



PARAGON

Hard Disk Manager

User Manual

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Product Overview

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operations to install the system from scratch and providing its data reliable protection to secure utilization of an outdated hard disk.

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

Getting Started

Product Components

- **Windows installation package** for regular system and data protection, drive partitioning, OS migration, and other operations. It's the main component of the product.
- **WinPE bootable environment** for emergency scenarios. It provides an excellent hardware support and the same interface as the Windows version (recommended for most scenarios).
- **Linux bootable environment** for emergency scenarios. Unlike the Windows and WinPE versions, it includes the 'Secure Erase' function. Please note that the Linux recovery image is not included into the installation package and should be downloaded separately. Find more details in [Building Recovery Media](#).

System Requirements

For the Windows installation package

- Windows 7 SP1 and later. Please note that the list of supported Windows versions may vary for your product.
- Opened ports in Firewall: inbound and outbound 80, 443



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

For the WinPE bootable environment

- Intel Pentium III CPU or its equivalent, with 1000 MHz processor clock speed
- At least 1 GB 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

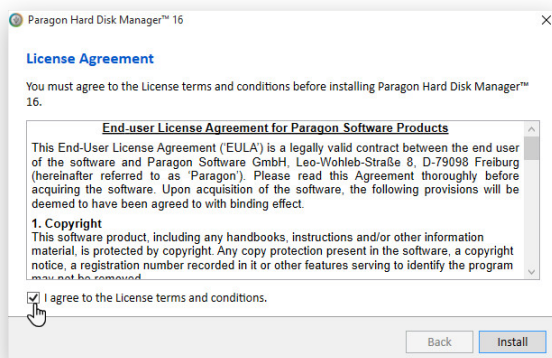
Installation

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++ 2015 Redistributable and if not found, it will be installed automatically (comes with the installation package). **Note!** Before installing this library in Windows 8.1 or Windows Server 2012 R2, the following OS updates should be present: KB2919442, KB2919355.
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.

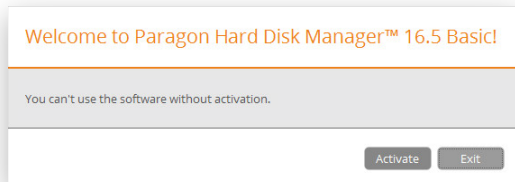


4. The final page reports the end of the setup process. Click **Finish** to complete the wizard.

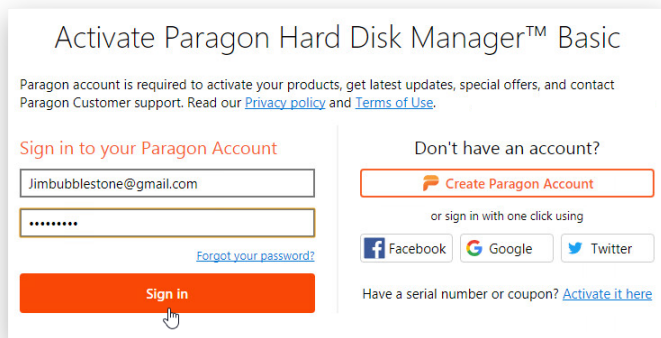
First Start

Activating Free Functions

1. After the installation you can see a program icon on the Windows desktop. Double click it to launch.
2. Once started, you will see an activation dialog. Hard Disk Manager is a commercially distributed product that includes basic drive partitioning and disaster recovery features that you can use completely for free after the activation over the Internet. Click **Activate** to proceed.



3. In the opened dialog enter an email and password of your Paragon's account, then click **Sign in**. If you don't have an account yet, please create it by clicking the corresponding option. Alternatively, you can sign in with your Facebook, Google, or Twitter account.

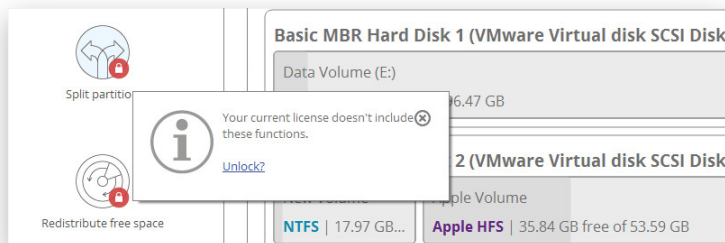


4. The product activation completes automatically after signing in to your account.

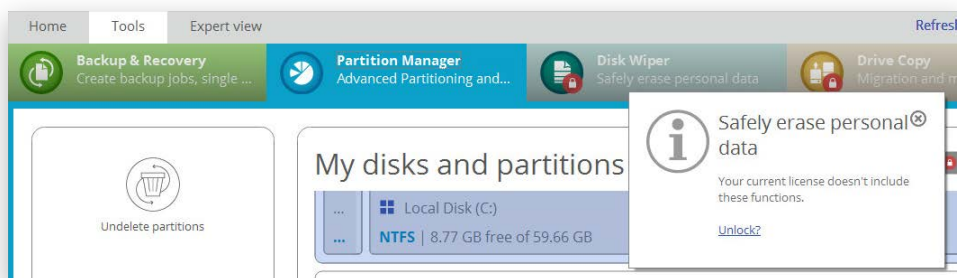
Buying Locked Functions

In the program's interface you can notice locked features and entire functionality scopes. All these are a part of Hard Disk Manager Advanced, you can purchase either in your MyParagon Account or directly from the product (recommended).

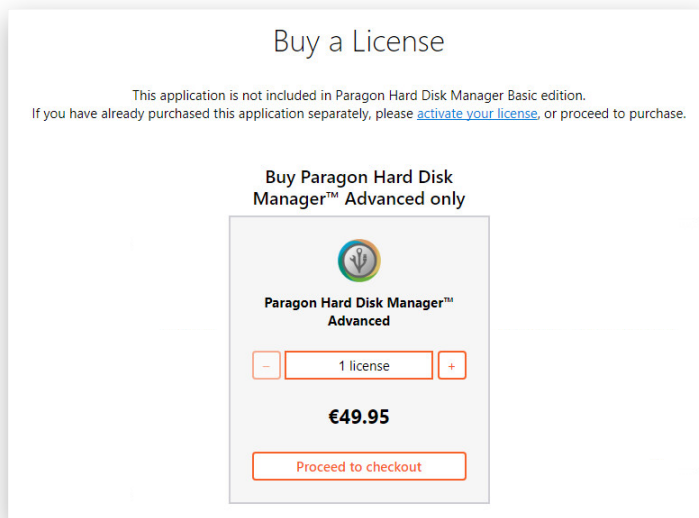
1. Select a locked product feature, then click **Unlock**.



Or click on a locked functionality scope.



2. Choose the number of licenses you'd like to buy, then click **Proceed to checkout**. You will be redirected to Paragon's e-shop, where you can complete the purchase. Please note that one consumer license can be activated and used on one device at a time, while the scope of a business license is subject to negotiation with the Sales Team and may vary for each customer.

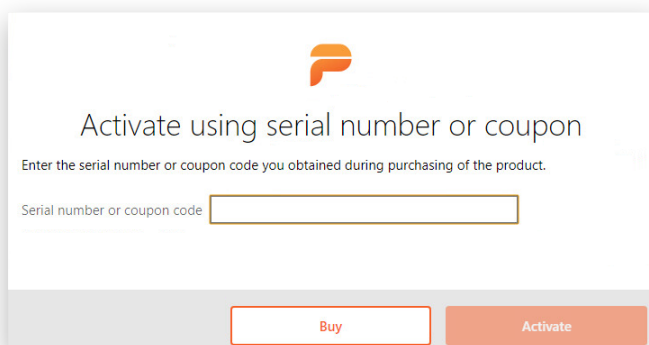


3. As a result the purchased license(s) will be binded to your MyParagon Account. All you need is to activate it on the computer.

Activating Paid Functions

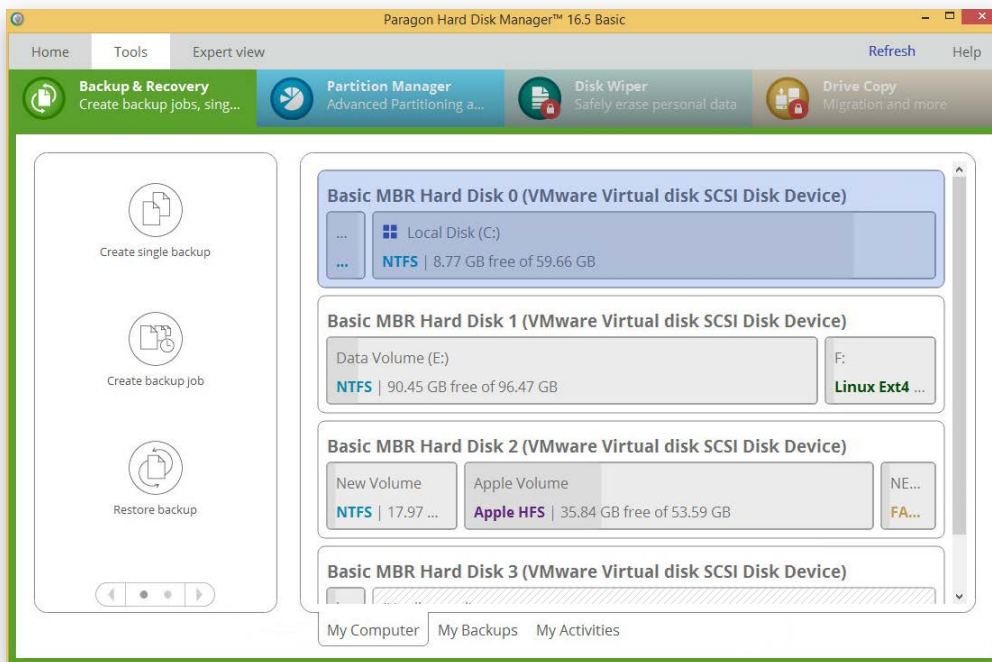
If you have purchased a product license online and it's binded to your MyParagon Account (the main scenario), please consult the [Managing Account](#) section to learn how to activate this license on the computer, thus enabling the locked features. If you've got a serial number at your disposal, which is not registered in MyParagon Account, please take the following steps:

1. Select any locked product feature, then click **Unlock**.
2. Click the **activate your license** hyperlink in the opened window.
3. Enter your serial number, then click **Activate**. This info will be sent to our activation server to complete the procedure.



Using the Product

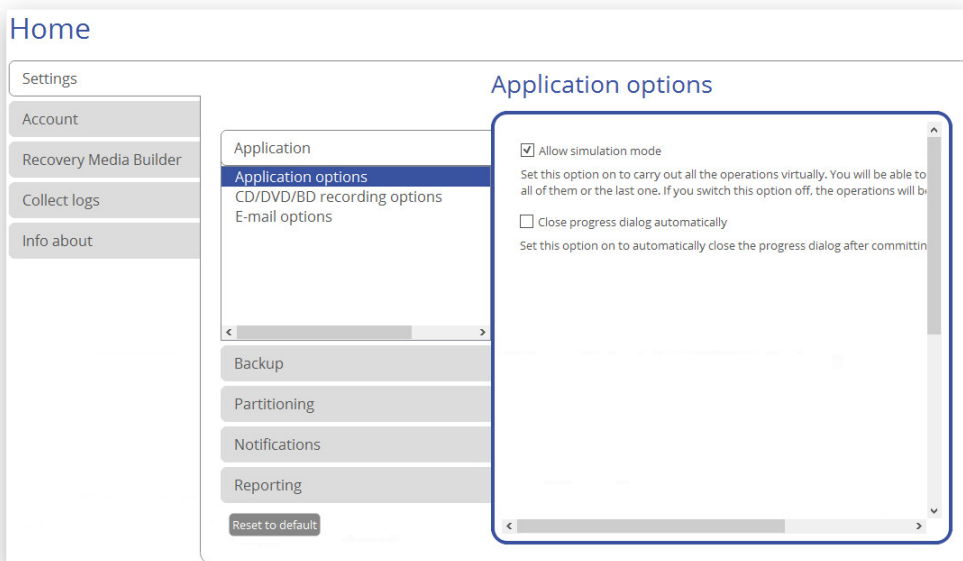
After the activation you will get access to the program interface. You will be prompted to take a brief product tour and build recovery media.



The upper area of the main window contains several tabs: [Home](#), [Tools](#) and [Expert view](#).

Home

Use this tab to change the program settings, manage your account, build bootable recovery media, collect program logs, or go to Paragon's website to download a free update, register the product, visit Paragon's Knowledge Base, etc.

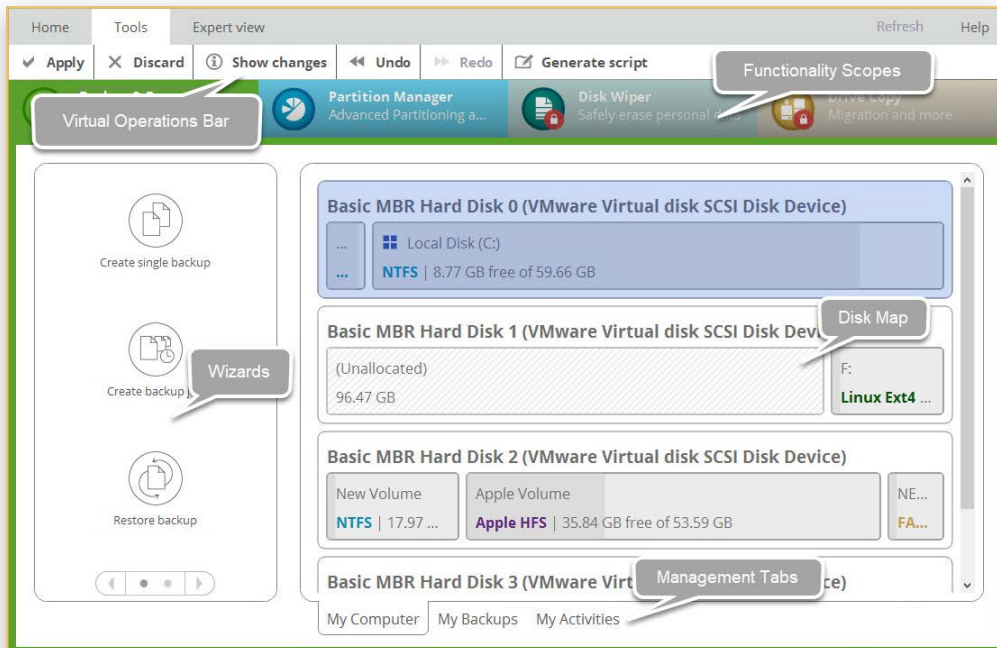


For more details, please consult the following chapters:

- [Changing Program Settings](#)
- [Managing Account](#)
- [Building Recovery Media](#)
- [Troubleshooting](#)

Tools

It is displayed each time you launch the program. Use this tab to see the layout of system storage devices, open program wizards and dialogs, monitor backup activities and some other actions.



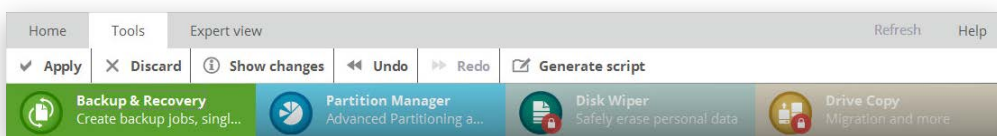
Functionality Scopes

For your convenience, the product functions are distributed among four groups. For example, partitions become resizable and can be moved directly on the Disk Map only when you are in **Partition Manager**, while 'My Backups' tab appears in **Backup & Recovery**. If you'd like everything to be available in one view, just go to Expert view.

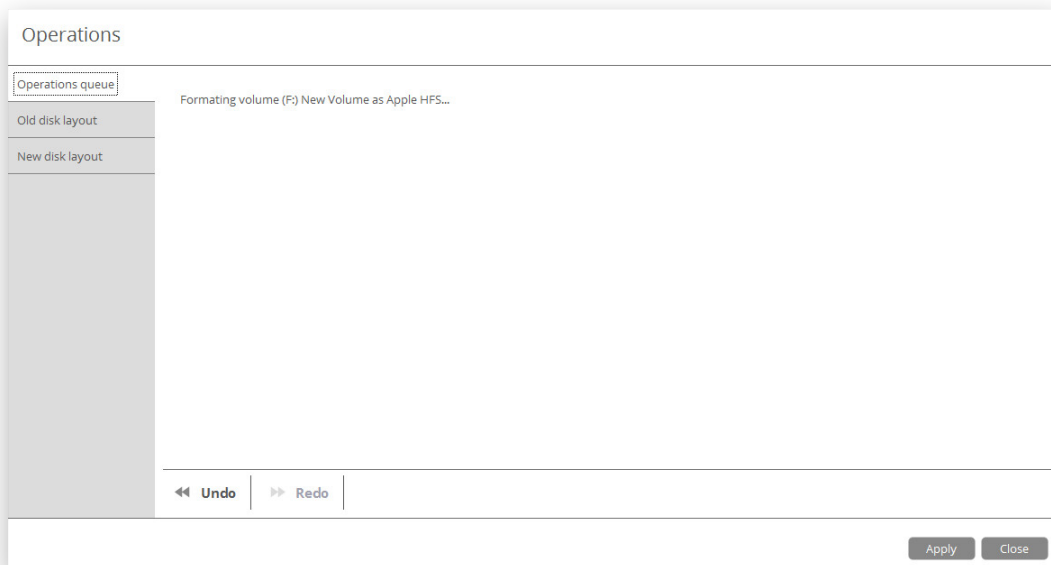
Virtual Operations Bar

By default, the program does not accomplish operations that may destroy the on-disk data (format, delete, restore, etc.) immediately, but places them on a special list (the so-called simulation mode). First it helps to avoid possible mistakes as you should confirm all provided changes. Second it saves your time and effort when executing several operations, as you don't need to wait for each operation to physically complete before proceeding to the next operation.

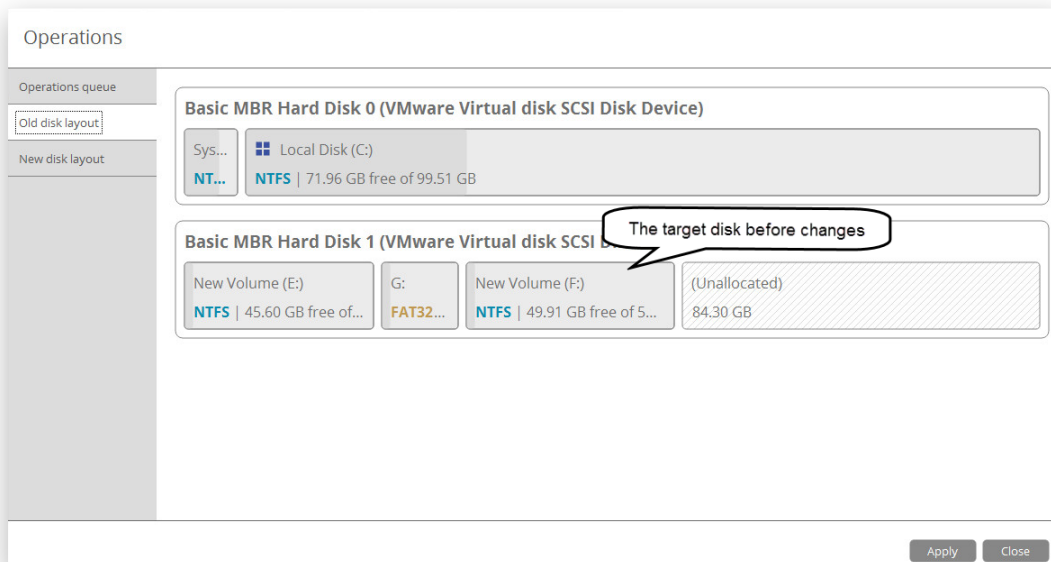
A corresponding bar appears in the upper area after you accomplish a potentially dangerous operation.



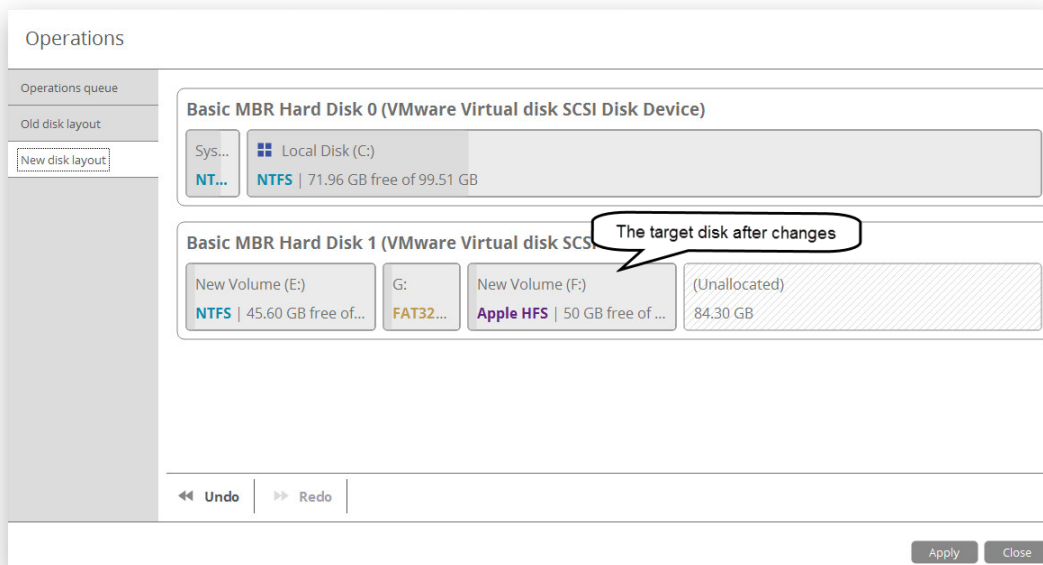
- **Apply**. Click to physically execute pending changes.
- **Discard**. Click to cancel all pending changes.
- **Show changes**. Click to see and manage pending changes.



Select **Old disk layout** to see your disks before accomplishing pending changes.

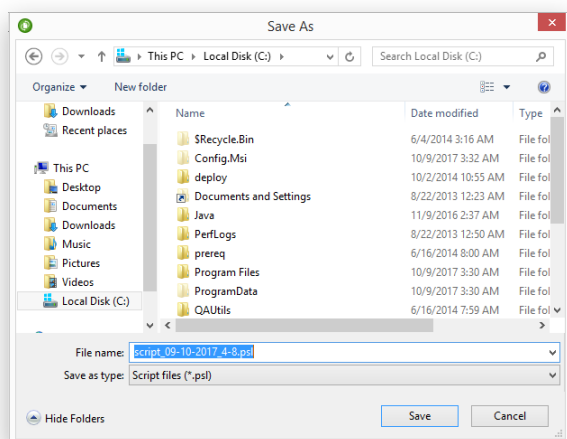


Select **New disk layout** to see your disks after accomplishing pending changes. Use the arrow buttons below to see how the target disk layout changes after each operation.



- **Undo.** Click to cancel the last pending operation.
- **Redo.** Click to cancel the last undo pending operation.
- **Generate script.** Generate a script out of all pending changes. A script may describe one or several operations with macro-language commands. The program installation package includes an interpreter utility "hdmengine_scriptapp.exe" that allows executing any set of operations automatically in the unattended mode. For more details, please consult [Using the Command Prompt](#).

If necessary, you can change the default location and filename for the created script file.



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

Disk Map

The Disk Map displays the layout of storage devices. Each device is represented with a rectangle bar that contains small-sized bars, which represent partitions or logical disks. By looking at the size of the bar's shaded area it is possible to estimate the used disk space.

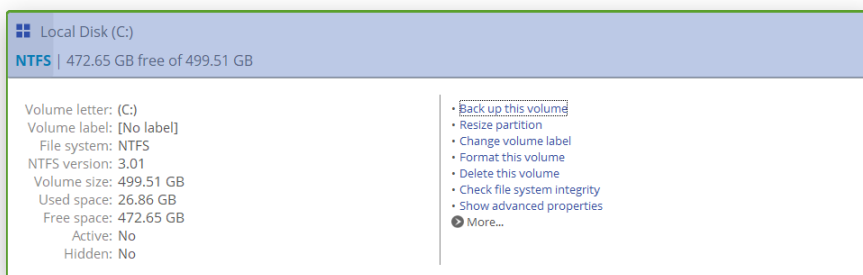
Large-sized bars display the following information about storage devices:

- Type (physical, virtual),
- Used partitioning scheme (MBR or GPT),
- Total capacity.

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

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

Left click a disk, volume, or block of free space to call a context-sensitive menu with detailed information on the selected object and a list of available operations.



For more details, please consult the following chapters:

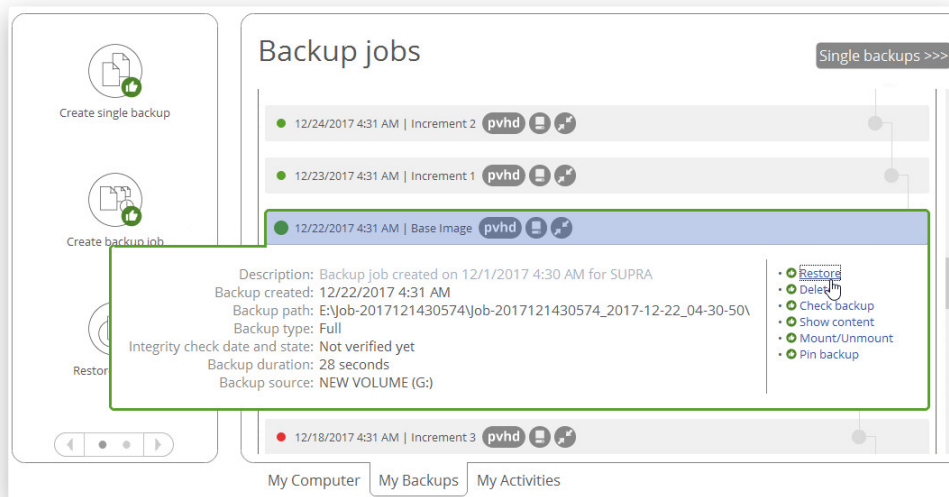
- [Protecting System and Data](#)
- [Managing Partitions and Disks](#)
- [Erasing Data](#)
- [Copying Data](#)

Wizards

Wizards are also grouped by functionality scopes. If the program window is relatively small, the wizards get into several tabs. Use the arrow buttons to switch between them. In [Expert view](#) you can choose what wizards to display and to hide.

Management Tabs

- Select **My Computer** (opened by default) to see the layout of storage devices. This tab is available in all four functionality scopes.
- Select **My Backups > Single backups>>>** to see all configured one-shot backup tasks or **My Backups > Backup jobs>>>** to see configured regular backup routines. Left click a backup image to call a context-sensitive menu with detailed information on the selected object and a list of available operations. Please note that this tab is only available in **Backup & Recovery** scope or [Expert view](#).

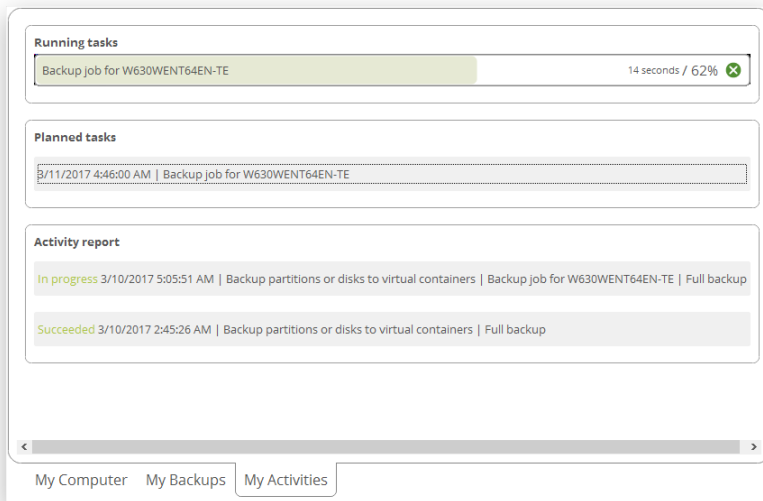


At each program start and after clicking **Refresh**, all backup data files are checked for availability. As a result, the program marks each backup image with one of the following flags:

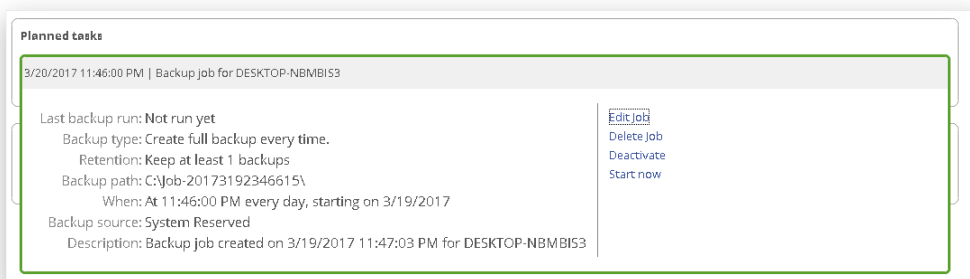
- **Green circle** means that all files required for restoring a backup image are available.
- **Grey circle** means that remote backup storage where a backup image resides is not available, either the specific external drive is not connected or network share cannot be reached (a network connection problem or the remote computer is switched off).
- **Red circle** means that a backup image is corrupted and cannot be restored. This problem can have different reasons, those that can be fixed and those that cannot.

