

Paragon System Recovery Lite

Quick User's Manual

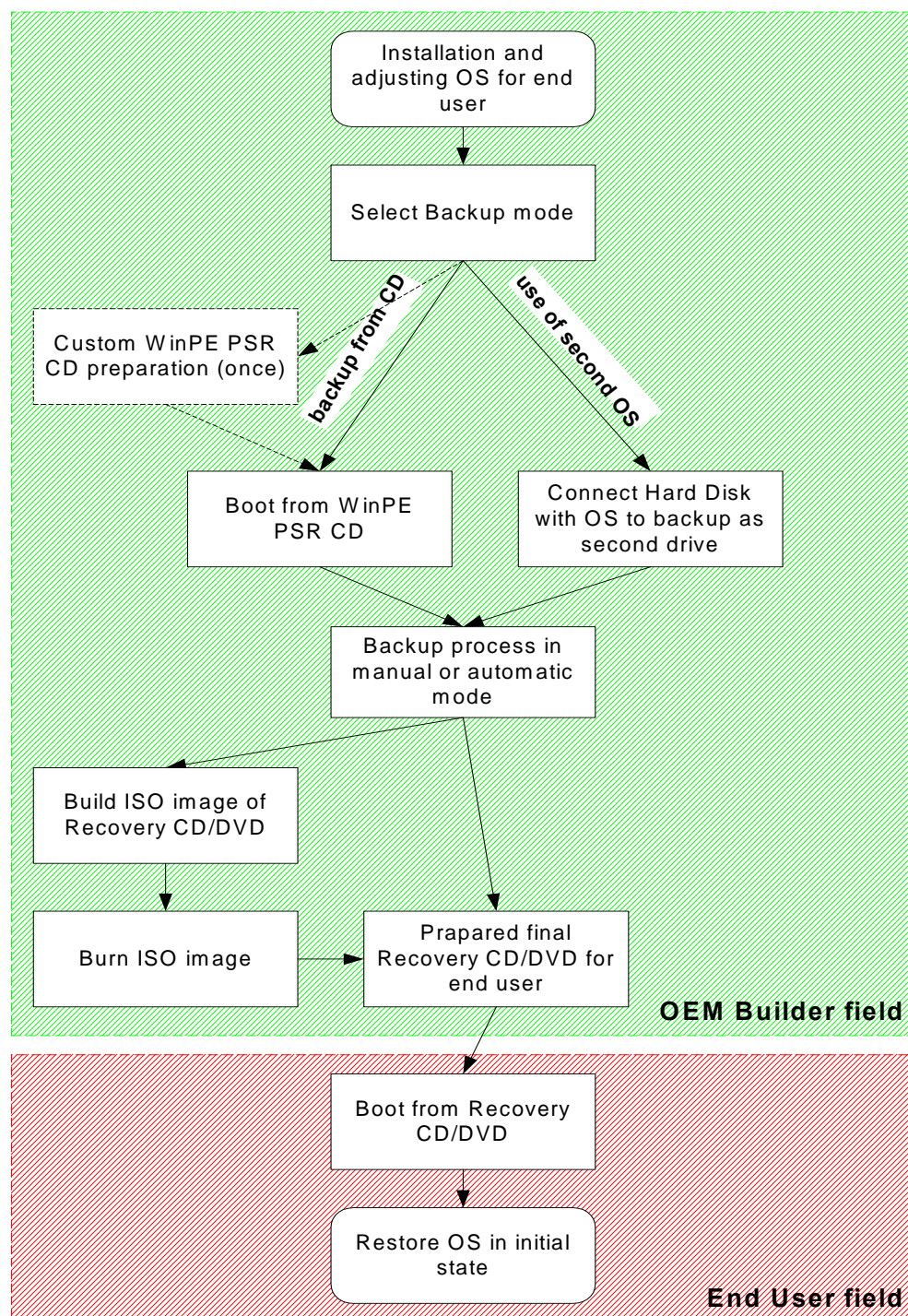
Table of contents

PARAGON SYSTEM RECOVERY LITE.....	1
1 FUNCTIONALITY OVERVIEW.....	3
1.1 BASIC WORK CONCEPT OF THE PROGRAM	3
1.2 PSR COMPONENTS.....	4
2 CREATING BACKUP IMAGE AND RECOVERY CD/DVD	5
2.1 BACKUP WIZARD	5
2.1.1 BACKUP IN THE AUTOMATIC MODE	13
2.2 RESTORING THE OPERATING SYSTEM FROM THE RECOVERY CD/DVD	14
2.3 CREATING CUSTOMIZABLE WINPE PSR CD.....	15
3 WORKING SCENARIOS.....	15
3.1 CREATING THE RECOVERY CD/DVD IN THE MANUAL MODE BY USING AN ADDITIONAL WINDOWS SYSTEM.	15
3.2 CREATING THE RECOVERY CD/DVD IN THE AUTOMATIC MODE BY USING AN ADDITIONAL WINDOWS SYSTEM.....	18
3.3 CREATING AN ISO IMAGE OF THE RECOVERY CD/DVD IN THE MANUAL MODE BY USING AN ADDITIONAL WINDOWS SYSTEM.	21
3.4 CREATING THE RECOVERY CD/DVD FOR A FIRST PARTITION OF THE PRIMARY HARD DISK BY USING WINPE IN THE AUTOMATIC MODE.....	24
3.5 CREATING THE RECOVERY CD/DVD FOR A FIRST PARTITION OF THE PRIMARY HARD DISK BY USING WINPE IN THE MANUAL MODE.....	25
4 ADDITIONAL CUSTOMIZATION OF THE RECOVERY CD/DVD (EXTRA EXPENDITURES)	25
4.1 GRAPHICS.....	25
4.2 DEPLOYMENT APPLICATION	26
4.3 ADJUSTING THE RECOVERY CD/DVD FOR A CERTAIN COMPUTER CONFIGURATION	26

1 Functionality Overview

PSR Lite is designed especially for OEM-manufactures as a powerful, reliable and easy-to-use solution of creating Recovery CD/DVDs with the operating system backup. It may be of great use while dealing with a large-scale shipping of computers since, unlike similar products on the market, it provides a unique opportunity to customize Recovery CD/DVDs for a particular computer configuration. With PSR Lite, recovering of a system into its initial state from the bootable CD/DVD is as easy as never before. By using such recovery disks, the end-user would restore the operating system just in several minutes, even without any particular knowledge in the computer field.

1.1 Basic work concept of the program



1.2 PSR Components

All the files of the program are stored in the folder **WinPEPSRBuilder**.

WINPEPSRBUILDER\CD\PSR\BACKUP\backup.exe – executable file of the Backup Wizard

WINPEPSRBUILDER\CD\PSR\BACKUP\dos.iso – ISO image, which serves as a base for creating Recovery CD/DVDs. The Recovery CD/DVD contains an additional backup of partitions for recovering purposes.

WINPEPSRBUILDER\CD\PSR\BACKUP\script.exe – executable file to work in the automatic mode.

WINPEPSRBUILDER\CD\PSR\BACKUP_autoburn.bat – batch file to launch the file *script.exe* with certain parameters.

WINPEPSRBuilder\CD\PSR\Backup\system.ps1 – script file for creating a backup image. It may be later used in the automatic mode of execution. The default script creates the Recovery CD/DVD for the primary hard disk.

WINPEPSRBuilder\CD\PSR\layout.ini – CD/DVD settings file. The parameter 'ISO directory' determines the path where the ISO image of the Recovery CD/DVD will be created.

WINPEPSRBuilder\crContent.bat – creates the content of the WinPE PSR CD in a folder on the hard disk. While operating with the file, WinPE CD should be inserted in the CD/DVD drive. The following parameters are used:

%1 – Determines a folder for storing the CD content. If there is no folder, it will be created.

%2 – CD-ROM drive letter (for instance, *E:*)

WINPEPSRBuilder\crISO.bat – creates an ISO image from the CD content folder. The following parameters are used:

%1 – Determines the source folder with the CD content

%2 – Determines the ISO image file.

WINPEPSRBuilder_example.bat – launches *crContent.bat* and *crISO.bat* with certain parameters.

WINPEPSRBuilder\CD\PSR\startnet.cmd – contains commands, which will be executed after the WinPE PSR CD is booted. This file will be copied to the folder */386/SYSTEM32* of the WinPE PSR CD.

2 Creating Backup Image and Recovery CD/DVD

PSR Lite is intended for creating Recovery CD/DVD with the backup image of one or several partitions (for instance, system + service partitions).

The bootable Recovery CD/DVD with the backup image is created by OEM-manufacturer using the Backup Wizard ([backup.exe](#)). The Recovery CD/DVD can be made either particularly for every supplied computer or direct for the whole bulk of similar computers. In the second case, the Recovery CD/DVD may acquire some [Deployment application](#). Especially for such purposes the program provides a unique opportunity to [customize](#) these disks.

2.1 Backup Wizard

The **Backup Wizard** is designed to make the process of creating backups as easy and convenient as possible.

Backup Wizard guides the user through the set of wizard's pages. Each page contains a simple question and prompts the limited number of possible answers. As the user proceeds through all these pages, the wizard gets ready to initiate the required operation.

PSR Lite enables the possibility to create Recovery CD/DVDs for the unlocked system partitions. The backup procedure may be carried out either from the WinPE PSR CD or a hard disk. In the second case, the source partition with an operating system should be located on the secondary hard disk.

