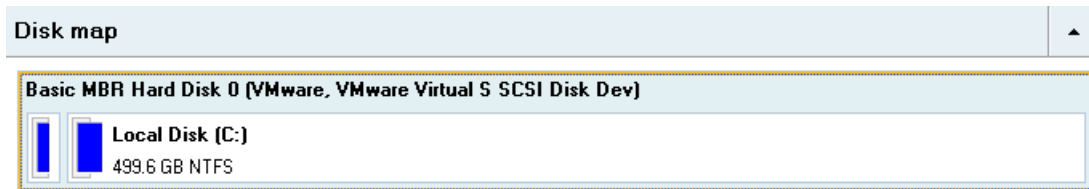
 You have unsaved changes.

Express Mode Button

By clicking on this button the user can switch to the [express mode of operation](#) at any time.

Disk Map

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. By looking at the size of the bar's shaded area it is possible to estimate the used disk space. For the selected at the moment object there's the possibility to call a context-sensitive popup menu with available operations.



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

- Type (basic or dynamic MBR/GPT),
- Manufacturer,
- Model.

Small-sized bars display the following information about logical disks and blocks of free space:

- Volume label (if exists),
- Drive letter,
- Total size,
- File system.

The Disk Map is synchronized with the [Context-sensitive Menu](#) and the [Properties Panel](#). Thus by selecting a disk on the map, the two will automatically display detailed information on it. To know more on the subject, please consult the [Viewing Disk Properties](#) chapter.



Since the Disk Map and the Disk and Partitions List have the same purpose, the user is allowed to extend only one at the moment by using a corresponding arrow button.

Disk and Partitions List

The Disk and Partitions List is another helpful tool that helps to get a clear-cut picture on the current state of the system hard disks and partitions. All objects (disks, partitions, or blocks of free space) on the list are sorted according to their starting position. For every item there is the possibility to call a context-sensitive popup menu with available operations.

Disk and partitions list									
Name	File system	Volume size	Partition size	Used	Free	Volume label	Hidden	Ac	
Basic MBR Hard Disk 0 (VMware, VMware Virtual S SCSI Disk Dev)		500 GB							
System Reserved	NTFS	350 MB	350 MB	256.8 MB	93.1 MB	System Reserved	No	Ye	
Local Disk (C:)	NTFS	499.6 GB	499.6 GB	11.7 GB	487.9 GB	[No label]	No	No	
Basic MBR Hard Disk 1 (VMware, VMware Virtual S SCSI Disk Dev)		500 GB							
(Unallocated)				Bytes	499.9 GB	[No label]	No	No	
Basic MBR Hard Disk 2 (VMware, VMware Virtual S SCSI Disk Dev)				Bytes	749.9 GB	[No label]	No	No	
(Unallocated)				Bytes	119.9 GB	[No label]	No	No	
Basic MBR Hard Disk 3 (VMware, VMware Virtual S SCSI Disk Dev)									
(Unallocated)									

The Disk and Partitions List provides detailed information on all hard disks and partitions found in the system including the following properties:

- Name,
- Volume label (if exists),
- Drive letter,
- File system type,
- Volume size,
- Amount of used and unused (free) space,
- Active/Inactive attribute,
- Hidden/Unhidden attribute.

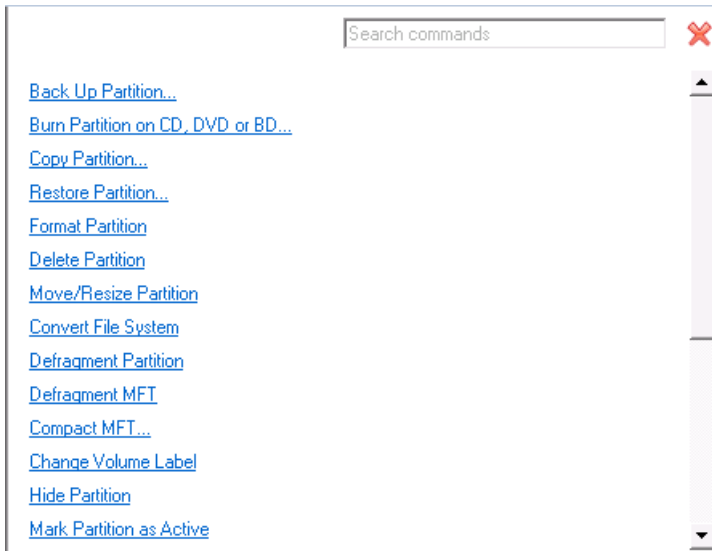
The Disk and Partitions List is synchronized with the [Context-sensitive Menu](#) and the [Properties Panel](#). Thus by selecting a disk on the list, the two will automatically display detailed information on it. To know more on the subject, please consult the [Viewing Disk Properties](#) chapter.



Since the Disk Map and the Disk and Partitions List have the same purpose, the user is allowed to extend only one at the moment by using a corresponding arrow button.

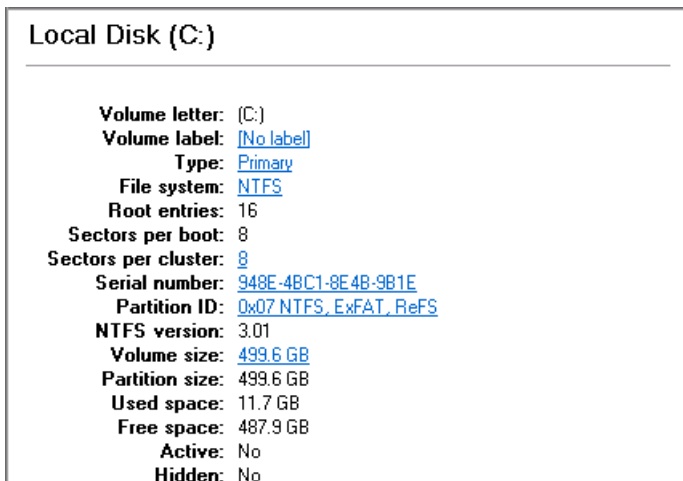
Context-sensitive Menu

The Context-sensitive Menu shows a list of operations available for an object (disk, partition, or block of free space) selected either on the [Disk Map](#) or the [Disk and Partitions List](#). If you click a corresponding record the appropriate wizard or dialog will be started. All default values for the operation parameters will correspond to the object's settings. If there too many items on the list, type in the first word of the required command in the **Search commands** field to filter the list.



Properties Panel

The Properties Panel provides information on the object (disk, partition, or block of free space) selected either on the [Disk Map](#) or the [Disk and Partitions List](#).



The Properties Panel helps to obtain the following data:

For a hard disk

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

For a partition

- Drive letter assigned to the disk,
- Volume label (if exists),
- Type of the logical disk,
- File system,
- Root entries,

- Serial number,
- NTFS version,
- Partition ID,
- Total size, used space and free space (in GB), etc.

Besides you can modify practically any partition property by clicking on the required value.

For a block of free space

- Total size (in GB).

Status Bar

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

Settings Overview

To call the Settings dialog, please click **Tool Button**, then select **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



General options

<p>Partition Alignment Mode</p> <p>Vista</p> <p>Align partitions according to the rules used in Windows Vista and later OSes.</p>
<p>Check FS integrity policy</p> <p>Once</p> <p>Standard protection from data loss with acceptable performance. The file system integrity will be checked for each volume only once just before accomplishing data-sensitive operations.</p>
<p>Data Loss Protection mode</p> <p>Reset</p> <p>Medium protection from data loss.</p>

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: 1 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



General copy and backup options

- HDD raw processing**
Copy an entire hard disk sector by sector without taking into account its partition structure.
- Partition raw processing**
Copy/Backup each partition sector by sector. All sectors will be processed one by one (even unused sectors). Requires more time to complete the operation.
- Skip archive files stored in archive library**
Choose this option to skip archive files stored in archive library. This will reduce operation time and backup image size.
- Automatic BCD update**
Add boot entry for target partition to BCD hive on copy/restore source partition

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

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



CD/DVD/BD recording options

Burn every CD/DVD/BD disk to the end.

Choose this option to allow the disk to be copied by third party tools.

Recording speed

Maximum recording speed

Fast recording. Choose this option if you have good quality disks and recorder.

Boot options

Specify a bootable ISO image to place on CD, DVD or BD along with backup data:

bootcd.iso

Browse

The specified ISO image **does not exist**.

Specify how would you like to boot from CD, DVD or BD:

Do not boot from CD, DVD or BD

ISO image folder

.\

Browse

Please select a folder to place ISO images to when CD, DVD or BD ISO maker is used.

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



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

[Change run during backup options](#)

In this section you may configure the hot processing mode:

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

Partitioning Options



Partitioning Options

Confirmations:

Ask for volume label before partition delete

Ask confirmation when converting FAT16 to FAT32.

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.

Virtual Mode Options



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



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.

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



Exclude from Copy/Backup

Specify masks for files and folders that must be excluded from copy/backup operations:

Files that contains your e-mail data (9 filters)

[Add filter](#) [Rename category](#) [Delete category](#)

- *.wab [Delete filter](#)
- *.pab [Delete filter](#)
- *.oab [Delete filter](#)
- *.pst [Delete filter](#)
- *.ost [Delete filter](#)
- *.dbx [Delete filter](#)
- *.log [Delete filter](#)
- *.rwz [Delete filter](#)
- *.contact [Delete filter](#)

Executable & Installations (8 filters)

[Add filter](#) [Rename category](#) [Delete category](#)

- *.dll [Delete filter](#)
- *.exe [Delete filter](#)
- *.ocx [Delete filter](#)
- *.vxd [Delete filter](#)

Add category...

[Change general backup 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](#).

Viewing Disk Properties

The [Disk Map](#) and the [Disk and Partitions List](#) are the main tools to get information on the properties of hard disks and partitions available in the system. To know more on the subject, please consult the corresponding chapters of the [Interface Overview](#) chapter.

Viewing Image Properties

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

Using the Restore Wizard

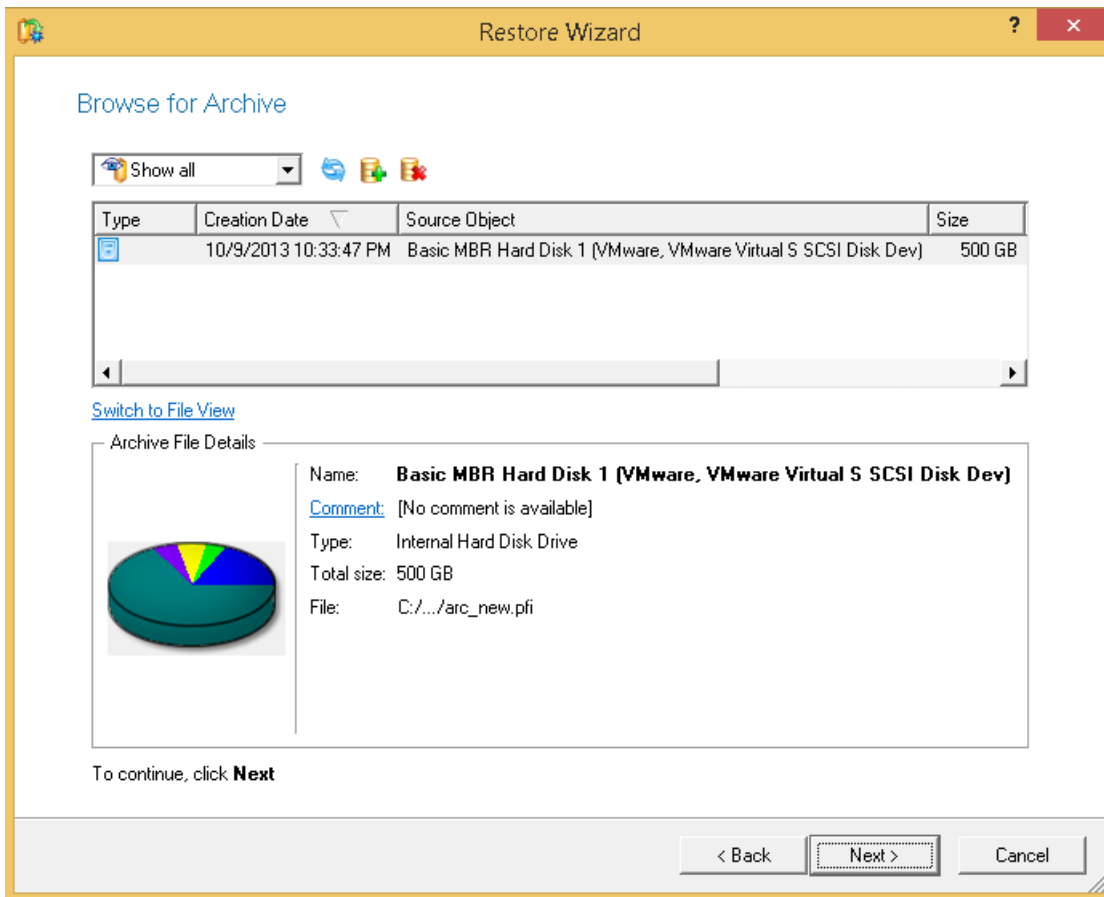
- Click the **Backup & Restore** tab on the Ribbon Panel, then select **Restore**.



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

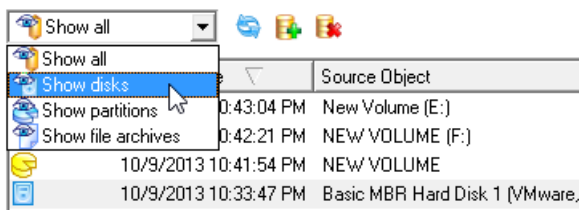
	Filtered archive
	Differential archive
	Incremental archive
	File increment to a partition archive

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

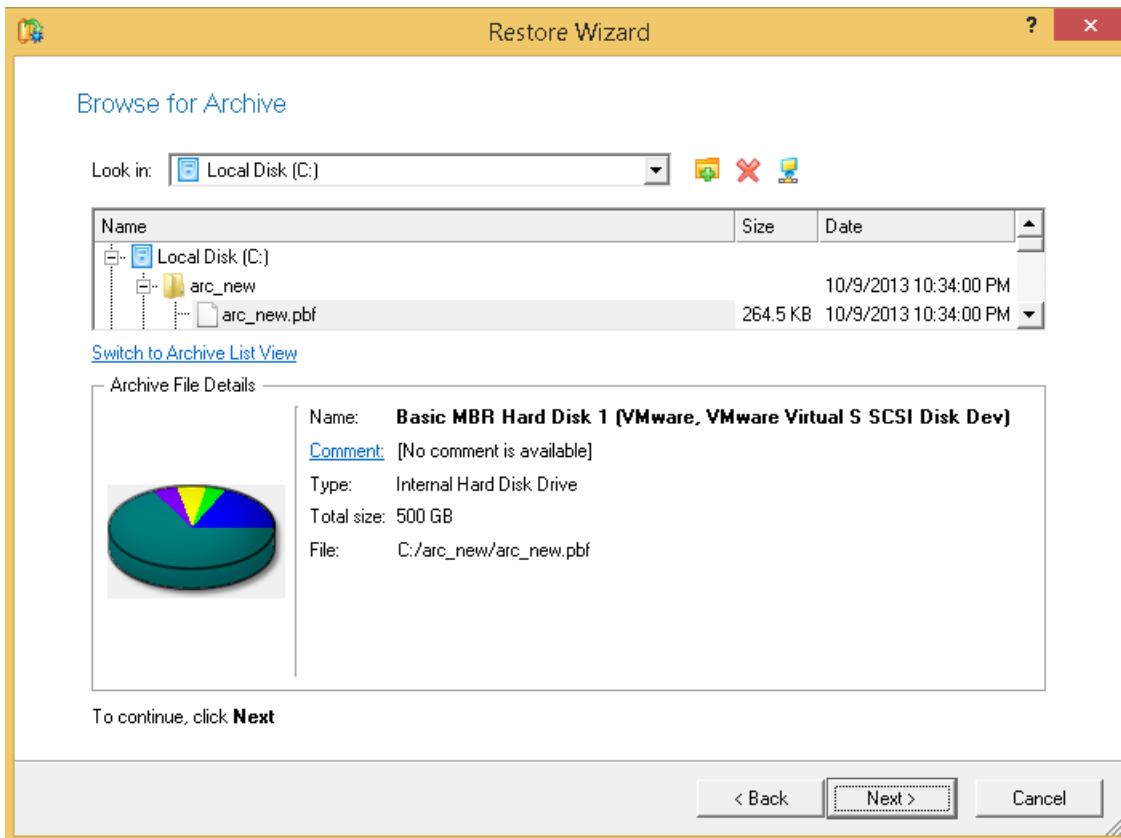
BUTTON	FUNCTIONALITY
	Refresh the contents of the database
	Show only existing archives
	Add the selected archive to the database
	Delete the selected archive from the database

