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Product Overview

Backup & Recovery is an easy-to-use tool for reliable backup of an entire computer, individual volumes or files. It helps to get consistent point-in-time copies of your PC including OS, running applications, user settings and all data in such a way that you don’t even feel any discomfort.

Backup & Recovery supports full, incremental and differential backup methods and their combinations as well as various backup retention options, which opens a way to create comprehensive backup strategies that allow keeping backup data precisely up to date with minimal effort and backup storage footprint. Your choice may depend on whether this applies to a home computer for which you may want only a few restore points to roll back, or a production environment that contains sensitive data. In any way, a smart backup configuration wizard simplifies backup routines – all essential setups can be done from one place and all options come with hints and recommendations. The backup timeline view helps to instantly grasp the key properties of selected backup jobs, including availability of restore points and the number of failed backup runs.

Several restore options are available for you to rule out an emergency situation as quickly as possible, from fast retrieval of specific files from a backup image, to complete restore of your computer to an earlier state without losing data, reinstalling and reconfiguring your programs. Even when OS fails to start up, you still have a chance to get everything back on track by loading your PC from a WinPE-based rescue media prepared beforehand.

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

As we continuously update and improve the product, live product screens may not match the screenshots contained in this document, despite the best effort to keep the document consistent with the product outlook.
**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 recovery environment** for emergency scenarios. It provides an excellent hardware support and the same interface as the Windows version (recommended for most scenarios).

**System Requirements**

**For the Windows installation package**
- Windows 7 SP1 and later (except for Server editions).
- Opened ports in Firewall: inbound and outbound 80, 443
- Internet Explorer 10.0 or higher

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

**For the WinPE recovery environment**
- Intel Pentium III CPU or its equivalent, with 1000 MHz processor clock speed
- At least 2 GB of RAM
- SVGA video adapter and monitor
- Keyboard
- Mouse

**Additional requirements**
- Recordable CD/DVD drive to burn bootable recovery environment to a compact disc

**Installation**

Before the installation, please make sure the **systems requirements** are met. If everything is OK, please do the following to install the product:

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. Please Read Paragon License Agreement and Privacy Policy carefully and then select the appropriate option to accept. Otherwise you won’t be able to proceed with the installation.
3. Enter your serial number in the corresponding field to activate the product on the computer. Please follow the provided links for more information.

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

**First Start**
After the installation you can see a program icon on the Windows desktop. Double click it to launch the application.
Backup & Recovery is built around the sidebar that gives you access to action wizards and settings. The sidebar located on the left side of the screen includes several buttons: Home, Backup & Recovery, Disks & Volumes, Settings & Tools, and Help. By clicking the Home button, you can see names of these buttons. On the right side is the working area that displays contents of the currently selected item.

At the bottom of the working area you can find the buttons of the so-called simulation mode (in Disk & Volumes mode only). It gives you the choice of placing potentially dangerous operations that may destroy the on-disk data (format, delete, restore, etc.) on a special list instead of immediate execution. 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.
Changing Program Settings

Click **Settings & Tools** on the sidebar 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 Settings**

- **Allow to send anonymous statistics.** Disable this option if you don’t want to share usage statistics with Paragon Software.
- **Check for updates.** Disable this option if you don’t want our program to automatically check company’s website for available updates once a day.
- **Close progress dialog automatically.** Enable this option to automatically close the progress dialog after accomplishing operations.

**E-mail Settings**

In this section you can set up e-mail transport for sending notifications. 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.

- **SMTP server.** 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.** Non-encrypted connections are usually established through port 25, while port 465 is used for SSL (Secure Socket Layer) connections.
• **Encryption.** 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.

• **E-mail address.** Enter the e-mail address of the user from whom notifications will be sent.

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

**Notifications Settings**

Our program can be set up to notify you by e-mail about successful completion and/or failure of most operations. This function is enabled when configuring tasks, while in this section you can test your e-mail transport. Find more details in **E-mail Settings.**
Building Recovery Media

Our program includes a user-friendly wizard that will guide you through the process of creating a WinPE 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. Click **Settings & Tools** on the sidebar, then select **Recovery Media Builder**.