For more details, please consult the following chapters:

- [Restoring Individual Files and Folders](#)
- [Restoring an Entire Disk or Separate Volumes](#)
- [Mounting a Backup Image](#)
- [Checking Backup Integrity](#)
- [Pinning Backup](#)
- [Repairing Corrupted Backup](#)
- [Adding a Backup Image](#)
- Select **My Activities** to see completed, scheduled and currently executed operations and their statuses. Please note that this tab is only available in **Backup & Recovery** scope.

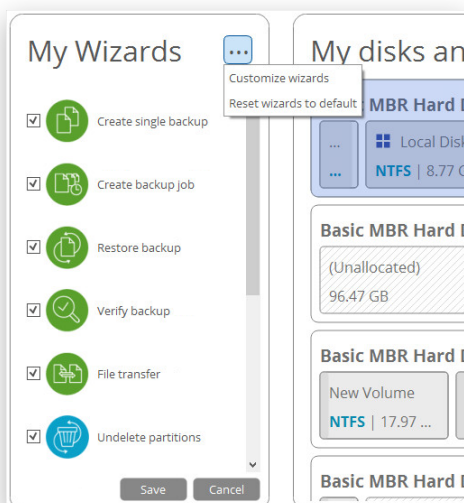


For any scheduled backup job you can call a context-sensitive menu with detailed information on the selected object and a list of available operations. For more details, please consult [Managing Backup Jobs](#).



Expert view

Use this tab to have all product functions in one view. This mode also allows you to adjust the working environment by hiding wizards you don't need.

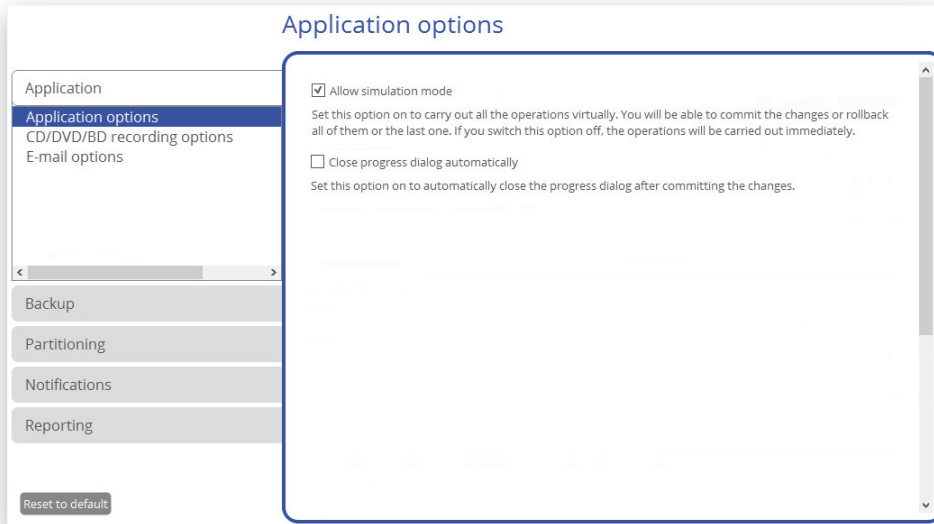


Changing Program Settings

Select **Home > Settings** to access the program settings. All settings are grouped into several sections, which functions are described in the following paragraphs. By selecting a section from the list, you can open a set of options.

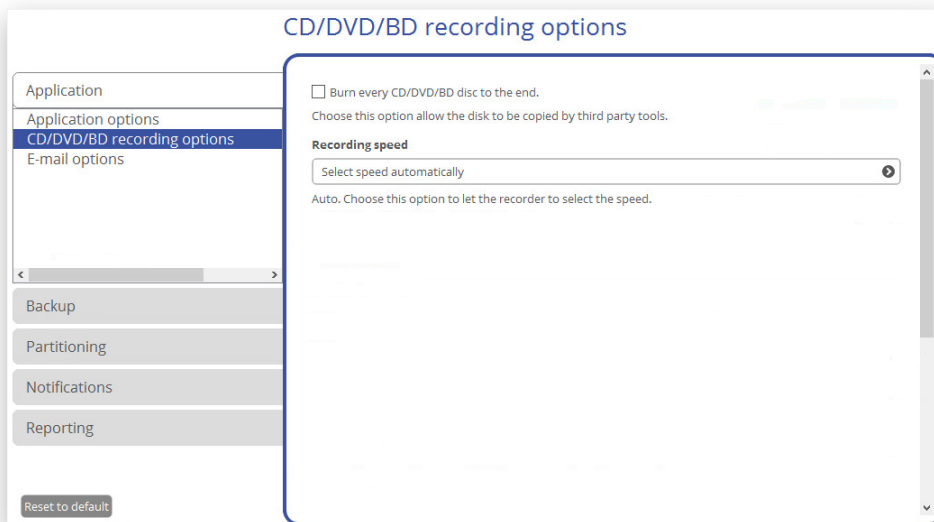
Application Section

Simulation Mode Options



- **Allow simulation mode** (enabled by default). The simulation mode is an effective way of protection from any troubles, since no potentially dangerous operation is executed until confirmation, thus giving you a second chance to weigh all pros and cons of this or that particular operation. For more details, please consult [Tools](#).
- **Close progress dialog automatically.** Mark the checkbox to automatically close the progress dialog after accomplishing operations.

CD/DVD/BD Recording Options



- **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.** Define how fast compact discs should be recorded (minimum, normal and maximum). Besides there is automatic mode when the program sets the most appropriate speed for each disc.

E-mail Options

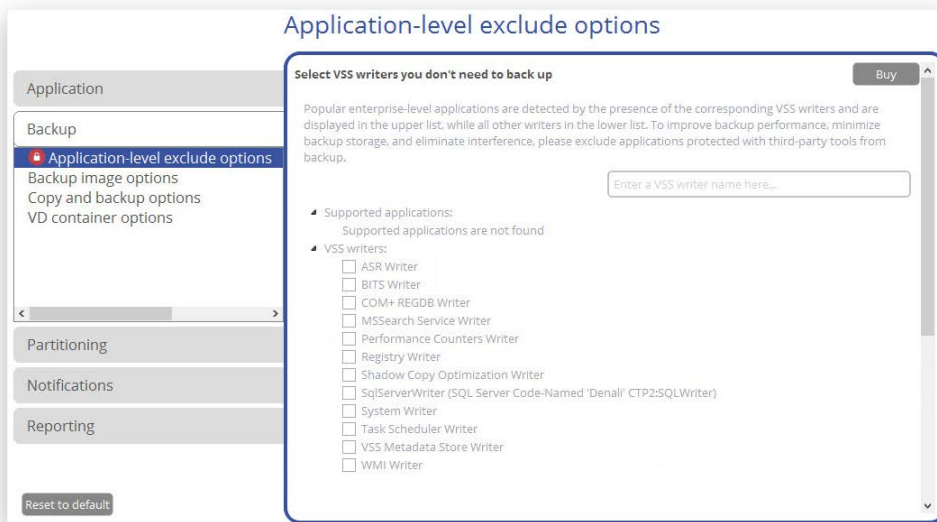
In this section you can set up e-mail transport for sending notifications and reports. Our e-mail client can well work with a private or corporate SMTP (Simple Mail Transfer Protocol) server, or one of public e-mail services. Please contact your network administrator or support of your e-mail service provider for detailed settings.

- **Outgoing mail server (SMTP).** All outgoing messages are first sent to this server, which then delivers them to recipients. The address may be represented as a traditional Internet host name (e.g.: smtp.gmail.com) or as an IP numeric address (e.g. xxx.xxx.xxx.xx).
- **SMTP port number.** Non-encrypted connections are usually established through port 25, while port 465 is used for SSL (Secure Socket Layer) connections.
- **Security options.** Our e-mail client supports non-encrypted, SSL and its successor TLS (Transport Layer Security) connections.
- **Login.** If your SMTP server requires authentication, select the corresponding option, then provide valid user credentials in the opened dialog.
- **Sender e-mail address.** Enter the e-mail address of the user from whom notifications and/or reports will be sent.

When you're done with the settings, enter a destination mailbox in the corresponding field, then click **Send** to check whether the e-mail transport is configured properly. You don't need to reply to the test email.

Backup Section

Application-level Exclude Options



Our program automatically detects supported enterprise-level applications deployed in the system by the presence of the corresponding VSS writers and displays them in the upper list. If a found application is being protected with a specially designed tool, please select it in the list to exclude from backup operations. This will help you to significantly improve backup performance of your Windows server, minimize backup storage, and eliminate interference.

Supported enterprise-level applications:

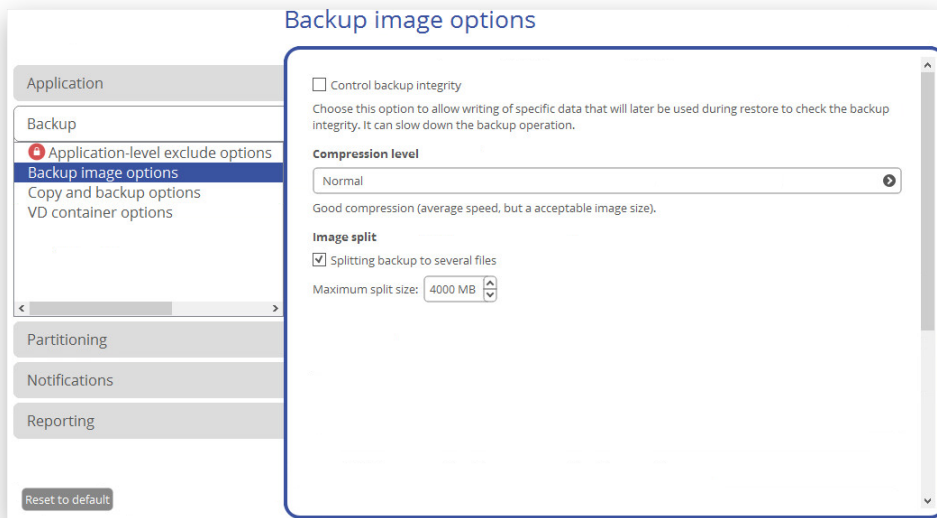
- MS Exchange
- MS SQL
- MS SharePoint
- MS Hyper-V
- VMware Server

Additionally, in the lower list you can see all other VSS writers running in the system for you to choose those you don't need to back up.



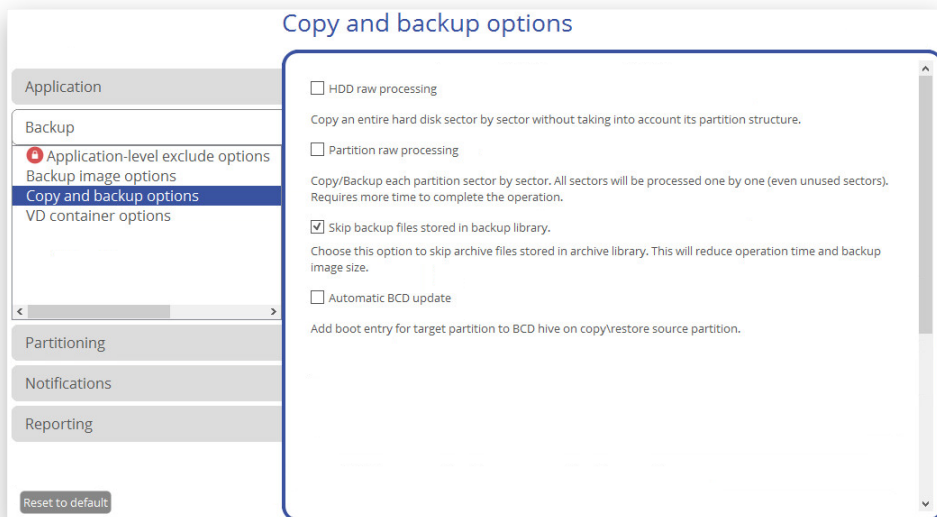
Windows OS may not run correctly after restore if you exclude system writers from backup.

Backup Image Options



- **Control backup integrity** (enabled by default). Use this option to make sure 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.
- **Compression level**. Select the default compression level for all created backup images from the pull-down list.
- **Image split**. By default, every backup image will be split to files of 4GB. This can help to avoid problems caused by a maximum file size limitation of your file system (e.g. 4GB for FAT32). Use the spinner control to set another size or disable this option if necessary.

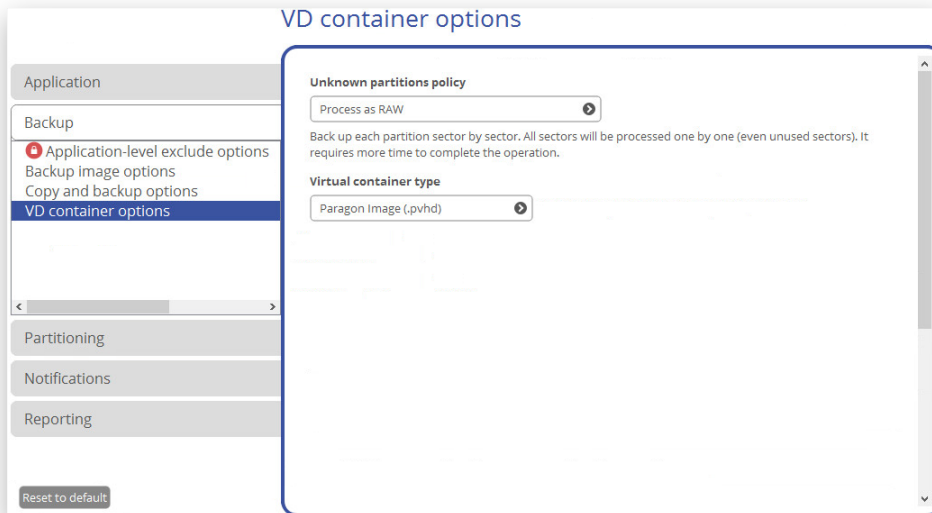
Copy and Backup Options



- **HDD raw processing**. Mark the checkbox to 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. If you enable this option, the operation will take more time to complete.
- **Partition raw processing**. Mark the checkbox to back up a partition in the sector-by-sector mode to successfully process unknown file systems. If you enable this option for processing supported file systems, the operation will take more time to complete.

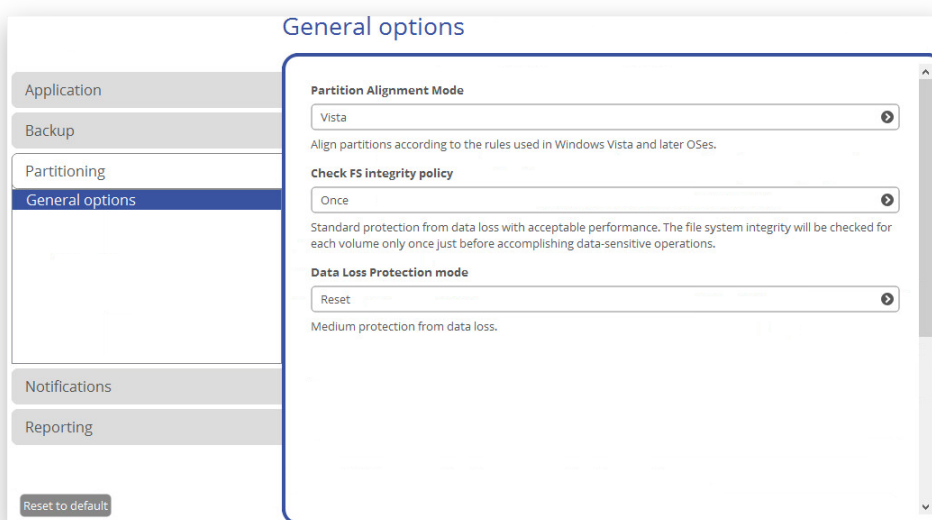
- **Skip backup files stored in backup library.** By default, backup images registered in the archive database will be skipped from processing, thus reducing the operation time and the resulted backup size.
- **Automatic BCD Update.** If necessary, unmark the checkbox to suppress automatic update of BCD (Boot Configuration Data) after copy/restore operations.

VD Container Options



- **Unknown partitions policy.** Here you can define behavior for processing unknown or unformatted partitions (skip from backup, process in the sector-by-sector mode, or ask the user each time this type of partition has been found).
- **Virtual container type.** By default, the program is configured to back up to pVHD (Paragon Virtual Hard Drive). Use this option to switch the resulted virtual container to VHD, VHDX, or VMDK. Please note that the use of pVHD enables to get full backup images several times smaller than the original objects, while incremental updates – dozens of times smaller when comparing to VHD, VHDX or VMDK, which have some fixed size of blocks, not dynamic. Besides encryption and password protection are only available for pVHD. However, if you're having a VMware or Microsoft hypervisor at your disposal and are planning to do instant virtualization, please make sure the used backup format matches your hypervisor.

Partitioning Section



- **Partition Alignment Mode.** There are three options you can choose from:

- **Legacy.** DOS and Windows operating systems 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 a 4K disk, each logical cluster is linked to two physical 4K clusters, which leads to double read-write operations.
- **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 disks.
- **Inheritance.** Select the option to disable the automatic partition alignment.
- **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.

Notifications Section

Credentials

Application
Backup
Partitioning
Notifications
Credentials
Reporting

Notification options

☒ MyParagon account Set credentials

Login: Login is not specified
Password: Password is not set

You must have a valid **MyParagon** account if you want to receive notifications. If you don't have it yet, please visit my.paragon-software.com for registration.

☐ SMTP Server Not configured

Please [configure SMTP options](#) if you'd like to receive e-mail notifications.
Please specify recipient e-mail addresses:

Enter recipient e-mail addresses using the Enter key as delimiter.

Reset to default

The program can be set up to notify you by email about successful completion and/or failure of most operations. Notifications are enabled on the last page of program wizards, while in this section you should specify the preferred e-mail transport, either MyParagon service or an SMTP server.

- The MyParagon service is the easiest option of getting things ready, as you only need to provide an email and password of a valid Paragon's account. This email address will be used as recipient to receive notifications. If you don't have an account yet, please create it by following the provided hyperlink.
- Getting notifications through an SMTP server offers more flexibility as you can specify several destination mailboxes, though its configuration might be a problem for novice users. Please consult [E-mail Options](#) for more details.



The MyParagon service doesn't support the e-mail reporting.

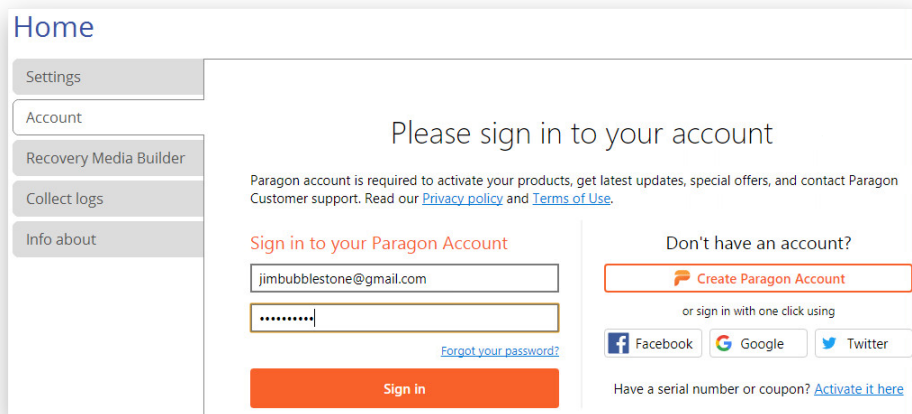
Reporting Section

In this section you can specify contents and properties of generated wipe reports. Reporting is enabled on the last page of the [Wipe Wizard](#).

- **Company name/Company address/User name.** Fill in these fields for easier report identification.
- **Report format.** Reports can be generated as PDF, HTML, or plain TXT files.
- **Report destination.** Reports can be stored locally or sent by e-mail. The e-mail reporting requires a properly configured SMTP transport. Please consult [E-mail Options](#) for more details.
- **Sector dump.** If required by your security regulations, use this option to additionally save contents of the first, middle, and last disk sectors as prove the wiping has been accomplished as planned.
- **Supervisor Approval.** Use this option to add a signature field for an executive or supervisor responsible for data sanitization procedures in your company.

Managing Account

1. Select **Home > Account**. In the opened dialog enter an email and password of your Paragon's account, then click **Sign in**. If you don't have an account yet, please create it by clicking the corresponding option. Alternatively, you can sign in with your Facebook, Google, or Twitter account.



2. If a success, you can see a list of registered products. Click **Activate on this computer** to enable paid features on the computer.



3. Use **Show details >** opposite a product to see the current activation status. If you need to activate your license on another computer, click **Release license** and then repeat [the activation procedure](#).



Building Recovery Media

The program includes a user-friendly wizard that will guide you through the process of creating a WinPE or Linux-based recovery media on a USB thumb drive or in an ISO file to later burn it to CD/DVD. For advanced users, there are capabilities to add drivers for specific hardware devices, configure network settings, and map network shares in the process.

1. Select **Home > Recovery Media Builder**.
2. The welcome page introduces the wizard's functionality. Besides you can see two options here:

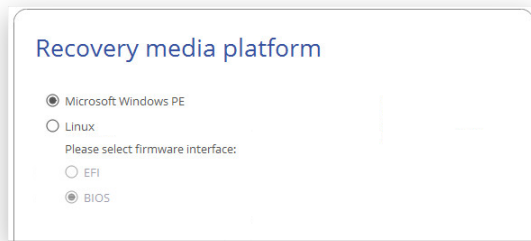


- **Advanced mode.** Please mark this option if you'd like the future bootable media to have pre-configured network settings, mapped network resources, or injected drivers for specific storage controllers or network cards.
- **Use ADK/WAIK.** Recovery Media Builder doesn't require Windows Assessment and Deployment Kit (ADK) or Automated Installation Kit (WAIK) to be installed in the system to build a WinPE-based environment, as it can directly use WIM image inside the operating system. However, some system builders remove this image from preinstalled Windows OS. If this is your case, mark the option to use **ADK/WAIK**. You will also need it to create an ISO image of the WinPE environment.

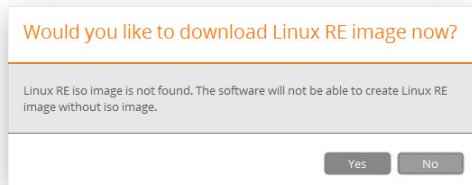


WAIK/ADK is a Microsoft's proprietary tool and can be obtained from its [Download Center](#) for free. Please note that you need a genuine Windows installation to be able to download this tool. Moreover you will need to download a version, which is suitable for your Windows OS – Recovery Media Builder automatically detects your system and offers [the required download link](#).

3. Select **Microsoft Windows PE**. As you can see on the screenshot there's no option to choose whether to build a 32-bit (BIOS mode) or 64-bit (UEFI mode) WinPE environment. For 64-bit systems there will be built 64-bit WinPE, while for 32-bit systems – 32-bit.

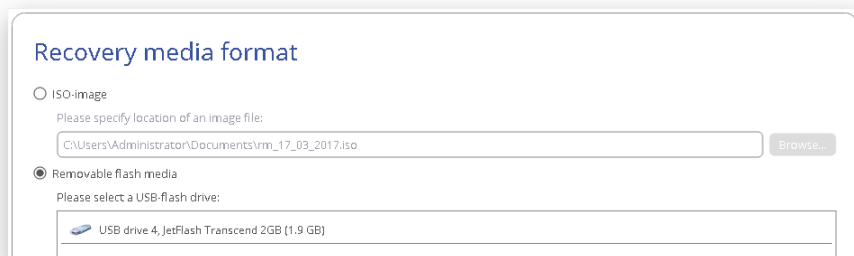


Please note that the Linux recovery image is not included into the installation package and should be downloaded separately. By selecting **Linux**, the wizard first prompts you to start the downloading. Click **Yes** to confirm.



If you select 'EFI', there will be created a 64-bit Linux environment, while 'BIOS' corresponds to 32-bit.

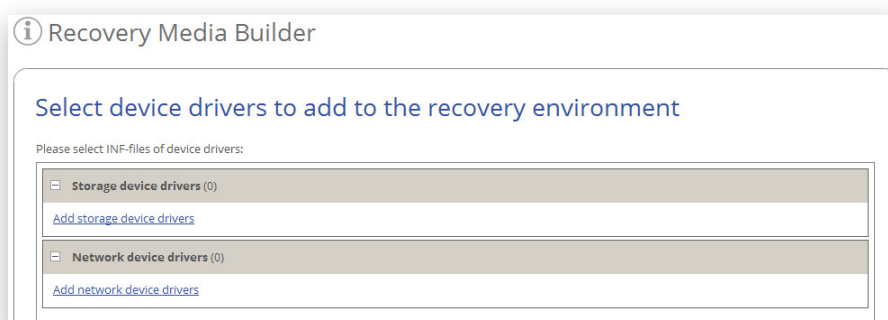
- Click on **Removable flash media**, then select a thumb drive of at least 512MB in size from the list of flash memory devices available in the system at the moment (if several). If you'd like to create an ISO image of the WinPE environment, please use the corresponding option.



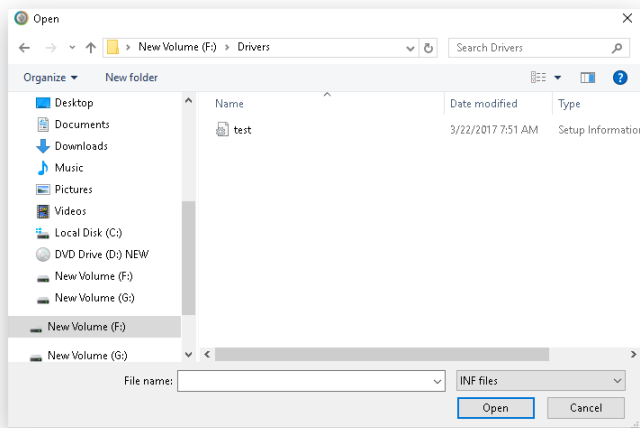
- If selecting a thumb drive, the wizard will warn you that all data on it will be deleted.

Additional steps of the advanced mode

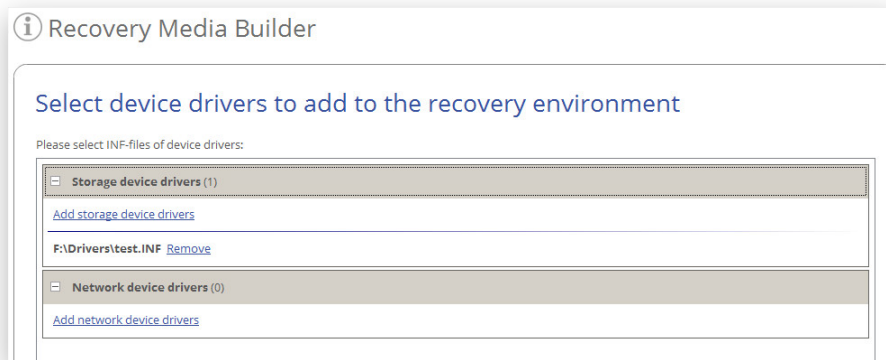
- Inject additional drivers for specific storage controllers or network cards. First click on the required link.



In the opened dialog browse for an .INF file of the required driver package located on a floppy disk, local disk, CD/DVD or a network share.



If successfully injected, you can see the specified driver on the list. If you'd like to add another driver, please repeat the procedure.



Recovery Media Builder can build 32-bit WinPE media configured to the uEFI mode, which is the only type compatible with Windows pads running on Intel Atom.



By default, WinPE environment doesn't support touch screens, thus Windows pads can only be managed by mouse and/or keyboard. You can add required drivers however through our driver injector.

7. Set up a network connection if needed. You've got several options to choose from:

Recovery Media Builder

Network configuration

☒ Connect to network automatically after the startup

☐ Detect network interface automatically

Network adapter to use: 1

☒ Obtain an IP-address from a DHCP server

☐ Specify an address

IP-address: . . .