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



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

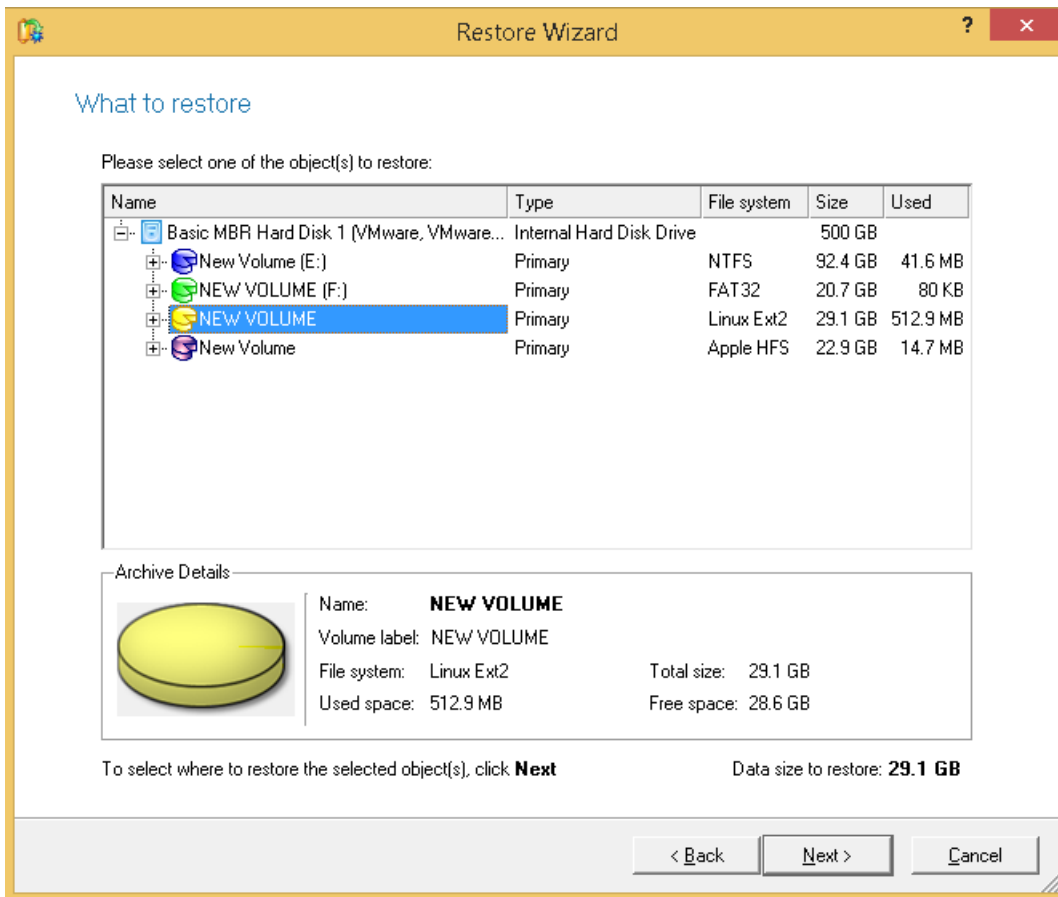


The section below (i.e. Archive File Details) displays a short description of the selected image, including:

- 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 **Archives** tab on the Ribbon Panel. The database window can be conditionally subdivided into several sections that differ in their purpose and functionality:

Type	Creation Date	Source Object	Size	Archive Size	Flags	Comment	Mounted
	10/17/2013 3:12:08 AM	New Volume	53 GB	1 MB	Increment/Differential, Compressed	Increment 1 Chain 2	
	10/17/2013 3:08:48 AM	Local Disk	44.1 GB	27.9 MB	Increment	Increment 2	
	10/17/2013 2:02:14 AM	Local Disk	44.1 GB	27.9 MB	Increment	Increment 1	
	10/16/2013 8:41:21 PM	Recovery	227 MB	4.7 GB	Increment	Backup_image_20131015_1639	
	10/16/2013 8:41:21 PM	New Volume	53 GB	4.7 GB	Increment	Backup_image_20131015_1639	
	10/16/2013 8:41:21 PM	Local Disk	44.1 GB	4.7 GB	Increment	Backup_image_20131015_1639	
	10/16/2013 8:41:21 PM	NO NAME	100 MB	4.7 GB	Increment	Backup_image_20131015_1639	
	10/16/2013 8:41:21 PM	Local Disk	128 MB	4.7 GB	Increment	Backup_image_20131015_1639	

1. **Properties Panel** that displays properties of the selected image.

2. **Files View**.

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.

Backup Wizard Startup

- In the Main Menu: select **Wizards > Back up a Disk or Partition...**



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

Backup Wizard Setup

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

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

Name	Type	Fi
My Computer	My Computer	
Basic MBR Hard Disk 0 (VMware, VMware Virtual S SCSI Disk Dev)	Internal Hard Disk Drive	
First Hard Disk Track	First Track	
Master Boot Record	MBR	
System Reserved	Primary	N
Local Disk (C:)	Primary	N
Basic MBR Hard Disk 1 (VMware, VMware Virtual S SCSI Disk Dev)	Internal Hard Disk Drive	
First Hard Disk Track	First Track	
Master Boot Record	MBR	




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

There are several ways the Wizard can store your data. Please select how would you like to save the archive:

- Save data to local/network drives.
- Save data to physical partitions.
- Save data to FTP locations.
- Burn the data to CD, DVD or BD.

- **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.

Select a folder where archive should be placed and specify archive name. Archive name will be used as a sub-folder where backup data files will be stored.

Archive location:   

Name	Size	Date
My Computer		
Local Disk (C:)		
New Volume (E:)		
NEW VOLUME (F:)		
RecoveryMedia (G:)		
Network		

Archive details

Archive name:

Estimated archive size: **2 MB**

Space available on backup destination: **92.4 GB**



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.

Please enter a short comment to describe the archive



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

- Whether the archive integrity will be controlled.



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

- Whether image file names will be set automatically in complex archives.
- Compression level for the backup image (including the No compression variant).
- Whether the archive will be split (if yes, you can set the maximum size for the archive files).



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

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

Result

After the backup operation is completed you receive an image of the selected 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 a dual boot Mac to an external USB drive](#)
- [Creating a differential to a full partition backup](#)

Restoring System and Data

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

Startup

- Click the **Backup & Restore** tab on the Ribbon Panel, then select **Restore**.



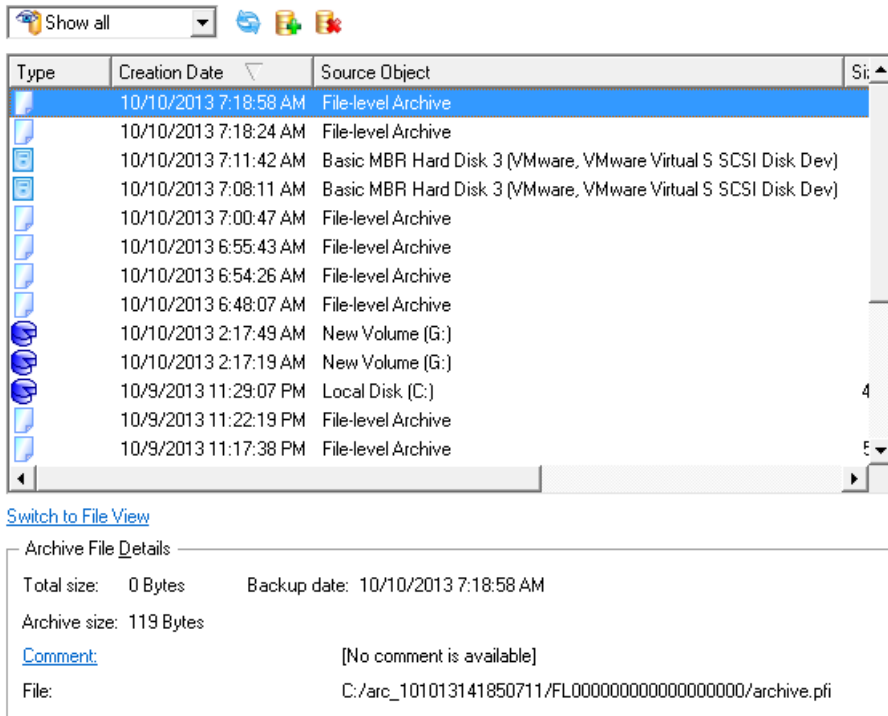
There are other ways to start up this function, please consult the [Interface Overview](#) chapter to know more on the subject.

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).



The screenshot shows a web interface for an archive database. At the top, there is a 'Show all' dropdown menu and three icons. Below is a table with columns for 'Type', 'Creation Date', 'Source Object', and 'Size'. The first row is selected and highlighted in blue. Below the table, there is a link 'Switch to File View' and a section titled 'Archive File Details' containing information about the selected file.

Type	Creation Date	Source Object	Size
File-level Archive	10/10/2013 7:18:58 AM	File-level Archive	
File-level Archive	10/10/2013 7:18:24 AM	File-level Archive	
Basic MBR Hard Disk 3 (VMware, VMware Virtual S SCSI Disk Dev)	10/10/2013 7:11:42 AM	Basic MBR Hard Disk 3 (VMware, VMware Virtual S SCSI Disk Dev)	
Basic MBR Hard Disk 3 (VMware, VMware Virtual S SCSI Disk Dev)	10/10/2013 7:08:11 AM	Basic MBR Hard Disk 3 (VMware, VMware Virtual S SCSI Disk Dev)	
File-level Archive	10/10/2013 7:00:47 AM	File-level Archive	
File-level Archive	10/10/2013 6:55:43 AM	File-level Archive	
File-level Archive	10/10/2013 6:54:26 AM	File-level Archive	
File-level Archive	10/10/2013 6:48:07 AM	File-level Archive	
New Volume (G:)	10/10/2013 2:17:49 AM	New Volume (G:)	
New Volume (G:)	10/10/2013 2:17:19 AM	New Volume (G:)	
Local Disk (C:)	10/9/2013 11:29:07 PM	Local Disk (C:)	4
File-level Archive	10/9/2013 11:22:19 PM	File-level Archive	
File-level Archive	10/9/2013 11:17:38 PM	File-level Archive	

[Switch to File View](#)

Archive File Details

Total size: 0 Bytes Backup date: 10/10/2013 7:18:58 AM

Archive size: 119 Bytes

[Comment:](#) [No comment is available]

File: C:/arc_101013141850711/FL00000000000000000000/archive.pfi

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



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


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

Look in: Local Disk (C:)

Name	Size	Date
arc_091013125156058		10/9/2013 11:17:27 PM
arc_091013131559760		10/9/2013 10:37:14 PM
arc_091013133756622		10/9/2013 6:38:02 AM
arc_091013140817551		10/10/2013 7:00:26 AM
arc_091013140825801		10/10/2013 7:00:44 AM
arc_101013053218496		10/9/2013 10:32:29 PM
arc_101013061434390		10/9/2013 11:14:51 PM
arc_101013062903344		10/9/2013 11:53:11 PM
arc_101013091536750		10/10/2013 2:15:43 AM
arc_101013091716250		10/10/2013 2:17:49 AM
arc_101013140759053		10/10/2013 7:08:19 AM
arc_101013141139475		10/10/2013 7:11:52 AM
arc_101013141139475.pbf	264.5 KB	10/10/2013 7:11:52 AM

[Switch to Archive List View](#)

Archive File Details



Name: **Basic MBR Hard Disk 3 (VMware, VMware Virtual S SCSI Disk)**
 Comment: [No comment is available]
 Type: Internal Hard Disk Drive
 Total size: 120 GB
 File: C:/arc_101013141139475/arc_101013141139475.pbf

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



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

File Backup Restore

- **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.

Click the check box next to any file or folder you want to restore from

Name	Type	Size
<input type="checkbox"/> FB Archive	File Level Archive	589.5 KB (603,660 Bytes)
<input checked="" type="checkbox"/> /		
<input checked="" type="checkbox"/> C:		
<input checked="" type="checkbox"/> arc_091013140825801		
<input checked="" type="checkbox"/> arc_091013140825801.pfi	File	576 KB
<input checked="" type="checkbox"/> arc_091013140825801.pfm	File	1.5 KB

To continue, click **Next**

Data size to restore: **589.5 KB**

- **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.

Restore files to:

The files and folders will be restored to the place where they were archived from.

When restoring files that already exist on your computer:

Leave existing files.
If a file exists in the original location, it won't be overwritten. Only missing/deleted files will be restored from backup.

Replace existing files
ALL selected files will be replaced with files from backup.

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).

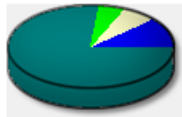
Sector Backup Restore

- **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.

Please select one of the object(s) to restore:

Name	Type	File system	Size	Used
Basic MBR Hard Disk 3 (VMware, VMware...)	Internal Hard Disk Drive		120 GB	
New Volume (G:)	Primary	NTFS	14.2 GB	163.8 MB
NEW VOLUME (E:)	Primary	Linux Ext4	8.3 GB	281.9 MB
NEW VOLUME (H:)	Primary	FAT16	8 MB	0 Bytes
NEW VOLUME (I:)	Primary	FAT32	5.8 GB	4 KB

Archive Details



Name: **Basic MBR Hard Disk 3 (VMware, VMware Virtual S SCSI Dis**
 Type: Internal Hard Disk Drive
 Total size: 120 GB

To select where to restore the selected object(s), click **Next**

Data size to restore: **120 GB**



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.

Basic MBR Hard Disk 0 (VMware, VMware Virtual S SCSI Disk Dev)

Local Disk (C:)
280.3 GB NTFS

Backup Capsule
219.3 GB

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

(Unallocated)
380 GB

91.4 ...

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: 167 MB - 767990 MB

Please specify size of free space before the partition: 0 MB - 753383 MB

Please specify size of free space after the partition: 0 MB - 753383 MB

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

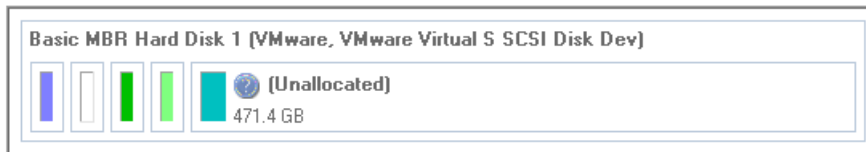
Partition Restore Options _____
 Assign the following drive letter: ▼

Restoring Hard Disk:



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

Your hard disk after the changes:



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.

- **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.

Result

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

Available operation scenarios:

- [Restoring a hard disk from the bootable Backup Capsule](#)
- [Restoring a system partition from external media \(CD/DVD\)](#)
- [Restoring a system partition from a network drive](#)
- [Restoring a dual boot Mac from an external USB drive](#)
- [Restoring separate files and folders from a backup](#)

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. Call a context menu for the selected object by the right mouse click, then select **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.

Are you sure you want to create a new partition on disk 3?

You are about to create a new partition in **(Unallocated), 119.9 GB** area. Please select size, position and file system of the new partition.

Basic MBR Hard Disk 3 (VMware, VMware Virtual S SCSI Disk Dev)

New Volume (H:)
114.7 GB NTFS

Create new partition as:

Please specify new partition size: 8 MB - 122,879 MB

Please specify size of free space before the partition: 0 MB - 122,870 MB

Please specify size of free space after the partition: 0 MB - 122,870 MB

Please select file system for new partition:

Please enter new volume label:

Please specify drive letter:

- **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 format routine

Please select number of sectors per cluster:

Restore defaults

- **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

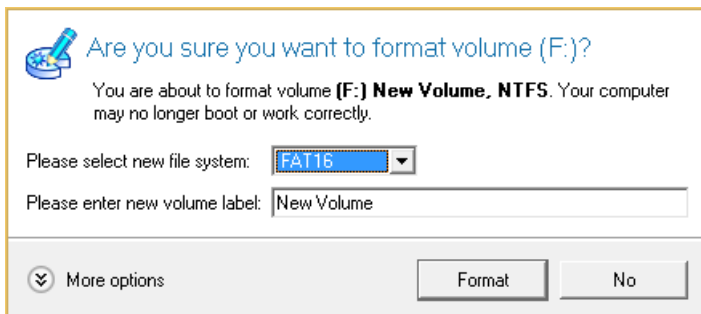
1. Select a partition on the Disk Map;
2. Call a context menu for the selected object by the right mouse click, then select **Format Partition**.