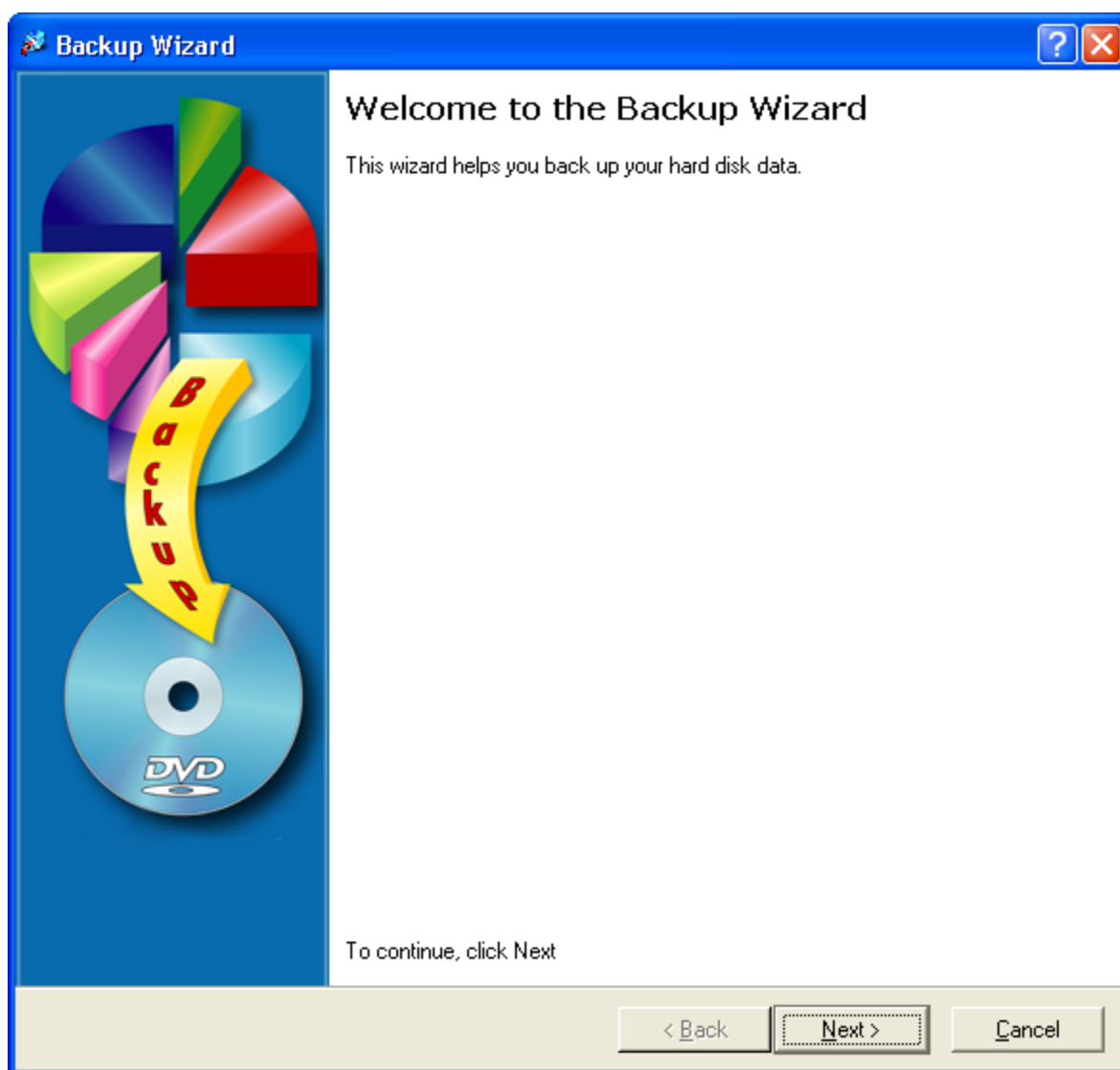


Even if a backup is created from the secondary hard disk, it will be recovered on the primary one.

Scenario

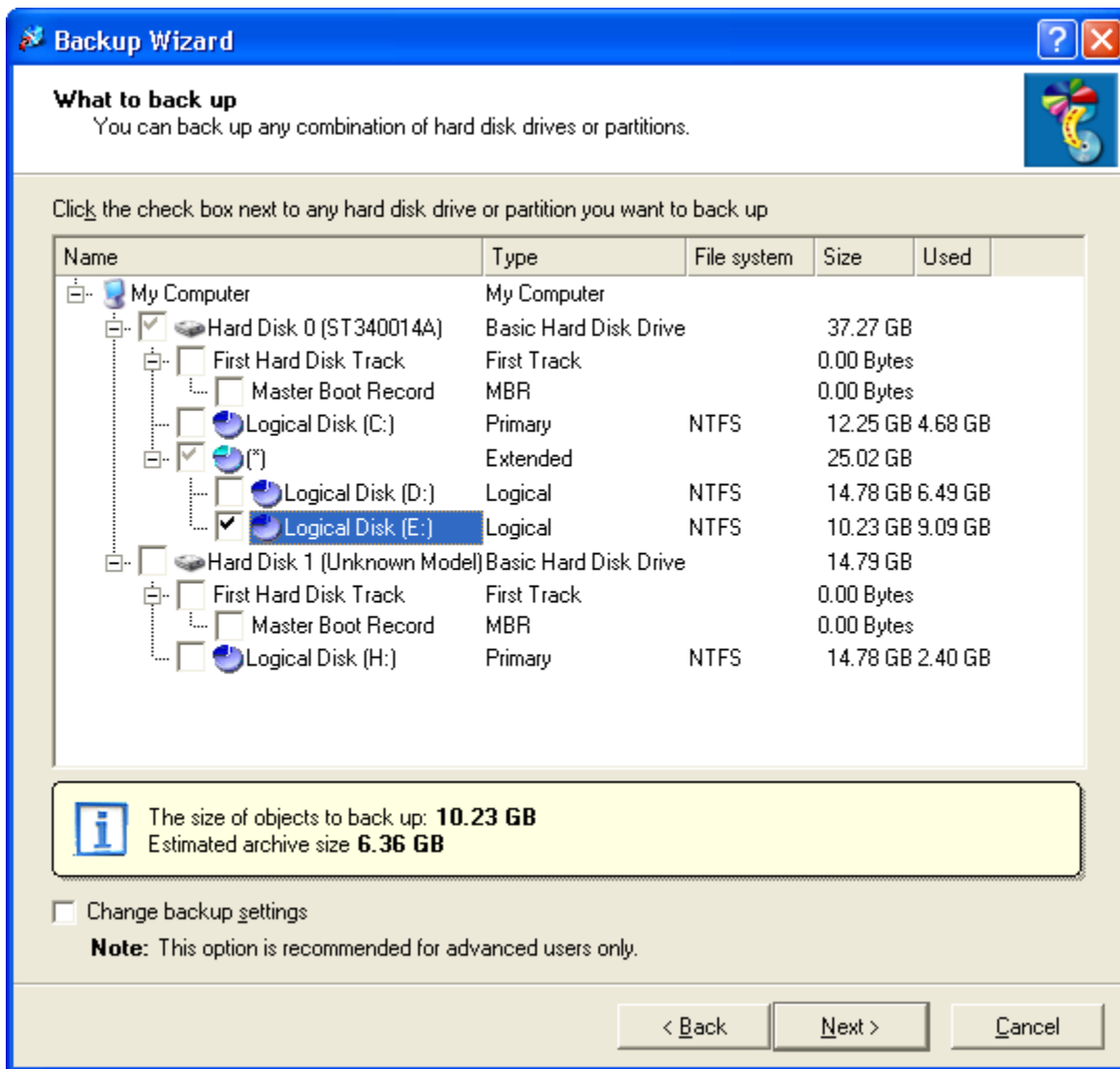
To create an image of a partition/ hard disk, follow the steps below:

1. Launch the Backup Wizard. It can be done either by using WinPE PSR CD environment or from the current installed version of the Windows.



The **Backup Wizard** opens its first page. It informs the user about the program. Click **Next** to continue.

2. On the **What to back up** page, select a hard disk or a partition you want to back up.

**Note:**

- Only unlocked partitions may be processed.
- The program also enables the possibility to back up service partitions.
- After the recovering procedure is completed, the beginning of the partition restored will coincide with the source partition, thus if the partition is not the first one, the system partition on the user's hard disk should start from the same sector as the source one.

Click on **Change Backup Settings** if you want to tune up the backup process.

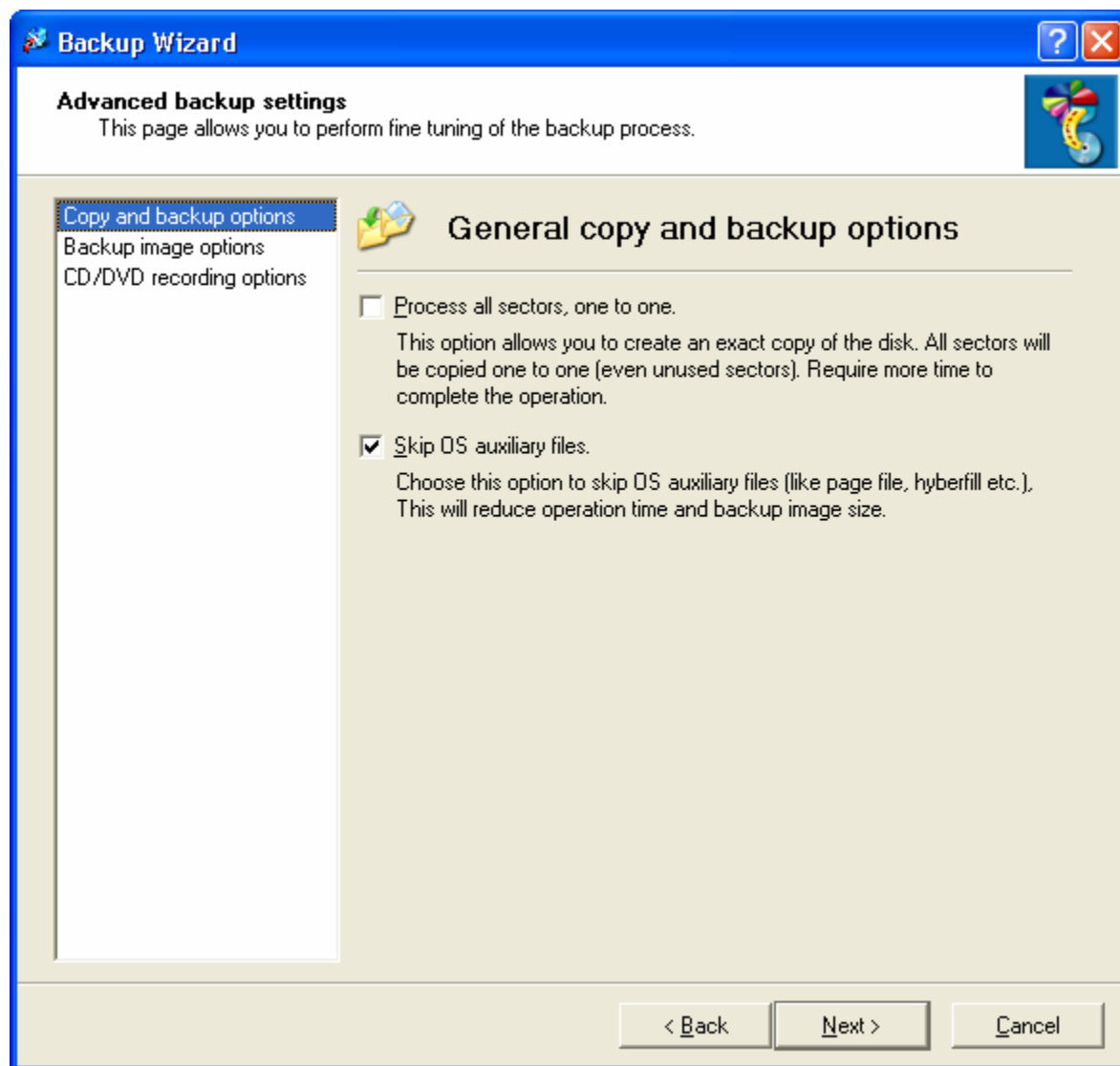


This option is recommended for advanced users only!

Click **Next** to continue.