Subnet mask: . . .

DNS address: . . .

☐ Connect to network manually after the startup

☐ Skip network adjustment

- **Connect to network automatically...** Specify the following parameters if you'd like to have an active network connection once the bootable environment has been started up:
 - **A network adapter to use.** Select a network adapter (if several in the system) to be used for the network connection.
 - **IP address settings.** Choose whether to get an IP address automatically from a DHCP server or set it manually.
- **Connect to network manually...** If selecting this option you will be prompted to configure network properties each time the computer has been started up from the bootable media.
- **Skip network adjustment.** Please use this option if you don't need network support on the bootable media.

8. Map a network share if needed. You've got several options to choose from:

Recovery Media Builder

Mount a network share

☒ Mount network share automatically after boot

Share: \\ServerShare\ Browse...

Login: xxxxxxxxxxxx

Password:

☐ Mount network share manually after boot

☐ Don't mount network share

- **Mount a network share automatically...** Mark this option if you'd like to have a mapped network resource once the computer has been started up from the bootable media. Manually type in a path to the required network share or click **Browse** to find it, then provide user credentials if necessary.

With no pre-defined user credentials your network share will be attempted to map under the Guest account.



Please use back slashes for WinPE-based media, like \\server\share, while for Linux – forward slashes, like //server/share.

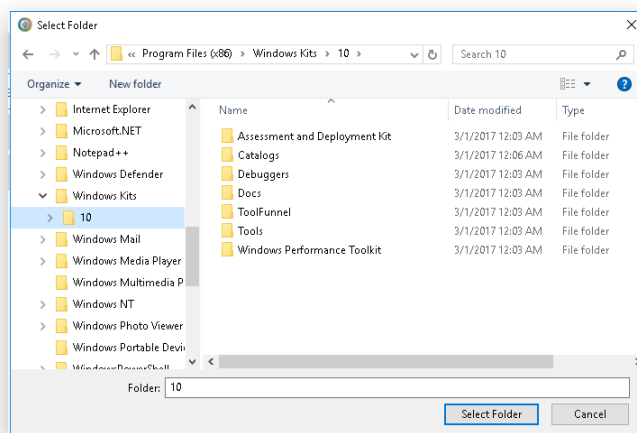
- **Mount a network share manually...** If selecting this option you will be prompted to map a network resource each time the computer has been started up from the bootable media.
- **Don't mount a network share.** Please use this option if you don't need to map network resources.

Additional steps if using WAIK/ADK

9. If you install WAIK or ADK by their default locations, the wizard automatically detects it. Otherwise, you will need to browse for the required folder. If you haven't installed one of these tools yet, click **Download WAIK/ADK** to get them directly from the Microsoft website.



Manually browsing for Windows OS kits:



The wizard won't continue until you install WAIK or ADK.



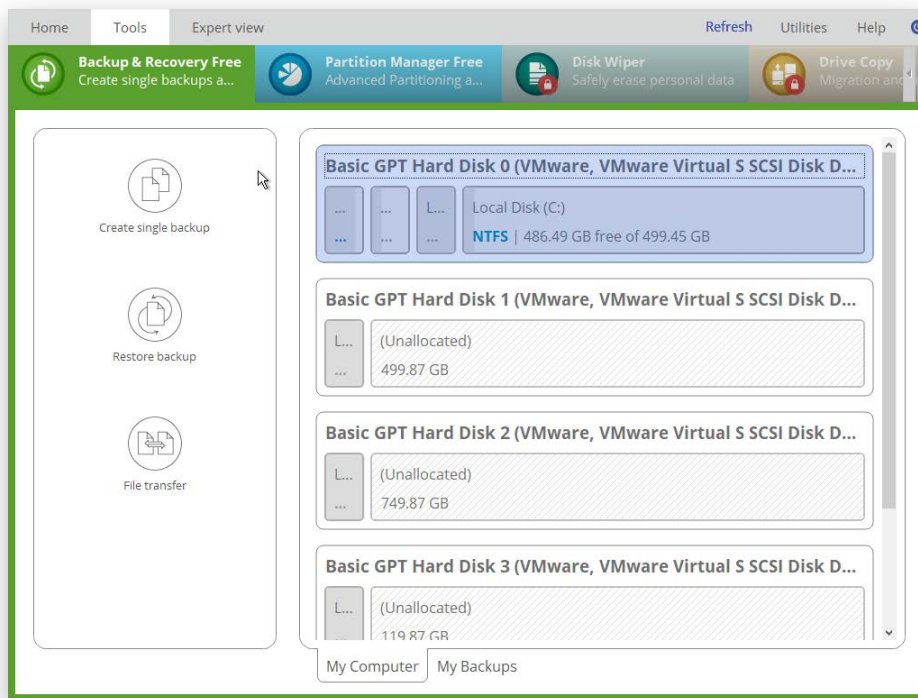
If running RMB under Windows 7, 8, 8.1, Server 2008 R2, Server 2012 R1/R2, please use ADK 8.1.

10. When done with all parameters, please confirm the operation to proceed.

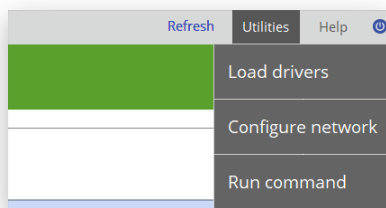
Booting from Recovery Media

The recovery media helps to boot your PC to load in an existing backup, secure important data, or rectify booting errors when Windows OS fails to start up.

1. Start up the computer from the prepared recovery media. To automatically boot from it, you should configure the on-board BIOS to start up from CD/USB first.
2. Once loaded, you will see the already familiar program interface, so please consult **First Start** for more details.



3. Additionally to the Windows wizards and dialogs, the recovery media includes several more utilities.



For more details, please consult the following chapters:

- [Fixing Boot Problems](#)
- [Adding Specific Drivers](#)
- [Configuring Network](#)
- [Using the Command Prompt](#)

4. Select an operation to start. If you have questions on how to use the program, please refer to the embedded help system, you can find in the right top corner of the window.

Protecting System and Data

Backup Scenarios

Configuring a One-shot Backup Task

The Create Single Backup Wizard allows you to create a point-in-time full backup image of entire disks, individual volumes or files. Full copies of disks and partitions help to secure your software environment, including the operating system, applications and data. This way, in case of emergency you will be able to recover your system to a working state within several minutes. But what if you need to back up a specific file or folder? Partition-level backup will surely protect the files you want, but it will also back up plenty of data you don't need, eating up time and backup storage. To solve this problem, the program also includes the file-level backup capabilities to protect the needed files like family pictures, favorite music, some project or document, or a financial report you're working on, while avoiding all the rest.

Backup data consistency at a specific point-in-time while OS or applications keep modifying data on disks is achieved by utilizing Microsoft Volume Shadow Copy Service that enables to quiesce a running machine, in other words to freeze its file system and to unlock files to be able to copy them to a backup location.

1. Open **Backup & Recovery** scope.
2. Select **Tools > Create single backup**, then click **Next** on the Welcome page of the wizard.
3. If necessary, edit the default backup name and description containing the current date and time.

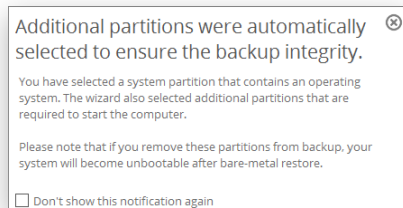
4. Initially the wizard prompts you to back up all available storage devices. If you don't need that, select the most suitable option on the left.

Disk / Partition

Left click an object(s) you'd like to back up.

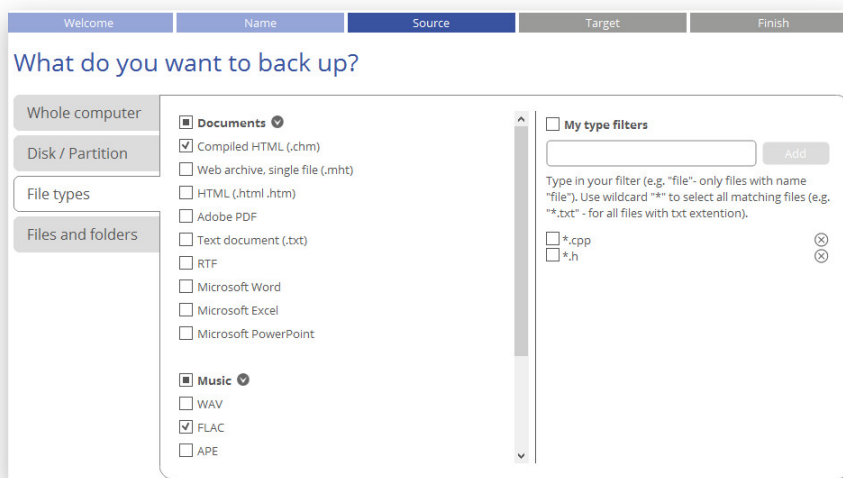
When selecting a volume that hosts Windows OS you may be warned that the wizard automatically selects another one that contains boot system files to ensure successful startup of the operating system after

restore. Though it's not recommended, you can use the Ctrl key to deselect any volume you consider unnecessary.



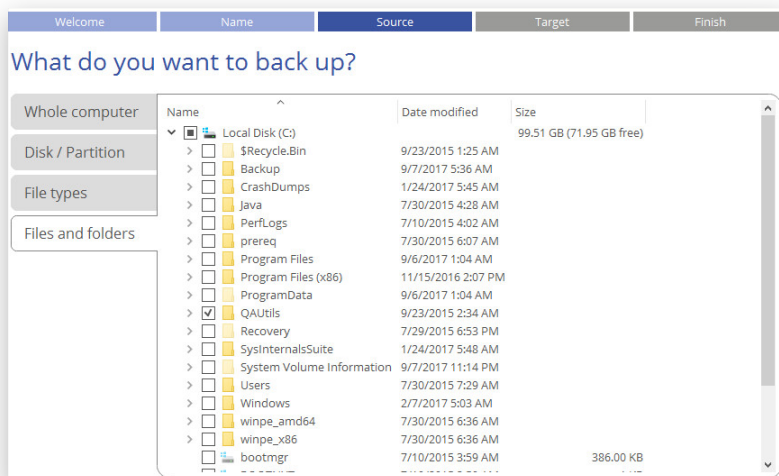
Types of files

The wizard includes three predefined categories containing file masks for popular document, music, and picture formats. Either select an entire category(ies) or use the arrow icon to expand it and choose a certain file mask(s). If you don't find the required mask, add your own through the **My type filters** option.



File and folders

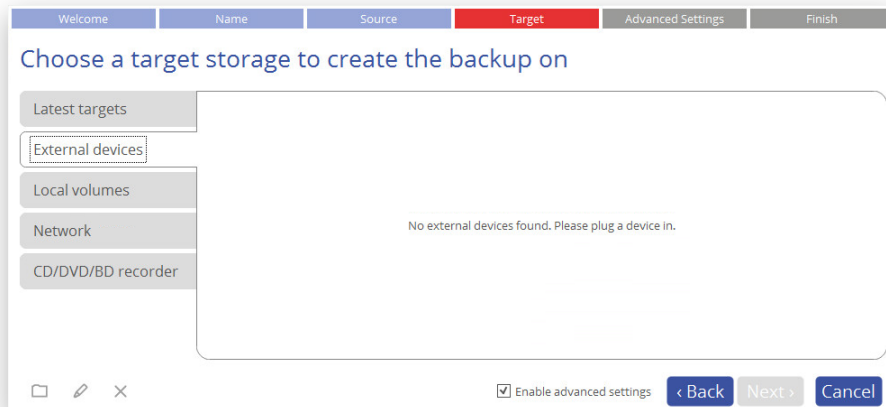
From a list of all partitions available in the system, mark a checkbox opposite a file, folder or even a whole partition to build up contents of the future backup image.



5. Specify location of the resulted backup image. If you'd like to exclude unimportant files from backup, enable password protection or set other advanced parameters, mark the corresponding checkbox and these options will get available later in the wizard.

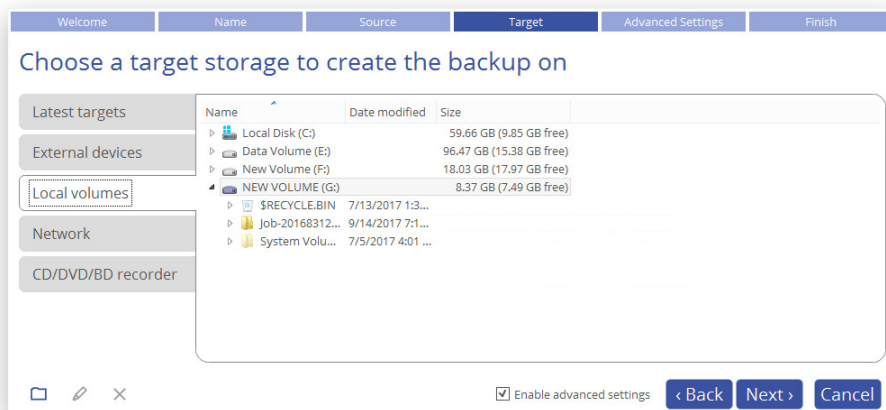
External devices

If you'd like to save it on an externally connected storage (hard disk, thumb drive, etc.), select **External devices**, then choose it from the list. If it's not present, please make sure it's available in the system, then try again.



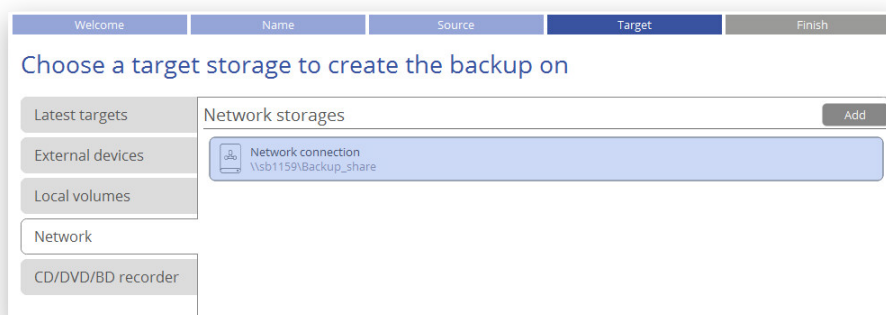
Local volumes

If you want to save it locally, select **Local volumes**, then browse to the target folder.



Network

If you're going to save it on a network share, select **Network > Add** to add a network share.



In the opened dialog edit the default connection name if necessary, then specify the required share by manually entering its location or through browsing the network, finally provide access credentials in the corresponding fields.

New network storage

Connection name
New Network connection

Connection path
\\sb035\\share Browse >>>

User name
sb035domain\\user

Password

Add Cancel

Once the connection is established, click on it to select and browse its contents. By using the corresponding options on the right you can edit or delete the connection.

Choose a target storage to create the backup on

Latest targets
External devices
Local volumes
Network
CD/DVD/BD recorder

Network storages Add

Name	Date modified	Size	Options:
\\sb1159\\Backup_share		645.30 GB (205.46 GB free)	Remove > Edit >
Job-20179735814	9/7/2017 4:03 ...		
New folder	9/7/2017 3:58 ...		
Storage	9/7/2017 3:58 ...		

CD/DVD/BD recorder

If you want to record it to CD/DVD/BD or create an ISO-image, select **CD/DVD/BD recorder**, then a recorder from the list of available devices.

Choose a target storage to create the backup on

Latest targets
External devices
Local volumes
Network
CD/DVD/BD recorder

Name	Disc types
NECVMWare VMWare IDE CDR10	CD-R/RW; DV...
Paragon CD Burner Emulator	CD-R/RW
Paragon DVD Burner Emulator	DVD+R/RW
Paragon DVD DL Burner Emulator	DVD+R/RW
Paragon BD Burner Emulator	BD-R/RE

☒ Enable advanced settings < Back Next > Cancel

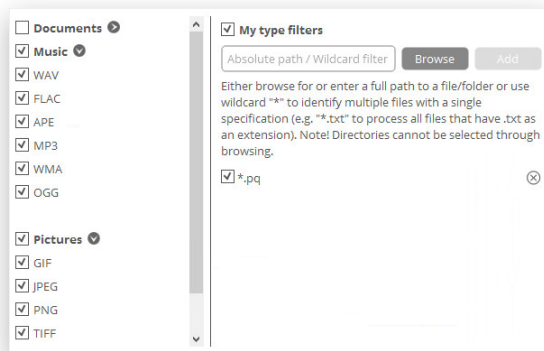
- At this step you can modify advanced backup settings, if the corresponding checkbox has been marked on the previous page of the wizard. Please note that all parameters set right here will be relevant for this backup task only.

- **Compression level.** Select the desired compression level from the pull-down list.
- **Image split.** By default, the created backup image will be split to files of 4GB. This can help to avoid problems caused by a maximum file size limitation of your file system (e.g. 4GB for FAT32). Use the spinner control to set another size or disable this option if necessary.
- **Password protection.** Specify a password and encryption algorithm to protect backup data from unauthorized access. Please note that this option becomes available when Paragon's container (.pvhd) is selected in [Home > Settings > VD container options](#).

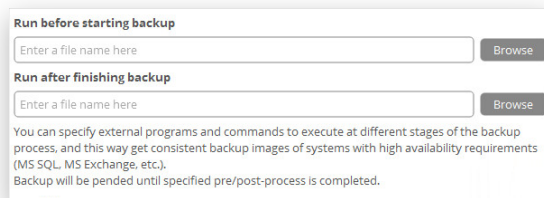
- **Expert settings.**
 - **Application-level excludes options.** If your computer hosts an enterprise-level application, supported by our program, and it is protected with a specially designed tool, please select it in the list to exclude from backup. This will help you to significantly improve backup performance, minimize backup storage, and eliminate interference. For more details, please consult [Application-level Exclude Options](#).

- **Backup exclude options.** Specify data you don't want to back up by either creating new or using existing exclude filters. The wizard includes several predefined categories containing file masks for popular document, music, video and picture formats. Either select an entire

category(ies) or use the arrow icon to expand it and choose a certain file mask(s). If you don't find the required mask, add your own through the **My type filters** option.



- **Run during backup options.** Specify external applications to execute at various phases of the backup process in order to obtain consistent backup images of systems with high availability requirements (MS SQL, MS Exchange, etc.). The point is to provide a coherent state of all open files and databases involved in a backup, taking into account that applications may still keep writing to disks.



- **Run before starting backup.** Specify an executable file (through browsing or typing a full path to it) that helps you to prepare running applications for backup. It may include specific commands/programs to delete unnecessary files, suspend services, flush transactions or caches, etc.
- **Run after finishing backup.** Specify an executable file to run after backup. It may include commands/programs to resume the previously suspended services, etc.

The program supports three types of executable files (.exe, .bat, .cmd). You can set parameters for your files directly from the line. However, if a file path contains word gaps, you need to enclose it in quotes in order to let the program distinguish between the path and the used parameters.

Requirements for batch files:

- All programs and commands must execute sequentially and finish before your .bat file completes its work.
- We recommend you to use external commands/programs in the following format - **Start/wait program.exe**. The wait option allows starting an application and waiting until it completes its work. This guarantees all included commands complete their execution before your .bat file does.

7. Review all parameters of the operation and modify them if necessary by going back to any of the required steps. If you'd like to be notified by email about successful completion and/or failure of this operation, mark the corresponding option and then select the required mode (the [e-mail transport](#) should be properly configured for this). Click **Finish** to start the backup process.

Finish the wizard

You have successfully completed the Create Single Backup Wizard. Please check the summary before starting the backup.

Backup summary

Backup name: Backup_20170908_0007
Source: Basic MBR Hard Disk 0 (VMware Virtual disk SCSI Disk Device)
Target: E:\

☒ Send e-mail notification about results of this operation
Send e-mail notifications about results of this operation to jimbubblestone@gmail.com. The recipient address is specified in Home > Settings > Notifications.

☒ Notify only on backup failure
☐ Notify on backup success and failure

< Back Finish Cancel

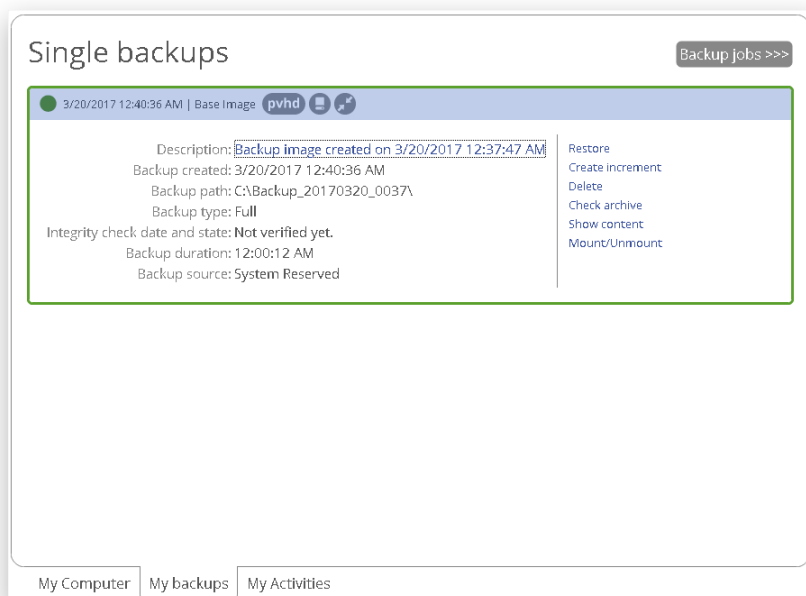
Creating an Incremental Update

After you get the first full backup image, we recommend you to do incremental updates regularly to keep the backup data up-to-date. An incremental backup only includes data changed since the time of creating the latest image in a chain, so it doesn't include data duplicates, which minimizes the backup storage footprint. Besides, incremental imaging allows having different time stamps of one and the same data.



If you need to regularly update backup data, you'd better use the Create Backup Job Wizard. For more details, please consult [Configuring a Regular Backup Routine](#).

1. Open **Backup & Recovery** scope.
2. Select **My Backups > Single backups>>>** to see all configured one-shot backup tasks. Left click a backup image to call a context-sensitive menu, then **Create increment**.



3. Change the default backup name, if necessary. Click **Create** to start the backup process.

Create incremental backup for "Base Image"?

Backup comment: Incremental backup for Base Image, created on 3/20/2017

Create No

Configuring a Regular Backup Routine

If you develop a specific project on a day-to-day basis and have to make a backup every evening so as not to lose the progress of your efforts, backup automation is a must. Besides, the backup automation enables to optimally utilize resources of your PC by scheduling backup tasks during off hours or whenever the computer has the least work-load to perform.

Paragon's technicians recommend you to configure regular backup jobs instead of one-short backup tasks to minimize negative aftereffects in case of emergency. The Create Backup Job Wizard will help in this process. The three predefined backup strategies should fill the needs of any home user. For advances users there's a way to create comprehensive backup policies that utilize full, incremental, and differential backup methods and their combinations, where backup runs can be scheduled from every hour till certain days of the month, or evoked by a certain event (system start or user logon).

1. Open **Backup & Recovery** scope.
2. Select **Tools > Create backup job**, then click **Next** on the Welcome page of the wizard.
3. If necessary, edit the default backup name and description containing the current date and time.

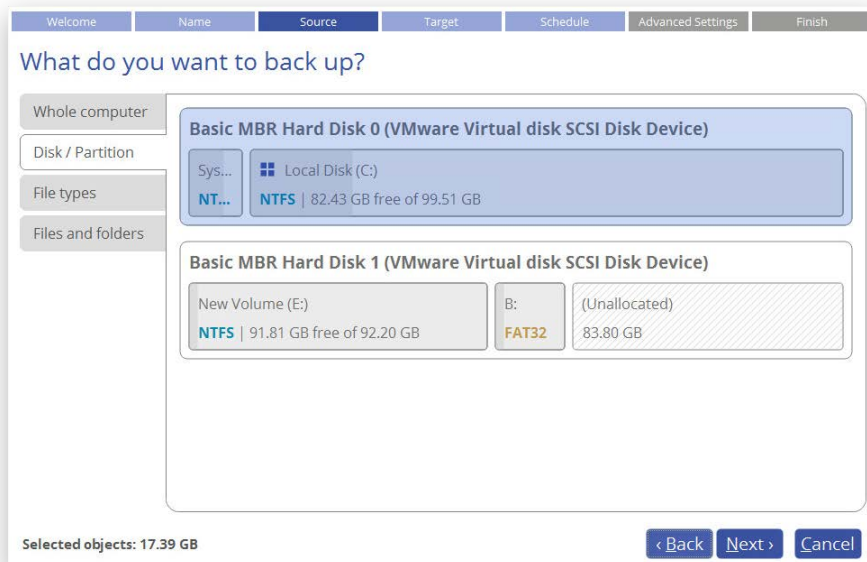
Welcome Name Source Target Schedule Finish

Enter a job name and description

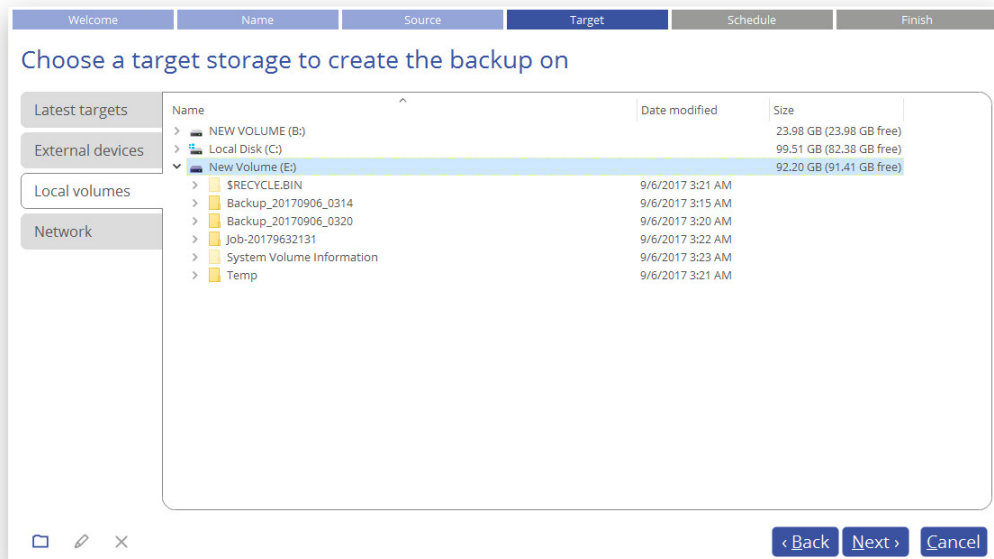
Backup job name:
Backup job for W100W64-01-95

Description:
Backup job created on 9/6/2017 2:17 AM for W100W64-01-95

4. Initially the wizard prompts you to back up all available storage devices. If you don't need that, select the most suitable option on the left, then required objects. For more details, please consult [the previous scenario](#).



- Specify location of future backup images (local or external storage, or a network share). For more details, please consult [the previous scenario](#).



- Select one the predefined backup strategies recommended by Paragon's technicians, then adjust it to your needs. If you'd like to exclude unimportant files from backup, enable password protection or set other advanced parameters, mark the corresponding checkbox and these options will get available later in the wizard.



In the current version of the product you're not allowed to modify all parameters of the selected backup strategy during configuration of a backup job. However, you can do it later when editing. For more details, please consult [Managing Backup Jobs](#).

Daily Backup

The daily backup is a necessity when it comes to protecting valuable information that keeps changing constantly, for example some project or document, or a financial report you're working on every day. The

main rule here is the more valuable the data, the more frequent backups are required. For production environments like SQL Server or Exchange Server, where multiple transactions occur every second, the optimal interval between backups is about 30 minutes. By reducing it even further you risk to heavily overload the entire infrastructure. For home users it is the daily backup that is considered optimal.

The screenshot shows a window titled 'List of strategies' with tabs for Welcome, Name, Source, Target, Schedule, and Advanced Settings. The 'Daily Backup' strategy is selected. A description states: 'Use this strategy. If you intend to backup your computer on a daily base. This strategy will create 6 incremental backup after the full backup. If you have activated the retention you can keep at least the latest 7 backups. Older backups will be deleted.' The settings are as follows:

- Run time: 2:18
- When: Every day
- Backup type: Full, then 6 increments (visualized with a circle and 6 dots)
- Retention: Keep at least the latest 7 backups (with an 'Enable' link)
- Options: Prevent from going into sleep / hibernate (with an 'Edit >' link)

At the bottom, there is a 'New strategy' button, a checkbox for 'Enable advanced settings', and navigation buttons '< Back', 'Next >', and 'Cancel'.