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 format routine

Please select number of sectors per cluster:

- **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:

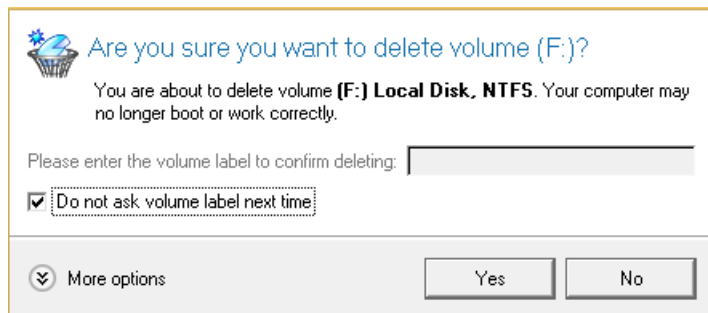
1. Select a partition on the Disk Map;
2. Call a context menu for the selected object by the right mouse click, then select Create **Delete Partition**.



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.

Changing Partition Attributes

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

Mark Partition Active/Inactive

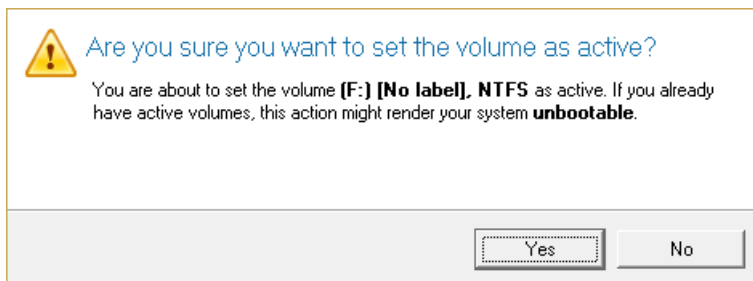
The program enables to set an active/inactive flag for primary partitions of a hard disk. By default, an operating system will boot only if its partition is active or bootable.

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

1. Select a primary partition on the Disk Map.
2. Call a context menu for the selected object by the right mouse click, then select **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. Call a context menu for the selected object by the right mouse click, then select **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.

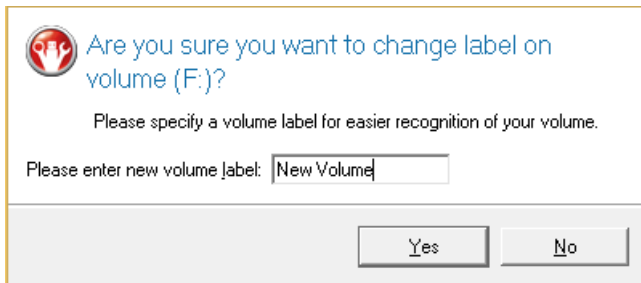
In order to change a partition label you should take the following steps:

1. Select a partition on the Disk Map.
2. Call a context menu for the selected object by the right mouse click, then select **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.

Hard Disk Management

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

Updating MBR

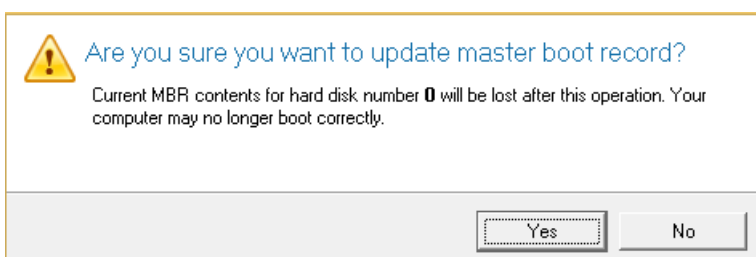
The program enables to overwrite the current bootable code in the MBR (Master Boot Record) by the standard bootstrap code. This can help to repair a corrupted bootable code of a hard disk resulted from a boot virus attack or a malfunction of boot management software.

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

1. Select a hard disk on the Disk Map.
2. Call a context menu for the selected object by the right mouse click, then select **Update MBR**.



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.

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).**

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

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

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

[Specify user name and password.](#)

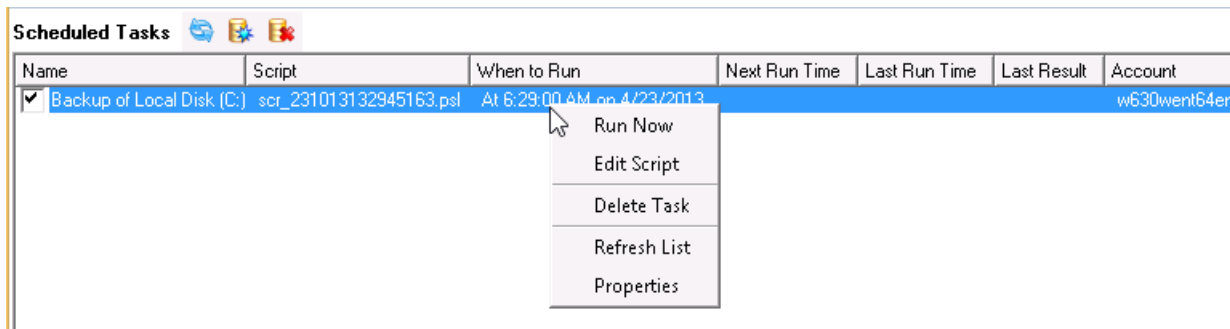


To run the task in the log-off mode, please specify administering login info by following the appropriate link in the left lower corner of the page.

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 Schedule tab on the Ribbon Panel:



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.

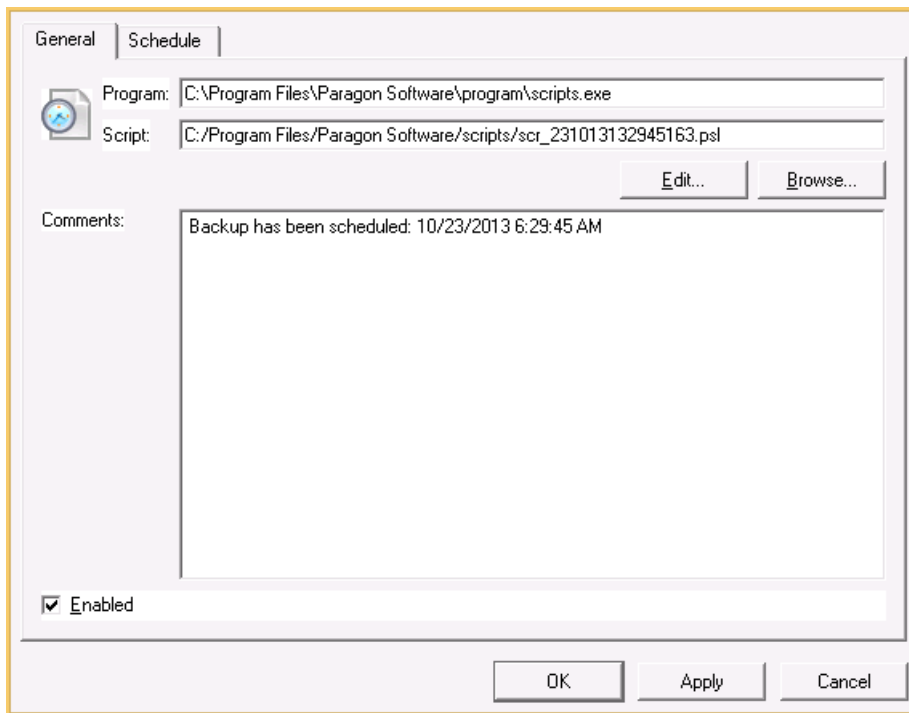
Task Editor

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 by clicking its icon on the [Virtual Operations Bar](#);

Schedule virtual operations?

All virtual operations you have made will be saved to the scheduler. No operations will be

Task name:

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

Do not reboot if it is required

Shutdown system after carrying out the tasks

Start the task on: at

Every day(s)

Do not run the task after:

[Specify user name and password.](#)

Discard all operations on close

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



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

Extra Functionality

This chapter describes the supplementary functionality available in the program.

View Partition/Hard Disk Properties

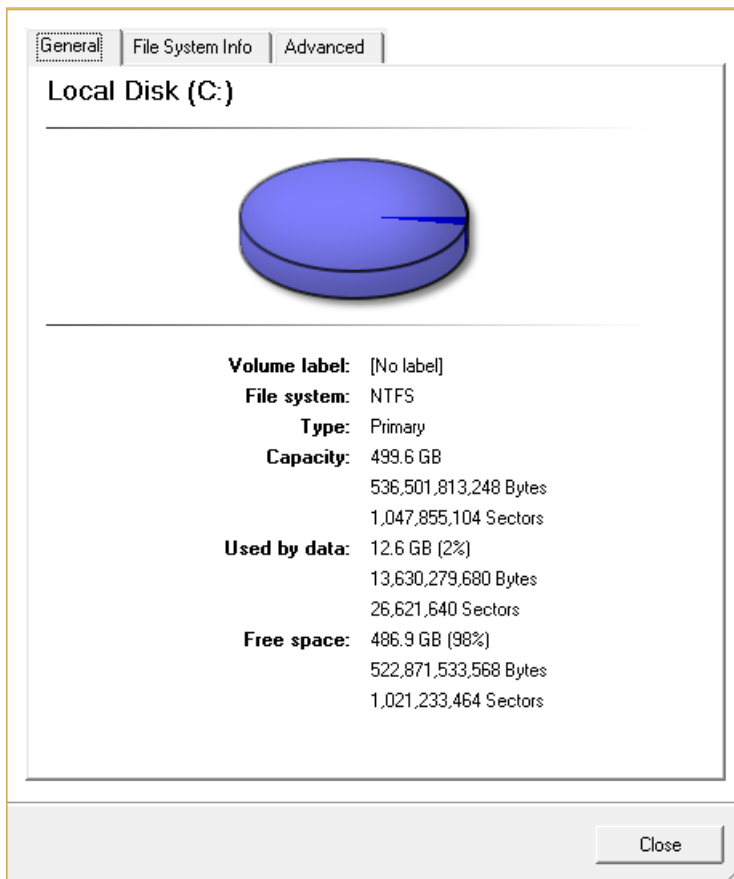
The program enables to obtain in-depth information on the properties of hard disks and partitions. Besides the general information, such as capacity, used space or file system type it provides the possibility to get info on hard disk geometry, cluster size, exact partition location, etc.

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

1. Choose a partition/hard disk on the Disk Map.
2. Call a context menu for the selected object by the right mouse click, then select **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.

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

- Click **Tool Button**, then select **File Transfer Wizard**.

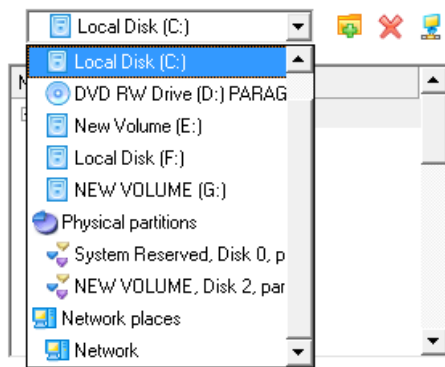


There are other ways to start up this function, please consult the [Interface Overview](#) chapter to know more on the subject.

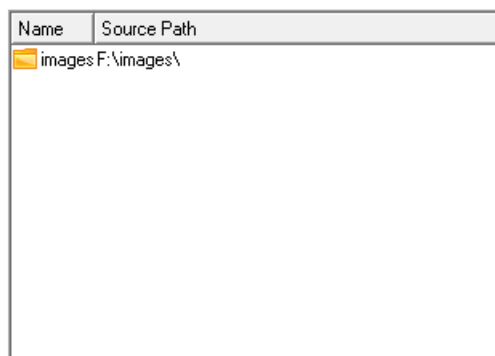
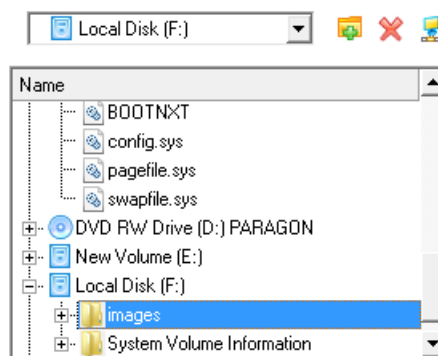
Setup

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.

Source

- **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.

ClipboardTotal data size: **1 GB****Source**

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.

There are several ways the Wizard can store your data. Please select how would you like to save the data:

- Save data to local/network drives.
- Save data to physical partitions.
- Burn the data to CD, DVD or BD.

- **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.

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

Objects to transfer	
Object(s) selected:	1
Total data size:	1 GB (1,078,198,272 Bytes)
Transfer destination	
Destination path:	C:\
Space available on destination:	485.9 GB (521,742,041,088 Bytes)
Overwrite existing files:	No

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

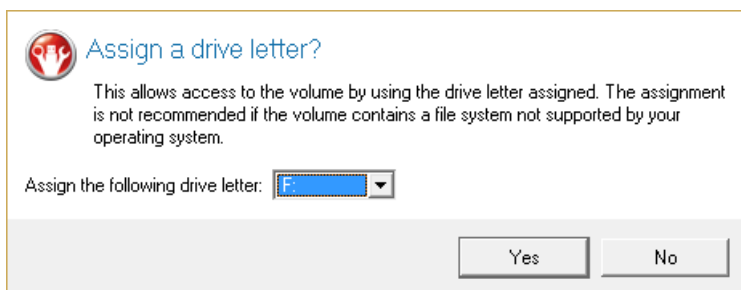
In order to mount a partition you should take the following steps:

1. Select a partition on the Disk Map.
2. Call a context menu for the selected object by the right mouse click, then select **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. Call a context menu for the selected object by the right mouse click, then select **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

Before you start mounting backup images, please study the following limitations:

- Archives can be mounted at the partition-level only, thus please use the 'Show partitions' option to view all partitions inside backup images;
- Archives will only be mounted for the current session and won't be available after the system restart;
- Archives containing Windows Storage Spaces are not supported;
- Archives containing ReFS partitions are not supported;
- pVHD archives located on physical (unmounted) partitions or in the backup capsule cannot be mounted;
- pVHD encrypted archives are not supported;
- pVHD LVM/LDM archives are not supported.

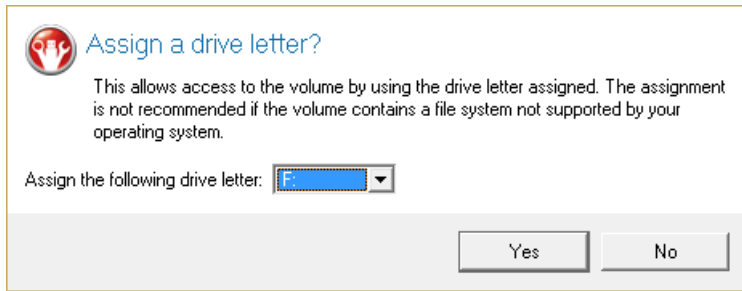
In order to mount an archive you should take the following steps:

1. Select a backup image in the Archive Database.
2. Call a context menu for the selected object by the right mouse click, then select **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.

4. The operation will be performed immediately after confirmation.



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:

1. Select a backup image in the Archive Database.
2. Call a context menu for the selected object by the right mouse click, then select **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.

3. The operation will be performed immediately after confirmation.

Test Surface

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

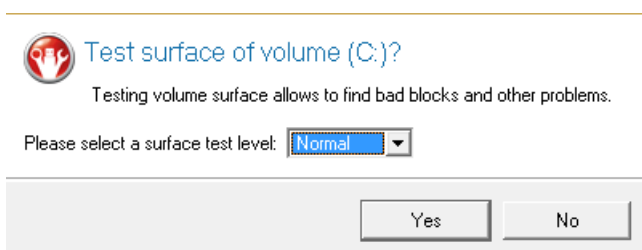
In order to start the surface test you should take the following steps:

1. Select a partition or a block of free space on the Disk Map.
2. Call a context menu for the selected object by the right mouse click, then select **Test Surface...**



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

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



4. The operation will be performed immediately after confirmation.

Check File System Integrity

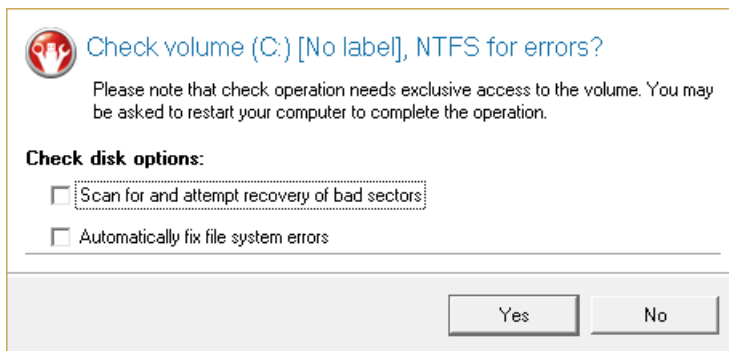
The program allows you to check integrity of a file system. It can be used to detect possible file system errors before performing any operation on a partition.

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

1. Select a partition on the Disk Map.
2. Call a context menu for the selected object by the right mouse click, then select **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

- Click the **Backup & Restore** tab on the Ribbon Panel, then select **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).