3. If you refused to customize backup settings proceed to **Step 4**, otherwise the **Advanced backup settings** page opens. Parameters are divided into three groups: *Copy and backup options*, *Backup image options*, *CD/DVD recording options*.

Copy and backup options



There are two options offered to the user here:

- ***Process all sectors, one to one.***

If this option is marked, imaging of partitions and hard disks will be accomplished in the **sector-by-sector** mode. More time required to complete the operation.

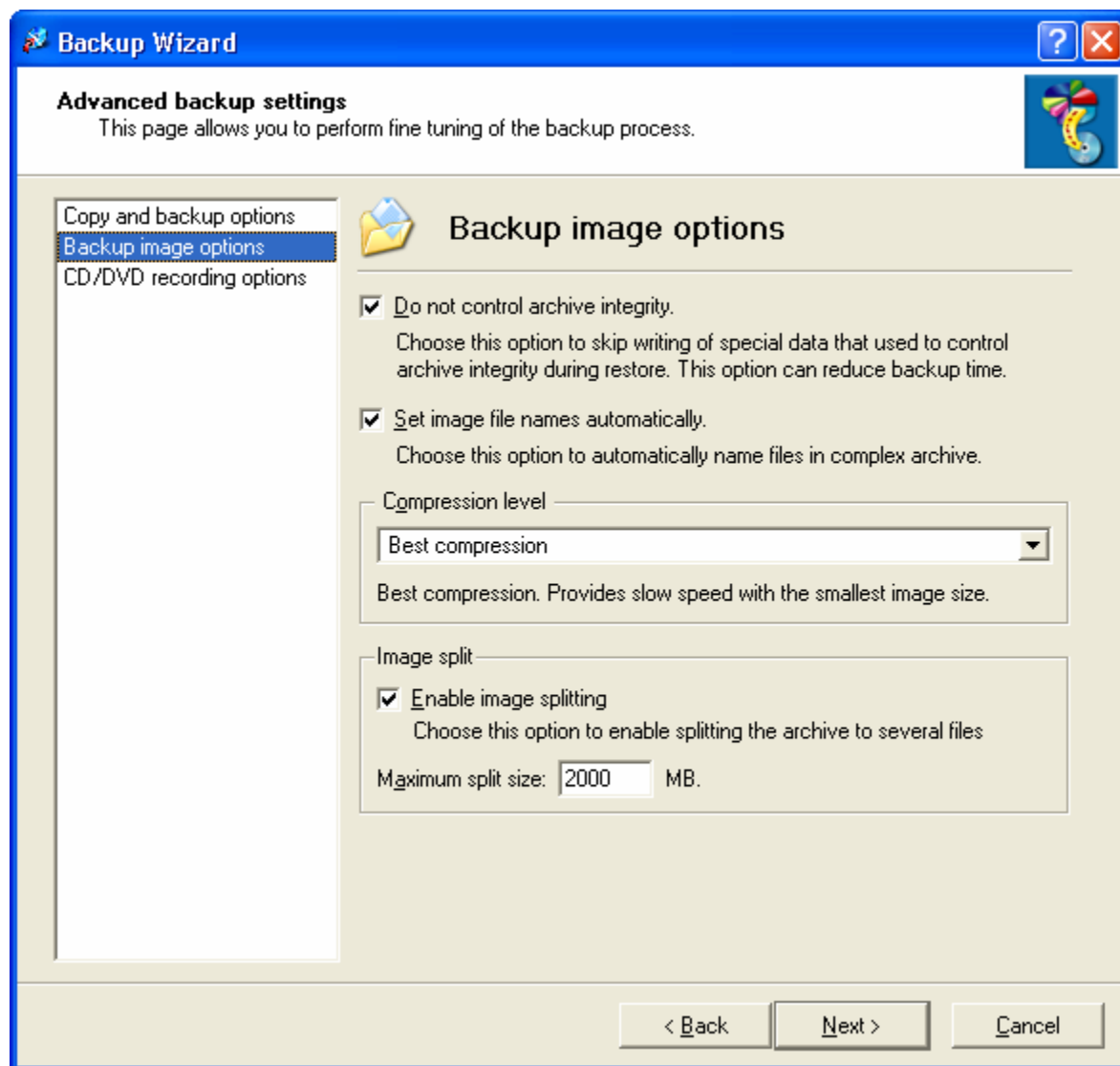
If this option is inactive, imaging operations may be performed in the **fast-copying** mode for partitions of supported file systems. If there are partitions of other file system types on the disk with **DOS partitioning scheme**, HDM will copy partitions of **supported** file system types in fast-copying mode, and will switch to sector-by-sector mode to copy partitions of other file system types.

- ***Skip OS auxiliary files.***

This option allows the program to ignore unimportant files when creating backup archives. This saves time and reduces the size of the backup archive. If the option is activated, the current version of the program ignores the contents of the PAGEFILE.SYS and HIBERFIL.SYS system files on NTFS partitions, but saves the information on their sizes and locations. When restoring an NTFS partition, HDM will generate the contents of these two files.

If this option is disabled, HDM backs up these files along with others on a partition.

Backup image options



Here you can define parameters of the backup image:

- **Do not control archive integrity.** The option controls the generation of the integrity validation code while creating backup archives. With this option deactivated, the program has a 2-7% performance gain, but the probability of occurring faults increases.
- **Set image file names automatically.** Choose this option to automatically generate default image file names by using the **disk number** and the **drive letter** (or the **partition number**).
- **Compression level.** This option defines the compression level for imaging operations. Using the image compression significantly slows the overall operation performance.

Approximate values for the compression ratio and speed deceleration

Level	Compression	Performance
None	No compression	No deceleration
Fast	95-80 % (1.05 – 1.25 times squeezing)	~90 % (~1.1 times slower)
Normal	65-70 % (1.4 – 1.5 times squeezing)	60-70% (1.4 – 1.7 times slower)

Best	40-50 % (2.0 – 2.5 times squeezing)	10-12% (8 – 10 times slower)
-------------	---	---------------------------------



In fact, the real value of compression ratio fundamentally depends on the statistical characteristics of the data being compressed. The efficiency depends on the CPU and hard disk performance

Image Splitting. The option controls the creation of multi-volume images of required volume size. Mark the checkbox to enable automatic splitting of large images in multiple volumes. Otherwise, the program will try to place entire image in a single file.

CD/DVD recording options

The screenshot shows the 'Backup Wizard' window with the 'Advanced backup settings' tab selected. The title bar reads 'Backup Wizard'. Below the title bar, the text 'Advanced backup settings' is followed by 'This page allows you to perform fine tuning of the backup process.' On the left, a sidebar lists three options: 'Copy and backup options', 'Backup image options', and 'CD/DVD recording options', with the latter being selected and highlighted. The main area is titled 'CD/DVD recording options' and contains two sections. The first section, 'Recording speed', has a dropdown menu currently set to 'Select speed automatically' and a note: 'Auto recording speed. Choose this option to allow the recorder to choose the best speed.' The second section, 'ISO image folder', has a text box containing 'D:/' and a 'Browse' button, with a note: 'Please select a folder to place ISO images to when CD or DVD ISO maker is used.' At the bottom of the dialog are three buttons: '< Back', 'Next >', and 'Cancel'.

Recording speed

Here you can define the speed with which the backup image will be recorded on CD/DVD:

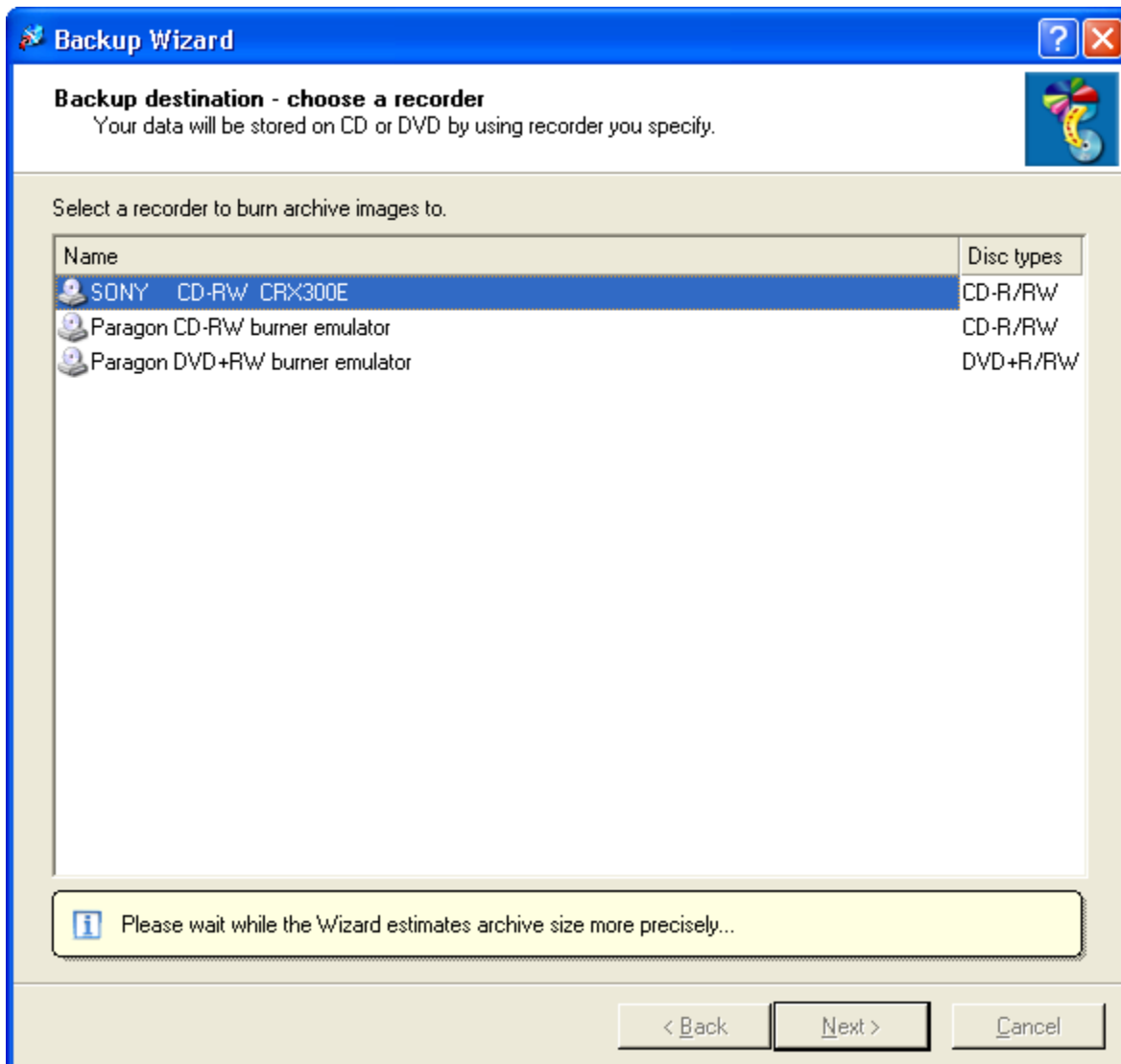
- **Minimum recording speed.** Choose this option if there is no confidence in quality of the disks or CD/DVD drive. Slow but reliable recording.
- **Normal recording speed.** Fast and reliable mode of execution. Fits most types of the recordable media.
- **Maximum recording speed.** Choose this option if you are sure about the quality of the disks and CD/DVD drive.
- **Select Speed automatically.** Choose this option to let the recorder select the most suitable speed.