- The main parameter you need to set is time you believe most convenient for backup, e.g. at night or early in the morning.
- To keep data precisely up to date with minimal time and backup storage footprint, we recommend a seven-day backup cycle of one full backup image followed by six incremental updates. To avoid the situation when backup data eats up the entire storage space, we also suggest enabling a retention policy that will only keep seven latest restore points.
- Finally, there are several auxiliary options you can use to tune up the backup job. Click **Edit >** to see them and adjust. Use the question mark next to the required option to get more details.

The 'Options' dialog box contains the following settings:

- ☒ Prevent from going into sleep / hibernate ?
- ☐ Wake up from sleep / hibernate ?
- ☐ Shutdown system after the backup complete ?
- ☒ Launch missed scheduled run as soon as possible ?

Buttons: Save, Cancel

On demand Backup

The on demand backup begins immediately without waiting for a schedule to run. It only produces full images. This type of backup might be useful before applying OS patches or installing some new software. It's similar to a one-shot backup operation, but additionally includes a simple backup data retention policy that keeps one latest backup on the storage (off by default).

Welcome | Name | Source | Target | **Schedule** | Finish

List of strategies

Select this strategy, if you wish to determine the execution time manually. Backup jobs will not automatically process. Only full backups will be created.

Daily Backup

On demand Backup

Weekly Backup

One Backup

Run time: 1:33

When: Schedule later

Backup type: Full backups only

Retention: Keep one backup only [Enable](#)

Options: Prevent from going into sleep / hibernate [Edit >](#)

[New strategy](#) ☐ Enable advanced settings [< Back](#) [Next >](#) [Cancel](#)

- To avoid the situation when backup data eats up the entire storage space, we suggest enabling a retention policy that will only keep one latest restore point.
- There are several auxiliary options you can use to tune up the backup job. Click **Edit >** to see them and adjust. Use the question mark next to the required option to get more details.

Weekly Backup

As you guess, the weekly backup comes into play when your data is not changed very often. Obviously, there's no need to back up your music collection on a daily basis, as in most cases losing the latest album won't be a huge disaster. Thus we recommend this backup strategy for protecting non-critical data when rollback to a state that took place a week ago works fine for you.

Welcome | Name | Source | Target | **Schedule** | **Advanced Settings** |

List of strategies

Use this strategy, if you intend to backup your computer on a weekly base. This strategy will only create full backups. If you have activated the retention you can keep at least the latest 3 backups. Older backups will be deleted.

Daily Backup

On demand Backup

Weekly Backup

One Backup

Run time and day: 2:18 Sun

When: Every week | every Sun

Backup type: Full backups only

Retention: Keep at least the latest 3 backups [Enable](#)

Options: Prevent from going into sleep / hibernate [Edit >](#)

[New strategy](#) ☒ Enable advanced settings [< Back](#) [Next >](#) [Cancel](#)

- The main parameters you need to set is time and day of week you believe most convenient for backup, e.g. at Sunday nights.
- We consider the use of the incremental imaging on a weekly basis not optimal, as the amount of data changes may be so huge, so it can nullify primary benefits of this backup method, i.e. small backup times and image files. Furthermore, restore from this incremental chain may be time-consuming. Thus

we recommend it to create full backup images only. To avoid the situation when backup data eats up the entire storage space, we also suggest enabling a retention policy that will only keep three latest restore points.

- Finally, there are several auxiliary options you can use to tune up the backup job. Click **Edit >** to see them and adjust. Use the exclamation mark next to the required option to get more details.

One Backup

This backup strategy is daily-based, but only produces and keeps one full backup image on the storage. We suggest using it if you don't need to have several restore points that reflect various time stamps of your data and prefer an external storage device as backup media.

Welcome | Name | Source | Target | **Schedule** | Advanced Settings

List of strategies

Daily Backup
 On demand Backup
 Weekly Backup
One Backup

Use this strategy, if you intend to backup your computer on a daily base. The new backup will replace the old backup every day.

Run time: 2:18

When: Every day

Backup type: Full backups only

Retention: Keep one backup only [Disable](#)

Options: Prevent from going into sleep / hibernate [Edit >](#)

New strategy
 ☒ Enable advanced settings
 < Back
 Next >
 Cancel

- The main parameter you need to set is time you believe most convenient for backup.
- To avoid the situation when backup data eats up the entire storage space, we also suggest enabling a retention policy that will only keep the latest restore point.

New strategy

Click **New strategy** to create your own backup policy that utilizes full, incremental, and differential backup methods and their combinations, where backup runs can be scheduled from every hour till certain days of the month, or evoked by a certain event (system start, user logon). For more details, please consult

[Managing Backup Jobs](#).

7. At this step you can modify advanced backup settings, if the corresponding checkbox has been marked on the previous page of the wizard. Please note that all parameters set right here will be relevant for this backup task only. For more details, please consult [Configuring a One-shot Backup Task](#).

8. Review all parameters of the operation and modify them if necessary by going back to any of the previous steps. When ready, click **Finish** to complete the wizard.

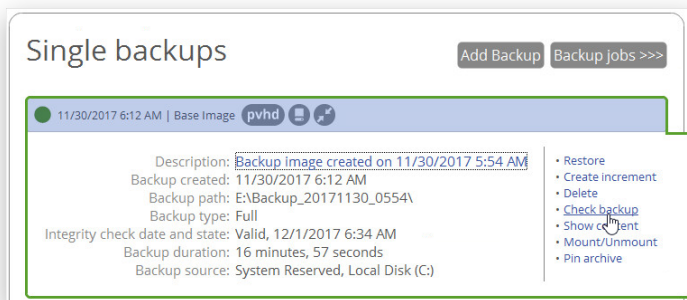
- If you'd like to force creation of the first backup image after completing the wizard, mark the **Create initial backup now** option.
- If you'd like to be notified by email about successful completion and/or failure of this operation, mark the corresponding option and then select the required mode (the [e-mail transport](#) should be properly configured for this).

- To allow the scheduled backup tasks while a non-admin user is logged in, specify administrative credentials by marking the corresponding option.

Checking Backup Integrity

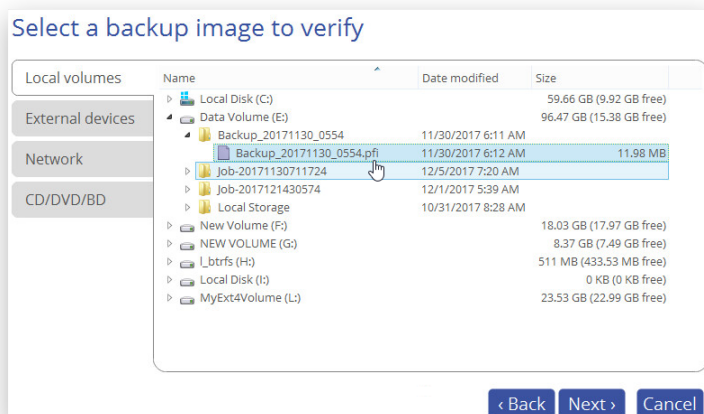
Unfortunately, backup media may fail at any moment. You can't predict when this will happen, but you can be certain it will. We suggest verifying integrity of backup images on a regular basis to make sure of their ongoing viability.

Any pVHD-based backup listed on **My Backups** tab can be verified for errors by clicking on it, then selecting **Check backup** in the opened context-sensitive menu.



There's also a separate wizard that helps you to check pVHD containers and legacy PBF images created by previous versions of our product.

1. Open **Backup & Recovery** scope.
2. Select **Tools > Verify backup**, then click **Next** on the Welcome page of the wizard.
3. Browse for the required backup image file (pVHD or PBF) or index file (PFI), then click **Next** to start the operation, which takes a couple of minutes.





Only pVHD containers and legacy PBF images are available to check at the moment.

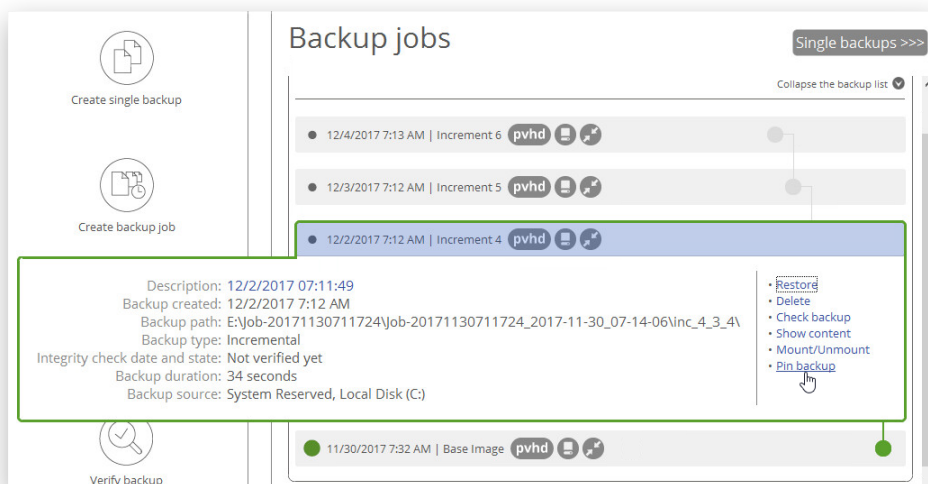
Pinning Backup

By pinning a backup image, you protect backup data it contains from both accidental and planned deletion caused by backup storage retention.

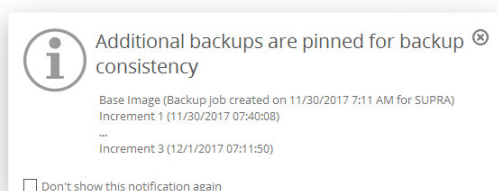
Key peculiarities:

- Pinning is only available for restore points created by regular backup jobs.
- If you pin an incremental update, the initial full image and all increments between in the corresponding chain will be pinned as well.
- If you pin a differential update, the initial full image will be pinned as well.
- If you delete a backup job with pinned restore points, they will not be deleted, but moved to the **Single backups** view.

1. Open **Backup & Recovery** scope.
2. Select **My Backups > Backup jobs>>>** to see configured regular backup routines. Left click a restore point of the required job to call a context-sensitive menu, then **Pin backup**.



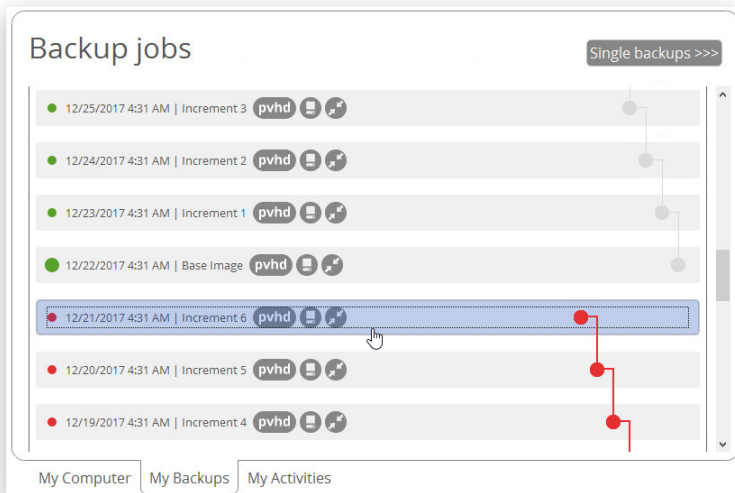
3. If the selected backup requires additional backup elements for restore, all these images will be pinned as well, acquiring the dependent backup icon.



4. Use the same algorithm to unpin the backup when not required any more.

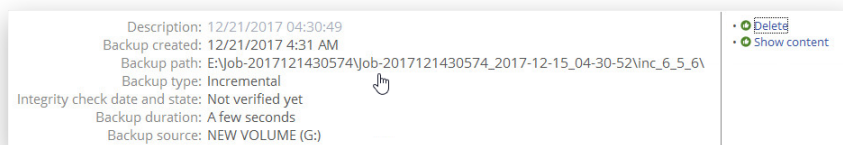
Repairing Corrupted Backup

If one of your backup images (entire backup chain) is marked with the red circle in **My Backups** view, then this backup is corrupted and cannot be restored until repaired.



This problem can have different reasons, those that can be fixed and those that cannot. You can try the following actions for repairing corrupted backup data:

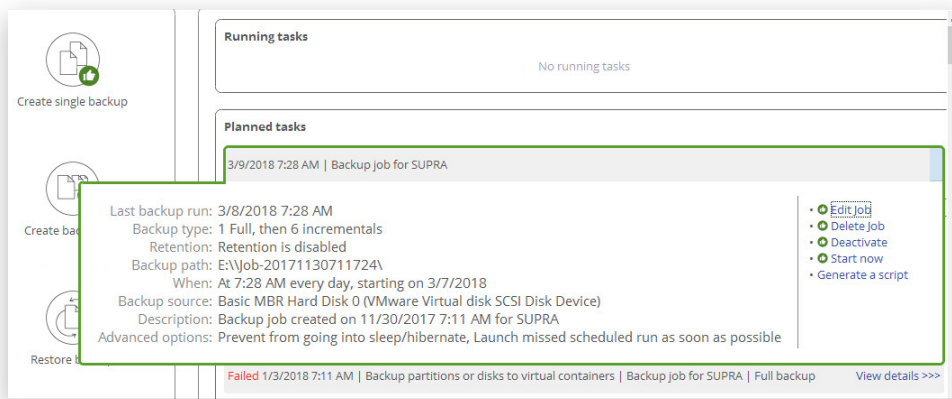
1. Click **Refresh** to force obtaining the update status on all backup data files. If the program finds a missing backup index file (.pfi) during this action, it is rebuilt automatically.
2. Left click a corrupted backup image to see where it's resided and then check that the corresponding folder exists by this path and contains the index (.pfi) and backup container (.pvhd or .vhd, vxdx, .vmdk) files.



- If the backup files are missing by the given path (you or Windows OS may have changed disk drive letter, or you may have moved this folder manually to another location), then add it back to the archive database. For more details, please consult [Adding a Backup Image](#).
- If the backup files are available by the given path, maybe the problem is in a corrupted index file (.pfi). Please delete it, then click **Refresh**. If it still doesn't help, this means one or several backup container files are damaged. The only way out is to create a new backup image.

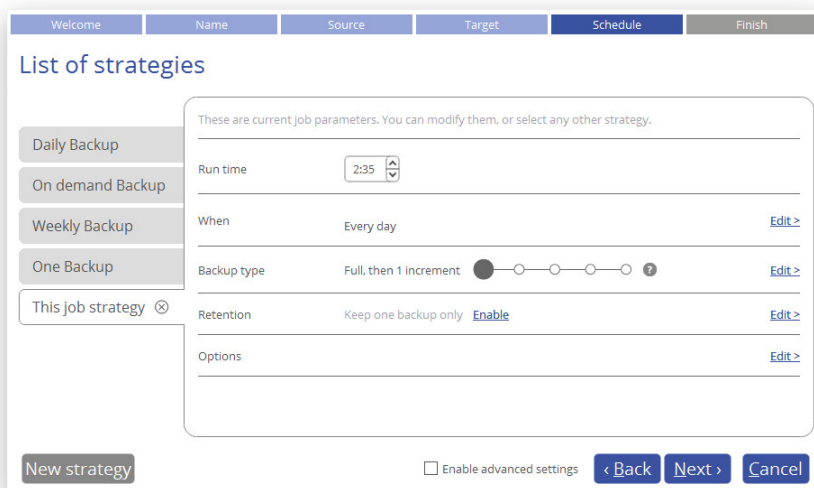
Managing Backup Jobs

1. Open **Backup & Recovery** scope.
2. Select **My Activities** or **My Backups**, then left click any of the planned backup jobs to call a context-sensitive menu with detailed information on the selected object and a list of available operations.

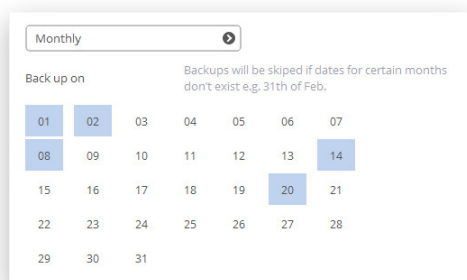
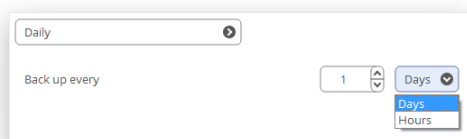


3. Select the required operation from the list:

- **Edit Job.** While being able to only specify the basic parameters during [creation of the backup job](#), right now you're allowed to change every single option of the specified backup strategy by using the **Edit>** link.



- **When.** Backup runs can be scheduled from every hour till certain days of the month.



Furthermore, you can choose a certain backup trigger event (system start or user login). If necessary, you can also disable the schedule.

On event

- ☒ Back up at system start
- ☐ Back up at user logon

- **Backup Type.** The program supports full, incremental and differential sector-level backup imaging and their combinations, which opens a way to create comprehensive backup policies to suit your needs at best. Below you can find some details on each backup type to help you make the right choice.

Change the backup strategy

Name / Description	When
Backup type	<input type="radio"/> Full backup Select this option to make only full images of the disks and/or partitions you select. You will be able to determine the number of full images you will retain.
Retention	<input checked="" type="radio"/> Full and incremental backup Number of increments until next full backup: 1
Options	<input type="radio"/> Full and differential backup Number of differentials until next full backup: 1

A full backup image includes all contents of the specified backup objects (all system hard disks, one or several partitions or disks) 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 time stamps of the same data, unchanged data will inevitably be duplicated in all images, thus taking additional space on backup media.

As an attempt to solve this problem, there has been developed a supplementary method called a differential backup. Containing only data changed since the time of creating a full or parental backup image it enables to considerably save your system resources. It is achieved by the exact bit-wise comparison of the previous data (saved in the parental image) with the current data (the backup object itself). Unfortunately, this type of backup doesn't help to avoid data duplicates inside several differentials based on one parental image. Thus if you're planning to keep two or more restore points, take a closer look at the incremental imaging.

Unlike differentials, an incremental backup only includes data changed since the time of creating the latest image in a chain, either full or incremental. In general, this type of backup is great except for one thing – restore of an incremental backup requires processing the initial full image and all increments between, which depending on the size of your backup chain may take plenty of time, while restore of a differential backup always involves two objects – one differential and its parental.

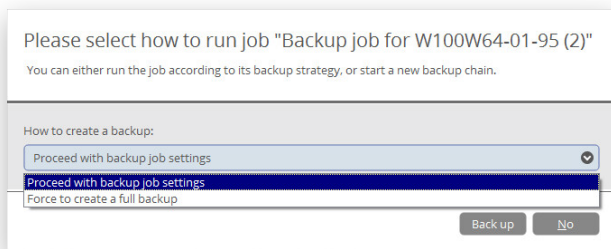
- **Retention.** To avoid the situation when backup data eats up the entire storage space, we also suggest enabling a retention policy to automatically get rid of obsolete restore points.

Change the backup strategy

Name / Description	When
Backup type	<input checked="" type="checkbox"/> Enable retention <input checked="" type="radio"/> Define a minimum number of backups to keep: 7
Retention	<input type="radio"/> Define the number of days to keep backups: 1 <input type="radio"/> Automatically delete backups when target disk is full

You can choose from the three data retention policies:

- Keep a certain number of backup images,
 - Keep all backup images created during a certain number of days,
 - Delete an entire backup chain when the storage runs out of space.
- **Delete Job** to delete the backup job.
 - **Deactivate** to stop the ongoing backup operation.
 - **Start now** to force creation of the next backup image, either incremental or full, which depends on the used backup strategy. By selecting the corresponding option you may force out-of-turn full backup, thus starting a new backup chain.



- **Generate script** to make a program script out of the backup job to run it later from the command prompt. For more details, please consult [Using the Command Prompt](#).

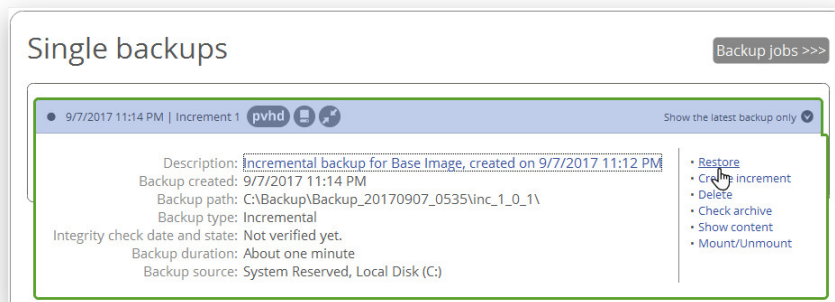


To learn more about scripts, please consult the Paragon Scripting Language manual.

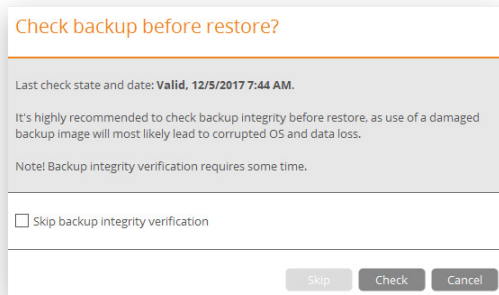
Windows Restore Scenarios

Restoring Individual Files and Folders

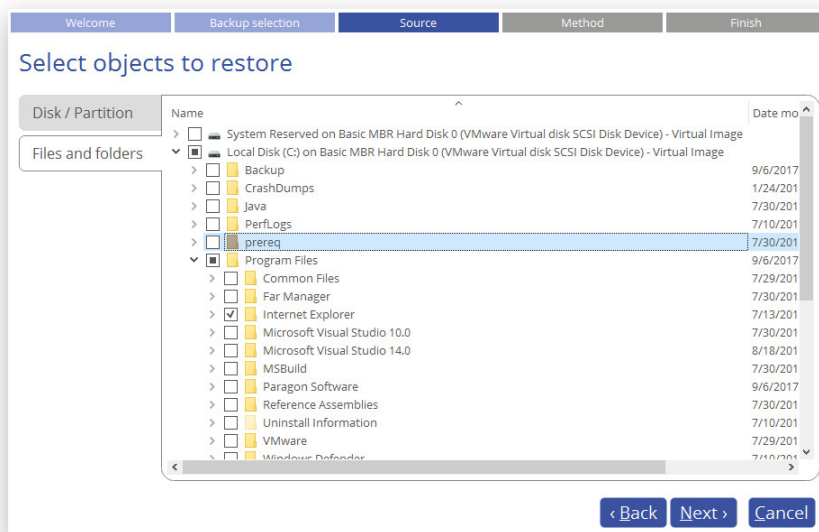
1. Open **Backup & Recovery** scope.
2. Select **My Backups > Single backups>>>** to see all configured one-shot backup tasks or **My Backups > Backup jobs>>>** to see configured regular backup routines. Left click a backup image to call a context-sensitive menu, then **Restore**.



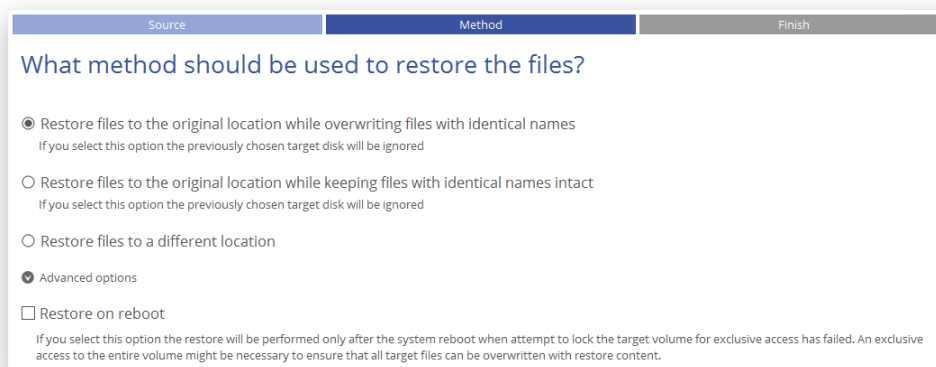
3. You will be prompted to check the selected backup for errors (recommended). Mark the corresponding option to skip this action if you're sure in its viability.



4. Select **Files and Folders**, then browse the backup image to specify what you need to extract by marking checkboxes next to the required data items.



5. Choose a way the selected data will be restored, either to original location by replacing files with identical names, to original location non-destructively, thus keeping two versions of files with the same names, or to a different location. The latter option requires setting a restore path.



Restore to the original location with overwriting existing files requires exclusive access rights to the entire target volume. By default, if the target volume cannot be locked, our program ends this type of operation with a corresponding error.

Click 'Advanced options > Restore on reboot' to allow restore in a special boot-time mode, when the volume lock is not possible.

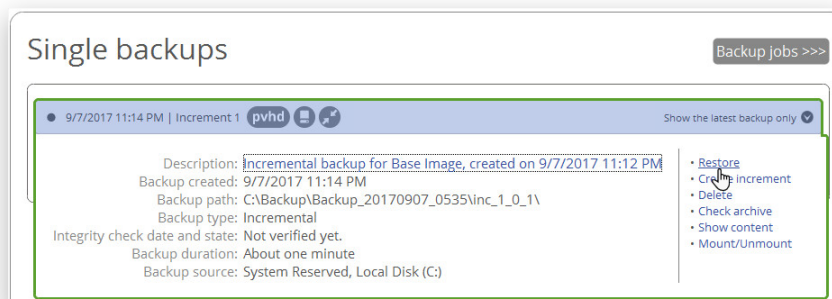
- Choose whether to execute the operation immediately after finishing the wizard, set up another restore operation(s) and then run all at once, or [generate a program script for later execution](#). If you'd like to be notified by email about successful completion and/or failure of this operation, mark the corresponding option and then select the required mode. Please make sure [the email recipient is specified](#). Click **Finish** to initiate the operation.

If selecting files with security attributes that cannot be restored at file-level correctly, the wizard will prompt you to restore the corresponding volume entirely.

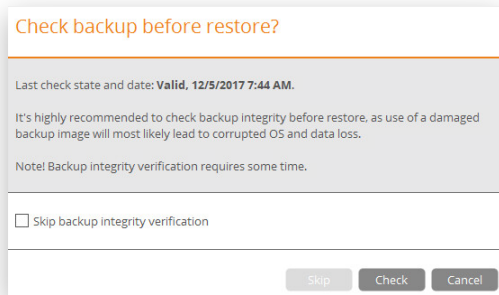


Restoring an Entire Disk or Separate Volumes

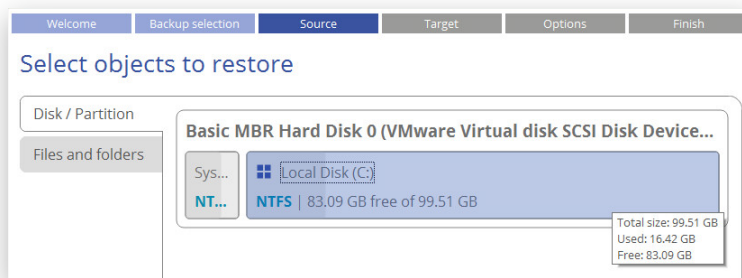
- Open **Backup & Recovery** scope.
- Select **My Backups > Single backups>>>** to see all configured one-shot backup tasks or **My Backups > Backup jobs>>>** to see configured regular backup routines. Left click a backup image to call a context-sensitive menu, then **Restore**.



- You will be prompted to check the selected backup for errors (recommended). Mark the corresponding option to skip this action if you're sure in its viability.



- Initially the wizard prompts you to specify an entire backup image or individual volumes or disks for restore – that's exactly what we need.



- The program offers to restore the selected backup object exactly where it belongs. However, you can choose any disk of enough capacity available in your system.



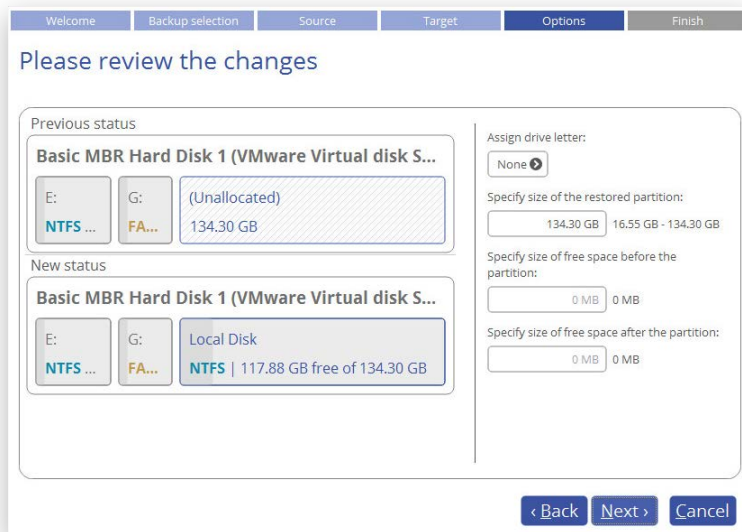
You will get a corresponding warning when trying to rewrite a bootable partition.