Type	Creation Date	Source Object	Size	Archive Size	Flags	Comm	Mounted
	10/14/2013 2:20:44 AM	Basic MBR Hard Disk 1 (VMware, VMware Virtual S SCSI Disk Dev)	500 GB	18.7 MB		No...	1*
	10/14/2013 2:20:15 AM	New Volume (F:)	499.9 GB	18.5 MB		No...	1*
	10/14/2013 2:18:38 AM	File-level Archive	4.2 MB	23 KB		No...	1*
	10/14/2013 2:18:19 AM	File-level Archive	4.2 MB	23 KB		No...	1*
	10/9/2013 10:26:43 PM	Local Disk (C:)	499.6 GB	3.8 GB		No...	1*
	10/9/2013 10:26:07 PM	Basic MBR Hard Disk 1 (VMware, VMware Virtual S SCSI Disk Dev)	500 GB	14.4 MB		No...	1*

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



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

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

Look in:

Name	Size	Date
arc_new		10/16/2013 10:14:35 PM
arc_new.pbf	264.5 KB	10/16/2013 10:14:36 PM
arc_new.pfi	2.2 MB	10/16/2013 10:14:36 PM
arc_new_0100p.000	6 MB	10/16/2013 10:14:24 PM
arc_new_0100p.pfm	1.6 KB	10/16/2013 10:14:24 PM
arc_new_0101p.000	1.2 MB	10/16/2013 10:14:26 PM
arc_new_0101p.pfm	1.2 KB	10/16/2013 10:14:26 PM
arc_new_0102p.000	28.6 MB	10/16/2013 10:14:32 PM
arc_new_0102p.pfm	4.1 KB	10/16/2013 10:14:31 PM

[Switch to Archive List View](#)

Archive File Details

Name: **Basic MBR Hard Disk 1 (VMware, VMware Virtual S SCSI Disk Dev)**
 Comment: My hdd 1
 Type: Internal Hard Disk Drive
 Total size: 500 GB
 File: E:/arc_new/arc_new.pbf

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



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

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

- Click **Tool Button**, then select **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.

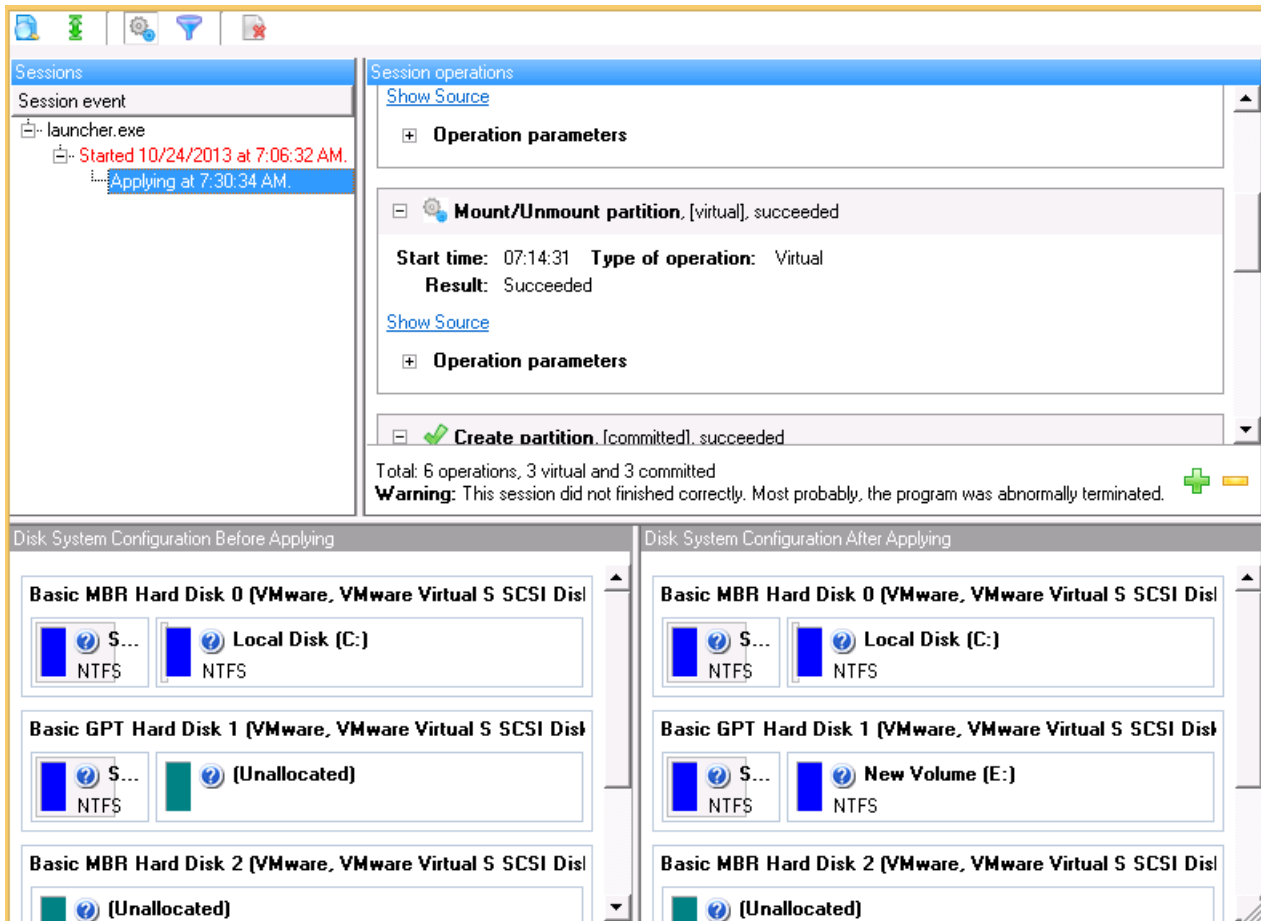
Result

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

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, click **Tool Button**, then select **View Log Files**.



Typical Scenarios

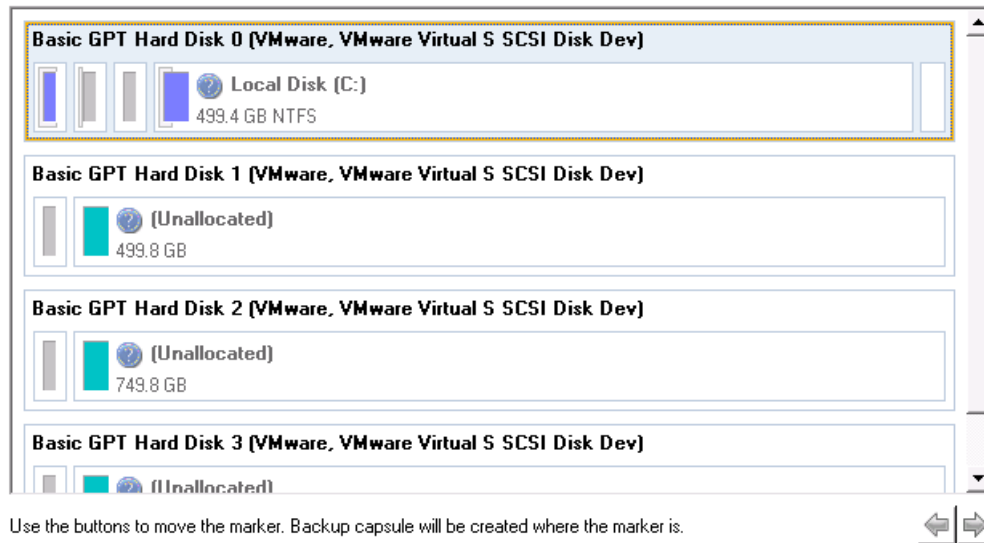
This chapter lists a number of the most frequently used scenarios that may be accomplished with the program. You can find here useful recommendations and descriptions of operations.

Backup Scenarios

Creating the Backup Capsule

1. Click the **Backup & Restore** tab on the Ribbon Panel, then select **Manage Capsule**.
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.

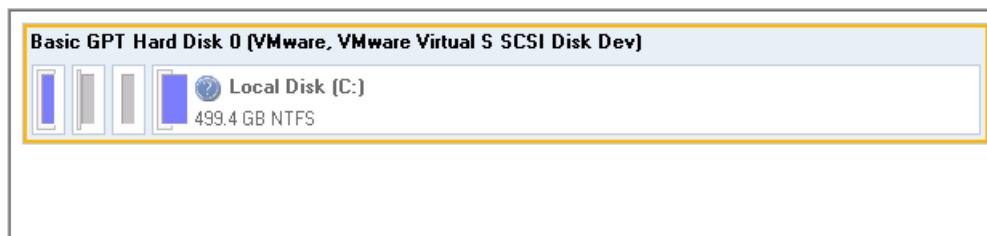
On this page you can select a hard disk where a backup capsule will be created as well as the relative position of the capsule on the hard disk.



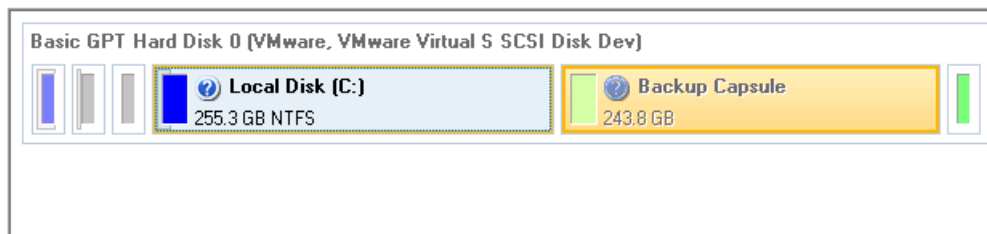
By default, the program allows the user to create the backup capsule only as the last primary or as the last logical drive within the extended partition. However, by activating the advance mode on the first page of the wizard you can remove this restriction that in its turn might result in some boot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

- Preview the resulted hard disk layout and change size of the backup capsule if necessary by moving the corresponding slider or manually entering the required value. It will be created at the expense of free space of the selected disk.

Your hard disk before creation of backup capsule:



Your hard disk after creation of backup capsule:



Backup capsule - current size is 244.1 GB

Min capsule size: 340 MB  250013 MB  Max capsule size: 488.3 GB

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

If the wizard cannot find enough free space in one block, it will redistribute free space, joining all free space blocks together into one united block and moving partitions 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. 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 **Backup & Restore** tab on the Ribbon Panel, then select **Back up a Disk or Partition**.



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

Click the check box next to any hard disk drive or partition you want to back up

Name	Type	File system	Size	U:
My Computer	My Computer			
<input checked="" type="checkbox"/> Basic MBR Hard Disk 0 (VMware, VMware Virtual S SCSI Disk Dev)	Internal Hard Disk Drive		500 GB	
<input type="checkbox"/> First Hard Disk Track	First Track		0 Bytes	
<input type="checkbox"/> Master Boot Record	MBR		0 Bytes	
<input checked="" type="checkbox"/> Local Disk	Primary	NTFS	350 MB	2E
<input checked="" type="checkbox"/> Local Disk (C:)	Primary	NTFS	280.3 GB	E
Basic MBR Hard Disk 1 (VMware, VMware Virtual S SCSI Disk Dev)	Internal Hard Disk Drive		500 GB	
<input type="checkbox"/> First Hard Disk Track	First Track		0 Bytes	
<input type="checkbox"/> Master Boot Record	MBR		0 Bytes	
<input type="checkbox"/> Local Disk (F:)	Primary	NTFS	499.6 GB	F
<input type="checkbox"/> NEW VOLUME	Primary	Linux Ext4	350 MB	E
Basic MBR Hard Disk 2 (VMware, VMware Virtual S SCSI Disk Dev)	Internal Hard Disk Drive		750 GB	
<input type="checkbox"/> First Hard Disk Track	First Track		0 Bytes	
<input type="checkbox"/> Master Boot Record	MBR		0 Bytes	



The size of objects to back up: **280.3 GB**
Estimated archive size **48.3 GB**



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.

There are several ways the Wizard can store your data. Please select how would you 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, DVD or BD.

- 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:	<input type="text" value="arc_091013135006539"/>
Estimated archive size:	5.5 GB
Space available on backup destination:	10.7 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, delete outdated backups from the Backup Capsule or resize it with the **Manage Backup Capsule Wizard**.

- Add comments to your backup describing its contents.

Please enter a short comment to describe the archive

	<input type="text" value="No comment"/>
---	---

- 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:

- Click the **Backup & Restore** tab on the Ribbon Panel, then select **Back up a Disk or Partition**.



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

Click the check box next to any hard disk drive or partition you want to back up

Name	Type	File system	Size	U:
My Computer	My Computer			
<input checked="" type="checkbox"/> Basic MBR Hard Disk 0 (VMware, VMware Virtual S SCSI Disk Dev)	Internal Hard Disk Drive		500 GB	
<input type="checkbox"/> First Hard Disk Track	First Track		0 Bytes	
<input type="checkbox"/> Master Boot Record	MBR		0 Bytes	
<input checked="" type="checkbox"/> Local Disk	Primary	NTFS	350 MB	2E
<input checked="" type="checkbox"/> Local Disk (C:)	Primary	NTFS	280.3 GB	E
Basic MBR Hard Disk 1 (VMware, VMware Virtual S SCSI Disk Dev)	Internal Hard Disk Drive		500 GB	
<input type="checkbox"/> First Hard Disk Track	First Track		0 Bytes	
<input type="checkbox"/> Master Boot Record	MBR		0 Bytes	
<input type="checkbox"/> Local Disk (F:)	Primary	NTFS	499.6 GB	F
<input type="checkbox"/> NEW VOLUME	Primary	Linux Ext4	350 MB	E
Basic MBR Hard Disk 2 (VMware, VMware Virtual S SCSI Disk Dev)	Internal Hard Disk Drive		750 GB	
<input type="checkbox"/> First Hard Disk Track	First Track		0 Bytes	
<input type="checkbox"/> Master Boot Record	MBR		0 Bytes	

The size of objects to back up: **280.3 GB**
Estimated archive size **48.3 GB**



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.

There are several ways the Wizard can store your data. Please select how would you 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, DVD or BD.

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

Select a recorder to burn archive images to.

Name	Disc types
 NEC\VMWare\VMware IDE CDR10	CD-R/RW; DVD-R/RW; DVD-RAM
 ISV CD Burner Emulator	CD-R/RW
 ISV DVD Burner Emulator	DVD+R/RW

Archive details

Archive name: (No more than 8 symbols and only in English.)

Estimated archive size: **3.1 GB**



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.

6. Add comments to your backup describing its contents.

Please enter a short comment to describe the archive



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



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:

For PBF images

1. Click the **Backup & Restore** tab on the Ribbon Panel, then select **Back up a Disk or Partition**.



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.

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

Click the check box next to any hard disk drive or partition you want to back up

Name	Type	File system	Size	U:
My Computer	My Computer			
<input checked="" type="checkbox"/> Basic MBR Hard Disk 0 (VMware, VMware Virtual S SCSI Disk Dev)	Internal Hard Disk Drive		500 GB	
<input type="checkbox"/> First Hard Disk Track	First Track		0 Bytes	
<input type="checkbox"/> Master Boot Record	MBR		0 Bytes	
<input checked="" type="checkbox"/> Local Disk	Primary	NTFS	350 MB	Z:
<input checked="" type="checkbox"/> Local Disk (C:)	Primary	NTFS	280.3 GB	C:
Basic MBR Hard Disk 1 (VMware, VMware Virtual S SCSI Disk Dev)	Internal Hard Disk Drive		500 GB	
<input type="checkbox"/> First Hard Disk Track	First Track		0 Bytes	
<input type="checkbox"/> Master Boot Record	MBR		0 Bytes	
<input type="checkbox"/> Local Disk (F:)	Primary	NTFS	499.6 GB	F:
<input type="checkbox"/> NEW VOLUME	Primary	Linux Ext4	350 MB	E:
Basic MBR Hard Disk 2 (VMware, VMware Virtual S SCSI Disk Dev)	Internal Hard Disk Drive		750 GB	
<input type="checkbox"/> First Hard Disk Track	First Track		0 Bytes	
<input type="checkbox"/> Master Boot Record	MBR		0 Bytes	

The size of objects to back up: 280.3 GB
Estimated archive size **48.3 GB**



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.

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, DVD or BD.

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

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

Select a folder where archive should be placed and specify archive name. Archive name will be used as a sub-folder where backup data files will be stored.

Archive location: C:\arc_101013072100201\

The image shows a 'Map Network Drive' dialog box overlaid on a file explorer window. The dialog box has a title bar with a question mark and a close button. It contains a 'Remote location mapping' section with a text box for 'A network share:' followed by a browse button (...). Below this is a 'Map to drive letter:' dropdown menu currently set to 'Z:'. At the bottom of the dialog is a checkbox labeled 'Make permanent connection' which is unchecked. There are 'OK' and 'Cancel' buttons at the bottom right of the dialog. The background file explorer shows a tree view with 'My Computer', 'Local Disk', and 'Network' visible.