ISO image folder

Determines the location of the ISO image. ISO images may later be used for creating Recovery CD/DVDs .

ISO image may be located on any partition except the source one, or on a network drive. In this case, while booting from the WinPE PSR CD, it is required to set up the network support.

4. On the **Backup destination** page the wizard offers to choose a recorder to burn backup images to.



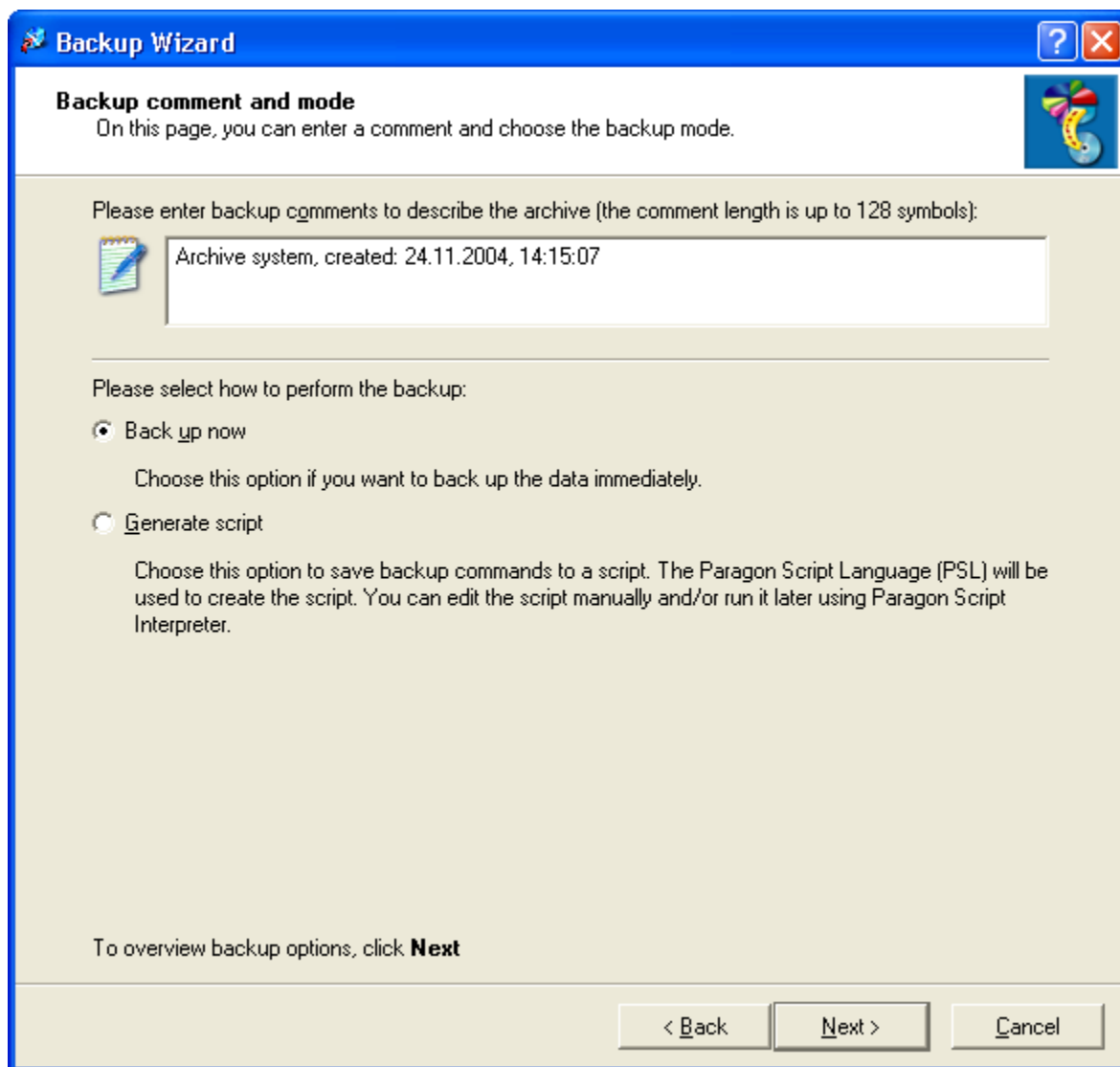
On this dialog page the user may choose whether he is willing to burn the Recovery CD/DVD using a physical CD/DVD recorder, or make an ISO image.



For proper work of the Recovery CD/DVD do not change the default name of the archive 'system' on this dialog page.

Click **Next** to continue.

5. On the **Backup comment and mode** page the user can associate a short descriptive text with the image file and choose the mode of the backup execution.



There are two modes of the backup execution offered to the user here:

- **Back up now** (immediate execution of the operation)
- **Generate script** (backup commands will be saved to a script file for further execution in the automatic mode).

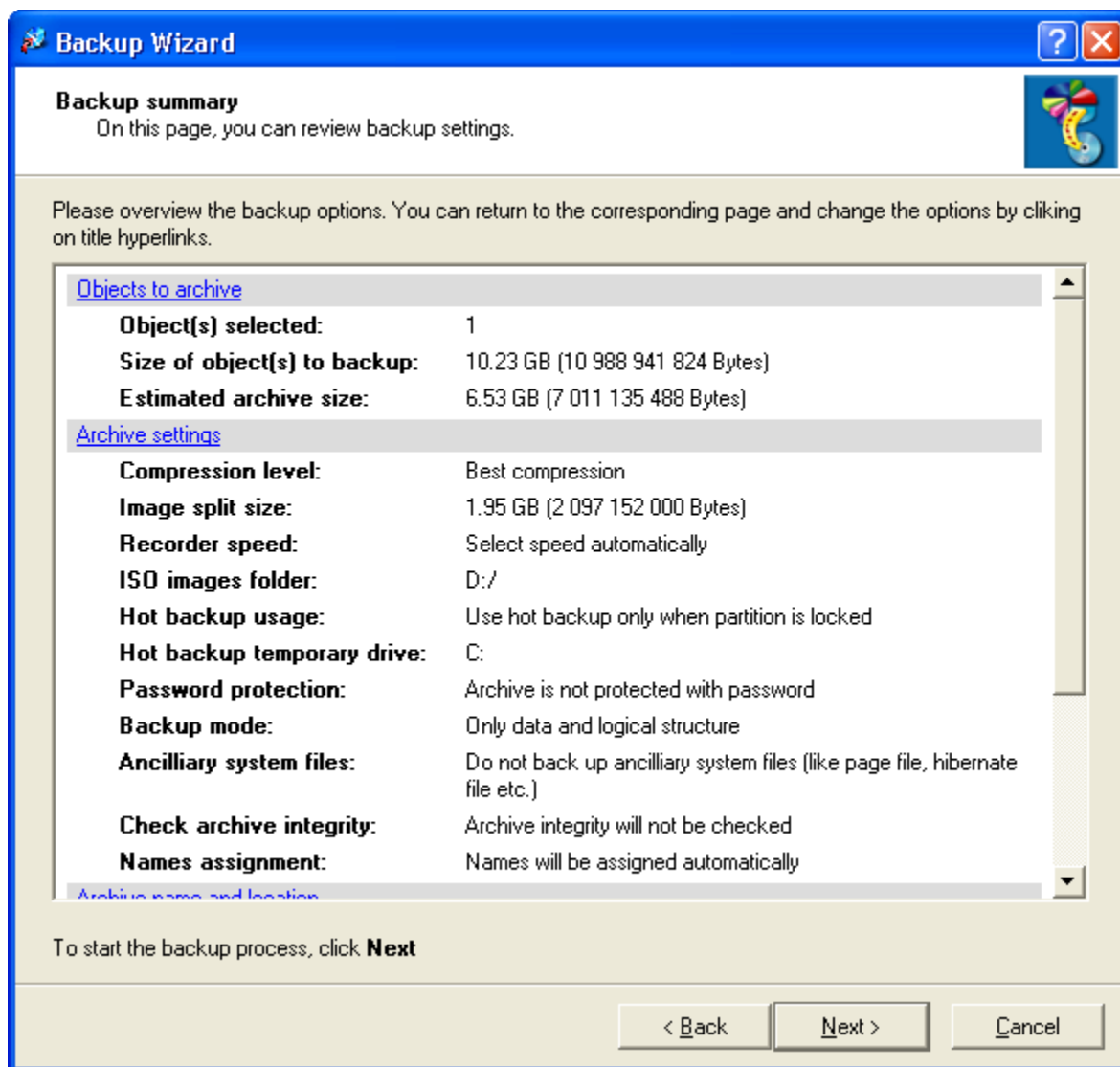
Note:

- The default ready-to-use script of the Backup Wizard ([system.psl](#)) enables to make a backup of the first partition on the primary hard disk. (see [Backup in the Automatic Mode](#)).
- Before creating a backup it is recommended to choose the minimum size of the system partition possible (in case of supplying computers with different hard disk capacity), to make sure that the user has the system partition not less than that of the image. Otherwise it would not be recovered. (see [Automatic Recovery Algorithm](#)). If the size of the system partition is minimized, the user would recover the partition even if the supplied hard disk was replaced by that of a lesser capacity.
- It is recommended to use NTFS file system to increase partitions size. In this case, the size modification procedure would take practically no time.

Click **Next** to continue.

Depending on the option selected, the user proceeds to the next page.

6. The **Backup Summary** page displays all the settings of the backup. In order to change something you should return to the step you need by clicking on the corresponding hyperlinks.



By clicking on the **Next** button you accept the planned changes and start the backup process.

The last page of the wizard will open when the operation is over.

2.1.1 Backup in the Automatic Mode

Script file [system.psl](#) is used to create backups in the automatic mode of execution. It may be generated either by using the Backup Wizard or manually.

Basic script commands:

img = "cdb://0/system.pbf" - determines the location of the Recovery CD. To make an ISO file when there is only one physical drive, set the following:

img = "cdb://1/system.pbf" – for a CD image

img = "cdb://2/system.pbf" – for a DVD image

select disk 0

select partition primary 0 – determines partition for a backup

cmp = 2 – set compression ratio (0 – No Compression; 1 – Fast; 10 – Normal; 2 - Best)

The path to the ISO image of the Recovery CD/DVD is set by the parameter 'ISO directory' in the file [layout.ini](#)

To create a backup in the automatic mode, launch the file [_autoburn.bat](#)

2.2 Restoring the Operating System from the Recovery CD/DVD

The recovery process into its initial state is carried out in the automatic mode of execution by the end-user, while booting from the Recovery CD/DVD.