- Next you can see the resulted disk layout. If necessary, specify a number of additional parameters (depends on the selected backup object).

Restoring a partition

Change size of the partition and its location as well as assign a particular drive letter. If you've got to do with a 64-bit Windows configured to the uEFI boot mode, the Switch EFI to boot from destination drive

option will become available for you to define what instance of Windows OS you'd like to boot from once the operation is over. Anyway you can specify a bootable device at any time through Boot Corrector.



Restoring a disk

If attempting to restore to a larger disk, use the corresponding option to resize on-disk partitions proportionally to occupy the entire target disk.

The program also provides you the option to preserve the original Disk Identifier (also Disk ID or Disk Signature) during restore. A Disk Identifier is a four-byte long number, randomly generated and written to the first disk sector during creation of the Master Boot Record. Windows OS since Vista uses disk signatures for location of boot devices in Boot Configuration Database (BCD), which stores information on boot critical files and settings. Windows requires the signatures to be unique, so if you try to connect a disk that has the same signature as the already connected storage device, Windows keeps this disk in offline mode and refuses to assign drive letters to its volumes – this problem is known as disk signature collision. This is why it is not recommended to preserve the original disk ID during restore, as in most cases it doesn't affect anything. For Windows Embedded and similar installations however, the change of the disk signature renders Windows OS completely unbootable, because these systems are linked to it.

Having protection against the disk signature collision, our program doesn't let you restore contents of a disk to another disk and keep the disk ID unchanged when the original disk is mounted. To accomplish this scenario, you should either disconnect the original disk or make it offline in the Windows Disk Management utility. If this disk hosts a running Windows OS, then you have to use [the WinPE recovery media](#).

For more details, please consult the following resources:

- <https://www.logicsupply.com/explore/io-hub/windows-embedded-matter-now/>
- <https://blogs.technet.microsoft.com/markrussinovich/2011/11/06/fixing-disk-signature-collisions/>

Please review the changes

Previous status

Basic MBR Hard Disk 1 (VMware Virtual disk SCSI D...)

E: NTFS | ... G: (Unallocated) 134.30 GB

New status

Basic MBR Hard Disk 1 (VMware Virtual disk SCSI D...)

Sys... NTFS | ... Local Disk NTFS | 83.09 GB free o... (Unallocated) 100.00 GB

☒ Resize proportionally
☒ Restore unique disk ID

- Choose whether to execute the operation immediately after finishing the wizard, set up another restore operation(s) and then run all at once, or [generate a program script for later execution](#). If you'd like to be notified by email about successful completion and/or failure of this operation, mark the corresponding option and then select the required mode. Please make sure [the email recipient is specified](#). Click **Finish** to initiate the operation.

How would you like to proceed?

☒ Restore now
 Select this option to perform the restore operation on your computer physically right now.

☐ Restore another disk or partition
 Select this option to restore more than one disk or partition at the same time.

☐ Generate a script
 Select this option to create a script for this restore task.

☐ Send e-mail notification about results of this operation

Restore operations:

Restore disk 0 from image "Backup_20170907_0535.pfi" to disk 1

< Back Finish Cancel

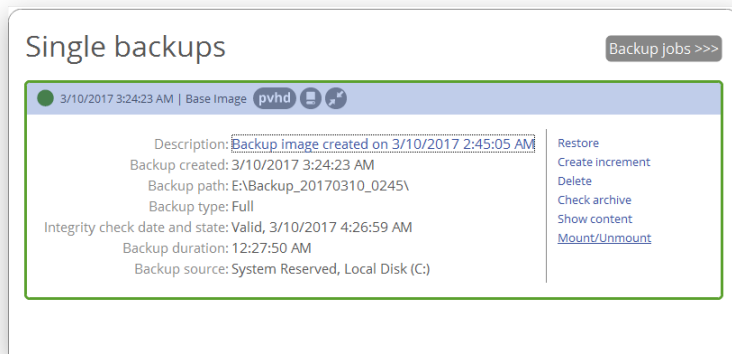
Mounting a Backup Image

You can assign a drive letter to any partition inside an existing backup image. As a result of the operation you will get a new partition in the system to easily browse through its contents and copy the required information even with the standard Windows tools.

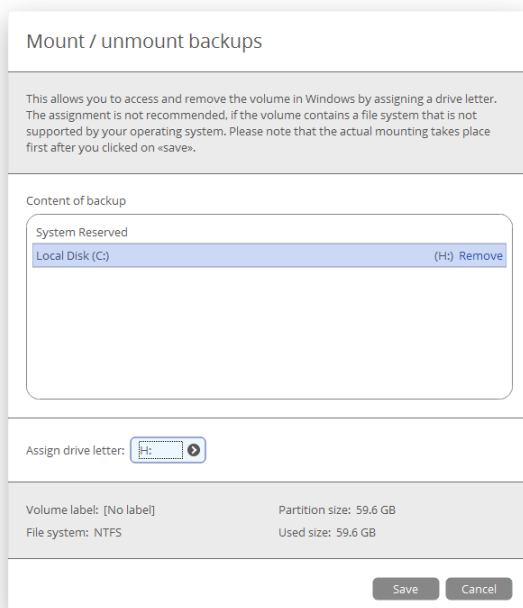
Before you start, please read the following limitations:

- System restart is required after the product installation to correctly mount backup images in Windows Server environment;
- Backup partitions will only be mounted for the current session and won't be available after the system restart;
- Backup images containing Windows Storage Spaces are not supported;
- Backup images containing ReFS partitions are not supported;
- Backup images located on physical (unmounted) partitions or in the backup capsule cannot be mounted;

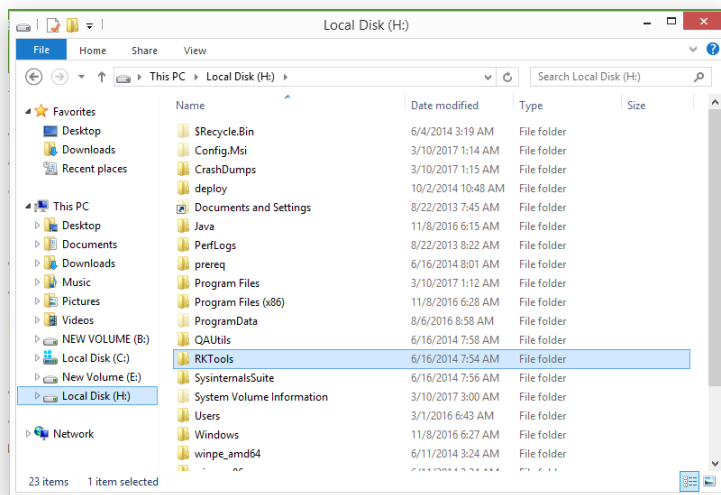
- Backup images containing LVM/LDM volumes are not supported.
3. Open **Backup & Recovery** scope.
 4. Select **My Backups > Single backups>>>** to see all configured one-shot backup tasks or **My Backups > Backup jobs>>>** to see configured regular backup routines. Left click a backup image to call a context-sensitive menu, then **Mount/Unmount**.



5. In the opened dialog you can see contents of the selected backup image. Select a partition you'd like to mount, then one of the vacant drive letters from the list to associate with the partition. Click **Save** to confirm.



6. Once mounted, you can treat the backup partition as you would any other Windows volume (browse, retrieve files, modify files).



7. Use the same algorithm to unmount the backup image when not required any more.

Adding a Backup Image

You can add existing backup images to the archive database and this way make them available in the program interface.

Supported backup data containers:

- Volume- and file-level virtual containers (pVHD, VHD(X), VMDK) created by the current version and then somehow transferred to another location.
- Volume- and file-level virtual containers (pVHD, VHD(X), VMDK) created by any 15th version.

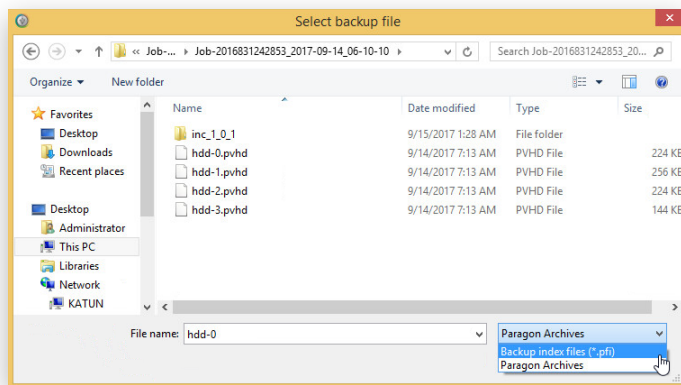


Although legacy PBF-based backup images cannot be added to the archive database (**My Backups** tab), you're allowed to specify an old image as restore point in the Restore Wizard.

1. Open **Backup & Recovery** scope.
2. Select **My Backups > Single backups>>>**, then **Add Backup**.



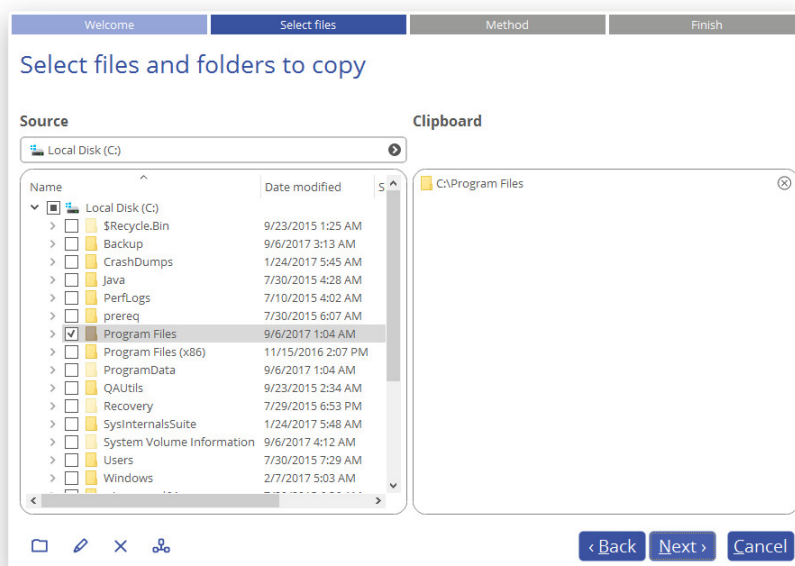
3. Browse for the required backup image, then click **Open**. By default, the program is configured to display backup index files (PFI) only. If you don't have it, please select **Paragon Archives**, then point to a supported virtual container.



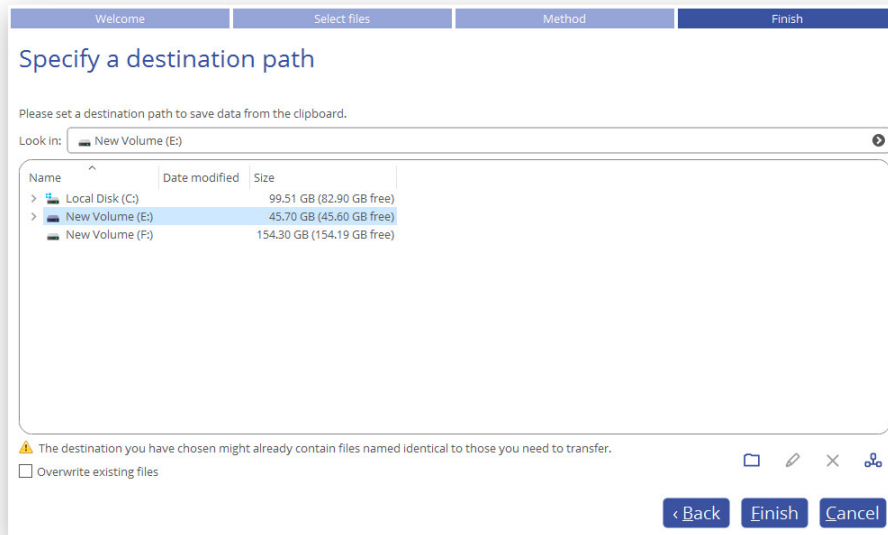
If no index file is found near the selected container, the program will offer to rebuild it.

Transferring Files between Storages

1. Open **Backup & Recovery** scope.
2. Select **Tools > File transfer**, then click **Next** on the Welcome page of the wizard.
3. Select a source disk, then mark files and directories you want to copy. The wizard enables you to browse both mounted and unmounted (without a drive letter) partitions. It is also possible to map a network drive. All selected files get to the Clipboard.

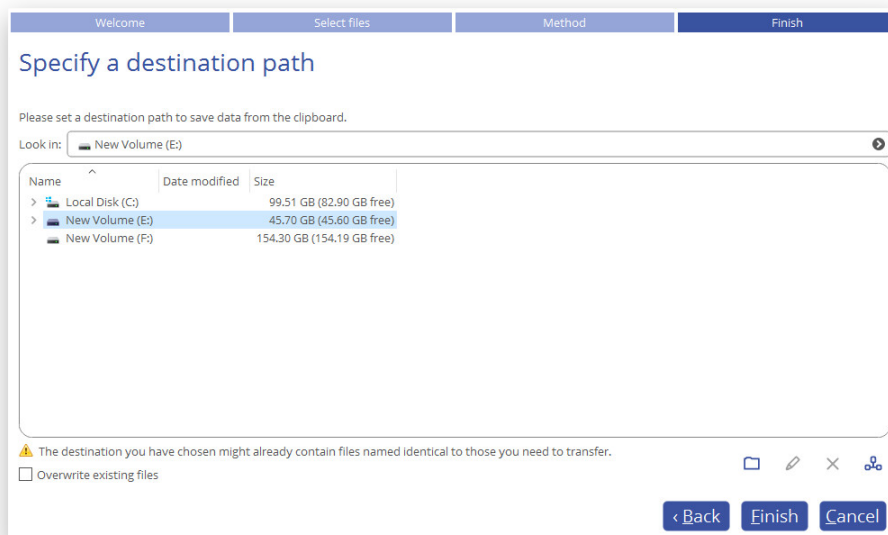


4. The wizard enables you to copy data to a local or external drive, a network share, a physical partition (without a drive letter), or burn it to a CD/DVD/BD disc. Choose the most suitable option.



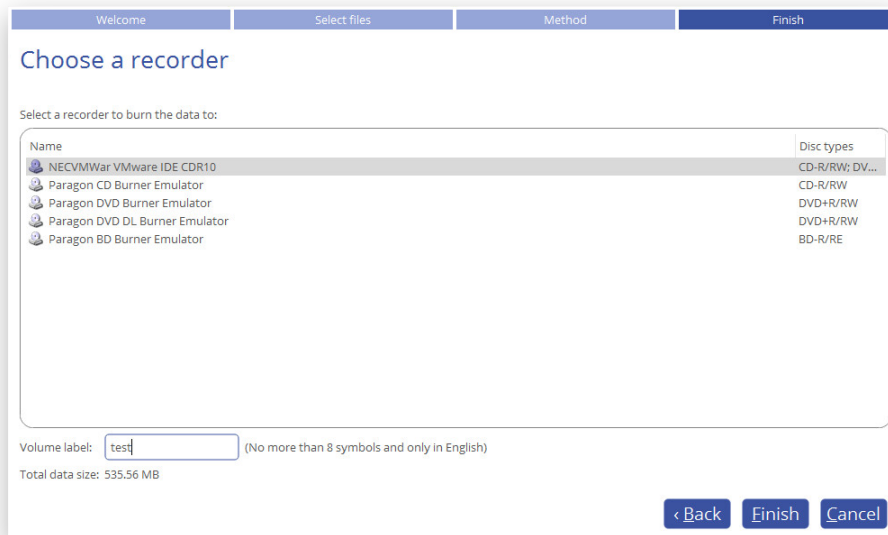
Local/Network

Select a local, external, or network drive to copy the data to. If you'd like to replace files with identical names, mark the corresponding option.



CD/DVD/BD

Select a recorder from the list of available devices and then set a volume label by entering it in the appropriate field.



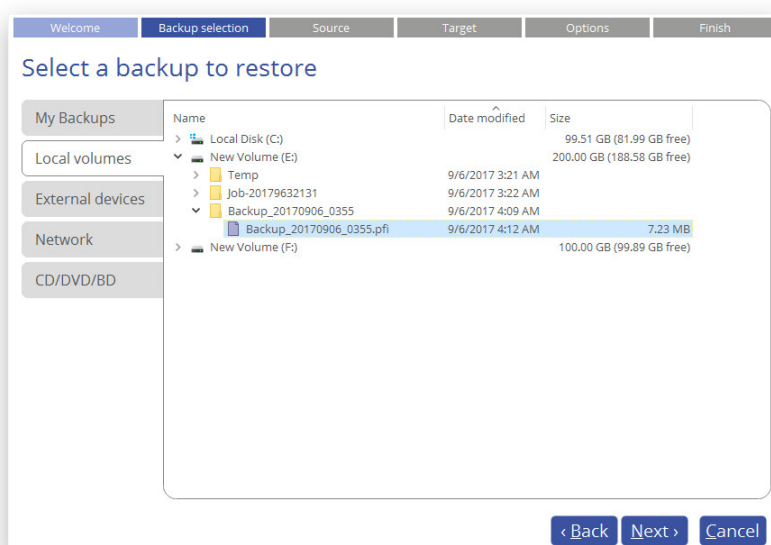
5. Click **Finish** to initiate the operation.

WinPE Restore Scenarios

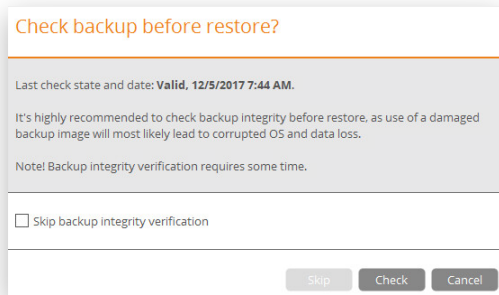
Restoring a Failed System

If your computer fails to start up because of a software glitch or after you accidentally deleted the entire Windows partition or some system files, you can get it back on track by utilizing a previously prepared recovery media and one of available backup images.

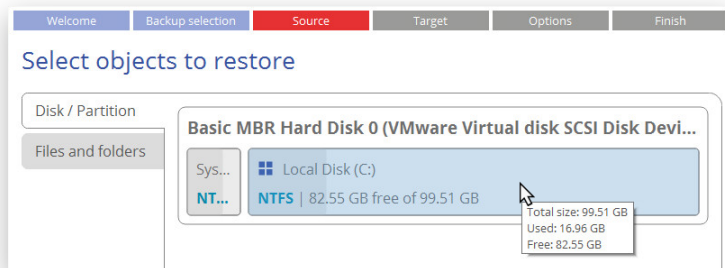
1. [Start up the computer from the WinPE recovery media.](#)
2. Select **Restore backup** in the Wizards pane.
3. The welcome page introduces the wizard's functionality. Click **Next** to continue.
4. Specify a backup image for restore. Depending on the location, first select a corresponding tab on the left, then browse for the required backup image file. To learn how to map a network share, please consult [Configuring Network](#).



5. You will be prompted to check the selected backup for errors (recommended). Mark the corresponding option to skip this action if you're sure in its viability.



6. Initially the wizard prompts you to specify an entire backup image or individual volumes or disks for restore – that's exactly what we need. If you need to restore individual files, select **Files and folders**, then backup data you want to recover. For more details, please consult [Restoring Individual Files and Folders](#).



7. The program offers to restore the selected backup object exactly where it belongs. However, you can choose any disk of enough capacity available in your system.



You will get a corresponding warning when trying to rewrite a bootable partition.

8. Next you can see the resulted disk layout. If necessary, specify a number of additional parameters (depends on the selected backup object).

Restoring a partition

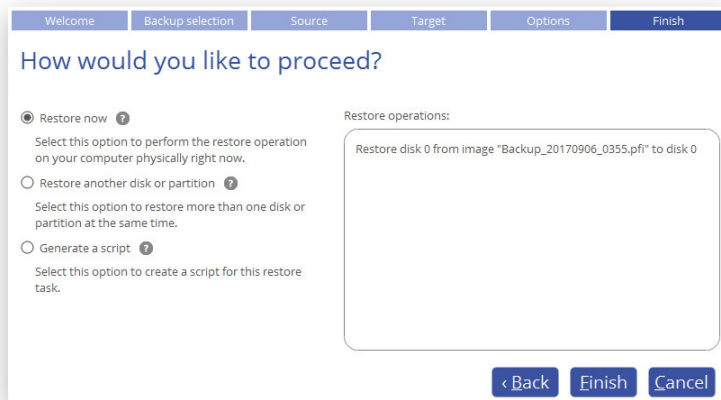
Change size of the partition and its location as well as assign a particular drive letter. If you've got to do with a 64-bit Windows configured to the uEFI boot mode, the Switch EFI to boot from destination drive option will become available for you to define what instance of Windows OS you'd like to boot from once the operation is over. Anyway you can specify a bootable device at any time through [Boot Corrector](#).

Restoring a disk

If attempting to restore to a larger disk, use the corresponding option to resize on-disk partitions proportionally to occupy the entire target disk.

The program also provides you the option to preserve the original Disk Identifier during restore. This helps to correctly restore Windows Embedded and similar installations. For more details, please consult the [Windows Restore Scenarios](#) chapter.

9. Choose whether to execute the operation immediately after finishing the wizard, set up another restore operation(s) and then run all at once, or [generate a program script for later execution](#). Click **Finish** to initiate the operation.

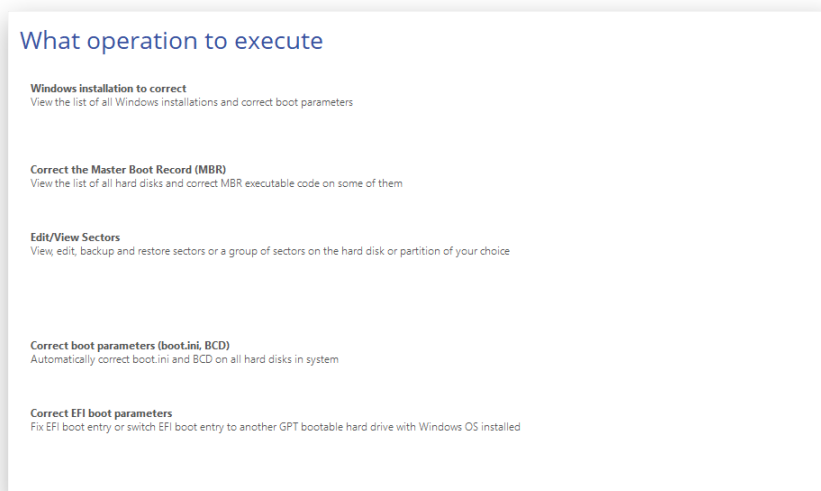


10. In the Progress window you can see in real-time a detailed report on all actions carried out by the program. Mark the checkbox at the bottom of the window to automatically switch off the computer on the successful accomplishment of the restore operation.
11. After completing the operation, please reboot the computer.

Fixing Boot Problems

If Windows OS doesn't boot after replacing a failed hardware device or you have any other boot issue resulting from a human or program error, or a boot virus activity, first try our boot repair tools before taking more radical actions.

1. [Start up the computer from the WinPE recovery media.](#)
2. Select **Boot Corrector** in the Wizards pane.
3. The welcome page introduces the wizard's functionality. Click **Next** to continue.
4. Click on the required operation to select.



- **Windows installation to correct.** Fix your Windows startup ability, if it fails to complete the startup procedure due to an unknown reason.

Choose a failed Windows installation from the list of found installations (if several). If necessary, click on the plus icon to get more info on the selected item.

What operating system to correct

The wizard has searched your computer for valid Windows installations. You can see results of the operation below. Note: The status "System" stays for a system partition, "Bootable" - for a boot partition.

☐ Microsoft Windows 10 64-bit Edition (Destination: Disk Microsoft Windows 10 64-bit Edition, Partition 0)

[Correct boot parameters](#)

Partition 0: System Reserved (C:)
Current values: Partition ID 8; Active

Partition 1: Local Disk (F:) Status: Bootable
Current values: Registry volume letter: C; Partition ID 7;

If you want to manually correct the chosen installation, click **Correct boot parameters**, then edit the required parameters. Otherwise, click **Next** to let the wizard fix the installation automatically.

Boot parameters editor

This editor allow you to correct partition parameters
Please correct some parameters if you want

Disk 0 Partition 0: System Reserved (C:)

☒ Active ☐ Hidden

Disk 0 Partition 1: Local Disk (F:)

Please choose new registry volume letter: C:

Partition ID

☒ Please select predefined ID from the list: 0x07 NTFS, ExFAT, ReFS

☐ Please enter ID manually: 7

- **Correct the Master Boot Record.** Use this option to overwrite the current bootable code in the MBR (Master Boot Record) by the standard bootstrap code, thus repairing a corrupted bootable code after a boot virus attack or a malfunction of boot management software.

Correct the Master Boot Record (MBR)

You can see the list of all hard disks in your system. All disks, where MBR correcting is available, can be choosed.

Please choose hard disks to correct their Master Boot Records:

Name	Type	Size
<input checked="" type="checkbox"/> Basic MBR Hard Disk 0 (VMware Virtual disk SCSI Disk Dev...	Internal Hard Disk Drive	100 GB
<input type="checkbox"/> Basic MBR Hard Disk 1 (VMware Virtual disk SCSI Disk Dev...	Internal Hard Disk Drive	200 GB
<input type="checkbox"/> Basic MBR Hard Disk 2 (VMware Virtual disk SCSI Disk Dev...	Internal Hard Disk Drive	100 GB

- **Edit/View Sectors.** You can directly access and modify sectors of an entire disk drive or individual partition, save and restore sectors from specified files as well as navigate through the system metadata.

Edit/View Sectors

You can see the list of all hard disks and partitions in your system.

Please choose the object to correct its Sectors:

Name	Type	Size
My Computer	My Computer	
Basic MBR Hard Disk 0 (VMware Virtual disk SCSI Disk Dev...	Internal Hard Disk Drive	100 GB
System Reserved (C:)	Primary	
Local Disk (F:)	Primary	
Basic MBR Hard Disk 1 (VMware Virtual disk SCSI Disk Dev...	Internal Hard Disk Drive	200 GB
New Volume (D:)	Primary	
Basic MBR Hard Disk 2 (VMware Virtual disk SCSI Disk Dev...	Internal Hard Disk Drive	100 GB
New Volume (E:)	Primary	

- ## What operating system to correct
- The wizard has searched your computer for valid Windows installations. You can see results of the operation below. Note: The status "System" stays for a system partition, "Bootable" - for a boot partition.
- ☒

Microsoft Windows 10 64-bit Edition (Destination: Disk Microsoft Windows 10 64-bit Edition, Partition 0)
- Partition 0: System Reserved (C:)**
Current values: Partition ID 8; Active

Partition 1: Local Disk (F:) Status: Bootable
Current values: Registry volume letter: C; Partition ID 7;

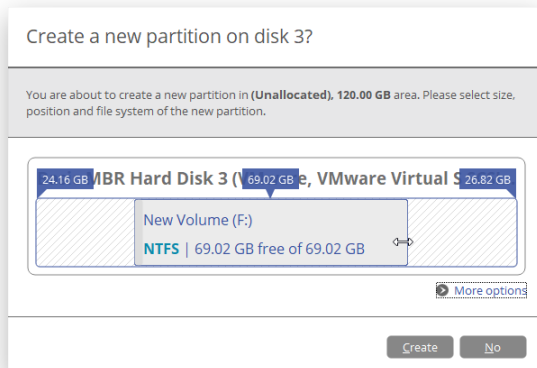
- ## Managing Partitions and Disks

Basic Partitioning Tasks

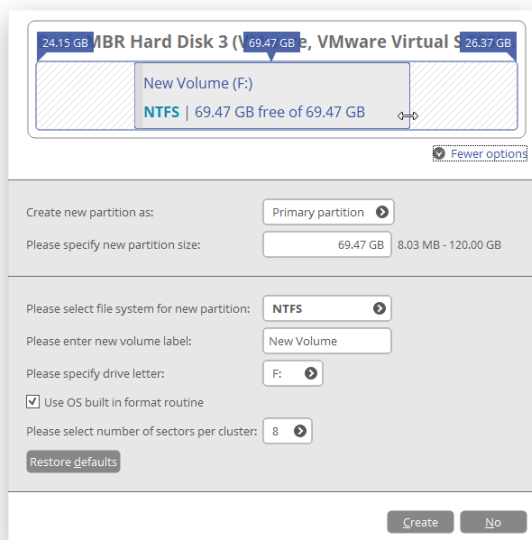
Creating a Partition

- Copyright© 1994-2018 Paragon Software Group. All rights reserved.