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

6. Edit the archive name if necessary.

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

Archive details	
Archive name:	<input type="text" value="arc_091013135006539"/>
Estimated archive size:	5.5 GB
Space available on backup destination:	10.7 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.

7. Add comments to your backup describing its contents.

Please enter a short comment to describe the archive

 <input type="text" value="No comment"/>

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.

For pVHD images

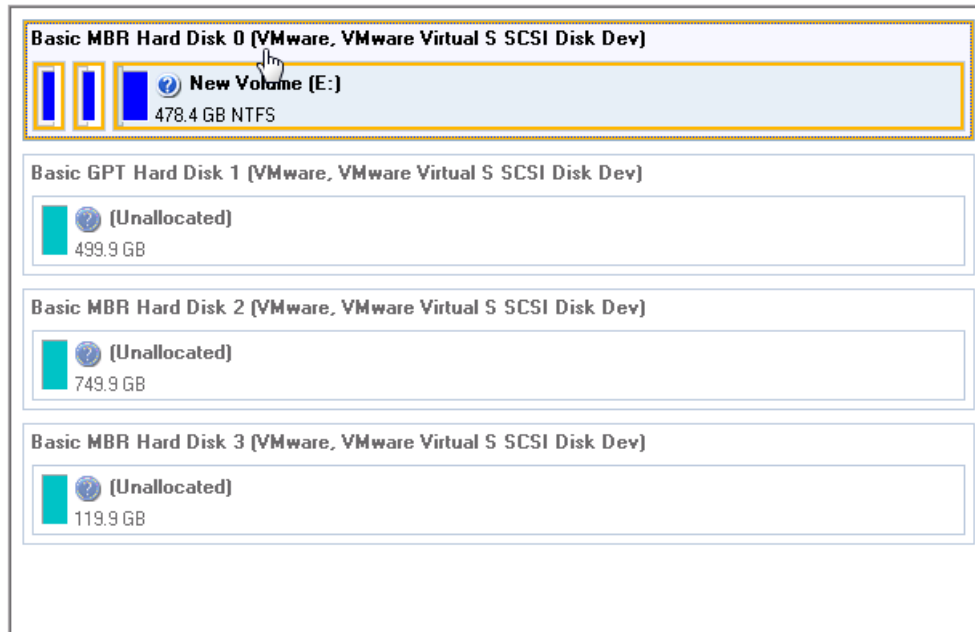
1. Click the **New Backup Format** tab on the Ribbon Panel, then select **Backup to VD**.



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 partitions or entire hard disks you'd like to back up by using **Shift** or **Ctrl** to select several objects at once. Click **Next** to proceed.

Press **Shift** or **Ctrl** to select several objects at once.



Change backup settings

Note: This option is recommended for advanced users only.



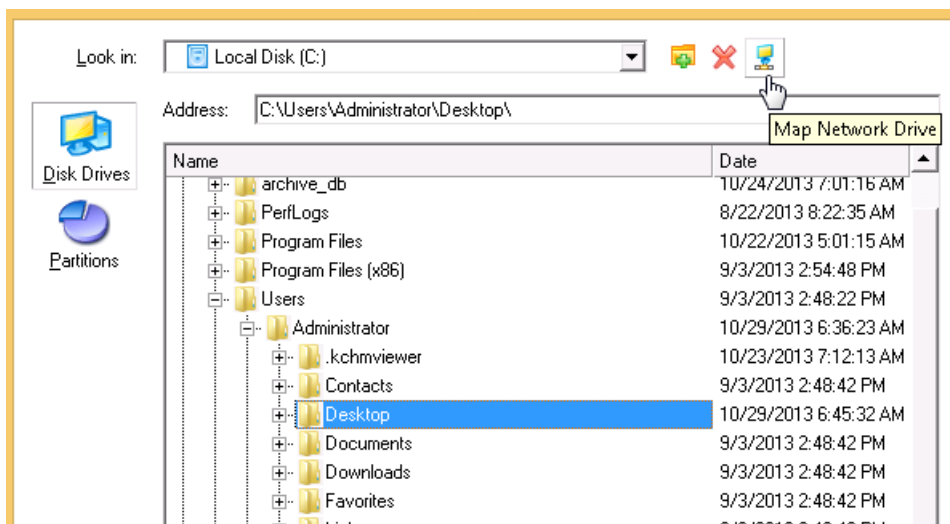
You've got the option to modify the default backup settings by marking the appropriate checkbox on this page.

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

- Specify location of the resulted pVHD in the 'Backup destination' section. If you'd like to save it locally, either enter a full path to the target folder in the corresponding field or use the **Browse** button to find it.

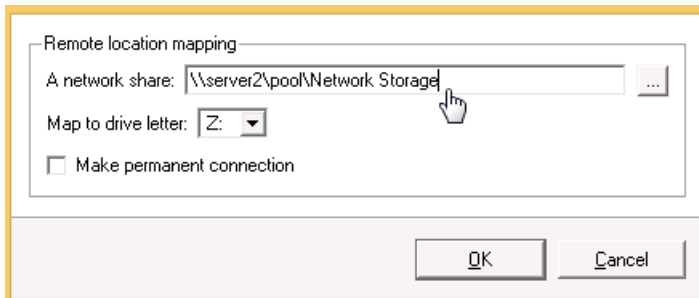


If you're going to save the backup image on a network share, or a physical partition (a partition that doesn't have a drive letter in the system), click on the **Browse** button. In the opened dialog you can see several options:

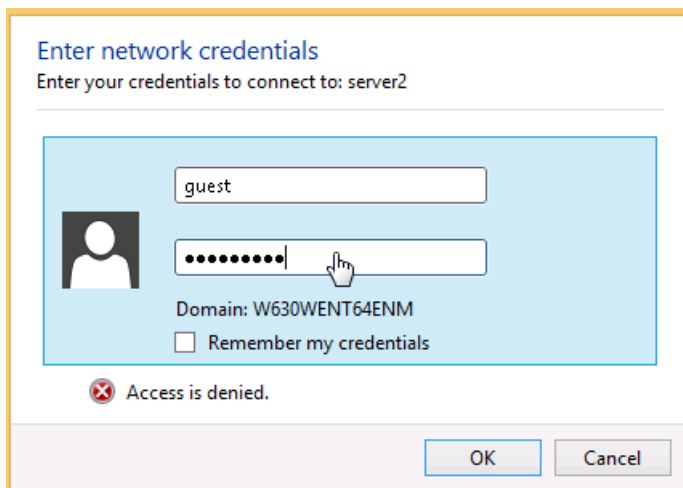


- Select **Disk Drives** to use a local disk as backup destination;
- Select **Partitions** to use a physical partition as backup destination;
- Click on the **Map Network Drive** icon to map a network share to use it as backup destination (our case).

5. To map a network share, please do the following:

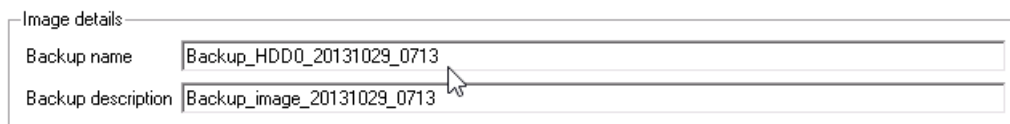


- Click the standard browse button [...] to browse for the required network share or manually enter a path to it;
- Define a letter from the pull-down list of available drive letters;
- Mark the checkbox to make this connection permanent. Otherwise it will only be available for the current Windows session;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



- Click **OK** when ready.

6. Edit the default archive name and description in the 'Archive details' section if necessary. Click **Next** to proceed.



7. Click **Finish** to complete the wizard, then apply the pending changes.



This operation can also be accomplished with our recovery media.

Backing up a dual boot Mac to an external USB drive

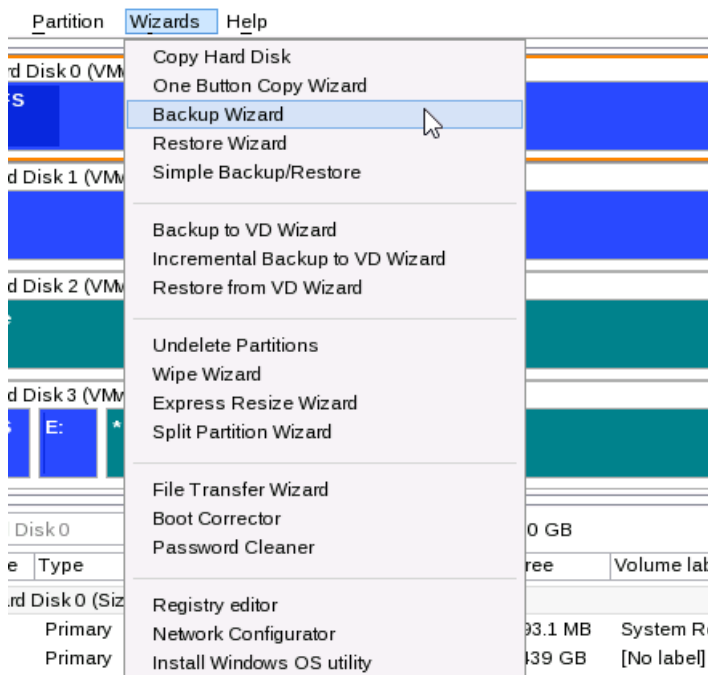
To back up a dual boot Mac (Mac OS X and Windows XP/Vista/7/8) and then place the resulted image to an external USB drive, please do the following:

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

Please use Recovery Media Builder to prepare Paragon's recovery environments on CD/DVD, flash, or in an ISO-image. You can get it 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. Connect an external USB drive to the computer.
3. 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.
4. In the Linux launch menu select **Backup & Recovery**.
5. Launch the Backup Wizard by selecting in the Main Menu of the program: **Wizards > Backup Wizard**.



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

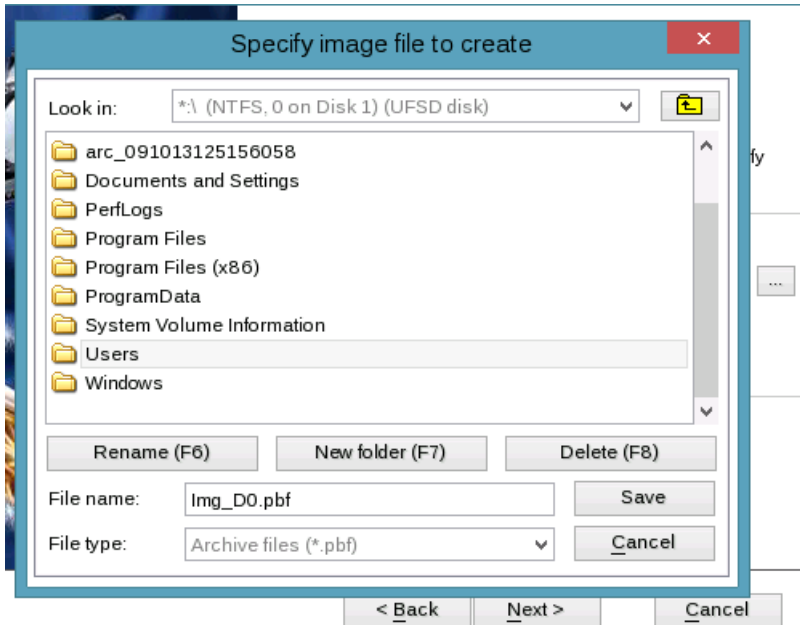
N	Volume	Type	File System	Size	Used	Free	Volume label	Active	Hidden
Basic Hard Disk 0 (Size 500 GB)									
0	*:	Primary	NTFS	350 MB	257 MB	93.1 MB	System Resen	Yes	Yes
1	*:	Primary	NTFS	500 GB	60.5 GB	439 GB	[No label]	No	No

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/BD**
Choose this option if you want the Wizard to burn the archive to CD/DVD/BD. You will be prompted to choose a 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: **490 GB**

Approximate archive size: **52.8 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.

Creating a differential to a full partition backup

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

1. Click the **Backup & Restore** tab on the Ribbon Panel, then select **Differential Backup**.
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).

Type	Creation Date	Source Object	Size	Archive Size
	10/9/2013 11:29:07 PM	Local Disk (C:)	477.7 GB	26.7 GB
	10/9/2013 11:22:19 PM	File-level Archive	24 KB	389 Bytes
	10/9/2013 11:17:38 PM	File-level Archive	589.5 KB	4.9 KB
	10/9/2013 11:15:18 PM	File-level Archive	293.5 MB	165.5 MB
	10/9/2013 11:09:02 PM	File-level Archive	24 KB	389 Bytes

[Switch to File View](#)

Archive File Details

Name: **Local Disk (C:)**

[Comment:](#) [No comment is available]

Volume label: [No label]

File system: NTFS Total size: 477.7 GB

Used space: 32 GB Free space: 445.6 GB

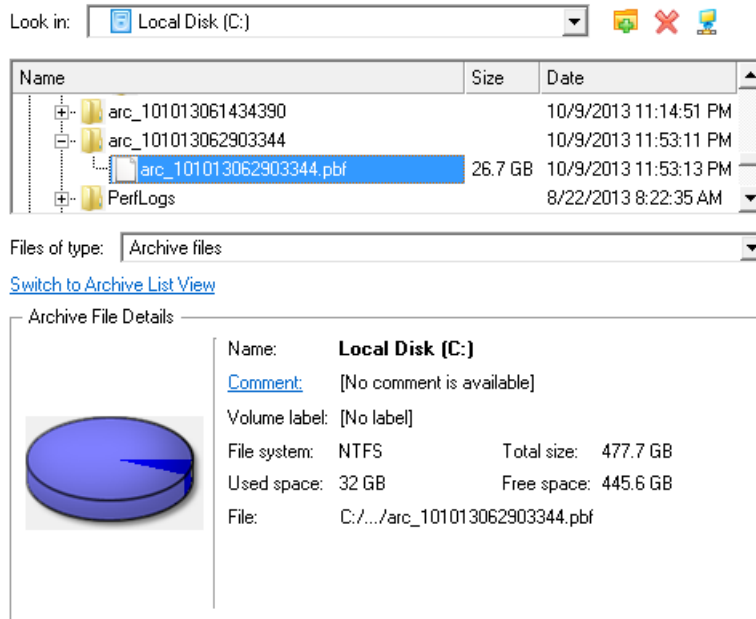
File: C:/.../arc_101013062903344.pbf

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



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

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



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. 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.

Archive Content

Name	Type	File system	Size	Used
<input checked="" type="checkbox"/> Local Disk (C:)	Primary	NTFS	477.7 GB	32 GB

Archive Details	
	<p>Name: Local Disk (C:)</p> <p>Volume label: [No label]</p> <p>File system: NTFS Total size: 477.7 GB</p> <p>Used space: 32 GB Free space: 445.6 GB</p>

Change backup settings

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

There are several ways the Wizard can store your data. Please select how would you 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, DVD or BD.

6. 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: **5.5 GB**

Space available on backup destination: **10.7 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 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 pVHD

You're allowed to do several incremental chains based on one base pVHD. To update a pVHD backup image, please do the following:

1. Click the **New Backup Format** tab on the Ribbon Panel, then select **Incremental Backup to VD**.
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.

Specify a base image to do an increment for

Show all    

Type	Creation Date	Source Object	Size	Archive Size
	10/29/2013 8:02:57 AM	VD Container	500 GB	11.5 GB

[Switch to File View](#)

Archive File Details

Name: Backup_HDD0_20131029_0713
 Comment: Backup_image_20131029_0713
 File: Z:/Backup_HDD0_20131029_0713/Backup_HDD0_20131029_0713.pfi
 Type: Full VD Container
 Parent: No
 Creation date: 10/29/2013 8:02:57 AM

[View archive detailed structure](#)

To continue, click **Next**




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.

Specify a base image to do an increment for

Look in:   

Name	Size	Date
[-] New Volume (E:)		
[-] Network Storage (\\server2\pool) [Z:]		
[-] Backup_HDD0_20131029_0713		10/29/2013 8:02:58 AM
[-] Backup_HDD0_20131029_0713.pfi	48 KB	10/29/2013 8:02:58 AM

Files of type:

[Switch to Archive List View](#)

Archive File Details

Name: Backup_HDD0_20131029_0713
 Comment: Backup_image_20131029_0713
 File: Z:/Backup_HDD0_20131029_0713/Backup_HDD0_20131029_0713.pfi
 Type: Full VD Container
 Parent: No
 Creation date: 10/29/2013 8:02:57 AM

[View archive detailed structure](#)



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

Our product enables to create several incremental chains based on one base pVHD, provided each chain contains changed data of a particular backup object(s). This option allows much flexibility in managing backup contents. In the wizard incremental chains will be automatically associated with their base image.

Virtual drives archive map

Please specify either the base image or the latest increment of the required incremental chain.