2. The welcome page introduces the wizard’s functionality. Recovery Media Builder doesn’t require Windows Assessment and Deployment Kit (ADK) 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, select **Use ADK**. You will also need it to create an ISO image of the WinPE environment.

   If you have installed ADK by its default location, the wizard automatically detects it. Otherwise, you will need to browse for the required folder. If you haven’t installed this toolkit yet, click **Download ADK** to get it directly from the Microsoft website. Please note that ADK is a Microsoft’s proprietary tool and can be obtained from its **Download Center** for free, provided you have a genuine Windows installation. Moreover, you need to download a version, which is suitable for your Windows OS.

   The wizard won’t continue until you install ADK.

   Please use ADK 8.1 if you run RMB under Windows 7, 8, 8.1, Server 2008 R2, Server 2012 R1/R2.

3. 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). Please note that all data on it will be deleted during the operation. If you’d like to create an ISO image of the WinPE environment, please use the corresponding option.
4. Inject additional drivers for specific storage controllers or network card if needed. First click on the required link.

![Add device drivers](image)

Then browse for an .INF file of the required driver package.

![Browse INF file](image)

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

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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.

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5. Set up a network connection and map a network share if needed.
**Network settings**

- **Connect to network automatically**... Specify the following parameters if you’d like to have an active network connection once the recovery 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 recovery media.

- **Do not set up network**... Please use this option if you don’t need network support on the recovery media.

**Mount options**

- **Do not mount a network share.** Please use this option if you don’t need to map network resources.

- **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 recovery 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.

- **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 recovery media.

6. 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. The user interface of the WinPE recovery media is identical to that of the Windows version except for having several additional utilities.

Find more details in:

- [Restoring an Entire Disk or Separate Volumes](#)
- [Configuring Network](#)
- [Network Troubleshooter](#)
- [Using the Command Prompt](#)

If you have questions on how to use our program, please refer to the embedded help system.
Protecting System and Data
Backup Tasks
Configuring Backup Job
Backup & Recovery includes all technologies to help you effectively protect different types of data. Do you need to secure your software environment, including the operating system, applications and data? Create a full backup image of entire disks or individual volumes to be able to recover your system to a working state within several minutes in case of emergency. Are you looking for an optimal way of securing individual files or folders? Use the file-level backup capabilities to protect family pictures, favorite music, some project or document without wasting time and backup storage on other on-disk data. Are you busy developing 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? Just automate your backup routines through scheduling.

Are you a pro in backup technologies? Configure comprehensive backup strategies that utilize full, incremental, and differential backup methods and their combinations as well as various backup retention options, where backup runs can be scheduled from every hour till certain days of the month, or evoked by a certain event. Does your backup policy engage an instant virtualization scenario? Set up our program to back up directly to a virtual container supported by your hypervisor. Do you need a rock-solid shield against unauthorized access to backup data? Several encryption algorithms to choose from, including 256-bit Advanced Encryption Standard (AES), ensure complete safety for sensitive data.

1. Click Backup & Recovery on the sidebar.

2. If this is the first time you do backup, you will see the backup configuration wizard. If you already have some backup jobs in the list, then click the plus icon.

3. Give a clear name to your backup job.

4. Click the Backup source icon, and then the most suitable option.
• **Entire Computer.** Choose this option to back up all storage devices of your PC.

• **Disk/Volumes.** 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 additionally selects another one that contains boot system files. Though it’s not recommended, you can deselect any volume you consider unimportant.

• **Files/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.
Switch to **Select files by file type** mode if you’re planning to back up specific types of files, for example Word documents or Excel workbooks. The wizard includes three predefined categories containing file masks for popular document, music, and video 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 **Add your file types...** option.

When you’re done with the file masks, mark a checkbox opposite a folder or partition where the wizard should look for your files.

5. Click the **Destination** icon, and then specify backup location (local or external storage, or a network share).
• **Local folders.** Browse your internal disks to find a storage place for the backup data. Use the corresponding buttons to create new, rename, or delete folders.

• **External drives.** Choose an externally connected storage (hard disk, thumb drive, etc.) from the list. If it’s not present, please make sure it’s available in the system, then try again.

• **Network locations.** Choose a mapped network share from the list or add a new one by specifying its name, location (a full path or through browsing the network), and access credentials.