2. Select **Tools > My Computer**, then left click a block of free space on a disk you'd like to partition. Select **Create new volume here** in the opened menu.
3. By default, there will be created an NTFS partition the size of the selected free block. Drag-and-drop borders of the free block on the Disk Map to define the partition size and position. If you want to modify other properties, click **More options**.



4. In the opened dialog you can change any predefined partition property.



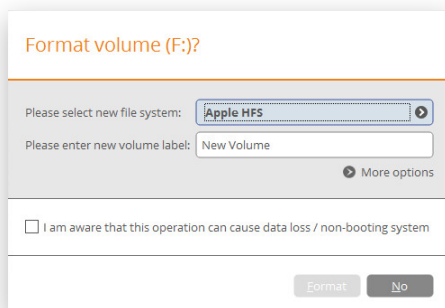
- Select the desired partition type (Primary, Extended, or Logical). The available alternatives depend on the selected block of free space – within a Logical block, only Logical partitions can be created; Within a Primary block, both Primary partitions or the Extended Partition are allowed to create.
- Drag-and-drop borders of the free block on the Disk Map to define the partition size and position. An accurate value in MB can be set in the corresponding field.
- To store data on the created partition you need to format it to one of the supported file systems:
 - FAT32 – use for data disks that are 32GB or less
 - NTFS – the primary file system for Windows OS
 - Ext 2/3/4 – the primary file system for Linux OS
 - Apple HFS – the primary file system for Mac OS X
- Enter a volume label to easily identify the partition later (optional parameter).

- Choose one of the vacant drive letters from the list to associate with the partition. The drive letter plays an important role in telling Windows where to look data.
 - By default, the amount of sectors per cluster will be specified according to the used OS and the chosen file system. If you'd like to set another value, unmark the **Use OS built-in routine** and define the desired value in the corresponding field. The cluster size is one of the crucial parameters of any file system. Its value implicitly affects the performance of the files input-output activity since it defines the size of the file system metadata. Besides, the so-called waste space factor also depends on it.
5. Click **Create** when ready. All introduced changes to the disk layout will be [pending until confirmed](#).

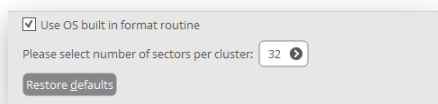
Formatting a Partition

When you create a new partition you will be prompted to choose the desired file system format as described above. This section explains how to format an existing partition.

1. Open **Partition Manager** scope.
2. Select **Tools > My Computer**, then left click an existing partition. Select **Format this volume** in the opened menu.
3. Select the desired file system from the list of the supported file systems and enter a volume label to easily identify the partition later (optional parameter). Since the selected partition may contain data, which will be lost after formatting, you need to confirm the operation.



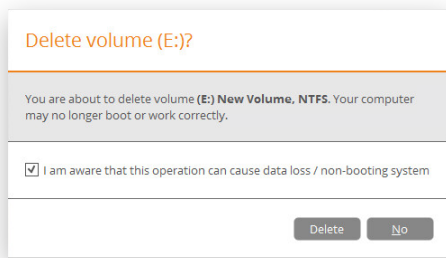
4. If you want to change the default amount of sectors per cluster, click **More options**. The cluster size is one of the crucial parameters of any file system. Its value implicitly affects the performance of the files input-output activity since it defines the size of the file system metadata. Besides, the so-called waste space factor also depends on it.



5. Click **Format** when ready. All introduced changes to the disk layout will be [pending until confirmed](#).

Deleting a Partition

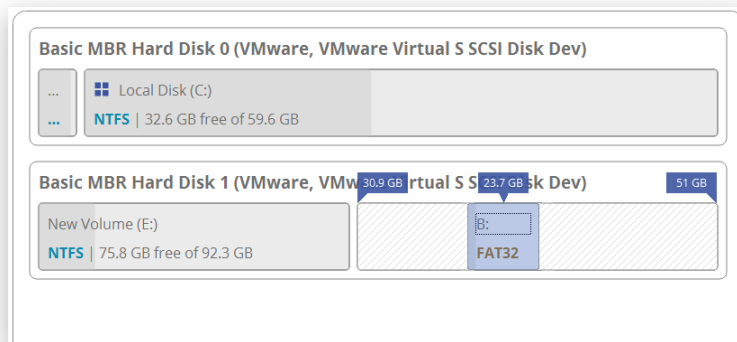
1. Open **Partition Manager** scope.
2. Select **Tools > My Computer**, then left click an existing partition. Select **Delete this volume** in the opened menu.
3. Since the selected partition may contain data, which will be lost after deleting, you need to confirm the operation.



4. Click **Delete** when ready. All introduced changes to the disk layout will be pending until confirmed.

Moving/Resizing a Partition

1. Open **Partition Manager** scope.
2. Select **Tools > My Computer**, then drag-and-drop borders of a partition on the Disk Map to define its size and position. All introduced changes to the disk layout will be pending until confirmed.



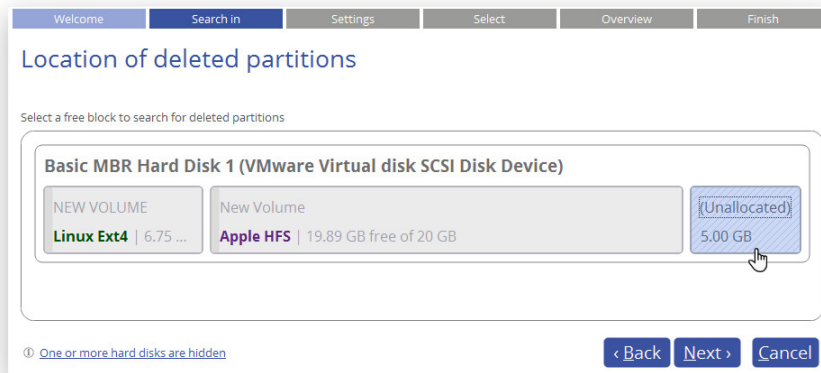
Resize or free space redistribution that leads to shrinking of an unlocked bitlocked volume may fail due to limitations of a Microsoft service used for accomplishing this type of operations.

Undeleting a Partition

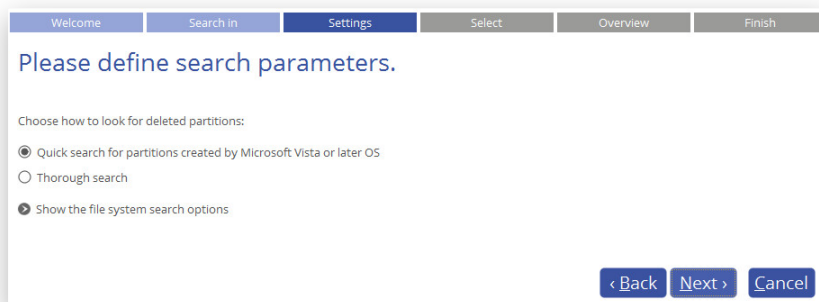
When simply deleting a partition (without additional wiping) disk management software only removes references to it in the Partition Table, thus leaving the possibility to recover it later.

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

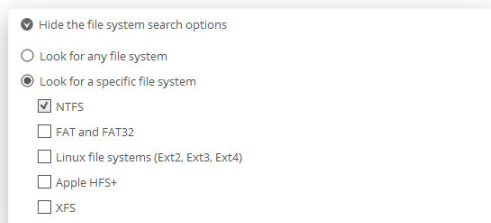
1. Open **Partition Manager** scope.
2. Select **Tools > Undelete partitions**, then click **Next** on the Welcome page of the wizard.
3. The wizard only displays disks that contain unallocated space. Choose a free block that used to be a partition.



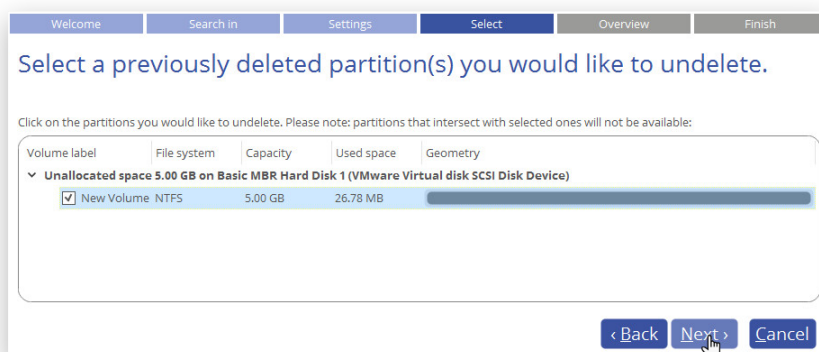
- By default, the wizard selects the quick search method. In most cases it's enough to find an accidentally deleted partition. However, if the wizard fails to find the partition you need, you can select the 'Thorough search' option to scan every single sector in the specified search area to get the most accurate results.



If you'd like to narrow the search results, select the corresponding option and mark a checkbox opposite the required file system.



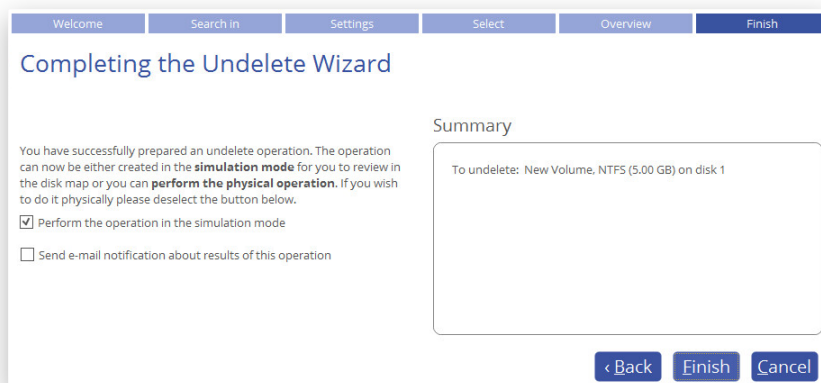
- By default, the program searches records of any deleted partition ever existed on the selected block of free space. So you can get several partitions to choose from. Most likely the required partition will be found first.



- Check the resulting disk layout, then click **Next** to confirm.



7. If you'd like to execute the operation immediately after finishing the wizard, disable the simulation mode by unmarking the corresponding option. If you'd like to be notified by email about successful completion and/or failure of this operation, mark the corresponding option and then select the required mode. Please make sure the email recipient is specified. Click **Finish** to complete.



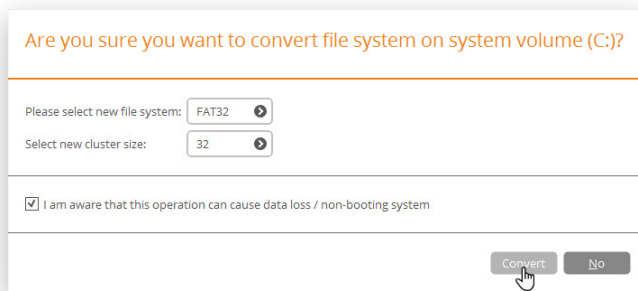
Converting File System

You can change type of an existing file system without formatting and completely safe for your data. First the original file system will be checked for consistency, then the partition data will be verified whether it meets the requirements of the target file system or not. And only after having passed this testing, the program will re-organize the file system metadata and user files.

Our program supports the following scenarios:

- FAT16/32 <> NTFS conversion
- NTFS <> HFS conversion
- NTFS <> Resilient FS 1.2/3

1. Open **Partition Manager** scope.
2. Select **Tools > My Computer**, then left click an existing partition. Click **More...**, then select **Convert file system** in the opened menu.
3. Initially the program suggests consistent values for all parameters.



- **New file system.** Choose a file system you would like to convert to from the list. The program only displays variants available for the operation, taking into account parameters of the selected partition and limitations of the used file system.
- **New cluster size.** Change the suggested cluster size. This parameter can have a profound effect on the overall performance. In a nutshell, larger clusters waste more space, but generally provide for slightly better performance, because of less fragmentation. So be particularly careful with it.

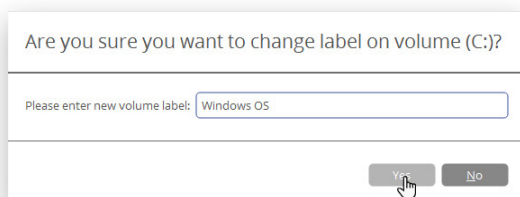


The cluster size value is expressed in sectors per cluster. To get it in Kbytes, please divide it into half.

4. Click **Convert** when ready. The operation will be [pending until confirmed](#).

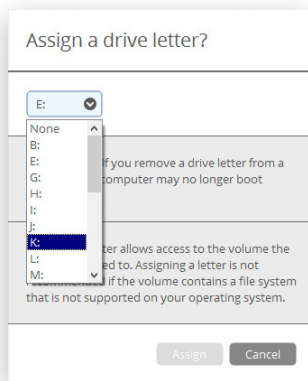
Changing Volume Label

1. Open **Partition Manager** scope.
2. Select **Tools > My Computer**, then left click an existing partition. Select **Change volume label** in the opened menu.
3. Enter a new catchy volume label. The operation will be performed immediately after confirmation.



Changing Drive Letter

1. Open **Partition Manager** scope.
2. Select **Tools > My Computer**, then left click an existing partition. Select **Change drive letter** in the opened menu.
3. Choose one of the vacant drive letters from the list to associate with the partition. The drive letter plays an important role in telling Windows where to look data.



After changing drive letter of the system partition, your Windows OS won't start up.

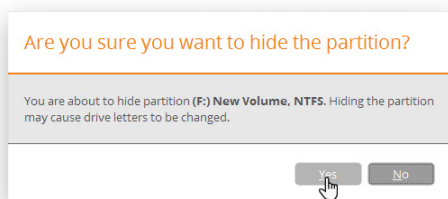
Some programs may not run properly either if changing drive letter of a data partition.

4. Click **Change** when ready. All introduced changes to the disk layout will be [pending until confirmed](#).

Hiding/Unhiding Partition

This option can help you hide a partition from OS, applications, and users, thus preventing access to its contents and vice versa. To prevent the situation when the operating system becomes unbootable, the program doesn't allow you to hide OS partitions.

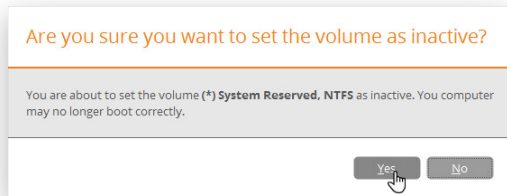
1. Open **Partition Manager** scope.
2. Select **Tools > My Computer**, then left click an existing partition. Click **More...**, then select **Hide/Unhide this partition** in the opened menu.
3. Click **Yes** when ready. The operation will be [pending until confirmed](#).



Making Partition Active/Inactive

You can set an active/inactive flag for primary partitions on an MBR-type hard disk. Please note that OS starts up only if the partition where its bootable files are resided is active or bootable.

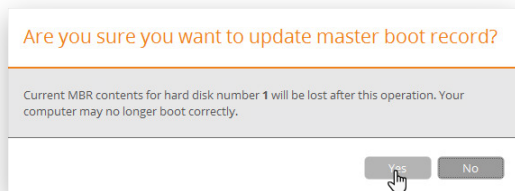
1. Open **Partition Manager** scope.
2. Select **Tools > My Computer**, then left click an existing partition. Click **More...**, then select **Mark this partition active/inactive** in the opened menu.
3. Click **Yes** when ready. The operation will be [pending until confirmed](#).



Updating MBR

The program enables you 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 after a boot virus attack or a malfunction of boot management software.

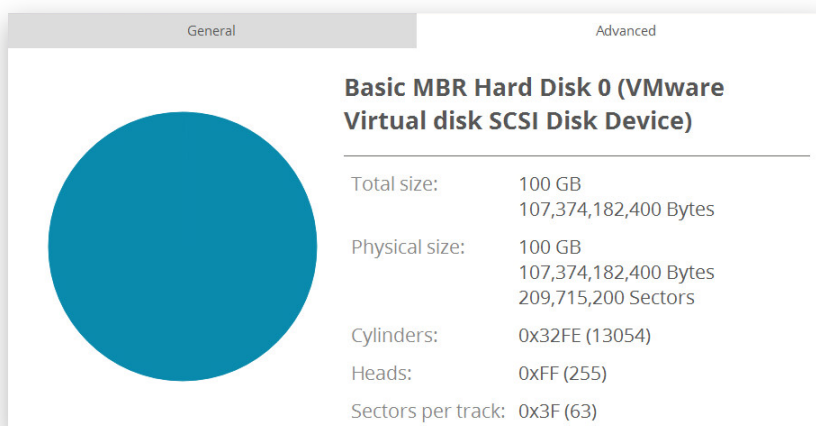
1. Open **Partition Manager** scope.
2. Select **Tools > My Computer**, then left click an existing MBR (Master Boot Record) disk. Select **Update MBR** in the opened menu.
3. Click **Yes** when ready. The operation will be pending until confirmed.



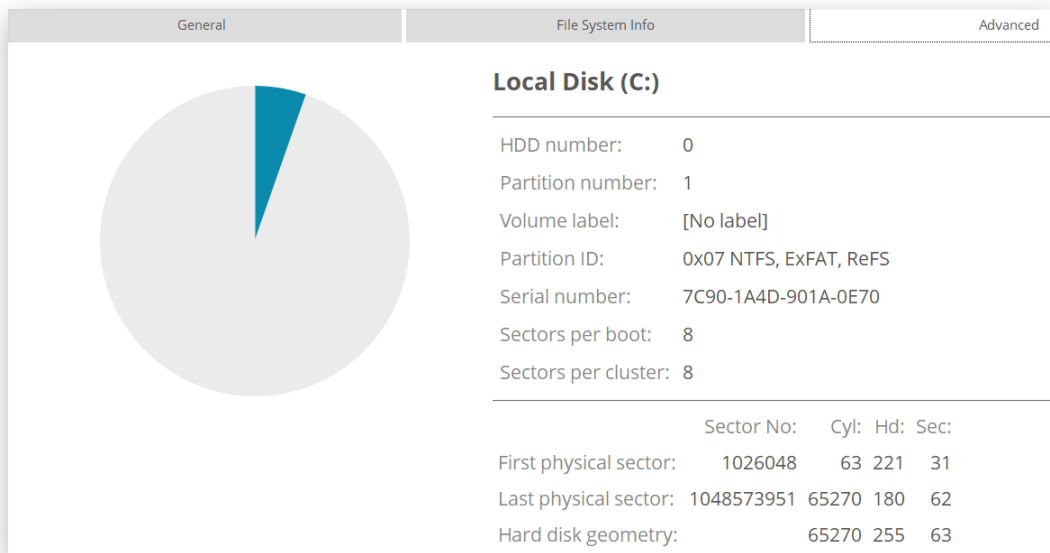
Getting Disk/Partition Properties

1. Open any functionality scope.
2. Select **Tools > My Computer**, then left click an existing partition or disk. Select **Show advanced properties** in the opened menu.
3. The program displays detailed information on the properties of an entire storage device or individual partition. 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.

Disk Properties:



Partition Properties:



Complex Partitioning Tasks

Splitting a Partition

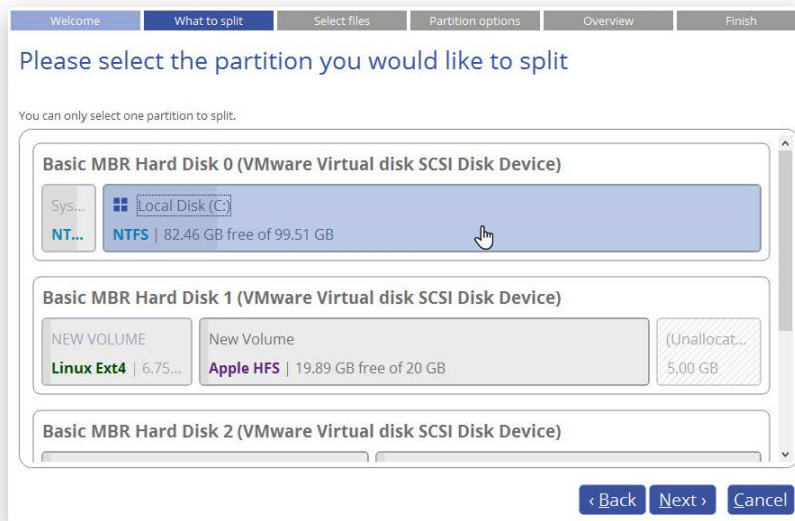
Let's assume you have one partition across the entire hard disk, like most other people who purchase a computer with a preinstalled operating system. So besides OS, it holds all your documents, favorite music, movies and family photos. This type of configuration is not optimal for effective data organization and safety. First, it negatively affects the system: huge amount of data aggravated by its inevitable excessive fragmentation causes poor performance in file search/access and read/write operations. Second, it's inconvenient for the user: system files and folders piled up with media and documents besides obvious difficulties in transparent organization become a naughty problem in case of a system malfunction.

The Split Partition Wizard can help you detach the operating system and data or different types of data by splitting one partition to two different partitions of the same type and file system – you just select a partition, then files and folders you'd like to move to the new partition, finally redistribute free space between the two partitions if necessary, and here you are!

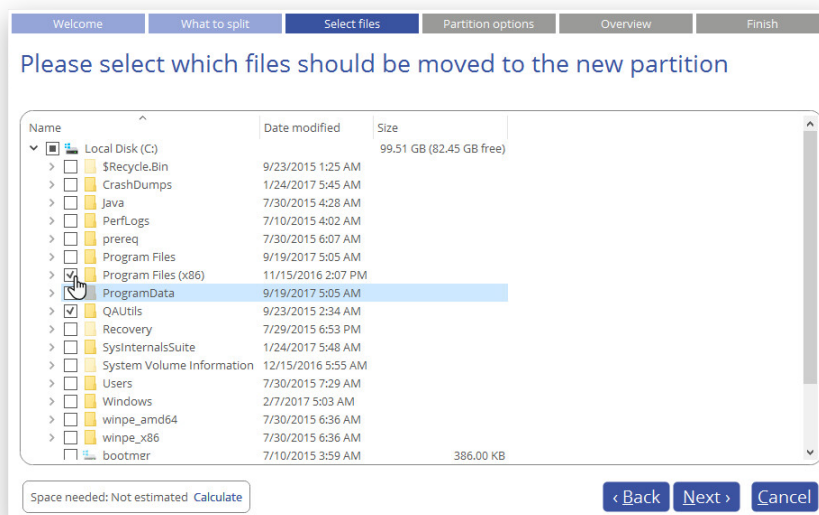
Before you start, please take into account the cases when the split operation is impossible to perform:

- Partition's type is not supported (you have selected a non-standard primary or logical partition);
- The selected partition is located on a dynamic disk;
- You've already got 4 primary partitions on a Basic MBR disk;
- You've already got 3 primary partitions on a Hybrid (Retained) GPT+MBR disk;
- There's not enough free space on the selected partition (free up to 50 MB);
- The selected partition has an unsupported file system.

1. Open **Partition Manager** scope.
2. Select **Tools > Split partition**, then click **Next** on the Welcome page of the wizard.
3. Choose a partition you'd like to split.



4. Mark checkboxes next to files or folders you'd like to move to the new partition. Please don't touch system files or folders like "Windows", "Users", "Program Files", config.sys, etc. for it may cause inability of the operating system to start up. Click **Calculate** to find out the amount of data to move or **Next** to calculate and proceed further. Please note that the calculation may take some time, so please be patient.



5. Redistribute free space between the partitions by clicking amongst them and dragging the border on the Disk Map or by entering the required value for the new partition in the corresponding field. By default, the wizard allocates all free space to the original partition. You should decide for yourself how much of it should be given to the new partition. Anyway we strongly recommend you to allocate some free space to both partitions.

Next you need to choose one of the vacant drive letters from the list to associate with the partition and change the default volume label, if necessary.

Welcome | What to split | Select files | **Partition options** | Overview | Finish

Please set options for the new partition

You can use the slider in the disk map to adjust the size of the partitions or enter it below manually.

Basic MBR Hard Disk 0 (VMware Virtual disk SCSI Disk Device)

Local Disk (C:) | NTFS | 31.40 GB free of 48.31 GB

SPLITVOL (E:) | NTFS | 51.20 GB free of 51.20 GB

New partition size: 51.20 GB

New drive letter: E:

New volume label: SPLITVOL

< Back | Next > | Cancel

- Check the resulting disk layout, then click **Next** to confirm.

Welcome | What to split | Select files | Partition options | **Overview** | Finish

Please review the changes

Changes:

Old status

Basic MBR Hard Disk 0 (VMware Virtual disk SCSI Disk Device)

Sys... | Local Disk (C:) | NTFS | 82.60 GB free of 99.51 GB

New status

Basic MBR Hard Disk 0 (VMware Virtual disk SCSI Disk Device)

Sys... | Local Disk (C:) | NTFS | 31.40 GB free of 48.31 GB

SPLITVOL (E:) | NTFS | 51.20 GB free of 51.20 GB

< Back | Next > | Cancel

- If you'd like to execute the operation immediately after finishing the wizard, disable the simulation mode by unmarking the corresponding option. If you'd like to be notified by email about successful completion and/or failure of this operation, mark the corresponding option and then select the required mode. Please make sure the email recipient is specified. Click **Finish** to complete.

Welcome | What to split | Select files | Partition options | Overview | **Finish**

Completing the split wizard

You have successfully prepared a split operation. The operation can now be either created in the **simulation mode** for you to review in the disk map or you can **perform the physical operation**. If you wish to do it physically please deselect the button below.

☒ Perform the operation in the simulation mode

☐ Send e-mail notification about results of this operation

Summary

Selected partition: Local Disk (C:)

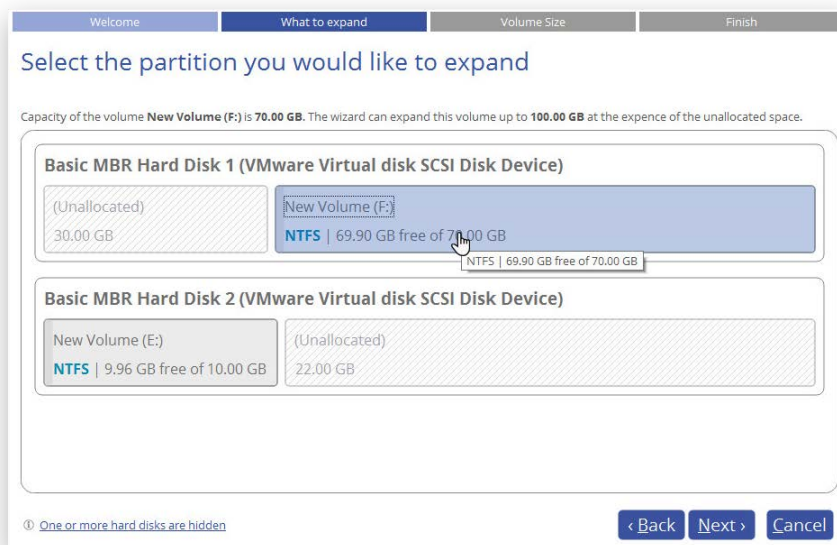
New partitions: Local Disk (C:), SPLITVOL (E:)

< Back | Finish | Cancel

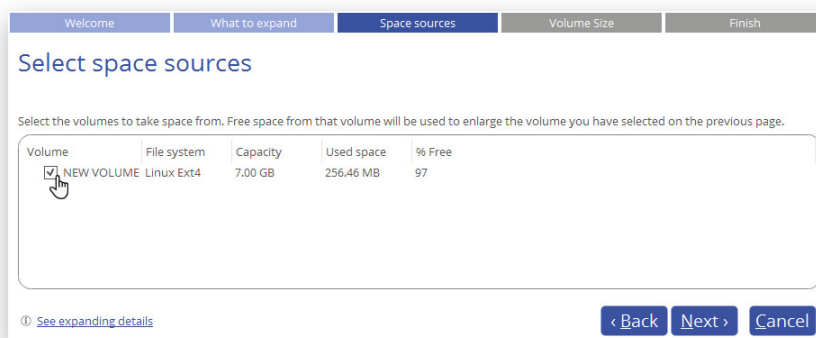
Redistributing Free Space

The Redistribute Free Space Wizard can help you increase free space on one partition by up-taking the on-disk unallocated space and the unused space of other partitions. By default, the wizard will add all existing blocks of the free space to the target partition. Additionally, you will be able to specify partitions to act as space donor. According to introduced changes the wizard will automatically recalculate positions of the involved partitions and move their contents to new locations.