All the data written by the user on the partitions recovered will be destroyed. The partitions will be recovered exactly into its initial state. Partitions not contained in the Backup image will not be affected.

Automatic Recovery Process Algorithm:

1. The initial sector for recovering is being taken from the backup image.
2. The program analyses the hard disk configuration, in case the initial sector is related to some partition, that partition would be deleted.
3. The program checks whether it is enough disk space for recovering a partition.
4. Partition is being recovered.
5. The recovered partition is being expanded up to the end of the free disk space.
6. The program writes a standard MBR code.

Note:

- All the boot managers like BootManager, etc. will be deleted!
- In case several partitions are being recovered, steps 1-5 will be repeated for every partition.
- At first all the operations are executed in the virtual mode, only after a successful completion of them, the operations will be applied. Otherwise, the program will inform about inability to start the process of execution.

There are two configuration types of the Recovery CD/DVD distributed by the Paragon Software:

- DOS environment for recovery
- Possibility to select the environment for recovery while booting from the Recovery CD/DVD: DOS or Linux

If there are only standard devices used, the DOS environment is more preferable since it provides great level of reliability, otherwise it is recommended to use Linux.

Linux is required to support external devices as well.

Supported Devices	Recovery Environment	
	DOS	Linux
IDE hard disks/CD/DVD ROMs	Yes	Yes
SCSI hard disks	Only in the INT 13 compatibility mode – check the SCSI BIOS	Yes
SATA hard disks	Only in the Legacy mode – check the SATA BIOS	Yes
USB (1.0 and 2.0) hard disks/ CD/DVD ROMs	No*	Yes
FireWire (IEEE1394) hard disks	No*	Yes

* - if there are DOS drivers for some device, they can be [included](#) into the Recovery CD/DVD.



While recovering under Linux it is strongly recommended to check the system on the destination computer configuration! Unfortunately, the standard Linux configuration is not always capable to support some special devices (Hardware compatability). In this case, it should be [adjusted to a particular computer configuration](#). Recovering under DOS has no such problems.

2.3 Creating Customizable WinPE PSR CD

It is much easier to create a required WinPE PSR CD with the help of the provided batch files.

To make an ISO image of the WinPE PSR CD, do the following:

- Copy the folder **WINPEPSRBUILDER** from the CD to the hard disk
- Edit the files [startnet.cmd](#), [system.ps1](#) and [_example.bat](#)
- Launch the file [_example.bat](#)

To [make a backup in the automatic mode](#) using WinPE PSR, write in the file [startnet.cmd](#)

_autoburn.bat

instead of

backup.exe

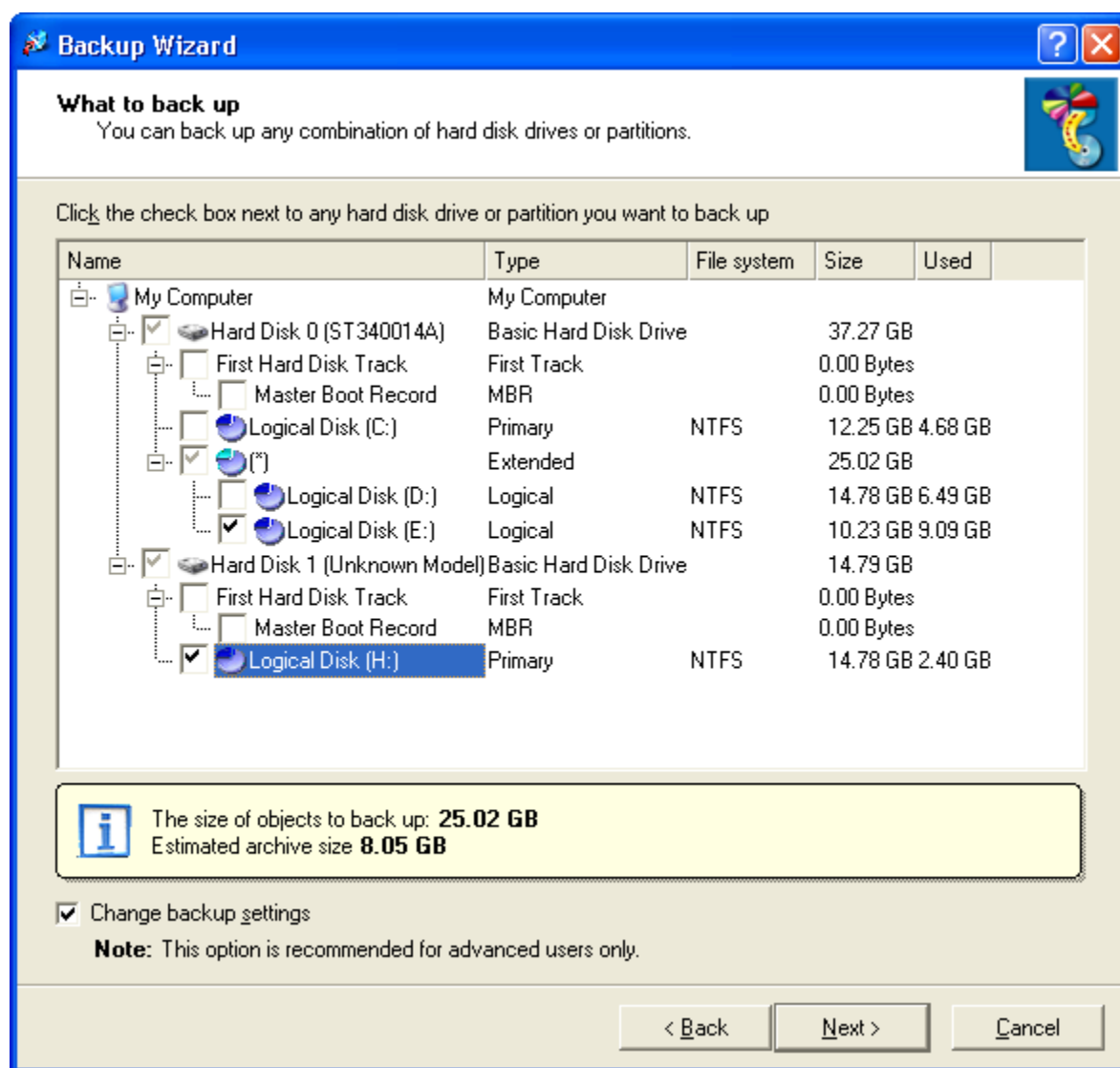
3 Working Scenarios

3.1 Creating the Recovery CD/DVD in the Manual Mode by Using an Additional Windows System.

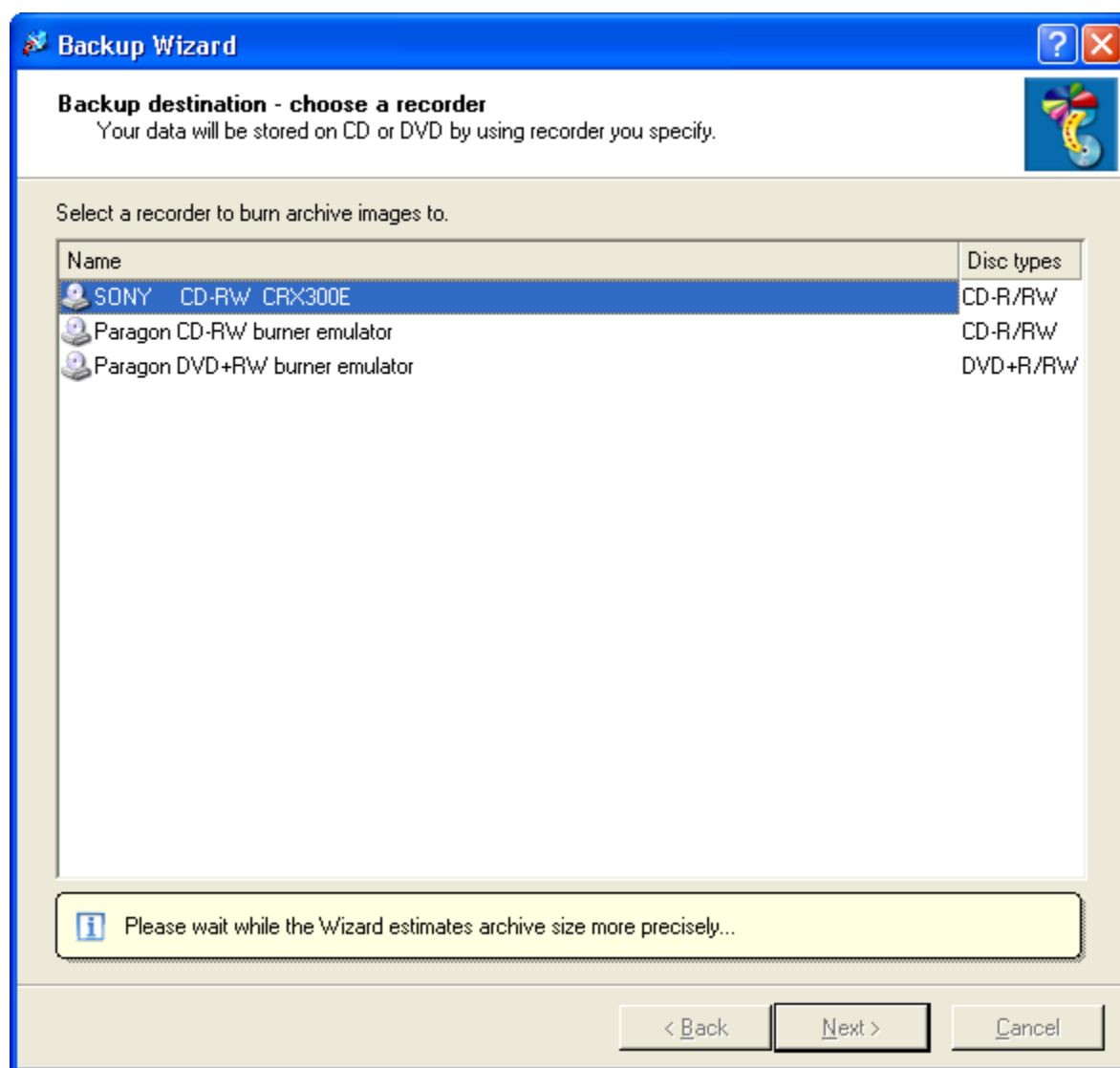
1. Install the Windows, carry out all the test and prepurchase arrangements with the operating system. Connect the source hard disk for creating the Recovery CD/DVD as a secondary device and boot the system from the primary hard disk.
2. Insert the PSR CD into the CD/DVD drive. If the Backup Wizard did not launch automatically, please do it manually:

WINPEPSRBUILDER\CD\PSR\BACKUP\backup.exe

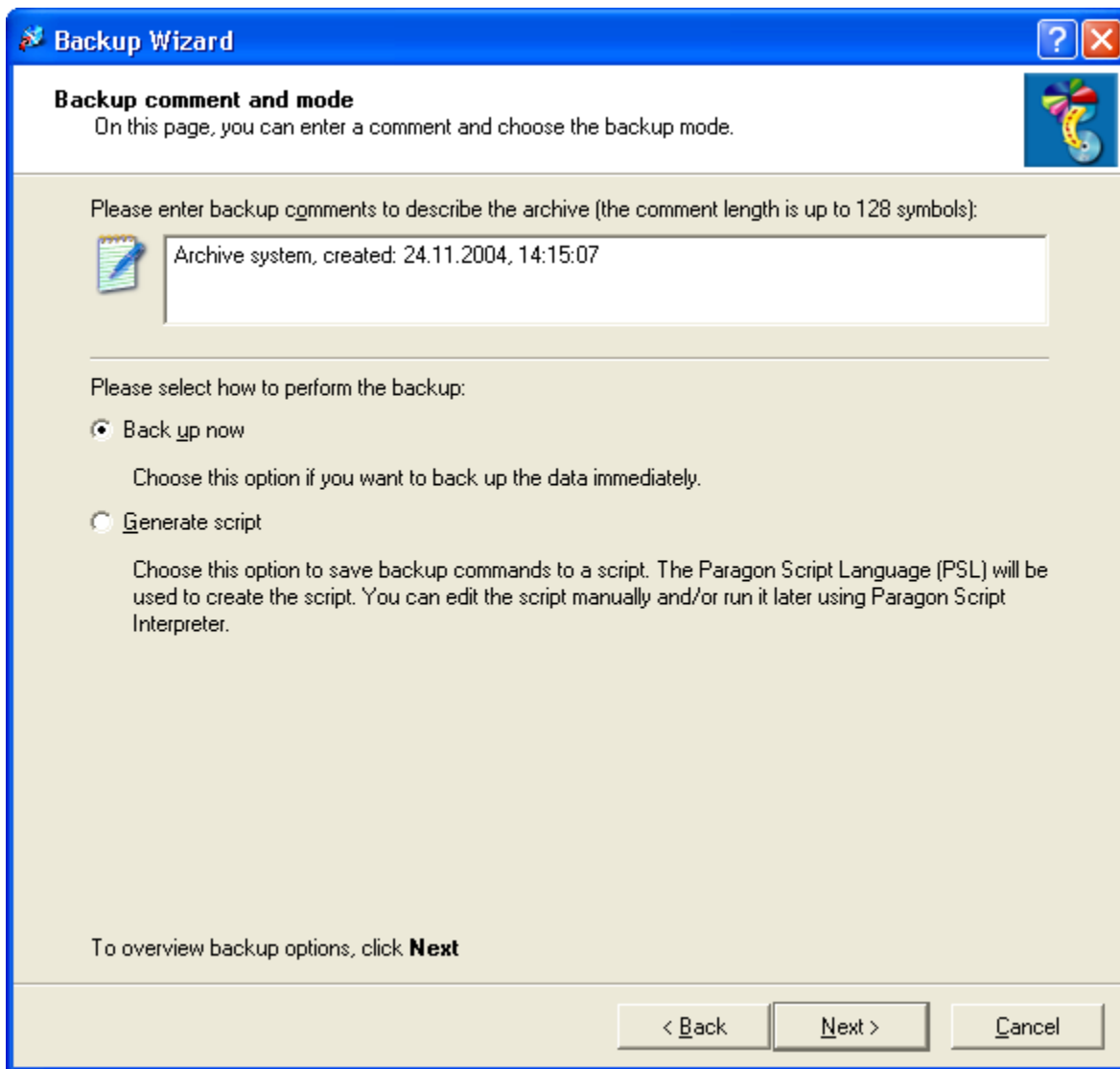
3. Select a system partition on the secondary hard disk