Name

- Base Image
 - Increment 1
 - Increment 2
 - Increment 3

Archive File Details

Name: Increment 3

[Comment:](#) Increment 3

File: Z:/Backup_HDD0_20131029_0713/inc_1_0_3/inc_3.pfi

Type: Incremental VD Container

Parent: Z:/Backup_HDD0_20131029_0713/Backup_HDD0_20131029_0713.pfi

Creation date: 10/29/2013 8:18:16 AM

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

Specify backup objects (partitions or entire hard disks)

Name	Type	File system	Size	Used
Backup_HDD0_20131029_0713	VD Archive		11.5 GB (12,362,862,592 Bytes)	
Basic MBR Hard Disk 0 (...)	Virtual Hard Disk Drive		500 GB	
System Reserved	Primary	NTFS	350 MB	256.8 MB
Local Disk	Primary	NTFS	21.2 GB	10.5 GB
New Volume	Primary	NTFS	478.4 GB	4.9 GB

Archive Details

Name: **Local Disk**

Volume label: [No label]

File system: NTFS

Used space: 10.5 GB

Total size: 21.2 GB

Free space: 10.6 GB

To specify increment properties, click **Next**

Data size to back up: **21.2 GB**



Advanced backup settings are unavailable for this type of backup.

5. Edit the default description to the created incremental image if necessary. Specify the required method of acquiring information on changed data:

Incremental Image Properties

Comment:

Diff compare method:

- Compare metadata
- Compare all data
- Compare changed data

- **Compare metadata** (default). At first file system metadata on each source and backup volume will be analyzed. As a result there will be built pairs of directory trees. If having to do with NTFS, directory trees will be built directly on MFT, skipping the file system analysis. Next action will be comparison of file attributes (e.g. creation/modification date) inside directory trees of the source and backup volumes to:
 - Copy all file clusters with changed attributes;
 - Copy all file clusters with changed location of cluster chains;
 - Copy all clusters of new files;
 - Copy all sectors with metadata, for instance all copies of directories and MFT for NTFS. Depending on a file system and its occupation, a full metadata copy can take up to several hundreds of megabytes.

This method is the fastest of all three, but increments will also be the largest.

- **Compare all data.** At first there will be created a list of all occupied cluster chains. After comparison with the backup contents, all changed clusters will be copied. This method is slower, but more space saving than the first one. Please note however that if an increment has been done after defragmentation, plenty of redundant data might fall into it, as during the defragmentation process data is being moved, but not changed.
- **Compare changed data.** It's a combination of the mentioned above methods. After detection of new/changed files, there will be created a list of clusters to copy. During the copying, clusters on source and backup volumes will be compared in order to copy only changed clusters and clusters of new files, as well as clusters of changed file system metadata (not all metadata). This method is the slowest of all three, but it can guarantee increments will only contain changed/new data.

6. Click **Finish** to complete the wizard, then apply the pending changes.

After the operation is completed you receive an incremental update to the selected pVHD backup image, placed next to the base image.



This operation can also be accomplished with our recovery media.

Recovery Scenarios

Restoring a hard disk from the bootable Backup Capsule

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

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

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



This scenario implies that the backup capsule is bootable.

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

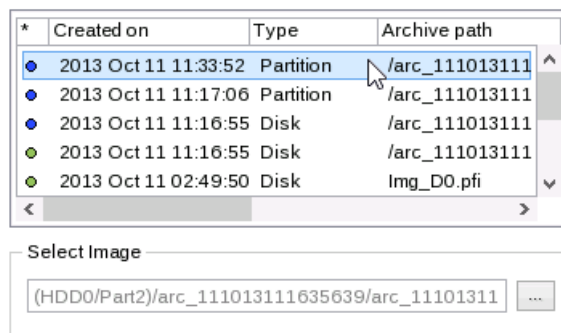


By default the Normal Mode will be automatically initiated after a 10 second idle period.

3. In the Linux launch menu select the Simple Restore Wizard. You can find the same wizard in PTS DOS as well.
4. On the Wizard's Welcome page, click the Next button.
5. On the What to Restore page, you can see a list of available images (if several). Most likely the required archive will be there too. If not, click the standard browse button [...] to find it. When you find your image, double click on it to proceed.

Please select the file with partition or hard disk image.

You can select image from list below (on Double click):



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

Disk preview

*: NTFS *: Free

Volume	Type	File System	Size	Used	Volume label
Basic Hard Disk 3 (Size 120 GB)					
*:	Primary	NTFS	14.3 GB	164 MB	New Volume
*:	Primary	NTFS	8.4 GB	8.9 MB	New Volume

Archive details:

Type: Image of the hard disk
 Archive path: /mnt/disk/sdb2/img_D3.pbf
 Created: 2013 Oct 10 Thd 04:49:39

To continue restore process, click Next.

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.

Basic Hard Disk 0 (VMware Virtual) - 500 GB

E: NTFS *: BackupCapsule BC *: Free

Basic Hard Disk 1 (VMware Virtual) - 500 GB

*: NTFS New Volume D: NTFS New Volume

Basic Hard Disk 2 (VMware Virtual) - 750 GB

*: NTFS *: Free

Basic GPT Hard Disk 3 (VMware Virtual) - 120 GB

*: Free

Basic Hard Disk 0 Model VMware Virtual, Size 500 GB

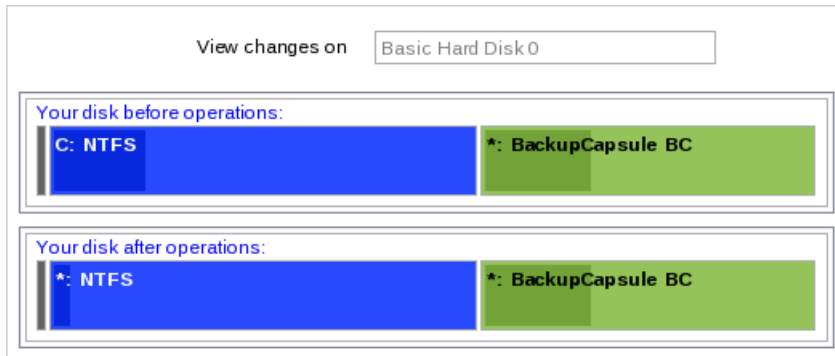
N	Volume	Type	File System	Size	Used	Free	Volume label	Active	Hidden
Basic Hard Disk 0 (Size 500 GB)									
0	*:	Primary	NTFS	350 MB	257 MB	93.1 MB	System Resen	No	No
1	E:	Primary	NTFS	191 GB	60.9 GB	130 GB	[No label]	No	No
2	*:	Primary	BackupCapsule	141 GB	7.8 GB	133 GB	BC	Yes	Yes
3	*:	Primary	Free	168 GB				No	No

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

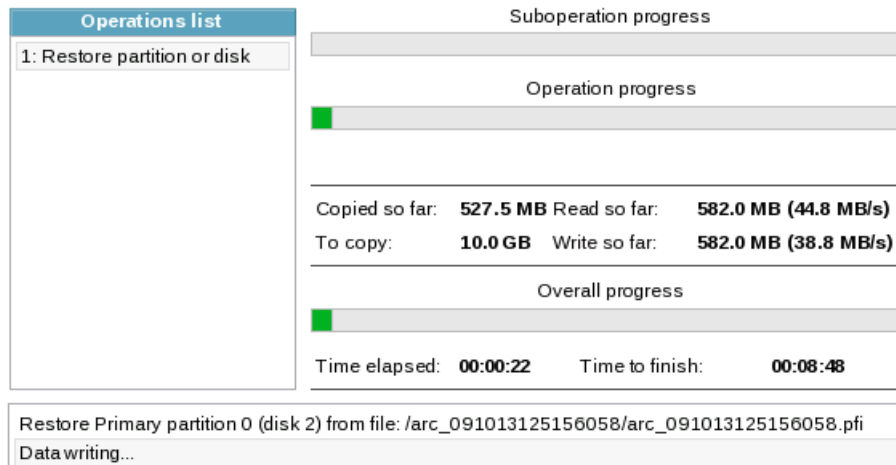


All contents on the disk selected for restoring purposes will be deleted during the operation.

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.

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.

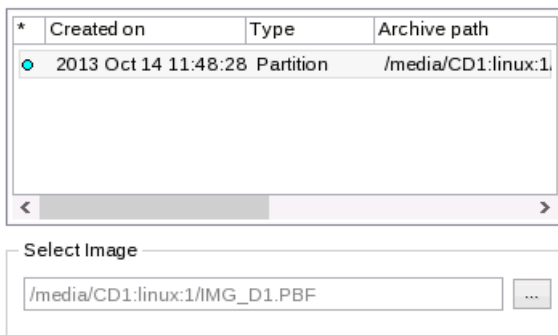


By default the Normal Mode will be automatically initiated after a 10 second idle period.

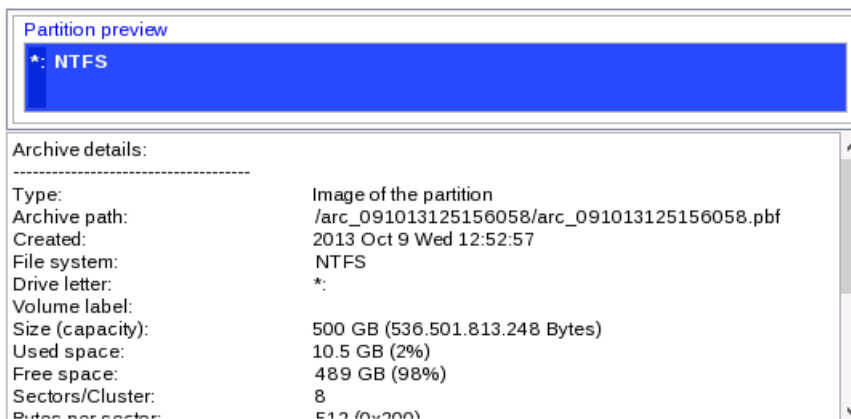
4. In the PTS DOS launch menu select the Simple Restore Wizard. You can find the same wizard in Linux as well.
5. On the Wizard's Welcome page, click the Next button.
6. On the What to Restore page, you can see a list of available images (if several). Most likely the required archive will be there too. If not, click the standard browse button [...] to find it. When you find your image, double click on it to proceed.

Please select the file with partition or hard disk image.

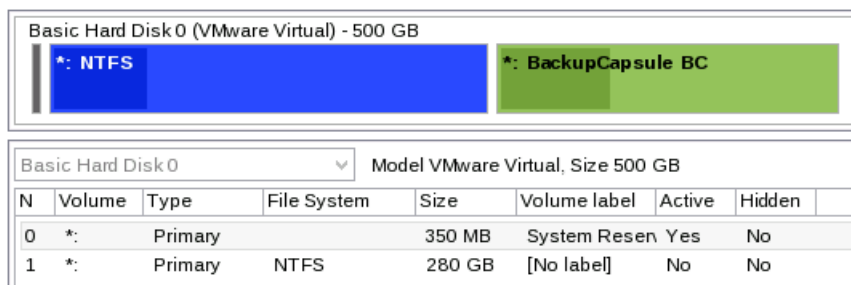
You can select image from list below (on Double click):



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.





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

New size: (10263 - 511649) MB

511649 MB

Free space before: (0 - 501386) MB

0 MB

Free space after: (0 - 501386) MB

0 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 Hard Disk 0

Your disk before operations:

*: NTFS *: BackupCapsule BC

Your disk after operations:

*: NTFS *: BackupCapsule BC

11. 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: Restore partition or disk	<p>Operation progress</p> <p>Copied so far: 376.4 MB Read so far: 430.0 MB (86.0 MB/s) To copy: 10.2 GB Write so far: 430.0 MB (47.8 MB/s)</p> <p>Overall progress</p> <p>Time elapsed: 00:00:12 Time to finish: 00:06:28</p>
Restore Primary partition 0 (disk 1) from file: /arc_091013125156058/arc_091013125156058.pbf	
Data writing...	

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

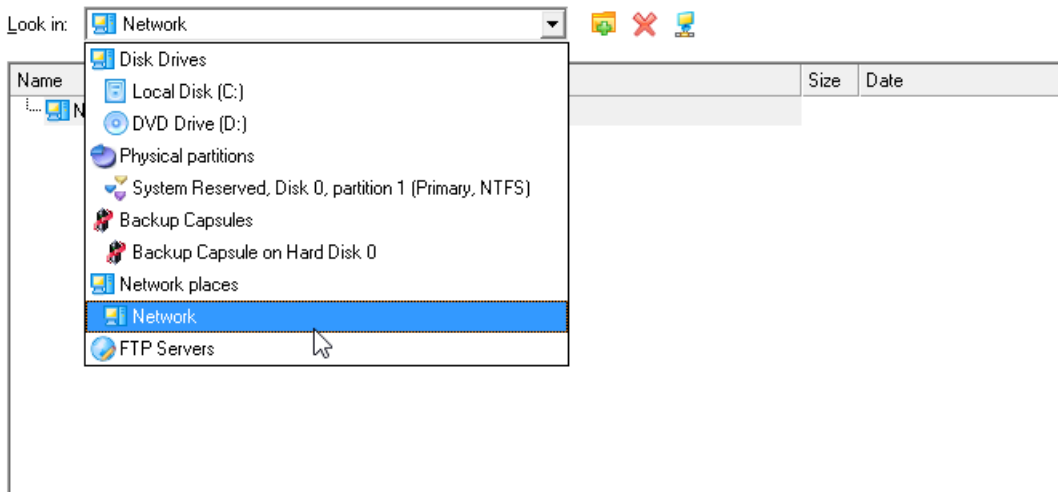
Restoring a system partition from a network drive

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.

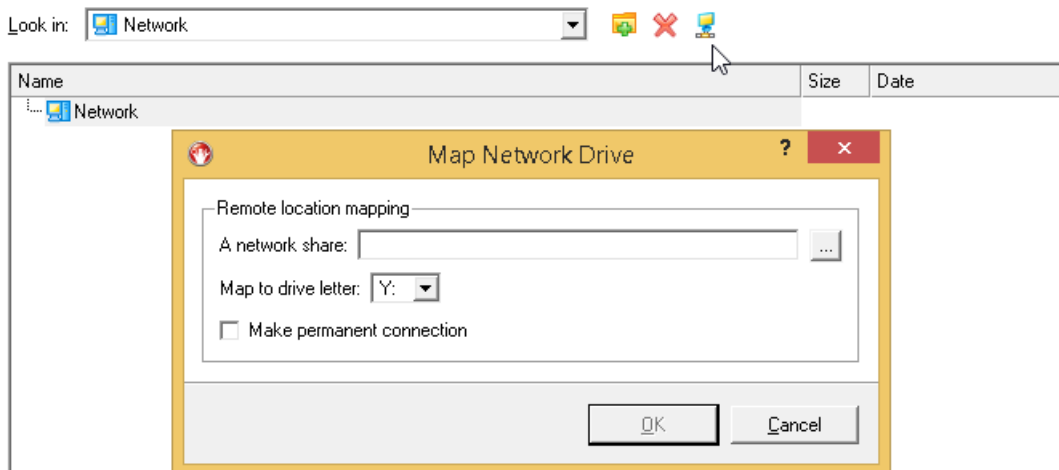
To restore your system partition from a backup image located on a network drive, please do the following:

For PBF images

1. Click the **Backup & Restore** tab on the Ribbon Panel, then select **Restore**.
2. On the Restore Wizard's Welcome page, click the Next button.
3. 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.

Name	Size	Date
pool (\server2) [Z:]		
Audio		3/6/2013 4:23:25 AM
!		4/16/2013 12:29:46 AM
!Backup Storage		10/10/2013 12:52:24 AM
arc_091013125156058		10/10/2013 12:51:36 AM
arc_091013133756622		10/10/2013 1:43:35 AM
diff_101013084041587		10/10/2013 2:00:08 AM
arc_091013133756622.pbf	4.7 MB	10/9/2013 6:38:02 AM
arc_091013133756622.pfi	576 KB	10/9/2013 6:38:02 AM
arc_091013133756622.pfm	1.6 KB	10/9/2013 6:38:02 AM

[Switch to Archive List View](#)

Archive File Details



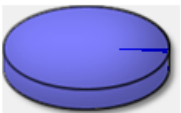
Name: **New Volume (E:)**
Comment: [No comment is available]
Volume label: New Volume
File system: NTFS Total size: 10.9 GB
Used space: 39 MB Free space: 10.9 GB
File: Z:\!Backup Storage\...\arc_091013133756622.pbf

- 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.