6. At this step you can click **Back up now** to create a full backup image of the specified data. Click this button again in the future and our program will create another full backup image reflecting changes since the initial backup.

Having a full backup is a good start, but we recommend you to continue configuration of the job in order to automate the backup process, optimize utilization of the storage space, protect your backup data from unauthorized access, and do some other useful setups.
7. Schedule your backup job by clicking either the watch icon on the backup timeline or the corresponding hyperlink.

We suggest choosing the daily backup 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.

The weekly or monthly backup comes into play when your data is not changed 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. The same goes for partitions that host the operating system.

While setting a start time for backup runs, please make sure it is during off hours (at night or early in the morning) or whenever the computer has the least work-load to perform. To allow backup runs when a non-admin user is logged in, or to wake up from sleep or hibernation automatically, click **Show advanced settings** to see and adjust the corresponding options.
8. Set up a backup strategy by clicking one of two hyperlinks in the corresponding section.

Backup & Recovery supports full, incremental and differential backup methods and their combinations as well as various backup retention options, which opens a way to create comprehensive backup strategies. Your choice may depend on whether this applies to a home computer for which you may want only a few restore points to roll back, or a production environment that contains sensitive data that might be needed for the future forensic analysis and/or it can be subject to compliance requirements.

For important files you choose to back up daily, we suggest a seven-day backup cycle of one full backup image followed by six incremental updates. It is a reasonable compromise between backup storage consumption and restore performance. 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.

For non-critical information protected on a weekly basis, we consider the use of the incremental imaging 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 type of backup chain may take plenty of time. Thus, we recommend it to create full backups only and keep no more than three latest restore points.

If you prefer an external storage device as backup media and don’t need to have several restore points, we suggest creating and keeping one full backup. The same goes for backups done before applying OS patches or installing new software.
If you need our help in working out an optimal backup cycle for your environment, please contact our Support Team.

9. Click **Options** to modify advanced backup settings. Please note that all parameters set right here will be relevant for this backup job only.

- **Backup container type.** By default, our program is configured to back up to pVHD (Paragon Virtual Hard Drive), but you can switch it to VHD, VHDX, or VMDK. Please note that pVHD-based full backups are 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, password protection, backup compression and splitting options are only available for pVHD. However, if you’re having a VMware or Microsoft hypervisor and are planning to do instant virtualization, make sure the used backup container type matches your hypervisor.

- **Password protection.** Specify a password and encryption algorithm to protect backup data from unauthorized access (recommended). Please note that setting, changing, or resetting password or
encryption algorithm forces creation of a full backup. This option is only available for pVHD containers.

- **Backup compression.** Select the desired compression level (none, fast, normal, best). Please note that the better compression level you choose, the more time backup takes. This option is only available for pVHD containers.

- **Backup splitting.** By default, created backup images are split to files of 4GB. This helps to avoid problems caused by a maximum file size limitation of FAT32 file system. Use the spinner control to set another size or disable the backup splitting. This option is only available for pVHD containers.

- **Prevent from sleep/hibernate during backup.** Use this option prevent your computer from going into sleep or hibernation mode until the backup is done.

- **Check backup integrity after creation.** Use this option to make sure the created backup data is 100 percent flawless.

- **Shut down system after backup.** Use this option if you want the computer to automatically shut down when the backup is completed. Please note however that in some cases you may lose unsaved data of the running apps because of this action:
  - If you don’t have running apps with unsaved data, the shutdown is absolutely safe;
  - If you do have running apps with unsaved data and your Windows session is not locked (interactive mode), our program initiates a 10-minute countdown, then the “soft OS shutdown”. This means that the operating system will ask you what to do with unsaved data and wait for you to save the data inside the running apps or confirm the shutdown without saving. So in this case the shutdown is also absolutely safe;
  - If you do have running apps with unsaved data and your Windows session is locked, then your computer will be shut down after a 10-minute countdown and all unsaved data will be lost.
  Please avoid this scenario.

- **Handling unknown volumes.** Set behavior for processing unsupported or unformatted partitions (skip from backup, process in sector-by-sector mode, or ask the user each time this type of partition has been found).

- **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.