1. Open **Partition Manager** scope.
2. Select **Tools > Redistribute free space**, then click **Next** on the Welcome page of the wizard.
3. Choose a partition you'd like to expand at the expense of others. Blocks of the free space (if any) will be automatically added to the target partition.



4. Choose one or several partitions (not only adjacent) to donate free space.



5. Set a new size for the target partition in the corresponding field.

- If you'd like to execute the operation immediately after finishing the wizard, disable the simulation mode by unmarking the corresponding option. If you'd like to be notified by email about successful completion and/or failure of this operation, mark the corresponding option and then select the required mode. Please make sure the email recipient is specified. Click **Finish** to complete.

Merging Partitions

The Merge Partitions Wizard enables to consolidate the disk space, which originally belongs to two adjacent partitions (or additionally separated by free blocks), into a single, larger partition. The order, in which two partitions have been chosen, is important since all contents of the second selected partition will be placed in a folder on the resulted joined partition.

Please note that the wizard can only merge two adjacent NTFS, FAT32 or FAT partitions, also separated by unallocated space.

- Open **Partition Manager** scope.
- Select **Tools > Merge partitions**, then click **Next** on the Welcome page of the wizard.
- Click on the left partition of the pair of partitions you need to merge, as the right one will be selected automatically. During the operation all contents of the right partition will be placed in a folder on the resulted joined partition.



If a system partition is the right one of the selected pair, Windows OS will become unbootable after the merge operation is over.

- By default, the wizard prompts an easy-to-understand folder name, which can be changed.

- Check the resulting disk layout, then click **Next** to confirm.

Please review the changes

Changes:

Old status

Basic MBR Hard Disk 2 (VMware Virtual disk SCSI Disk Device)

New Volume (F:)
NTFS | 22.94 GB free of 23.00 GB

New Volume (G:)
NTFS | 26.93 GB free of 27.00 GB

New status

Basic MBR Hard Disk 2 (VMware Virtual disk SCSI Disk Device)

New Volume (F:)
NTFS | 49.87 GB free of 50.00 GB

< Back Next > Cancel

- If you'd like to execute the operation immediately after finishing the wizard, disable the simulation mode by unmarking the corresponding option. If you'd like to be notified by email about successful completion and/or failure of this operation, mark the corresponding option and then select the required mode. Please make sure the email recipient is specified. Click **Finish** to complete.

Completing the merge wizard

You have successfully prepared a merge operation. The operation can now be either created in the **simulation mode** for you to review in the disk map or you can **perform the physical operation**. If you wish to do it physically please deselect the button below.

☒ Perform the operation in the simulation mode

☐ Send e-mail notification about results of this operation

Summary

Selected partitions: New Volume (F:),
New Volume (G:)

Folder name: Files from New Volume (G)

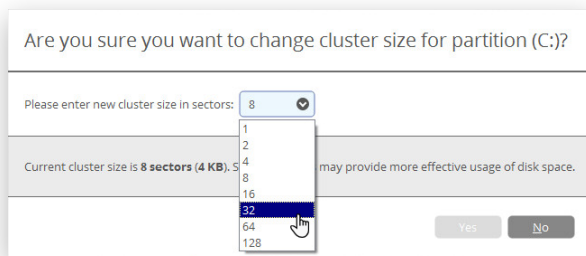
< Back Finish Cancel

Advanced Partitioning Tasks

Changing Cluster Size

The cluster size can have a profound effect on the overall performance. In a nutshell, larger clusters waste more space, but generally provide for slightly better performance, because of less fragmentation. So be particularly careful with it.

- Open **Partition Manager** scope.
- Select **Tools > My Computer**, then left click an existing partition. Click **More...**, then select **Change Cluster Size** in the opened menu.
- Change the default cluster size according to your needs, then click **Yes**. All introduced changes to the disk layout will be pending until confirmed.

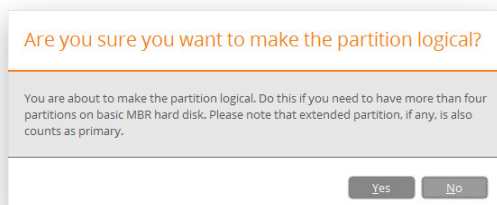


The cluster size value is expressed in sectors per cluster. To get it in Kbytes, please divide it into half.

Converting to Logical/Primary

You can include a primary partition into the extended partition or exclude a logical partition from the extended partition without partition duplication.

1. Open **Partition Manager** scope.
2. Select **Tools > My Computer**, then left click an existing partition. Click **More...**, then select **Make partition logical/primary** in the opened menu.
3. Click **Yes** when ready. The operation will be [pending until confirmed](#).



The operating system won't start up if you make the system partition logical.

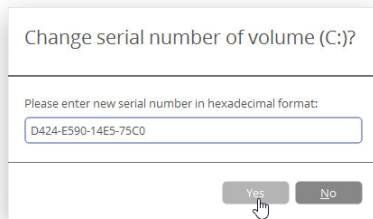
Changing Serial Number

FAT16, FAT32, and NTFS file systems include the serial number parameter. It is generated automatically while formatting a partition and is saved in the boot sector.

You can modify this parameter for FAT16, FAT32, or NTFS partitions without re-formatting.

1. Open **Partition Manager** scope.

2. Select **Tools > My Computer**, then left click an existing partition. Click **More...**, then select **Change volume serial number** in the opened menu.
3. Enter a new serial number for the selected partition. It should contain 8 hexadecimal figures (0..9 or A..F). The operation cannot proceed until you enter all 8 symbols.



4. Click **Yes** when ready. The operation will be [pending until confirmed](#).

Change Primary Slots

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

In Linux:

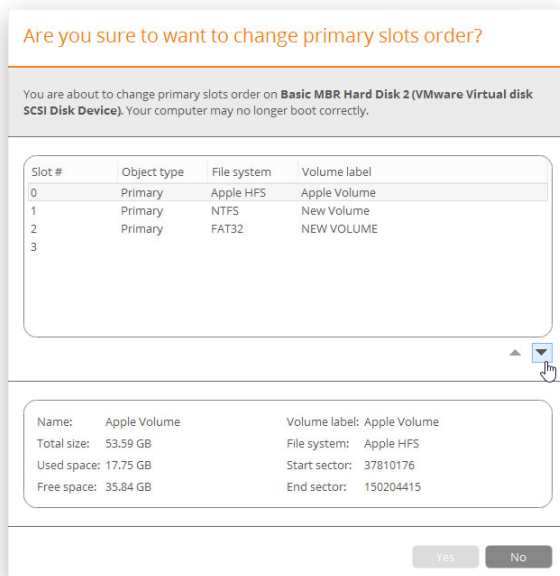
In Linux, every partition has a special symbolic name that encodes a hard disk containing a partition, and a partition itself. Partitions are addressed and accessed by using their symbolic names. Symbolic names are automatically generated by Linux in accordance with the order of hard disks in BIOS and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

In DOS:

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

Our program helps you to change enumeration of the primary partitions, and this way fix problems concerning an inappropriate order of partitions on an MBR disk.

1. Open **Partition Manager** scope.
2. Select **Tools > My Computer**, then left click an existing MBR disk. Click **More...**, then select **Change primary slots** in the opened menu.
3. Use the arrow buttons to move the selected partition up and down within the primary part of the partition table.



- Click **Yes** when ready. The operation will be pending until confirmed.

Converting a Partition Table

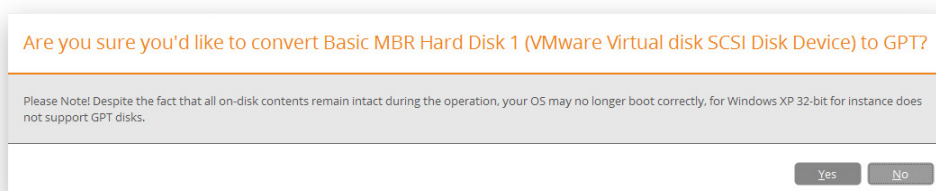
Your storage device may have GPT (GUID Partition Table), MBR (Master Boot Record), including dynamic disk configurations, or a hybrid GPT+MBR partition table.

GPT is now used on Windows and Mac computers as the primary partition scheme, while MBR used to be the main and only partition scheme for Windows computers up to Vista. A hybrid GPT+MBR partition scheme is a necessity for Apple BootCamp users. Dynamic disk configurations are mostly employed by business.

Our program allows easy non-destructive conversion between various partition schemes:

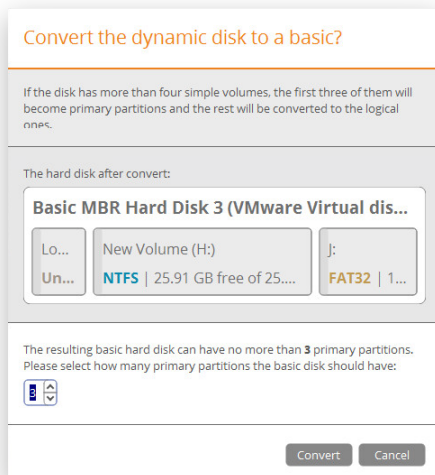
- Basic GPT <> Basic MBR disk conversion. Please note that only 64-bit Windows OSes since Vista are able to boot from a GPT disk. So if you've got a 32-bit Windows OS accommodated on an MBR disk, it won't start up after converting to GPT.
- Dynamic GPT/MBR > Basic MBR disk conversion. Please note that our program can only process dynamic disks containing solid simple volumes (without extension).

- Open **Partition Manager** scope.
- Select **Tools > My Computer**, then left click an existing disk. Select **Convert to MBR/GPT disk** in the opened menu (available operation depends on the selected storage device).
- Click **Yes** when ready. The operation will be pending until confirmed.



According to the DOS partitioning scheme a hard disk can have up to four Primary partitions. If there is an Extended partition on the disk, only three primary partitions are allowed. So when attempting to convert a basic GPT disk or a dynamic disk containing several volumes, our program will ask you to choose the

preferred number of primary partitions, and the rest (if there are more than four volumes on the disk) will be converted to logical disks within the Extended partition.



Editing Disk Sectors

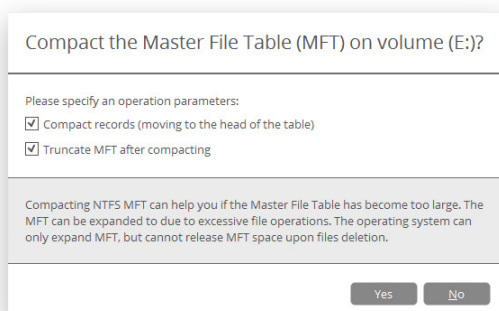
You can directly access and modify sectors of an entire disk drive or individual partition, save and restore sectors from specified files as well as navigate through the system metadata. For more details, please consult [Fixing Boot Problems](#) chapter.

NTFS Optimization

As you know NTFS partitions get more and more redundant records about deleted files over time, which slows down performance. On database servers that host MS SQL or Exchange it may cause severe performance degradation. We include tools that help you organize valid and delete redundant records inside NTFS MFT (Master File Table) in a couple of minutes, so you don't need to rebuild the system or defragment the entire disk when that is the only problem.

Compact MFT

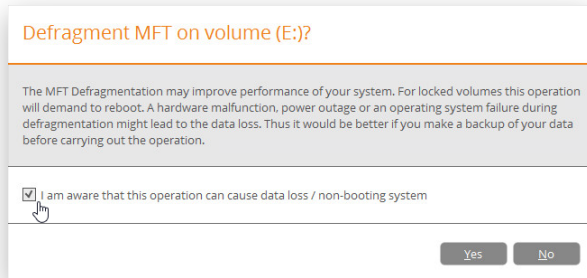
1. Open **Partition Manager** scope.
2. Select **Tools > My Computer**, then left click an existing NTFS partition. Click **More...**, then select **Compact MFT** in the opened menu.



- **Compact records.** Unmark the option if you don't want to shift MFT records to the head of the table (not recommended).
 - **Truncate MFT after compacting.** Unmark the option if you don't want to remove emptied table rows that appeared during the operation (not recommended).
3. Click **Yes** when ready. The operation will be [pending until confirmed](#).

Defragment MFT

1. Open **Partition Manager** scope.
2. Since a hardware or software failure, or power outage during this operation may lead to data loss, please make a backup of the specified NTFS partition. For more details, please consult [Backup Scenarios](#) chapter.
3. Select **Tools > My Computer**, then left click an existing NTFS partition. Click **More...**, then select **Defragment MFT** in the opened menu.



4. Confirm the operation, then click **Yes**. The operation will be [pending until confirmed](#).

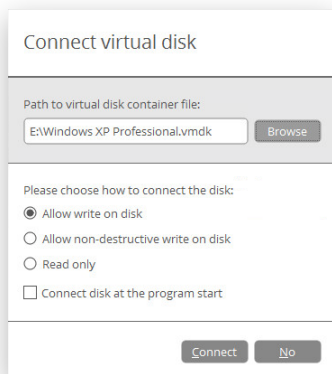
Partitioning Virtual Disks

Guess you didn't know that partitioning of virtual disks could be done from outside without login into a guest virtual machine? Our program helps you to connect a virtual disk as if it was an ordinary physical disk and do drive partitioning. Our solution supports disks of all popular virtualization vendors, including VHD(X), VMDK, and VDI. And if you feel uneasy about spoiling anything, just enable the non-destructive mode and all changes on the connected disk will be saved to a snapshot. This snapshot can later be merged with its parental disk by using standard tools included with the virtualization software.

Limitations:

- A virtual disk opened for writing with a 3rd party tool (e.g. being used by a virtual machine) won't be connected, as asynchronous parallel writing to the disk file will most likely result in data corruption.
- A virtual disk opened for reading with a 3rd party tool (e.g. it's a parent VMware disk, which snapshot is being used by a virtual machine) will be opened for reading only with the corresponding notification.
- The non-destructive connection is unavailable for .vdi disks, as our program doesn't support Oracle VirtualBox snapshots.
- Virtual disks connected from compact discs will be available for reading only.
- A double disk connection is prohibited.

1. Open **Partition Manager** scope, then click **Add VD** located in the upper right area of the Disk Map.
2. Connect a virtual disk from a local disk, a flash stick, a mapped network share, or a compact disc.

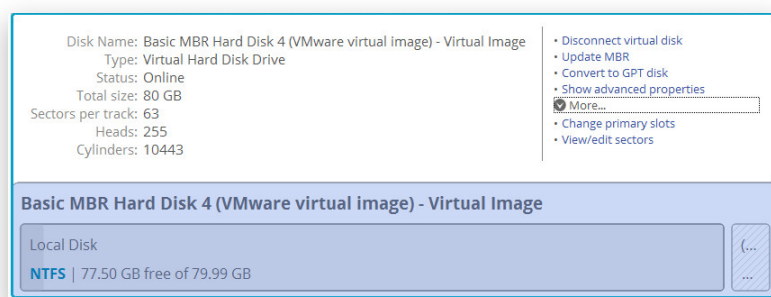


- **Allow write on disk.** By default, the selected disk will be connected in read/write mode until you disconnect it or exit the program.
- **Allow non-destructive write on disk.** It is a special read/write mode, when all changes on the connected disk are being saved to a snapshot, thus providing complete safety for the original disk's contents. If needed, this snapshot can later be merged with its parental disk by using standard tools of virtualization software vendor.
- **Read only.** Use this mode to avoid modification of data on the virtual disk.
- **Connect disk at the program start.** Use this option to have the virtual disk connected automatically at every program start.



Although you're allowed to connect virtual disks from network shares, we do not recommend it due to modest performance.

3. Click **Connect** when ready. The operation will be performed immediately.
4. As a result a new disk will appear on the Disk Map. Now you can change its layout, copy data from/to, check surface and file system integrity, optimize NTFS, and accomplish other operations.

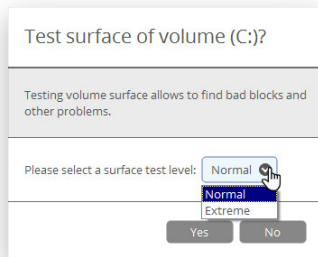


Checking Partitions for Problems

Testing Partition Surface

You can test surface of existing partitions and blocks of free space for bad or unstable sectors. During the operation all found questionable and damaged sectors will be marked unusable in the file system metadata, thus minimizing the risk of data loss.

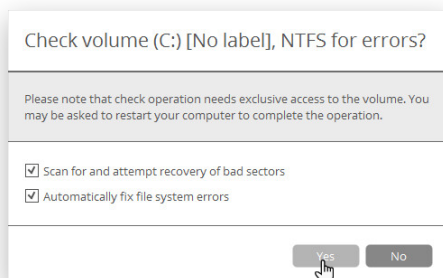
1. Open **Partition Manager** scope.
2. Select **Tools > My Computer**, then left click an existing partition. Click **More...**, then select **Test partition surface** in the opened menu.
3. Select the required verification level, and then click **Yes**. The operation will be pending until confirmed.



Checking File System Integrity

You can check the integrity of a file system to detect and repair errors before copying data or performing drive partitioning.

1. Open any functionality scope.
2. Select **Tools > My Computer**, then left click an existing partition. Select **Check file system integrity** in the opened menu.
3. If you'd like the program to automatically fix file system errors and/or find and attempt to repair bad sectors, just enable the corresponding options, and then click **Yes**. The operation will be pending until confirmed.



Erasing Data

You probably don't have an idea that deleted data can be easily recovered by novice, while pros can retrieve data even from a disk destroyed by mechanical means. Your private data is yours alone and should not be exposed to third party in any way. This can be achieved by erasing your storage device.

1. Open **Disk Wiper** scope.
2. Select **Tools > Wipe disks or partitions**, then click **Next** on the Welcome page of the wizard.
3. Choose whether to irreversibly destroy all on-disk data or only remnants of deleted files. Please note that the clear free space operation is available for known file systems only.

Welcome Scenario **Wipe target** Algorithm Overview Finish

What is your wipe scenario?

☒ **Wipe out all the data**
Choose this option if you want to completely destroy all data on the selected objects.

☐ **Clear (wipe) free space**
Choose this option if you want to destroy the traces of data that may have left after an ordinary delete operation.

< Back Next > Cancel

4. Select one or several partitions or disks you'd like to erase completely or clear free space only.

Welcome Scenario **Wipe target** Algorithm Overview Finish

What would you like to wipe?

Please choose an object for wiping. It can be a whole hard disk, a single partition or a block of unallocated space. Depending on the wipe scenario you've chosen, some of the objects might become unavailable for selection.

Basic MBR Hard Disk 0 (VMware Virtual disk SCSI Disk Device)
Sys... Local Disk (C:) NTFS | 82.46 GB free of 99.51 GB

Basic MBR Hard Disk 1 (VMware Virtual disk SCSI Disk Device)
NEW VOLUME New Volume (Unallocated...) Linux Ext4 | 6.75... Apple HFS | 19.89 GB free of 20 GB 5.00 GB

Basic MBR Hard Disk 2 (VMware Virtual disk SCSI Disk Device)

< Back Next > Cancel

5. Select a specific data erasure algorithm or create your own method.

Welcome Scenario Wipe target **Algorithm** Overview Finish

What algorithm would you like to use?

Specific algorithm

You can skip the verification completely or partly by disabling it or reducing the percentage of sectors to check. Please note that it will be derivation from the original algorithm.

Paragon's algorithm

Algorithm consists of the 4 passes. At first overwrite each erased sector with a forcefully randomized 512-byte string, new for each sector, using state-of-the-art cryptographically secure pseudo-random number generator (CSPRNG). After that overwrite each erased sector with its complement. Then overwrite each sector with 512-byte CSPRNG string, again forcefully randomized and different from the first pass, and new for each sector. Finally fill each erased sector with 0xAA mask and verify everything.

Approximate wipe time: **00:57:10**

☒ Verify wipe results Percentage of sectors to check: 100

☐ Set wipe stamp [Read more about this option](#)

New algorithm < Back Next > Cancel

Please note that the SSD Trim option becomes available in the wizard, if our program detects one or several SSD (NVME SSD) drives in your system. We highly recommend you not to apply traditional HDD-based wiping algorithms for your solid state drives. First, the data wiping eats up write cycles, which are limited for SSD. Second, none of traditional erasure software is able to control the specific region the data is written to, as this is controlled by SSD controllers. Thus the data wiping doesn't guarantee complete data destruction on SSD.

However, even SSD Trim doesn't securely delete data. Because the SSD hardware controller does the job independently, you cannot say for sure when it actually trims all blocks. Furthermore, SSD drives use some unallocated space as a buffer during the wear leveling to keep data records there.

Only the so called 'Secure Erase' function can help you to irreversible and completely delete data from SSD. Many SSD manufacturers include it into their hardware management tools. Our Linux-based recovery environment also contains this capability. So if you need a guaranteed permanent deletion of data from your SSD or NVME SSD drive, please use the secure erase.

The list of supported wiping algorithms may vary for your product.



The 'trim' command works for individual volumes, entire drives, and remnants of deleted files.

To create a new wiping algorithm, define up to four wiping patterns, number of passes for each wiping pattern and for the group of patterns. The Mask spinner control allows you to set a two-figure hexadecimal character value ("00" by default). The available range is from "00" to "FF". You can also choose whether to carry out residual data verification or not specifying the percentage of sectors to check.

Create a new algorithm

Define your personal wipe algorithm here.

Algorithm name:

<input checked="" type="checkbox"/> Mask: <input type="text" value="0"/>	Pass count: <input type="text" value="1"/>
<input type="checkbox"/> Mask: <input type="text" value="0"/>	Pass count: <input type="text" value="1"/>
<input type="checkbox"/> Mask: <input type="text" value="0"/>	Pass count: <input type="text" value="1"/>
<input type="checkbox"/> Mask: <input type="text" value="0"/>	Pass count: <input type="text" value="1"/>

Pass count for the group of patterns:

☒ Verify wipe results Percentage of sectors to check:

☐ Set wipe stamp

By marking the **Set wipe stamp** option, information on the used wipe program, algorithm, device serial number, and other properties will be added to the MBR (Master Boot Record) of the wiped storage device to get notified during the boot phase how and when the storage has been wiped. Please note this option is available when wiping entire disks only.

```

Paragon Hard Disk Manager
HDD S/N: N/A
Method: Custom
1 Pass - 01 (1), 2 Pass - 02 (2), 3 Pass - 03 (3), Total Passes=6
Started: 05:46:52 2014-09-26
Ended: 05:48:27 2014-09-26
Status: SUCCESS
System ID: VMware-56 4d ea 93 2

```

6. Check the resulting disk layout, then click **Next** to confirm.

Welcome Scenario Wipe target Algorithm Overview **Finish**

Please review the changes

Changes:

Previous status

Basic MBR Hard Disk 1 (VMware Virtual disk SCSI Disk Device)

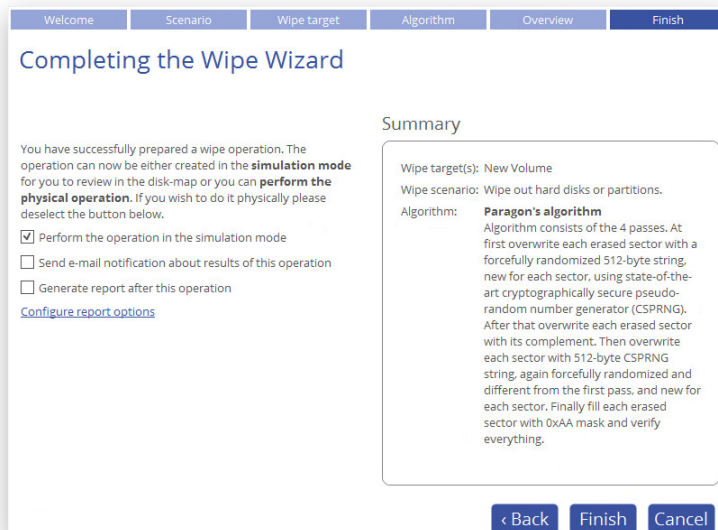
NEW VOLUME Linux Ext4 6.75...	New Volume Apple HFS 19.89 GB free of 20 GB	(Unallocat... 5.00 GB
------------------------------------	--	--------------------------

New status

Basic MBR Hard Disk 1 (VMware Virtual disk SCSI Disk Device)

NEW VOLUME Linux Ext4 6.75...	New Volume Not formatted 20 GB free of 20 GB	(Unallocat... 5.00 GB
------------------------------------	---	--------------------------

7. If you'd like to execute the operation immediately after finishing the wizard, disable the simulation mode by unmarking the corresponding option. The two other options help you to set up e-mail notification about successful completion and/or failure of the wipe operation and to let the program generate a wipe report (the [e-mail transport](#) should be properly configured for both scenarios). Click **Finish** to complete.

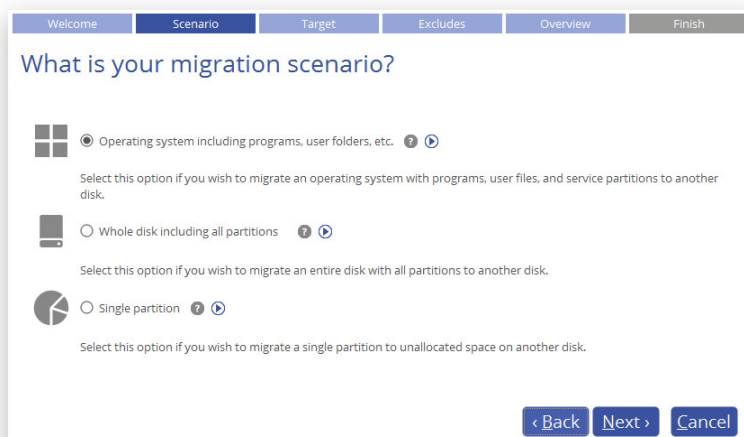


Copying Data

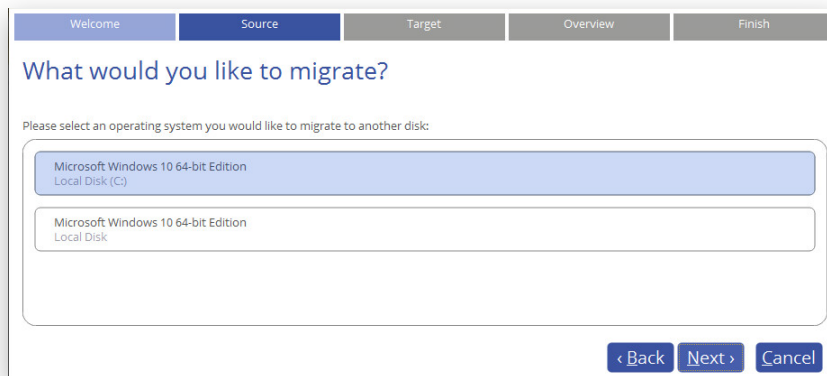
Sooner or later each of us faces the problem of having not enough space on the internal disk to install a new game or application, or to store a favorite music album or family pictures. Worse still, is a situation when a system HDD or a trendy SSD starts to deteriorate, threatening to die any moment. When this is happening to us, the only thought we've got is how to transfer Windows OS, applications and all data to a newer and larger storage device with minimal time and effort.

Fortunately, there are technologies that help to straightforward the process of moving all contents of your disk, including standard bootstrap code and other system service structures, to another storage device without having to re-install the operating system and applications. Our program can help you to perform fast and safe migrations of Windows OS, single partitions and entire disks to new storage devices and even downsizes to smaller capacity drives.

1. Connect a new disk to the computer.
2. [Launch Hard Disk Manager](#).
3. Open **Drive Copy** scope.
4. Select **Tools > Migrate**, then click **Next** on the Welcome page of the wizard.
5. Select the preferred migration scenario. We pick the first option, as we're going to transfer Windows OS to a fast but relatively small SSD drive.