Please select one of the object(s) to restore:

Name	Type	File system	Size	Used
Basic MBR Hard Disk 2 [VMware, VMware Virtual S SCSI Disk D...]	Internal Hard Disk Drive		750 GB	
Local Disk	Primary	NTFS	499.6 GB	9.7 GB
Local Disk (L...)	Primary	NTFS	250.3 GB	72.5 MB

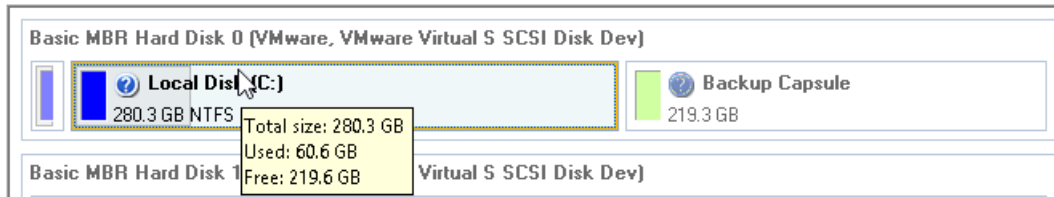
Archive Details



Name: **Local Disk**
Volume label: [No label]
File system: NTFS Total size: 499.6 GB
Used space: 9.7 GB Free space: 489.9 GB

- 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.

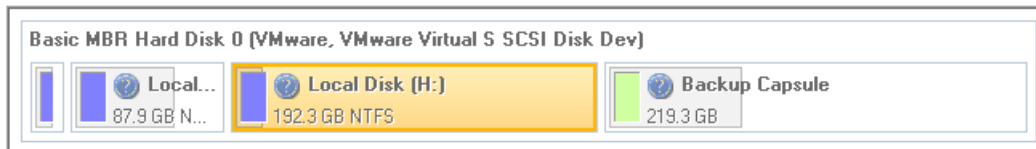
Please select a place you would like to restore the archive to. Note that if you select an existing hard disk or partition, its content will be **deleted** and replaced with the one from the archive.



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

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

Your hard disk after the changes:



Geometry Restore Options

Please specify the size of the restored partition: 10263 MB - 196936 MB

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

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

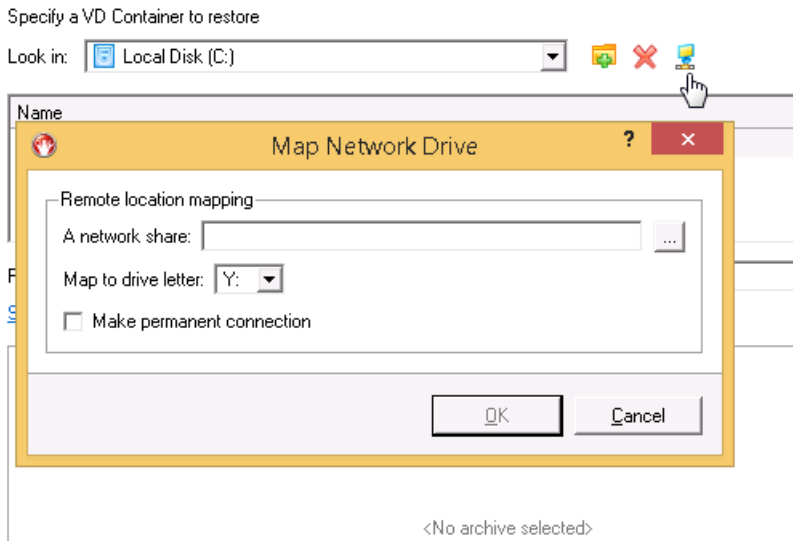
Partition Restore Options

Assign the following drive letter:

- On the next page of the wizard confirm the operation by selecting the appropriate option.
- 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.
- After completing the operation close the wizard, and then reboot the computer.

For pVHD images

- Select **Switch to Full Scale Launcher**, then click the **Restore from VD** item of the Wizards menu.
- On the Restore Wizard's Welcome page, click the Next button.
- On the Browse for Archive page you need to specify the required backup image:
 - Map a network disk where your archives are placed:
 - Call the Map Network Drive dialog by clicking the appropriate button;

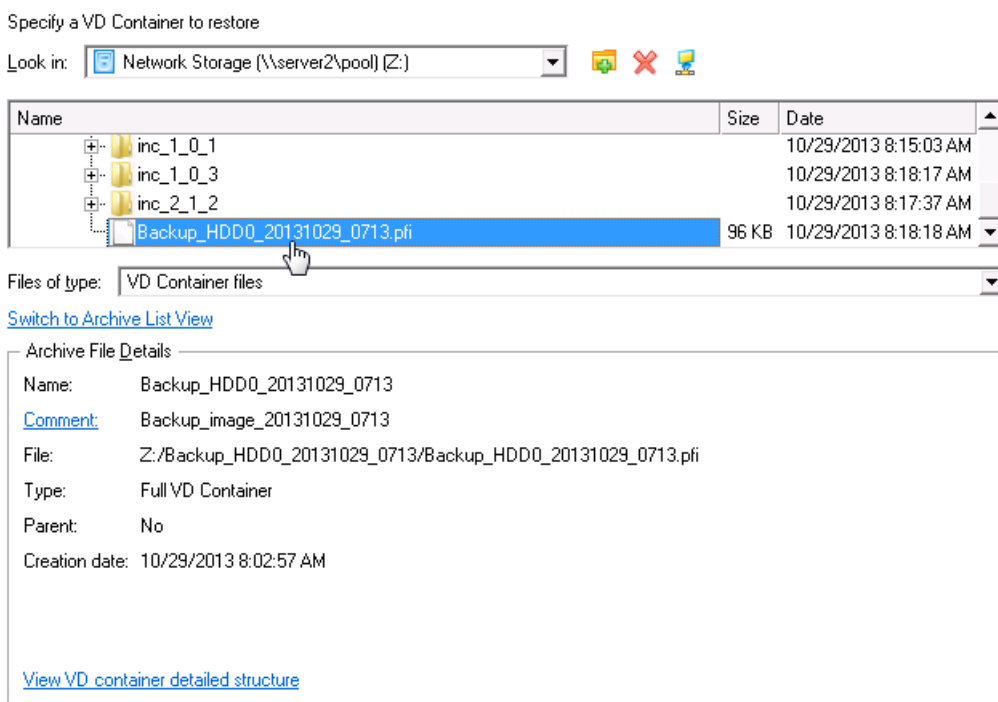


- Click the standard browse button [...] to browse for the required network share or manually enter a path to it;
- Define a letter from the pull-down list of available drive letters;
- Click the Connect as user button at the foot of the dialog page to specify a user name and password to access the selected 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. If you need more information on the selected backup object, please click the corresponding link at the bottom of the section. Click **Next** to proceed.




- The What to Restore page displays detailed information about the contents of the archive. Select the required item to restore.

Please select hard disk or partition to restore. If you need to restore several objects at once please use Linux-based Recovery Media.

Name	Type	File system	Size	Used
Backup_HDD0_20131029_0713	VD Archive		11.5 GB (12,362,911,744 Bytes)	
Basic MBR Hard Disk 0 (PVHD i...	Virtual Hard Disk Drive		500 GB	
System Reserved	Primary	NTFS	350 MB	256.8 MB
Local Disk	Primary	NTFS	21.2 GB	10.5 GB
New Volume	Primary	NTFS	478.4 GB	4.9 GB

Archive Details



Name: **Local Disk**
Volume label: [No label]
File system: NTFS
Used space: 10.5 GB

Total size: 21.2 GB
Free space: 10.6 GB

To continue, click **Next**

Data size to restore: **21.2 GB**



If you need to restore several backup objects from a pVHD image in one operation, please use the Linux-based recovery media.

- 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.

Specify where you'd like to restore

Basic MBR Hard Disk 0 (VMware, VMware Virtual S SCSI Disk Dev)

New Volume (E:)
478.4 GB NTFS

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

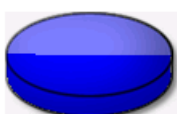
(Unallocated)
499.9 GB

Basic MBR Hard Disk 2 (VMware, VMware Virtual S SCSI Disk Dev)

(Unallocated)
749.9 GB

Basic MBR Hard Disk 3 (VMware, VMware Virtual S SCSI Disk Dev)

Object details



Name: **Local Disk (C:)**
Volume label: [No label]
File system: NTFS
Used space: 10.6 GB

Total size: 21.2 GB
Free space: 10.5 GB



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.

Basic MBR Hard Disk 0 (VMware, VMware Virtual S SCSI Disk Dev)

New Volume (E:)
478.4 GB NTFS

Geometry Restore Options

Please specify the size of the restored partition: 21721 10835 MB - 21721 MB

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

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

Partition Restore Options

7. Click **Finish** to complete the wizard, then apply the pending changes.
8. 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.
9. After completing the operation, please reboot the computer.



This operation can also be accomplished with our recovery media.

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.



Please use Recovery Media Builder to prepare Paragon's recovery environments on CD/DVD, flash, or in an ISO-image. You can get it here: www.paragon-software.com/my-account/.

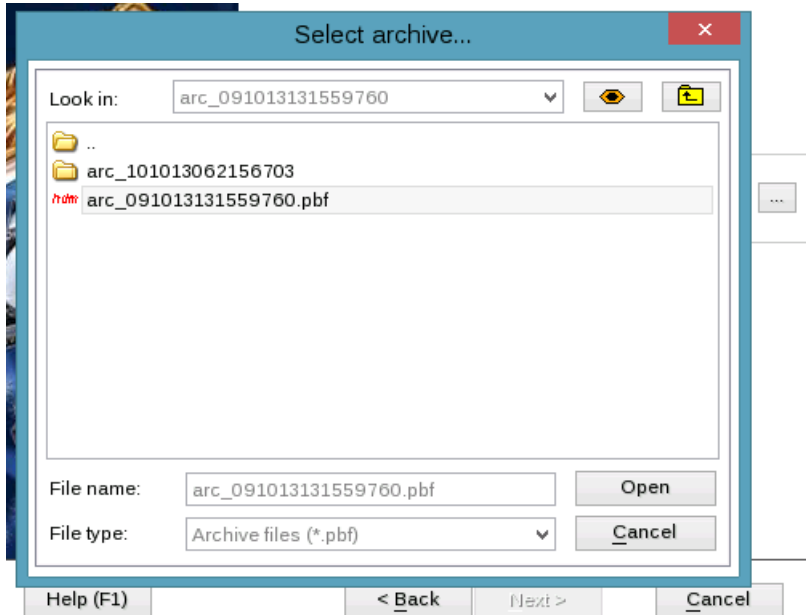
To automatically boot from the recovery media please make sure the on-board BIOS is set up to boot from CD/USB first.

2. 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.

Disk preview

Volume	Type	File System	Size	Used	Volume label
Basic Hard Disk 3 (Size 120 GB)					
*:	Primary	NTFS	14.3 GB	164 MB	New Volume
*:	Primary	NTFS	8.4 GB	8.9 MB	New Volume

Archive details:

Type: Image of the hard disk
 Archive path: /mnt/disk/sdb2/img_D3.pbf
 Created: 2013 Oct 10 Thd 04:49:39

To continue restore process, click Next.

9. On the next page specify a hard disk to restore the image to.

N	Volume	Type	File System	Size	Volume label	Active	Hidden
0	*:	Primary	NTFS	14.3 GB	New Volume	No	No
1	*:	Primary	NTFS	8.4 GB	New Volume	No	No
2	*:	Primary	Free	97.3 GB		No	No



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.

Operations list

1: Restore partition or disk

Suboperation progress

Operation progress

Copied so far: **8.9 MB** Read so far: **14.0 MB (14.0 MB/s)**
 Write so far: **14.0 MB (14.0 MB/s)**

Overall progress

Time elapsed: **00:00:06** Time to finish: **00:00:00**

```
Restore Disk 3 from file: /mnt/disk/sdb2/Img_D3.pbk
Opening archive Img_D3_0300p.000...
Restore Primary partition 0 (disk 3) from file: /mnt/disk/sdb2/Img_D3_0300p.000
Data writing...
Opening archive Img_D3_0301p.000...
Restore Primary partition 1 (disk 3) from file: /mnt/disk/sdb2/Img_D3_0301p.000
Data writing...
```

Close

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

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

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

1. Connect the second hard disk to the computer.
2. Start up the computer from our Linux/DOS recovery media.



Please use Recovery Media Builder to prepare Paragon's recovery environments on CD/DVD, flash, or in an ISO-image. You can get it 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.

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.

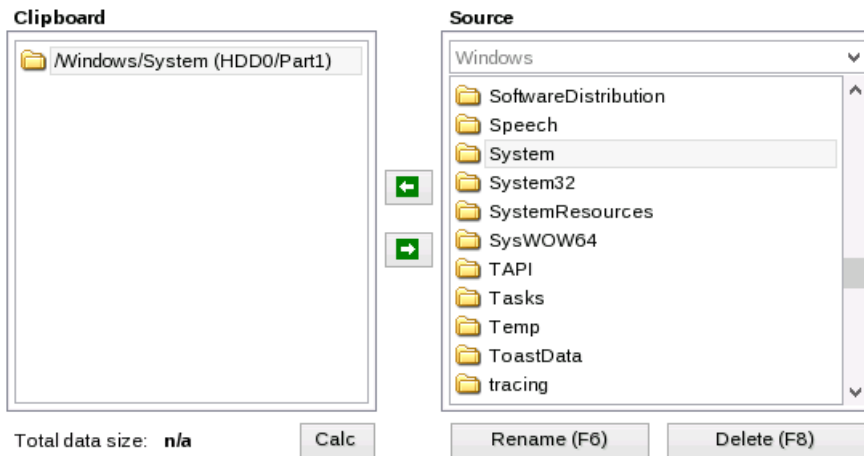


By default the Normal Mode will be automatically initiated after a 10 second idle period.

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.



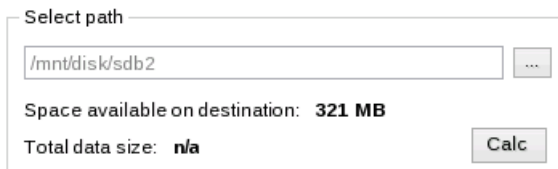
Click the Calc button to estimate the resulted data size.

- 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.

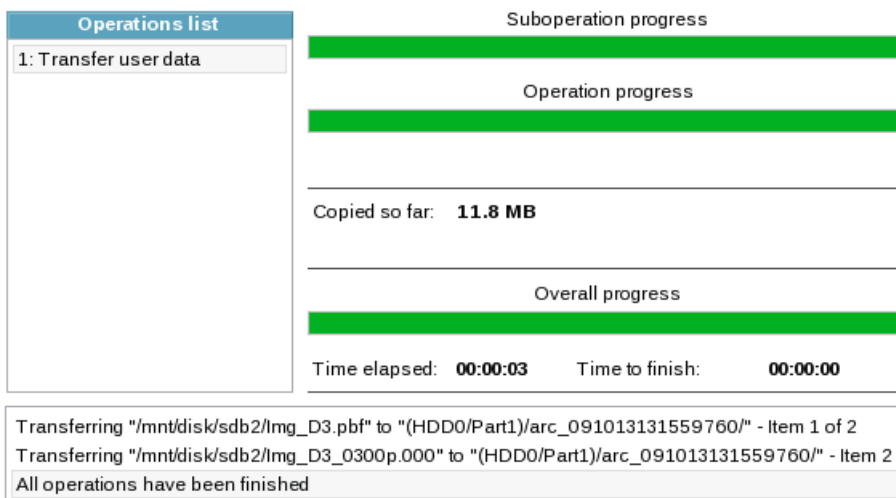
Please select how would you like to save the archive:

- 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/BD**
Choose this option if you want the Wizard to burn the archive to CD/DVD/BD. You will be prompted to choose a drive.

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



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



Please use Recovery Media Builder to prepare Paragon's recovery environments on CD/DVD, flash, or in an ISO-image. You can get it here: www.paragon-software.com/my-account/.

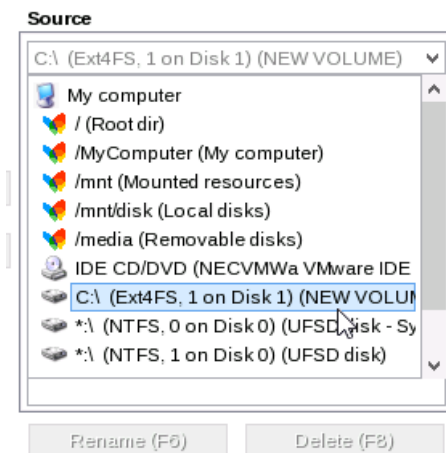
To automatically boot from the recovery media please make sure the on-board BIOS is set up to boot from CD/USB first.

2. 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.