- **Execute before 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.

- **Execute after backup.** Specify an executable file to run after backup. It may include commands/programs to resume the previously suspended services, etc.

Our 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 our 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.

10. Review all parameters of the operation and modify them if necessary. Click **Back up now** to save the changes and start the backup.

11. If everything went smooth, the resulted status on the backup timeline would be "Succeeded" (the green OK icon).
Managing Backup Jobs

By selecting an existing backup job from the list on the sidebar, you can see its properties and available operations in the working area. The backup timeline helps to instantly grasp the key properties of selected job, including availability of restore points and the number of failed backup runs.

- Click **Files and folders** (Disk and volumes or Entire Computer for a volume-level backup job) to change backup objects.

- Click **Local folder** (Network folder or External Drives) to change backup location. Please note that after changing the backup location, Backup & Recovery forces creation of a full backup in the new place. All backup data in the old location remains intact and can be used for restore without limitations.

- By clicking corresponding links, you can change the current backup schedule and/or backup strategy properties.

- Click **Backup up now** to force running the backup job.

- Click the desired restore point on the backup timeline, then select the require operation (Explore, Mount/Unmount, Delete).

  Find more details in:
  
  - Restoring Individual Files and Folders
  
  - Mounting a Backup Image

- Use the minus icon on the sidebar to delete the selected job and all restore points produced by that job or only the job.
Restore Tasks

Restoring Individual Files and Folders

1. Click **Backup & Recovery** on the sidebar.

2. Select an existing backup job, click the desired restore point on the backup timeline, then select **Explore**.

![Backup & Recovery interface](image)

Be ready to provide a valid password to access contents of an encrypted backup image.

3. Browse the backup image to specify what you need to extract by marking checkboxes next to the required data items. Click **Export** when ready.
4. Specify where you’d like the selected files to be restored. Use the corresponding buttons to create new, rename, or delete folders.

Restoration 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.

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.
5. The operation starts immediately after confirmation.

**Restoring an Entire Disk or Separate Volumes**

This scenario would be identical on the WinPE recovery media, except for the necessity to additionally import a backup image you’re planning to use for restore. Find more details in [*Importing a Backup Image*](#).

1. Click **Backup & Recovery** on the sidebar.

2. Select an existing backup job, click the desired restore point on the backup timeline, then select **Restore**.

Be ready to provide a valid password to access contents of an encrypted backup image.

3. By default, the program prompts you to restore all backup objects inside the selected restore point exactly where they belong. Just click **Restore now** to start the operation or change any of the defaults as described below.
• Select another restore point from the drop down list, if necessary.

• Click the Disk/Volumes icon (or File/Folders for a file-level backup job) to specify backup objects you’d like to restore by marking/unmarking checkboxes next to the required data items.

• Click the Original location icon to choose any disk of enough capacity available in your system as backup target.
You will be warned when trying to rewrite a bootable partition.

4. Use the corresponding buttons to check the original and resulting disk layouts.
5. The operation starts immediately after confirmation.

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.

1. Click Backup & Recovery on the sidebar.
2. Select an existing backup job, click the desired restore point on the backup timeline, then select Mount/Unmount.
3. 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 **Next** to confirm.

4. Once mounted, you can treat the backup partition as you would any other Windows volume (browse, retrieve files, modify files).
5. Use the same algorithm to unmount the backup image when not required any more.

Importing a Backup Image

You can add an existing backup job and all restore points produced by that job to the "My Backups" list and this way make them available in the program interface.

This function is available on the WinPE recovery media only, helping you to quickly start a backup or restore operation.

Supported backup data containers:

- Volume- and file-level virtual containers (pVHD, VHD(X), VMDK) created by the current version.
- Volume- and file-level virtual containers (pVHD, VHD(X), VMDK) created by any 15-16th version.

Backups imported in the WinPE recovery environment are only available for the current session, so you won’t be able to use them in Windows after system restart.

1. Start up the computer from the WinPE recovery media.
2. Click Backup & Recovery on the sidebar.
3. Left click the three-dot icon on the sidebar opposite "My Backups", then select Import backup.
4. Browse for the required backup index file (PFI), then click **Next**.