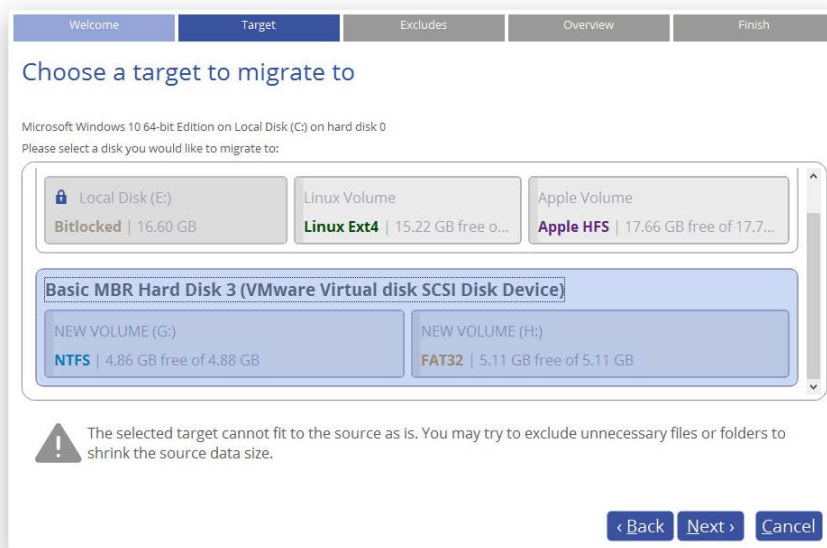


6. The wizard will search your system for supported operating systems. If several OSes have been found, you will need to choose the one you'd like to migrate.



7. Depending on your choice, it will then automatically pick one or two on-disk partitions (Windows may have System Reserved, a special hidden partition that contains boot critical files, while in the uEFI+GPT mode there will be another hidden partition, called EFI System Partition) and prompt you to select a destination disk, if there are more than two storage devices besides the source.

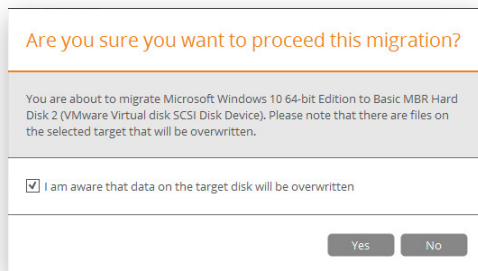
If the selected disk is not enough in capacity to hold your OS, you will be prompted to exclude files from the main system partition at the next step to try to fit in to the destination.



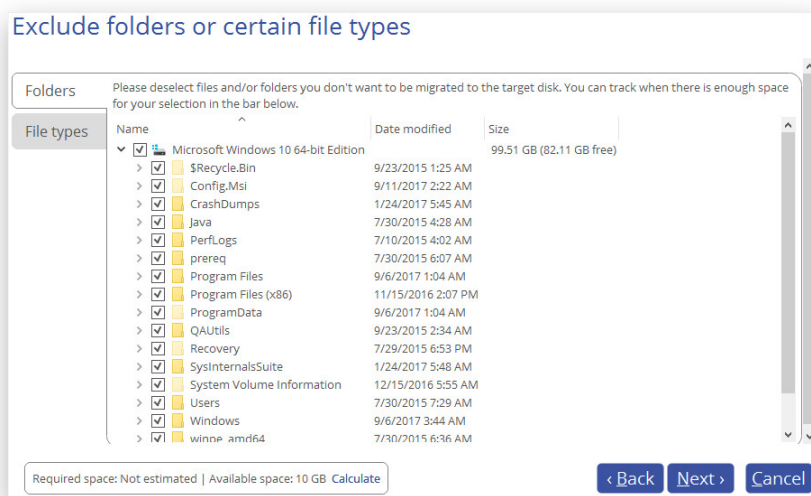
If the selected disk is the same size or larger than the source, but you're still willing to remove redundant data from the migration process, mark the corresponding option to do it later.



8. The destination disk will be checked for the presence of files. If found, you will be warned that all data stored on this disk will be lost during the upcoming operation. Use Windows Explorer or any file manager to save all important data to another location, then confirm you agree to proceed.

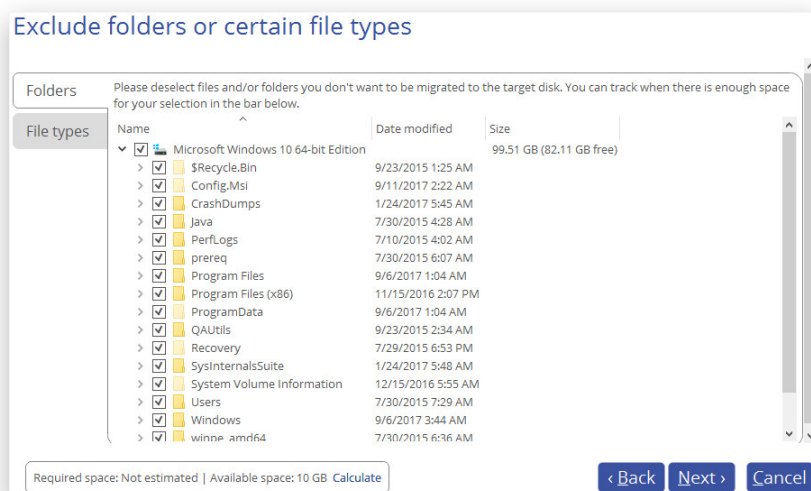


9. If the destination disk is not enough in capacity to hold your OS, first click **Calculate** to know exactly how much data you need to exclude. The calculation takes a while, so please be patient.

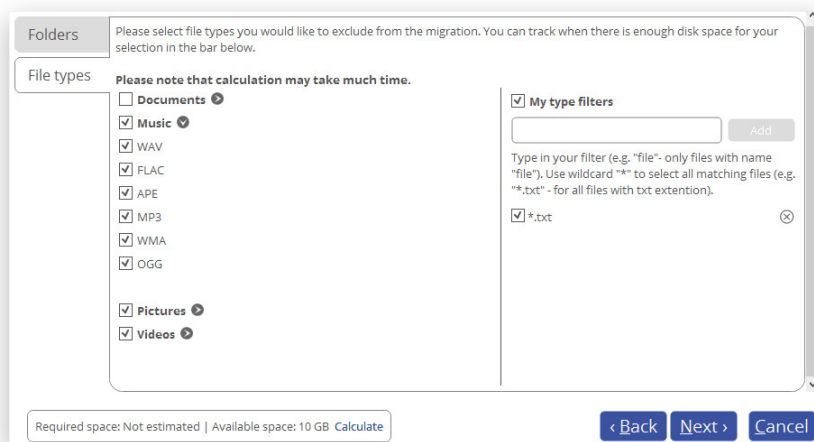


The wizard includes two data exclusion modes, available under the corresponding tabs:

- **Folders** (default). Double click the system partition to see its contents, then unmark checkboxes opposite unnecessary files and folders to try to fit in to the destination disk. We do not recommend you to exclude system files, but those that could take plenty of disk space, like video, music, photos, etc. When ready, click **Calculate** to make sure you get a success.

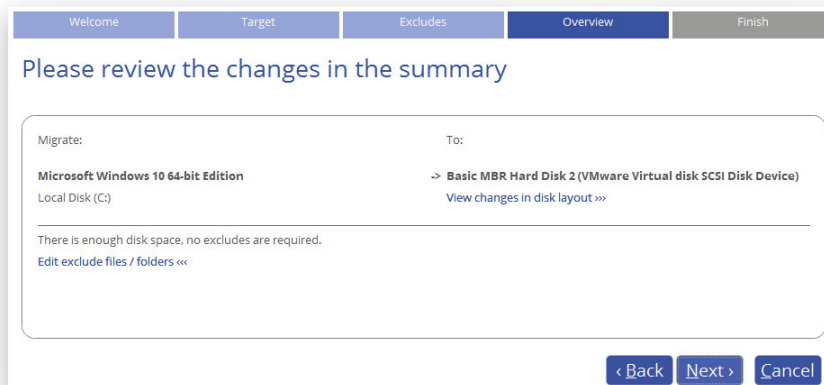


- **File types.** By clicking on this tab, you can see three predefined categories containing file masks for popular document, music, and picture formats. Either select an entire category(ies) or use the arrow icon to expand it and choose a certain file mask(s). If you don't find the required mask, add your own through the **My type filters** option. When done, click **Calculate** to make sure you get a success.

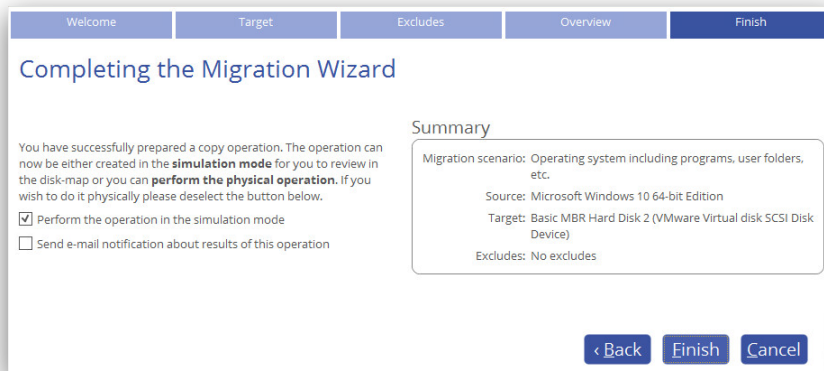


If the destination disk is the same or larger than the source, then the data space calculation won't be available in the program's interface.

10. Review all parameters of the operation and modify them if necessary by going back to any of the required steps.



- If the destination disk is larger than the source, then the wizard will prompt you to expand the resulted partition across all on-disk space. Unmark the corresponding option if you don't need that.
 - If the destination disk becomes Bootable GPT as a result of the migration process, you'll see one more option that will allow you to make OS bootable on this disk. Please note that you can specify a bootable device at any time through Boot Corrector.
11. If you'd like to execute the operation immediately after finishing the wizard, disable the simulation mode by unmarking the corresponding option. If you'd like to be notified by email about successful completion and/or failure of this operation, mark the corresponding option and then select the required mode. Please make sure the email recipient is specified. Click **Finish** to complete.



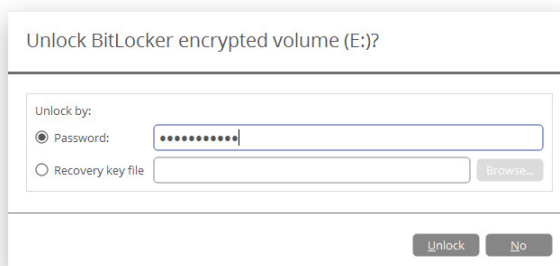
12. When the migration is over, first check up Windows OS starts up from the SSD. If yes, delete the Windows OS partition from the source disk, then re-partition the disk according to your needs.

Extra WinPE Scenarios

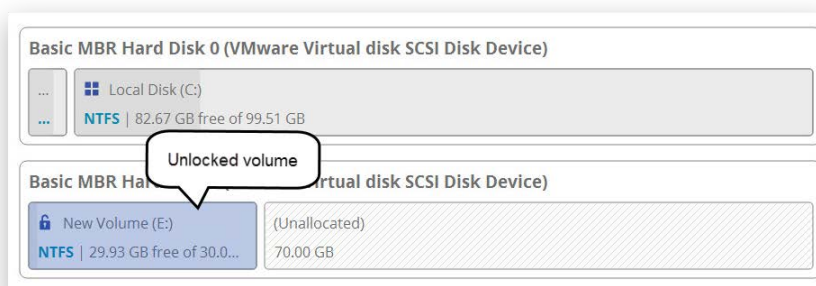
Unlocking Bitlocked Volumes

The program allows you to accomplish backup, restore, or copying of Windows BitLocker encrypted volumes, but only when they are unlocked. Until that the locked volumes will be recognized in the program's interface as "Bitlocked".

1. [Start up the computer from the WinPE recovery media.](#)
2. Open **Tools > My Computer**. Left click a volume detected as "Bitlocked", then select **Unlock Bitlocker encrypted volume** in the opened menu.
3. Either enter a password or provide a path to a recovery key (**recoverykey.bek**). For more details, please consult documentation provided by Microsoft.



4. Click **Unlock** when ready. All introduced changes to the disk layout will be [pending until confirmed](#).
5. As a result of the operation the volume gets correctly recognized and is available to work with.



The same action can be accomplished in the Windows version of the program.



Resize or free space redistribution that leads to shrinking of an unlocked bitlocked volume may fail due to limitations of a Microsoft service used for accomplishing this type of operations.

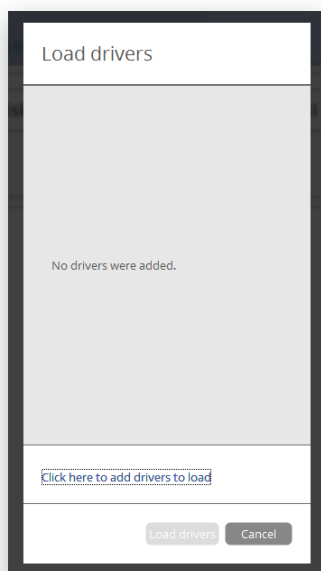
Adding Specific Drivers

The WinPE recovery media offers excellent hardware support. However, in case of not having a driver for your disk controller, for example, your hard disks will be unavailable to work with. Please use this scenario to inject drivers for unknown storage controllers, network cards, or other devices.



To avoid this action every time you start up the recovery media, we recommend you to inject additional drivers during its creation. For more details, please consult [Building Recovery Media](#).

1. [Start up the computer from the WinPE recovery media](#).
2. Select **Utilities > Load drivers**.
3. Use the corresponding link to browse for an .INF file of the required driver package on a floppy disk, local disk, CD/DVD or a network share. To learn how to map a network share, please consult [Configuring Network](#).



The chosen package gets on the list. Repeat this action to inject more drivers. Click **Load drivers** to accomplish the operation.



The WinPE environment can either be 32- or 64-bit, so are to be drivers for injection.

Configuring Network

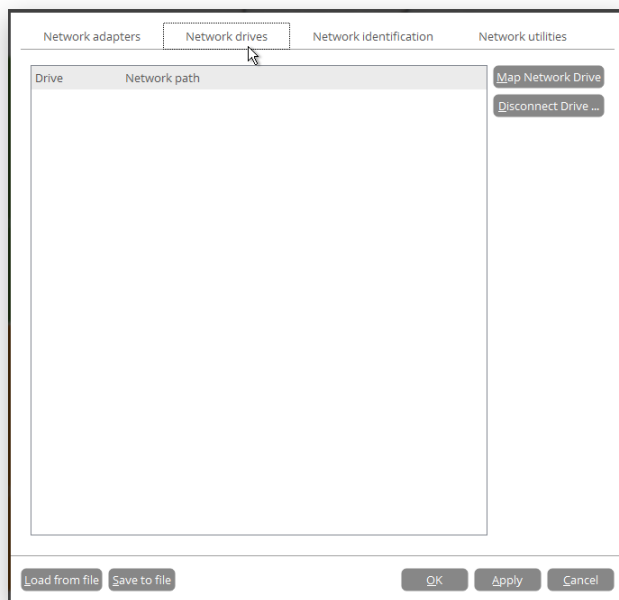
If your local network has a DHCP server, a network connection will be automatically configured once the WinPE recovery media has loaded. Otherwise, you will need to do it manually by providing an IP address, a network mask, default gateway, etc. in Network Configurator. Additionally, this wizard will help you map a network share, ping a network resource, or measure transit delays of packets across an Internet Protocol (IP) network to track down problematic nodes.



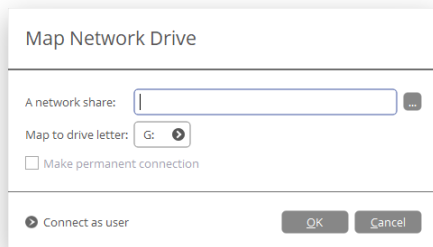
To avoid this action every time you start up the recovery media, we recommend you to pre-configure network settings and map network resources during its creation. For more details, please consult [Building Recovery Media](#).

1. [Start up the computer from the WinPE recovery media.](#)
2. Select **Utilities > Configure network**.
3. Provide an IP address, a network mask, default gateway, etc. to configure your network device according to network environment.

4. Use the **Network drives** tab to manage network shares.



5. Click **Map Network Drive** to map a network share.



- 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;
 - If you'd like to make this connection permanent, mark the corresponding checkbox. Otherwise it will only be available for the current 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. Use the **Network identification** tab to change a network name of your computer (generated automatically) and a workgroup name.

The screenshot shows the 'Network Identification' tab of the Network Configuration Wizard. At the top, there are four tabs: 'Network adapters', 'Network drives', 'Network identification' (which is selected), and 'Network utilities'. Below the tabs, there are three input fields: 'Computer Name:' with the value 'MININT-R1LONSL', 'Workgroup:' with the value 'WORKGROUP', and 'Primary DNS suffix:' which is empty. At the bottom of the window, there are four buttons: 'Load from file', 'Save to file', 'OK', and 'Cancel'.

7. By default, the wizard saves all network settings in the "netconf.ini" file located on the WinPE RAM drive, thus it will only be available until you restart the computer. However, you can just once configure your network device and then save this file to some other destination, for instance a local drive, and this way avoid constant re-configuration, just by providing a path to it. So click **Save to file** to save the "netconfig.ini" file to the required destination.

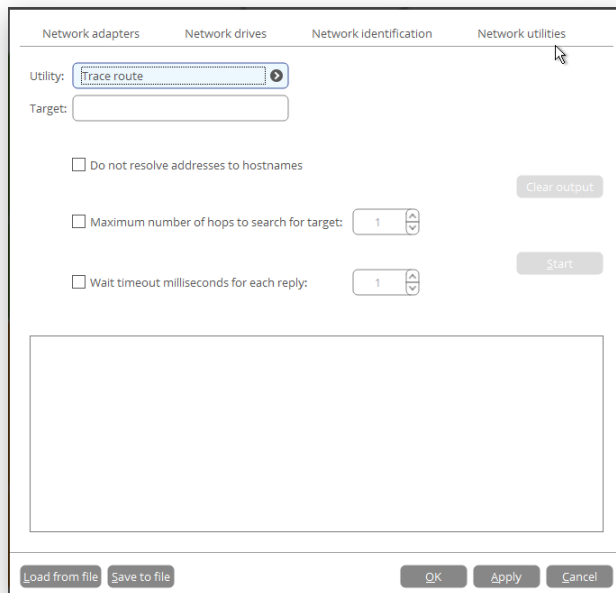
Network Troubleshooter

Network Configurator includes a traceroute/ping utility that enables to get detailed information on particular routes and measure transit delays of packets across an Internet Protocol (IP) network. So with its help you can easily track down problematic nodes.

1. [Start up the computer from the WinPE recovery media.](#)
2. Select **Utilities > Configure network**.
3. Click on the **Network identification** tab, then select **Ping** to ping a network host. Click **Start** when you're ready with all parameters.

The screenshot shows the 'Network utilities' tab of the Network Configuration Wizard. At the top, there are four tabs: 'Network adapters', 'Network drives', 'Network identification', and 'Network utilities' (which is selected). Below the tabs, there is a 'Utility:' dropdown menu with 'Ping' selected. Below that is a 'Target:' input field. There are three checkboxes: 'Ping the specified host until stopped' (unchecked), 'Resolve addresses to hostnames' (unchecked), and 'Number of echo requests to send:' with a value of '1' and a small up/down arrow. To the right of these checkboxes are two buttons: 'Clear output' and 'Start'. At the bottom of the window, there are four buttons: 'Load from file', 'Save to file', 'OK', and 'Cancel'.

- **Target.** Type in the required IP address or its DNS name.
 - **Ping the specified host until stopped.** Mark the option to ping the chosen host for indefinite time.
 - **Resolve addresses to hostnames.** Mark the option to display hostnames instead of IP addresses.
 - **Number of echo requests to send.** By default, the utility sends 1 echo request, which you can modify however.
4. Select **Trace route** to trace a route to a network host. Click **Start** when you're ready with all parameters.



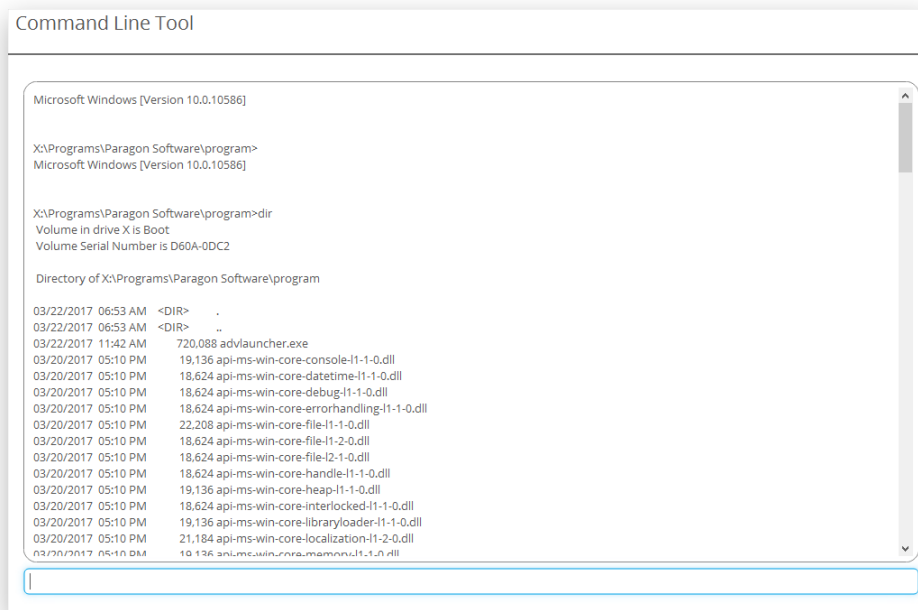
- **Do not resolve addresses to hostnames.** Mark the option to display IP addresses instead of hostnames.
- **Maximum number of hops to search for target.** By default the utility goes through maximum 30 hops when searching for the target host, which you can modify however.
- **Wait timeout milliseconds for each reply.** By default the utility waits 4 seconds for each echo reply message. If not received within the timeout, an asterisk (*) is displayed.

Using the Command Prompt

The primary function of the command prompt is running [generated program scripts](#) with different parameters. Additionally, it can help you with opening Notepad or Diskpart, running batch files, or solving a variety of issues such as failure to connect to the internet or website loading problems.

1. [Start up the computer from the WinPE recovery media.](#)
2. Select **Utilities > Run command.**
3. The embedded command prompt utility is similar to Windows CMD. It supports the auto-complete and commands history features:
 - **Arrow up/Arrow down** to navigate the history,
 - **Tab** to complete or select a path,
 - **Esc** to clear a text field,
 - **Return** to run a command.

Type in **hdmengine_scriptapp.exe <path to a generated script file> --multiple** to run the required program script.



The 'multiple' parameter is obligatory to use in WindowsPE. To learn more about scripts, please consult the Paragon Scripting Language manual.

```

C:\Program Files\Paragon Software\Hard Disk Manager 16 Internal\program>hdmengine_scriptapp.exe C:\script.ps1
Some of the Paragon disk engine is already running.

C:\Program Files\Paragon Software\Hard Disk Manager 16 Internal\program>
  
```

Troubleshooting

In case of having difficulties with handling the product first visit our Knowledge Base to find an existing remedy: <https://kb.paragon-software.com/>.

If your issue is not described there, please address our support engineers for assistance. To help you solve your problem with minimal time, our engineers need operation logs and your brief description.

1. Reproduce your issue (make it happen again).
2. Select **Home > Collect logs**. Provide an e-mail address used for registering the product, then describe the encountered problem. Please don't worry - we respect your privacy, so none of your confidential data will be exposed.

Home

Settings
Recovery Media Builder
Collect logs
Info about

Collect software logs

Please specify issue details

Please enter an e-mail address used during the product registration. With its help Paragon Support Department will be able to associate your log files with your request through an [on-line request system](#).

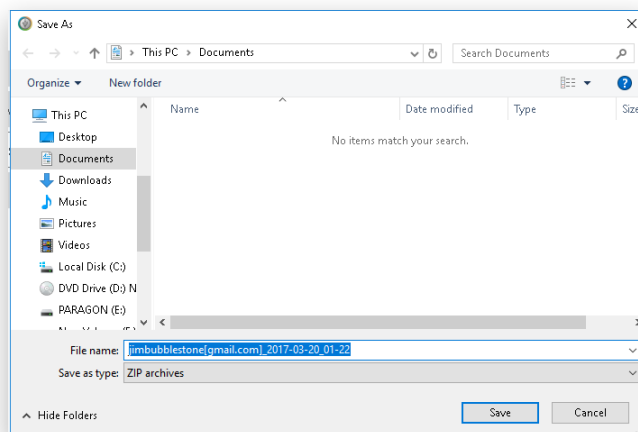
jimbubblestone@gmail.com

Please describe the encountered issue:

Hello Paragon Software, My BR16 doesn't seem to back up my Windows OS correctly. Please help me.

Next >

3. Browse for the required location of the log files package and edit the default file name, if necessary. Click **Save** when ready.

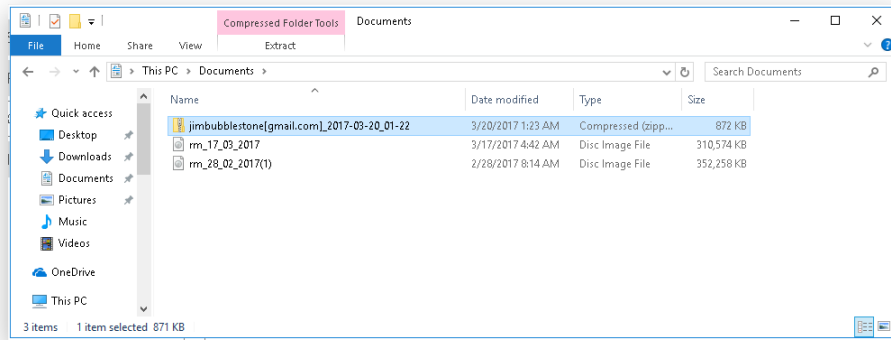


4. Once the operation is over, click **Open folder with logs...** to check the prepared package doesn't contain anything confidential, but layouts of your disks, performed operations, etc.

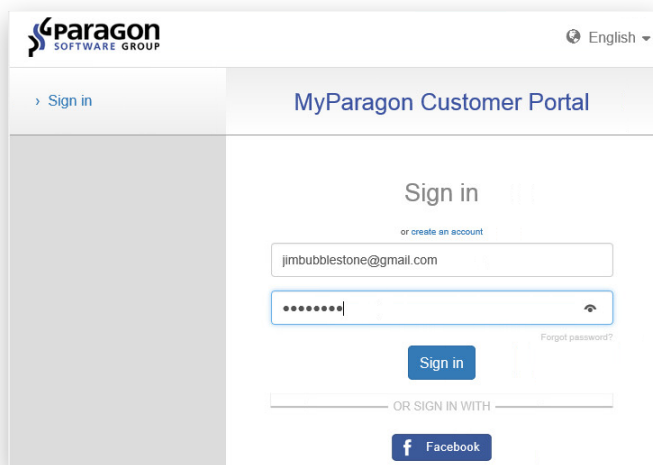
Collect software logs

The log files have been successfully collected!

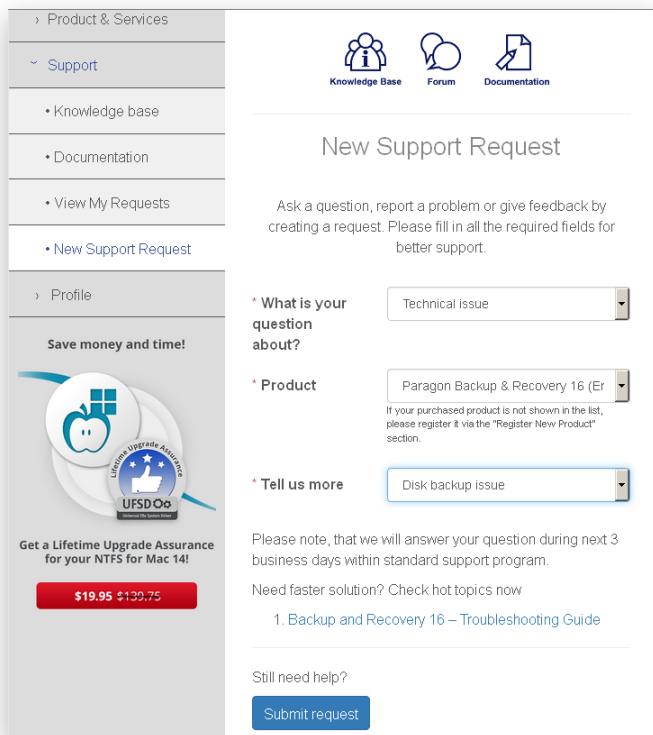
Open the folder with logs in Windows Explorer



5. Use the link on the first page of the wizard to sign in to MyParagon Account.



6. Go through the first-level ticket request form, then click **Submit request**.



7. Go through the second-level ticket request form, attach the prepared logs package, then click **Post request**. That's all. Our support engineers will get in touch with you in a little while.