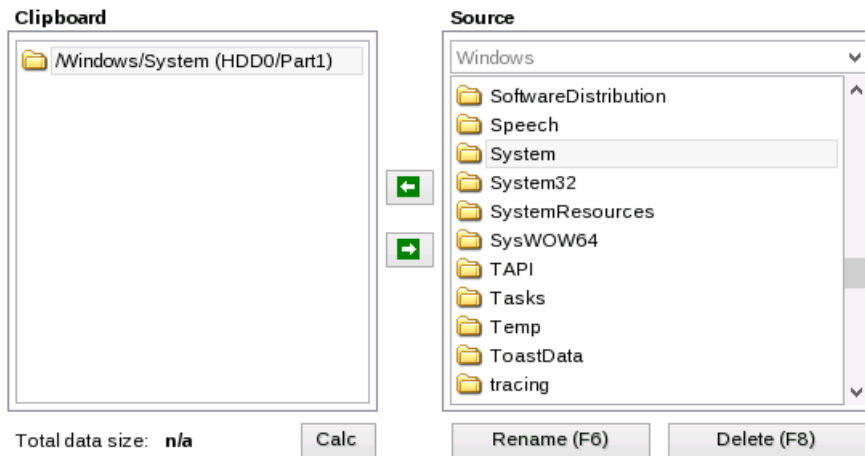


By default the Normal Mode will be automatically initiated after a 10 second idle period.

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 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/BD**
Choose this option if you want the Wizard to burn the archive to CD/DVD/BD. You will be prompted to choose a 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
NECVMWAr	VMware IDE CDR10	CD-R;CD-RW;D
Paragon	CD Burner Emulator	CD-R;CD-RW
Paragon	DVD Burner Emulator	DVD+R;DVD+F

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.

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.



Please use Recovery Media Builder to prepare Paragon's recovery environments on CD/DVD, flash, or in an ISO-image. You can get it 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.

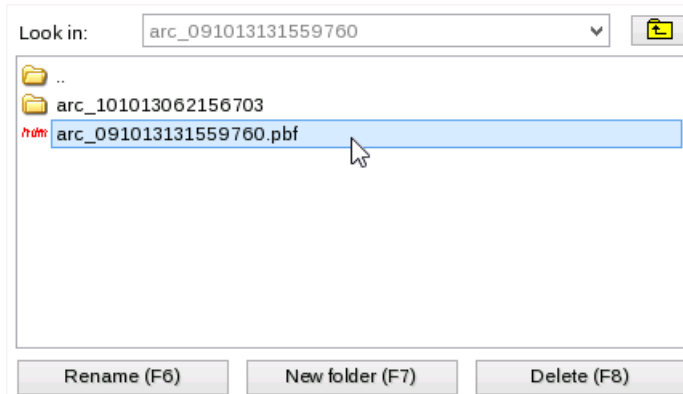
2. In the boot menu select **Normal Mode** to use the Linux recovery environment (more preferable) or **Safe Mode** to use the PTS DOS recovery environment (in case you've got problems with Linux). Moreover you've got the option to boot into the **Low-Graphics Safe Mode** (PTS DOS safe mode) to cope 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.



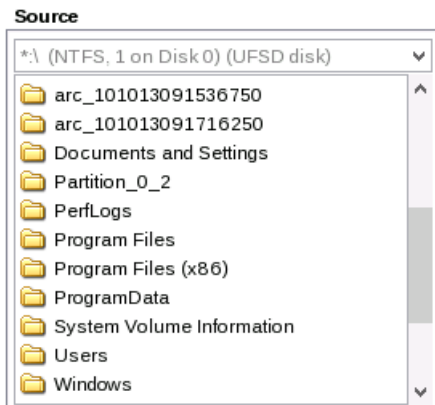
By default the Normal Mode will be automatically initiated after a 10 second idle period.

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.

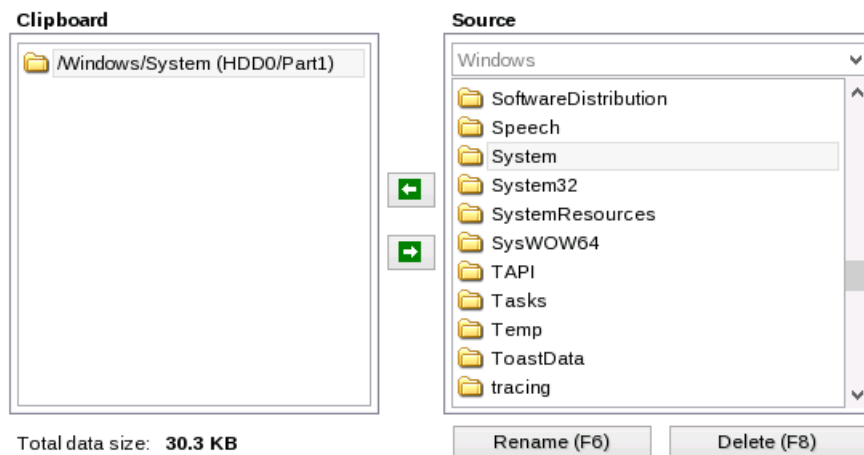
5. Select a disk where the system backup is stored from the pull-down list in the right pane of the page.



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.



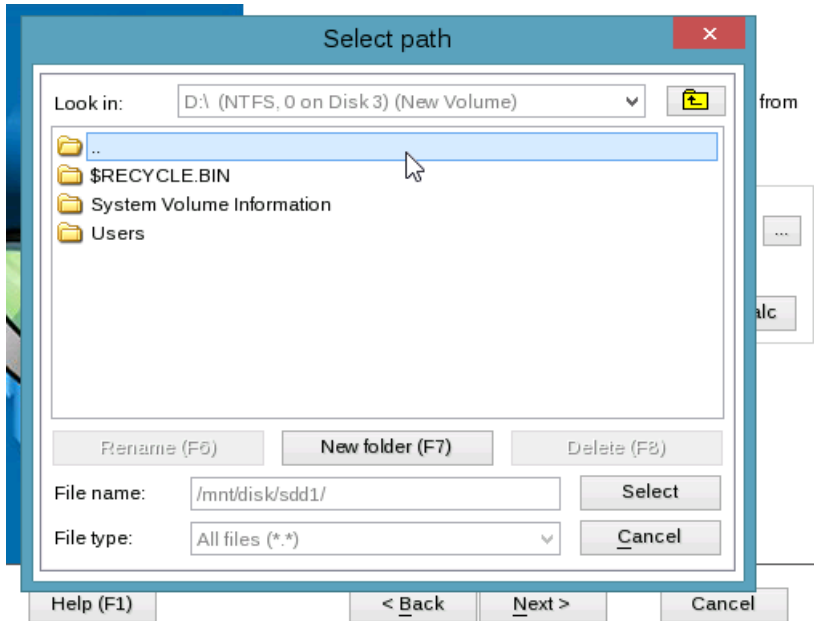
Click the Calc button to estimate the resulted data size.

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 archive:

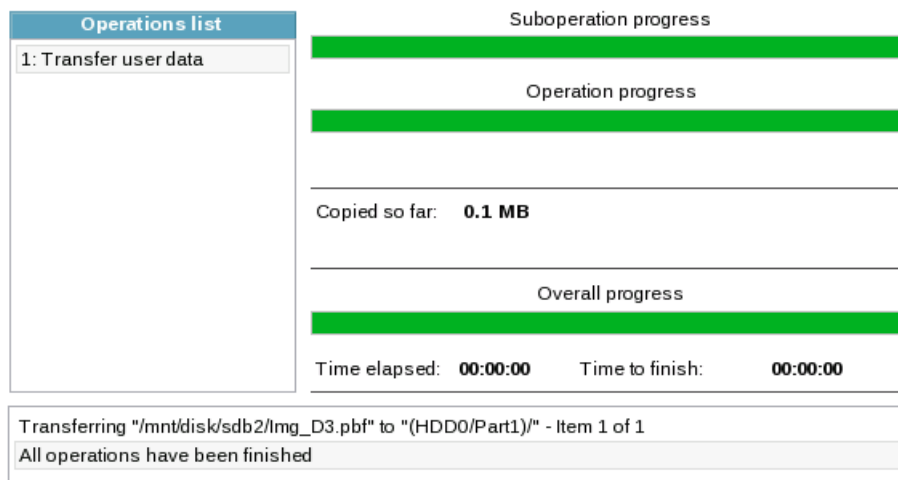
- Save data to any local drives or a network share**
Choose this option if you want to save your data to local mounted or physical partition, to USB or FireWare external drives and to a mounted network share. You will be prompted to choose a location you want to save the archive to.
- Burn data to CD/DVD/BD**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

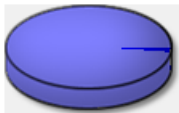
1. Click the **Backup & Restore** tab on the Ribbon Panel, then select **Restore**.
2. On the Restore Wizard's Welcome page, click the Next button.
3. On the Browse for Archive page choose the required archive in the browser-like window. The Archive File Details section displays a short description of the selected image.

Look in: Backup Capsule on Hard Disk 0

Name	Size	Date
Backup Capsule on Hard Disk 0		
arc_091013125156058		10/10/2013 6:55:53 PM
DIFF130258590010000000		10/10/2013 6:55:52 PM
DIFF130258594470000000		10/10/2013 6:55:54 PM
arc_091013125156058.pbf	1.1 GB	10/10/2013 6:53:54 PM
arc_091013125156058.pfi	28.9 MB	10/10/2013 6:53:56 PM
arc_091013125156058.pfm	110.3 KB	10/10/2013 6:53:57 PM
arc_111013111635639		10/10/2013 9:33:56 PM
arc_111013111635639.pbf	215.8 KB	10/10/2013 9:33:57 PM
arc_111013111635639.pfi	29.2 MB	10/10/2013 9:33:56 PM
arc_111013111635639_0200p.000	1.1 GB	10/10/2013 9:33:49 PM
arc_111013111635639_0200p.pfm	110.3 KB	10/10/2013 9:33:49 PM
arc_111013111635639_0201p.000	8.7 MB	10/10/2013 9:33:56 PM

[Switch to Archive List View](#)

Archive File Details

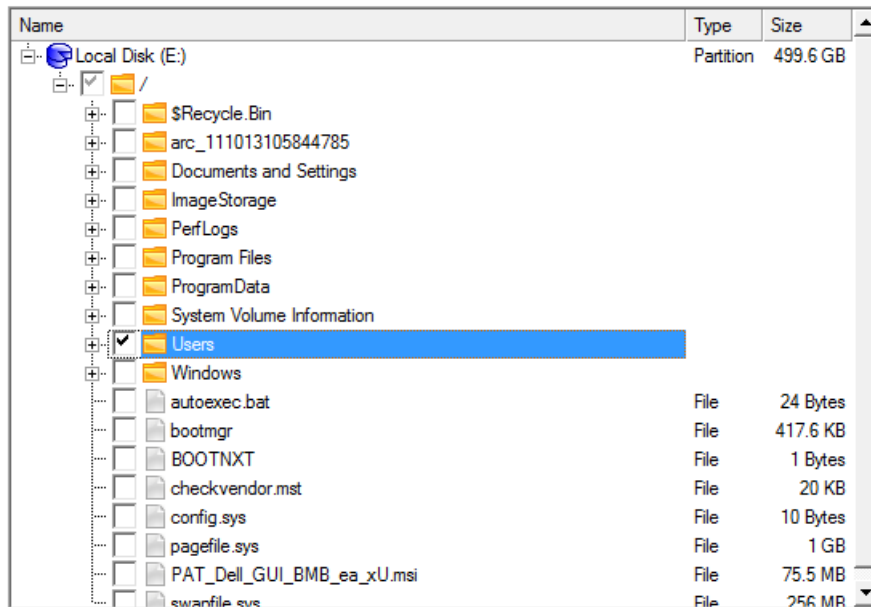


Name: **Local Disk (C:)**
Comment: [No comment is available]
Volume label: [No label]
File system: NTFS
Used space: 10.5 GB
File: /.../arc_091013125156058.pbf

Total size: 499.6 GB
Free space: 489.1 GB

4. 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.

Click the check box next to any file or folder you want to restore from



To continue, click **Next**

Data size to restore: less than 14.8 GB

- 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.

Restore files to: ▼

The files and folders will be restored to the place where they were archived from.

When restoring files that already exist on your computer:

Leave existing files.
If a file exists in the original location, it won't be overwritten. Only missing/deleted files will be restored from backup.

Replace existing files
ALL selected files will be replaced with files from backup.

- On the Restore Summary page review all parameters of the operation and modify them if necessary.

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

Objects to Restore	
Object(s) selected:	1
Total data size:	71.9 MB (75,470,833 Bytes)
Specified restore destination	
Destination path:	C:\
Space available on destination:	219.4 GB (235,588,853,760 Bytes)

- On the next page of the wizard confirm the operation by selecting the appropriate option.
- 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 close the wizard, and then reboot the computer.

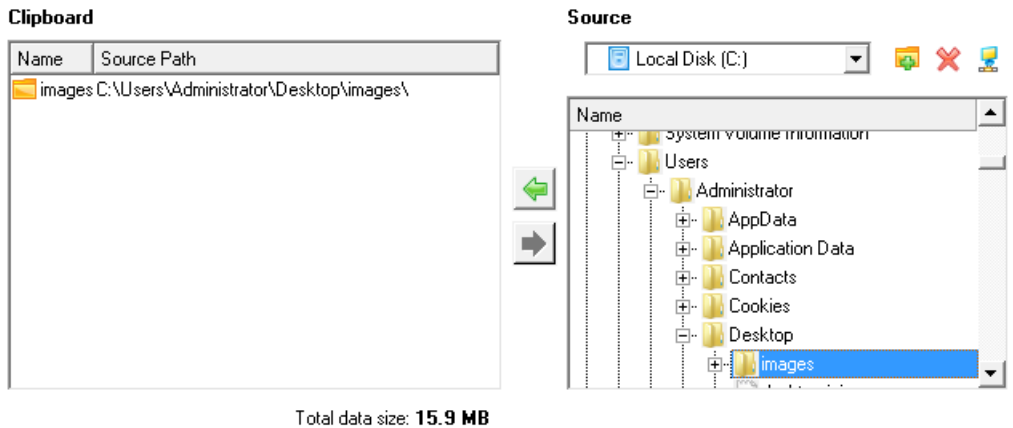
File Transfer Wizard

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

- 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.

Type	Creation Date	Source Object	Size	Archive Size	Flags
	10/11/2013 4:16:55 AM	Basic MBR Hard Disk 2 (VMware, VMware Virtual S SCSI Disk Dev)	750 GB	5.1 GB	
	10/10/2013 7:18:58 AM	File-level Archive	0 Bytes	119 Bytes	
	10/10/2013 7:18:24 AM	File-level Archive	0 Bytes	248 Bytes	
	10/10/2013 7:11:42 AM	Basic MBR Hard Disk 3 (V	0 Bytes	44.7 MB	
	10/10/2013 7:08:11 AM	Basic MBR Hard Disk 3 (V	0 Bytes	57.8 MB	
	10/10/2013 7:00:47 AM	File-level Archive	0 Bytes	4.8 MB	
	10/10/2013 6:55:43 AM	File-level Archive	0 Bytes	389 Bytes	
	10/10/2013 6:54:26 AM	File-level Archive	0 Bytes	85.9 KB	
	10/10/2013 6:48:07 AM	File-level Archive	71.5 MB	4.8 MB	
	10/10/2013 2:17:49 AM	New Volume (G:)	14.2 GB	38 KB	
	10/10/2013 2:17:19 AM	New Volume (G:)	14.2 GB	22.7 MB	

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



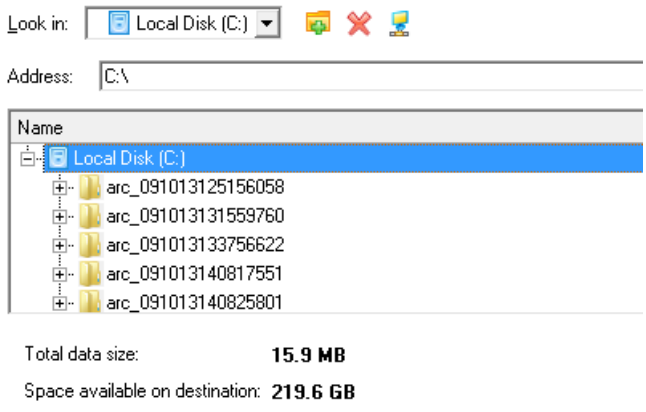
3. On the Select Destination Type, choose the way the data will be stored. Select the **Save data to any local drive or a network share** item.

There are several ways the Wizard can store your data. Please select how would you like to save the data:

- Save data to local/network drives.
- Save data to physical partitions.
- Burn the data to CD, DVD or BD.

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

Please select the destination path where to save the data from clipboard.



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

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

Objects to transfer	
Object(s) selected:	1
Total data size:	7.6 GB (8,248,732,638 Bytes)
Transfer destination	
Destination path:	C:\
Space available on destination:	219.4 GB (235,588,853,760 Bytes)
Overwrite existing files:	No

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

Troubleshooter

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

- 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.

- 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.

- 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.

- 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.

- 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.

- 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.

- 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.

- 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.