Please note that Paragon’s backup index files are browsable. Just click on a PFI file to see backup items stored in corresponding backup containers.

5. Upon success, you will see a new preconfigured backup job on the list with available restore points on the backup timeline.
Managing Partitions and Disks

Partitioning lets you divide a single physical drive into a number of logical drives, each of which serves as a container with its own drive letter and volume label, thus enabling the operating system to process data more efficiently. Partitioning also makes it possible to organize data so that it is easy to find and manage. By detaching the OS from the rest of the data you can tackle one more crucial issue – in case of a system malfunction, you can get the system back on track in minutes by recovering it from a backup image located on the other partition of the hard drive. Finally partitioning is a necessity if you’re planning to run several OSs on a single hard drive to effectively delineate the boundaries of each OS.

Basic Partitioning Tasks

Creating a Partition

1. Click **Disks & Volumes** on the sidebar.

2. Left click a block of free space on a disk you’d like to partition in the working area, then select **Create volume** on the sidebar.

3. By default, you will be prompted to create a primary NTFS partition named “New Volume” that will be the size of the selected free block. This partition will also acquire the first vacant drive letter.

   If necessary, change the partition size by using the “Volume size” slider or setting an accurate value in the corresponding field. You can also change the default volume label to easily identify the partition later.

4. Click **Show advanced options** if you want to modify other properties.

   - Select the desired partition type (Primary or Extended). 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.
   
   - Select the desired file system from the list, otherwise you won’t be able to store data on the created partition.
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

- 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. Select "None" if you do not want this partition to be available in the system.
- If the partition does not occupy the entire free block, define its position by using the corresponding sliders or setting accurate values of unallocated space before and after the partition.
- 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 format 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.

You won’t be able to work with a partition formatted to a Windows unsupported file system, unless you have a third-party driver installed, for instance Apple HFS for Windows.

5. Use the corresponding buttons to check the original and resulting disk layouts.
6. If necessary, click Notifications to set up e-mail notification about successful completion and/or failure of the operation. Find more details in Notifications Settings.
7. Use the corresponding buttons to check the original and resulting disk layouts. Click Create now to start the operation immediately or Place in queue to add this task to the list of pending changes for later execution.

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. Click Disks & Volumes on the sidebar.
2. Left click an existing partition in the working area, then select Format volume on the sidebar.
3. By default, you will be prompted to format the partition to one of the Windows-native file systems (depends on partition size) with the volume label “New Volume”.
   If necessary, select another file system from the list and change the default volume label to easily identify the partition later.

   Supported file systems:
   - FAT32 – use for data disks that are 32GB or less
   - NTFS – the primary file system for Windows OS
4. Click **Show advanced options** if you want to change the default amount of sectors per cluster. 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. Use the corresponding buttons to check the original and resulting disk layouts.

6. If necessary, click **Notifications** to set up e-mail notification about successful completion and/or failure of the operation. Find more details in **Notifications Settings**.

7. Use the corresponding buttons to check the original and resulting disk layouts. Click **Format now** to start the operation immediately or **Place in queue** to add this task to the list of pending changes for later execution.

**Deleting a Partition**

1. Click **Disks & Volumes** on the sidebar.

2. Left click an existing partition in the working area, then select **Delete partition** on the sidebar.

3. By default, our program only suggests removing references to the selected partition from the Partition Table.
4. If you’d like to additionally destroy the on_partition data, mark the **Make the deleted data unrecoverable** option to specify data erasure algorithm and other parameters. Find more details in [Erasing Data](#).

5. Use the corresponding buttons to check the original and resulting disk layouts.

6. If necessary, click **Notifications** to set up e-mail notification about successful completion and/or failure of the operation. Find more details in [Notifications Settings](#).

7. Use the corresponding buttons to check the original and resulting disk layouts. Click **Delete now** to start the operation immediately or **Place in queue** to add this task to the list of pending changes for later execution.

**Moving/Resizing a Partition**

1. Click **Disks & Volumes** on the sidebar.

2. Left click an existing partition in the working area, then select **Move or Resize** on the sidebar. Alternatively, you can drag-and-drop borders of a partition directly on the Disk Map to define its size and position.