4. Select a CD/DVD recorder

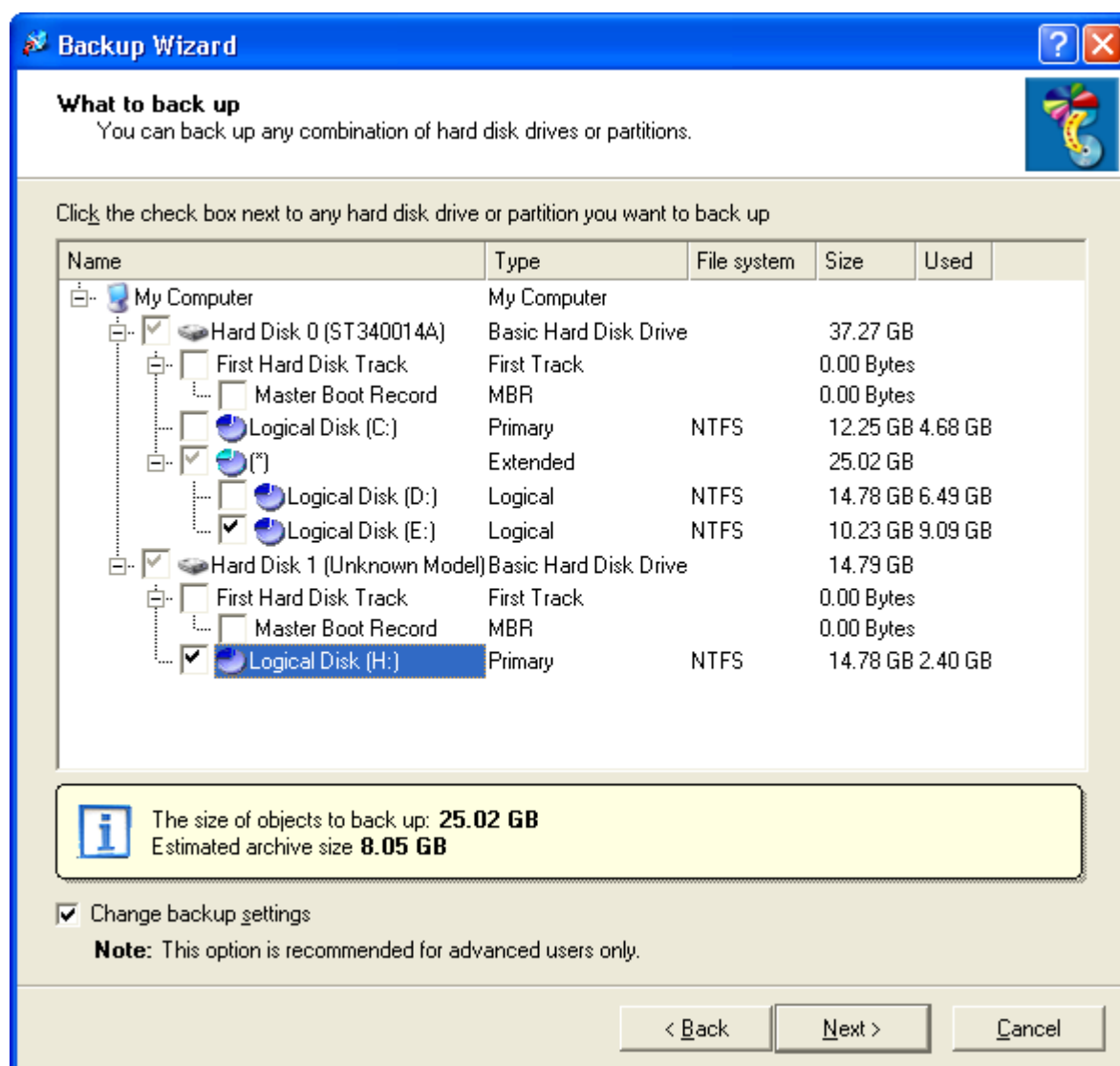


5. Mark the option 'Backup Now' and burn the Recovery CD/DVD

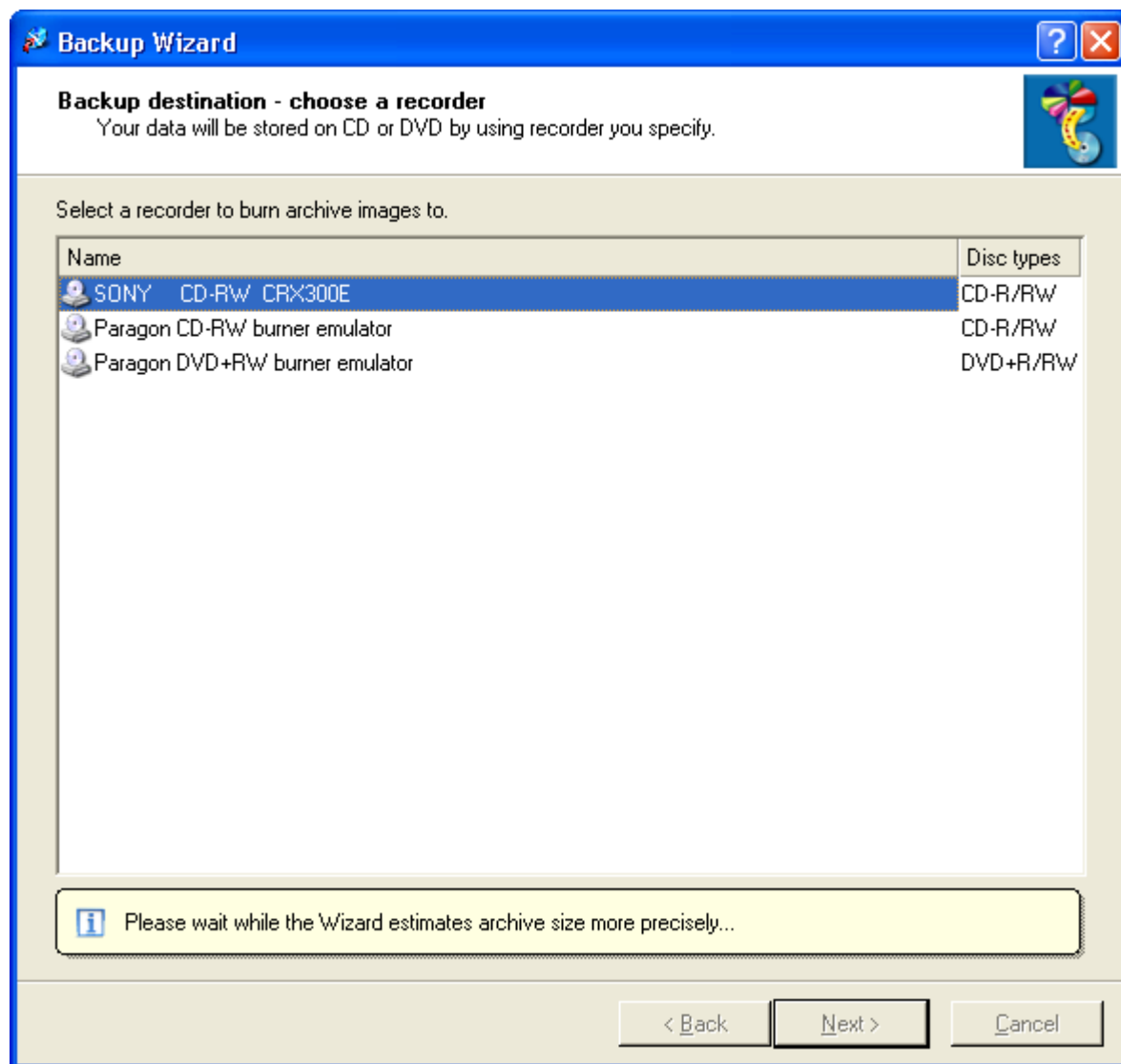


3.2 Creating the Recovery CD/DVD in the Automatic Mode by Using an Additional Windows system.

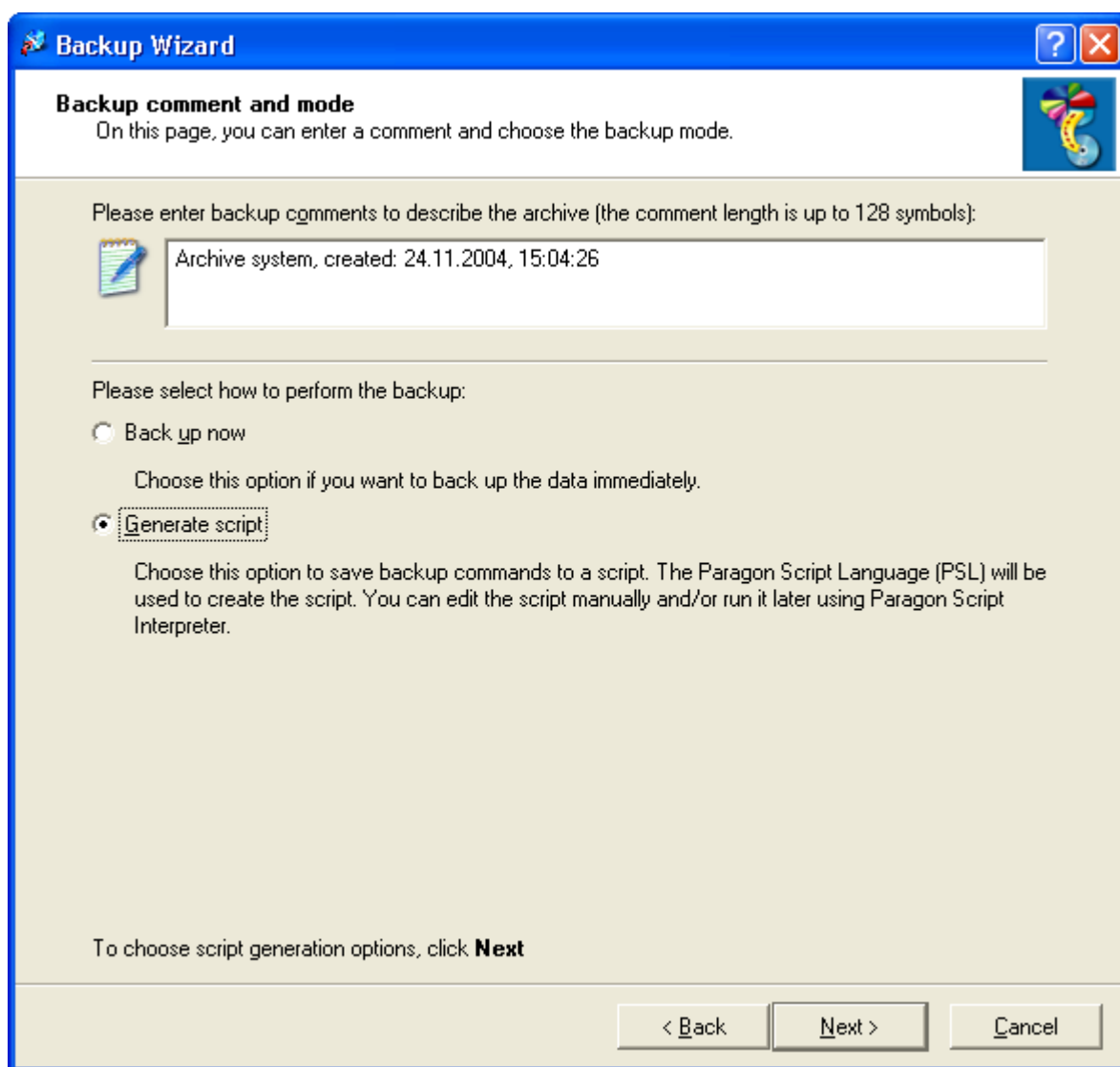
1. Install the Windows, carry out all the test and prepurchase arrangements with the system. Connect the source hard disk for creating the Recovery CD/DVD as a secondary device and boot the system from the primary hard disk.
2. Copy the folder **WINPEPSRBUILDER\CD\PSR** to the hard disk
3. Generate a script file:
 - Launch the Backup Wizard (**WINPEPSRBUILDER\CD\PSR\BACKUP\backup.exe**)
 - Select a system partition on the secondary hard disk



- Select a CD/DVD recorder



- Mark the option 'Generate Script'



- Generate a script
- To execute the script – launch the file **WINPEPSRBUILDER\CD\PSR\BACKUP_autoburn.bat**

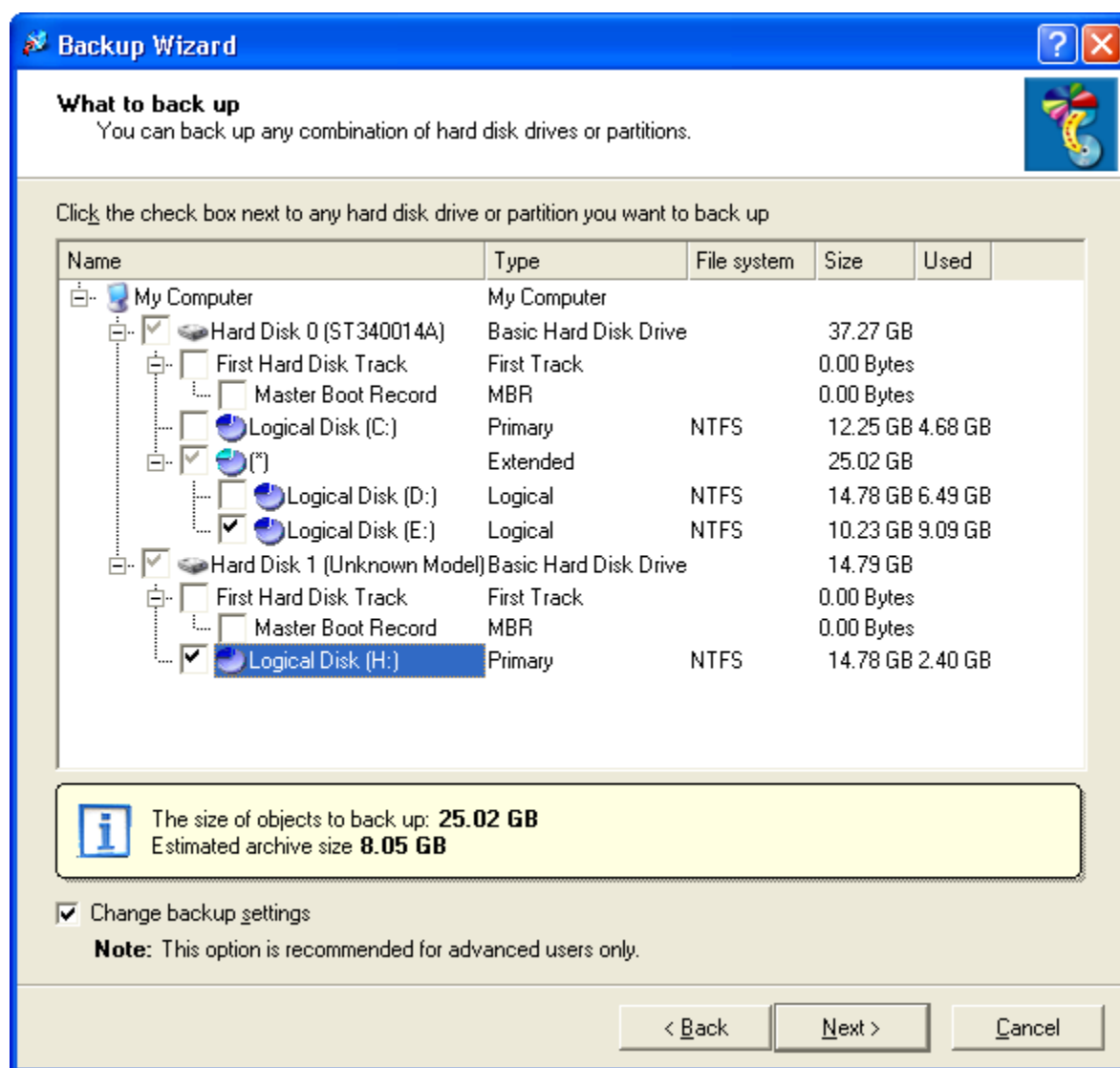
Recovery CD/DVD will be created in the automatic mode.