3. Use the corresponding sliders or set accurate values to define new size and the amount of unallocated space before and after the partition.
4. Use the corresponding buttons to check the original and resulting disk layouts.

5. If necessary, click Notifications to set up e-mail notification about successful completion and/or failure of the operation. Find more details in Notifications Settings.

6. Click Change now to start the operation immediately or Place in queue to add this task to the list of pending changes for later execution.

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Resizing 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.

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**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.

Backup & Recovery 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 our program offers this function only for blocks of free space.

1. Click Disks & Volumes on the sidebar.

2. Left click a block of free space that used to be a partition in the working area, then select Undelete volumes on the sidebar.

3. 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 “Full search” option to scan every single sector in the specified search area to get the most accurate results.
4. By default, our 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.

5. Use the corresponding buttons to check the original and resulting disk layouts.

6. If necessary, click **Notifications** to set up e-mail notification about successful completion and/or failure of the operation. Find more details in **Notifications Settings**.

7. Click **Undelete now** to start the operation immediately or **Place in queue** to add this task to the list of pending changes for later execution.

**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, our program will reorganize the file system metadata and user files.

Our program supports the following scenarios:

- FAT16/32 <> NTFS conversion
- NTFS <> HFS conversion

1. Click **Disks & Volumes** on the sidebar.
2. Left click an existing partition in the working area, then select **Convert file system** on the sidebar.
3. Choose a file system you would like to convert to from the list. Our program only displays variants available for the operation, taking into account parameters of the selected partition and limitations of the used file system.

If necessary, you can 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.

4. Use the corresponding buttons to check the original and resulting disk layouts.
5. If necessary, click **Notifications** to set up e-mail notification about successful completion and/or failure of the operation. Find more details in **Notifications Settings**.
6. Click **Convert now** to start the operation immediately or **Place in queue** to add this task to the list of pending changes for later execution.

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

1. Click **Disks & Volumes** on the sidebar.
2. Left click an existing partition in the working area, then select **Change volume label** on the sidebar.
3. Change the default volume label to easily identify the partition later.

![Image showing volume label change process]

4. Use the corresponding buttons to check the original and resulting disk layouts.
5. Click **Change now** to start the operation immediately or **Place in queue** to add this task to the list of pending changes for later execution.

**Changing Drive Letter**

1. Click **Disks & Volumes** on the sidebar.
2. Left click an existing partition in the working area, then select **Change drive letter** on the sidebar.
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.

![Image showing drive letter change process]
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. Use the corresponding buttons to check the original and resulting disk layouts.

5. Click **Change now** to start the operation immediately or **Place in queue** to add this task to the list of pending changes for later execution.

**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, our program doesn’t allow you to hide OS partitions.

1. Click **Disks & Volumes** on the sidebar.

2. Left click an existing partition in the working area, then select **Hide/Unhide partition** on the sidebar.

3. Click **Hide/Unhide now** to start the operation immediately or **Place in queue** to add this task to the list of pending changes for later execution.

**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. Click **Disks & Volumes** on the sidebar.

2. Left click an existing partition in the working area, then select **Set partition as active/inactive** on the sidebar.

3. Click **Set active/inactive now** to start the operation immediately or **Place in queue** to add this task to the list of pending changes for later execution.
**Updating MBR**

Our 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. Click **Disks & Volumes** on the sidebar.
2. Left click an existing MBR disk in the working area, then select **Update MBR** on the sidebar.
3. Click **Update now** to start the operation immediately or **Place in queue** to add this task to the list of pending changes for later execution.

**Getting Disk/Partition Properties**

1. Click **Disks & Volumes** on the sidebar.
2. Left click an existing partition or disk in the working area, then select **Properties** on the sidebar.
3. Our program provides 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:

View properties of "Data Volume (D)" (78.13 GB)

Volume label: Data Volume
File system: NTFS
Type: Primary
Capacity: 78.13 GB
  80,686,080,000 Bytes
Used by data: 56.66 GB (72%)
  60,940,388,944 Bytes
  11802894 Sectors
Free space: 21.46 GB (28%)
  23045681152 Bytes

Close
Checking Partitions for Problems

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

1. Click **Disks & Volumes** on the sidebar.

2. Left click an existing partition or block of free space in the working area, then select **Check file system** on the sidebar.

3. If you’d like our program to automatically fix file system errors and/or find and attempt to repair bad sectors, just enable the corresponding options.

4. If necessary, click **Notifications** to set up e-mail notification about successful completion and/or failure of the operation. Find more details in **Notifications Settings**.

5. Click **Check now** to start the operation immediately or **Place in queue** to add this task to the list of pending changes for later execution.

This operation requires exclusive access to the volume, so please be ready to restart the system.
**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.

Below you can find a step-by-step guide how to transfer Windows OS to a fast but relatively small SSD drive.

1. Connect a new disk to the computer.
2. Launch Backup & Recovery.
3. Click **Disks & Volumes** on the sidebar.
4. Left click the three-dot icon opposite "Operations", then select **Find and copy OS**. Alternatively, you can left click a Windows OS volume in the working area, then select **Copy operating system** on the sidebar.
5. Our program 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.

![Select operating system to copy](image)

6. 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).

   If there are more than two storage devices besides the source, you can select a destination disk from the drop-down list.

   If the selected disk is not enough in capacity to hold your OS, you will be suggested to exclude files from the main system partition.
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, just click **Exclude files and folders**.

- By default, our program is configured to expand the resulted OS 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 available for selection. Please note that you can specify a bootable device at any time through Boot Corrector.

All data stored on the specified destination disk will be lost during the migration, so please use Windows Explorer or any file manager to check and save important data to another location.

7. 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 highly recommend you not to exclude system files, but those that could take plenty of disk space, like video, music, photos, etc.

Click **OK** when ready to let our program calculate the amount of selected data and go back to the main dialog window. Please note that the calculation may take some time, so please be patient.
8. Use the corresponding buttons to check the original and resulting disk layouts.

9. If necessary, click **Notifications** to set up e-mail notification about successful completion and/or failure of the operation. Find more details in **Notifications Settings**.

10. Click **Copy now** to start the operation immediately or **Place in queue** to add this task to the list of pending changes for later execution.

11. When the migration is over, first check up Windows OS starts up from the destination disk. If yes, delete the Windows OS partition from the source disk, then re-partition the disk according to your needs.
Extra WinPE Scenarios
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. Click Settings & Tools on the sidebar, then select Network Configurator.
3. Use the Network properties tab to change the computer identification on the network.

- **Device name and Workgroup.** Click Change if you’d like to join a specific workgroup or edit an automatically generated computer name.

- **Adapter properties.** By default, the recovery environment is configured to get an IP address from a local DHCP server. If there’s no DHCP server on the network, please set up IP settings manually, providing a static IP address, network mask, default gateway, etc.

4. Use the Network drives tab to manage network shares.
Click **Map Network Drive** to map a network share.

- Define a letter from the pull-down list of available drive letters;
- Click **Browse** to navigate to the required network share or manually enter a path to it, using back slashes, like in `\server\share`;
- Mark the **Reconnect at sign-in** checkbox if you’d like to make this connection permanent. Otherwise it will only be available for the current session;
- Mark the **Connect using different credentials** checkbox to specify access credentials if the selected network share is not open for everyone. By default, the Guest account is used to map network shares.

**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. Click **Settings & Tools** on the sidebar, then select **Network Configurator > Troubleshooting**.
3. By default, you will be prompted to verify the connection to `google.com`. 

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- **Remote host.** Type in the required IP address or its DNS name in the corresponding field.
- **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.

Click **Run** when you’re ready with all parameters.

4. Select **Trace route** in the drop-down menu to see the path Internet packets traverse to reach a specified destination.

    - **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.

Click **Run** when you’re ready with all parameters.

### 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. Click **Settings & Tools** on the sidebar, then select **Command line.**
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_scriptsapp.exe <path to a generated script file> --multiple` to run the required program script.

Please note that the ‘multiple’ parameter is obligatory to use in WindowsPE. To learn more about scripts, please consult the Paragon Scripting Language manual.
**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/](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. Click **Settings & Tools** on the sidebar, then select **Logs Collector Tool**. 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.

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 **Explore logs location** to check the prepared package doesn’t contain anything confidential, but layouts of your disks, performed operations, etc.
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.