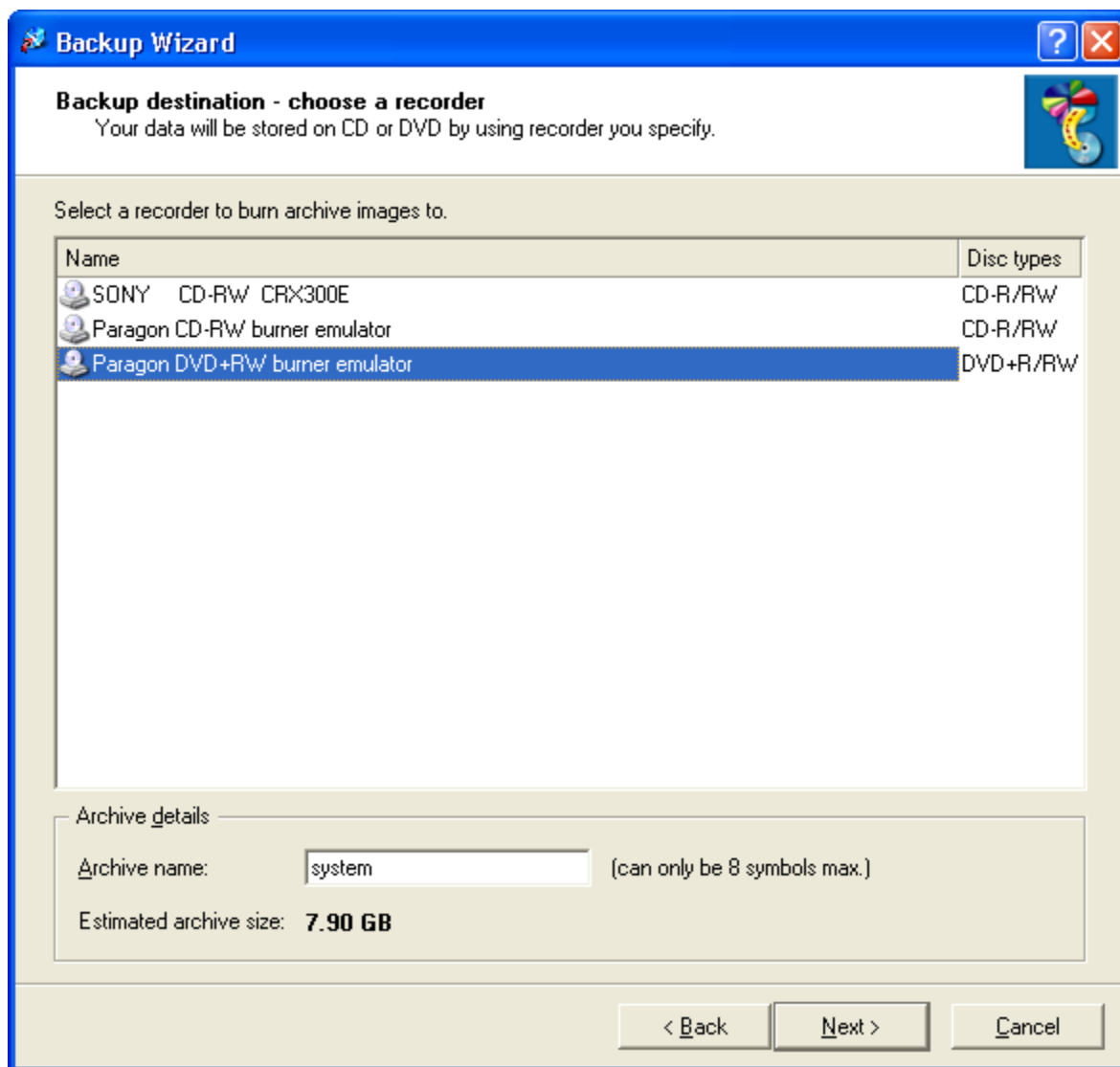
Do not change the default name of the script file 'system.psl'

3.3 Creating an ISO Image of the Recovery CD/DVD in the Manual Mode by Using an Additional Windows System.

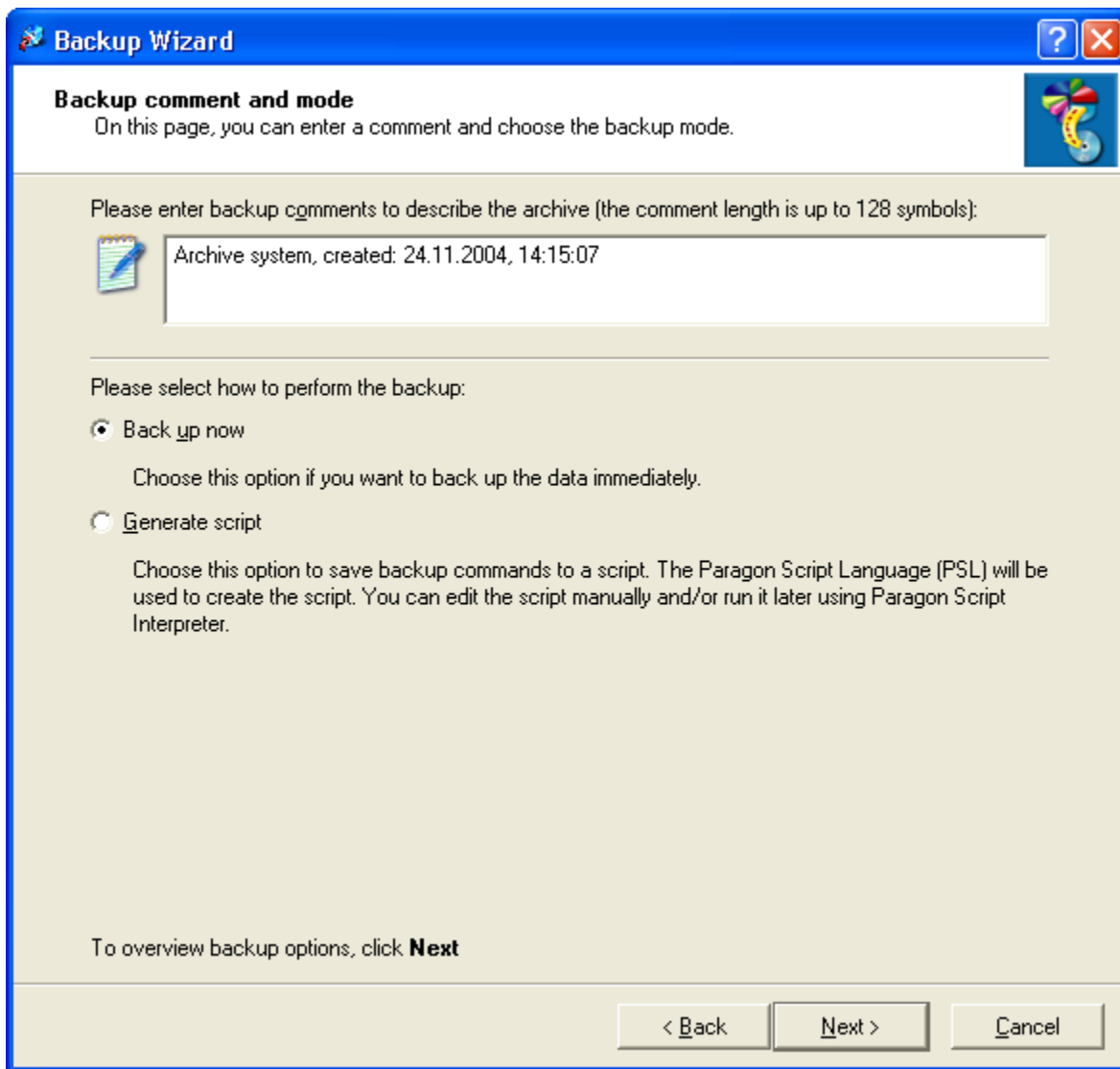
1. Install the Windows, carry out all the test and prepurchase arrangements with the system. Connect the source hard disk for creating the Recovery CD/DVD as a secondary device and boot the system from the primary hard disk.
2. Copy the folder **WINPEPSRBUILDER\CD\PSR** to the hard disk and launch the Backup Wizard: (**WINPEPSRBUILDER\CD\PSR\BACKUP\backup.exe**)
3. Select a system partition on the secondary hard disk.



4. Select as a recordable device "Paragon DVD+RW burner emulator" for Recovery DVD or "Paragon CD-RW burner emulator" for Recovery CD



5. Mark the option 'Backup Now'



6. After the Wizard completes its work the ISO image 'system_0.iso' will be created in the folder **WINPEPSRBUILDER\CD\PSR\BACKUP**. The file [layout.ini](#) enables to set another location of the file.

3.4 Creating the Recovery CD/DVD for a First Partition of the Primary Hard Disk by Using WinPE in the Automatic Mode

1. Prepare the WinPE PSR CD:
 - Copy the folder **WINPEPSRBUILDER** from the CD to the hard disk
 - Replace *backup.exe* by *_autoburn.bat* in the file [startnet.cmd](#)
 - Edit the file [_example.bat](#)
 - Launch the file [_example.bat](#)
 - Insert when required the WinPE CD
 - Burn the ISO image
2. Install the Windows, carry out all the test and prepurchase arrangements with the system.
3. Connect a secondary recordable device (for instance, USB drive)
4. Boot from the just-made WinPE PSR CD
5. The Recovery CD/DVD will be created automatically

3.5 Creating the Recovery CD/DVD for a First Partition of the Primary Hard Disk by Using WinPE in the Manual Mode

1. Prepare the WinPE PSR CD:
2. Copy the folder WINPEPSRBUILDER from the CD to the hard disk
3. Edit the file [_example.bat](#)
4. Launch the file [_example.bat](#)
5. Insert when required the WinPE CD (OPK)
6. Burn the ISO image
7. Install the Windows, carry out all the test and prepurchase arrangements with the system.
8. Connect a secondary recordable device (for instance, USB drive)
9. Boot from the WinPE PSR CD
10. Select a system partition, CD/DVD recorder
11. Mark the option 'Backup Now' and burn the Recovery CD

4 Additional Customization of the Recovery CD/DVD (Extra Expenditures)

4.1 Graphics

It is possible to make customizable versions of the Recovery CD with modified graphic outlook for a particular customer. In order to do so, the customer should provide three images.

- [BACK.JPG](#) – **background image of the recovery process execution dialog**
Simple JPG format. Any rate of compression is possible. The size is 640x480 . Any colour palette may be used. It is recommended to make the image in the Paint or the Photoshop
- [IMG.JPG](#) – **image for a process execution dialog**
Simple JPG format. Any rate of compression is possible. The size is 134x250. Any colour palette may be used.
- [DB_BG.bmp](#) – **image for the main menu of the Recovery CD**
This picture should be realized in a specific colour palette. Only 16 definite colours presented in the example may be used.
BMP format, non-standard palette. The size is 640x480.

We suggest the following ways to do so:

- Open the file [DB_BG Palette.bmp](#) in the Paint
- Edit the picture using 16 colour scheme located within the frame (use the "Pick Color" tool for that). Edit the image outside the frame
- Save the image in the BMP format



The frame must be exactly on its place. Do not move or modify it!

4.2 Deployment Application

Recovery CD/DVD may be used not only as a tool for recovering an operating system by the end-user, but in manufacturing as well.

First of all, the PSR provides an opportunity to use it as a Deployment tool for shipping small batches of similar computers. It may be of great use, since it does not require network support. The only device needed is CD/DVD recorder.

PSR may also be used as an auxiliary tool in the Deployment technological chain. It is often the case in manufacturing, when after carrying out some diagnostic tests with Hardware and Software, the system requires to be recovered. It may be done with the Recovery CD/DVD as well.

Paragon Software provides a unique opportunity to create special Recovery CD/DVDs, where it is possible to launch specific batch files before and after recovering process under DOS, that is before the recovering process there is a possibility to launch some tests, and after it – carry out some arrangements to make a system ready for selling. It should be noted that the Silent mode of the information output is optional and may be easily switched off providing full control over the processes. Under the DOS environment the program enables to access NTFS partitions via Paragon NTFS drivers for DOS. The NTFS partitions would be assigned as FAT16/32 partitions.

4.3 Adjusting the Recovery CD/DVD for a Certain Computer Configuration

In some cases certain devices require additional configuration.

The program allows including additional drivers (for instance DOS drivers for external USB devices) into the Recovery CD/DVD.

The same goes for the Linux operating system, where in some cases the hardware requires additional adjusting of the system itself. That is why it is recommended to check the appropriate work of the Recovery CD/DVD under Linux for a certain computer configuration.