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Partition Manager™ 10 for Virtual Machines

User Manual

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Introduction

Partition Manager 10 for Virtual Machines is a special version of our Linux/DOS bootable environment (delivered as an ISO image) that contains fully functional Partition Manager 10 Professional. It's optimized to work with virtual machines of any virtualization software vendor – backup/restore virtualized systems, re-partition and clone virtual disks, fix boot problems, optimize performance of NTFS and FAT file systems, etc. If you do care about effective data organization and speed of your virtual machines – this very tool is exactly what you need.

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

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

Features Overview

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

Key Features

Features	Benefits
Support for GPT	Enjoy support of GPT (GUID Partition Table) disks, used now in Windows 7/Vista, Server 2008, Mac OS X and Linux
Merge partitions	Consolidate the disk space, which originally belongs to two adjacent partitions (NTFS, FAT16/FAT32), into a single, larger partition
Redistribute free space	Increase free space on one partition by up-taking the on-disk unallocated space and the unused space of other partitions
Backup/Restore	Back up separate partitions or entire virtual disks of any virtualization software vendor to get everything back on track in minutes when a disaster strikes
Smart Defrag	27 defragmentation strategies available to defragment FAT and NTFS file systems
Boot Corrector	Fix most of the system boot problems that can be a result of a human factor, program error, or a boot virus activity
File Transfer Wizard	Replace corrupted data from a previously created image in case of an operating system failure as well as transfer data between virtual and physical environments

Virtual operations	Preview changes before they are applied and chain multiple operations into one job
Change cluster size	Control the waste space factor and performance of the files input-output activity
View/Edit sectors	Directly access and modify sectors on virtual disks, save and restore sectors from specified files, navigate through the system metadata, etc.

Supported Technologies

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

- **Paragon Power Shield™** technology to provide data consistency in case of a hardware malfunction, power outages or an operating system failure.
- **Paragon UFSD™** technology to browse partitions of any file system including hidden and unmounted, modify and copy files and folders, etc.
- **Paragon Restore with Shrink™** technology to restore a backup image to a free block of smaller size taking into account only the amount of actual data of the image.
- **Paragon Smart Partition™** technology to securely perform hard disk partitioning operations of any complexity.
- **Microsoft Dynamic Disk** (simple, spanned, striped, mirrored, RAID-5) to offer more management flexibility without the partition limitation of basic disks. Dynamic storage can be particularly beneficial for large-scale businesses when dealing with many physical hard disks involving complex setup.
- **GUID Partition Table** (GPT). It is the next generation of a hard disk partitioning scheme developed to lift restrictions of the old MBR. GPT disks are now supported by Windows Vista/7, Server 2008, Mac OS X and Linux.

Supported Virtual Machines

You can use our Linux/DOS environment with virtual machines of any vendor that supports startup from a bootable ISO image.

Supported File Systems

- NTFS (v1.2, v3.0, v3.1)
- FAT16
- FAT32
- Linux Ext2FS
- Linux Ext3FS

- Linux Ext4FS
- Linux Swap
- Apple HFS+
- Other file systems (in the sector-by-sector mode)

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

Supported Media

- Parallel ATA (IDE) HDD
- Serial ATA (SATA) HDD
- External SATA (eSATA) HDD
- SCSI HDD
- All levels of SCSI, IDE and SATA RAID controllers
- RAID support (hardware and software)
- CD-R/RW
- DVD-R/RW
- DVD+R/RW
- DVD+/-R (DL)
- BD-R
- BD-RE
- USB 1.x/2.0 and IEEE 1394 (FireWire) devices
- PC card storage devices

Getting Started

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

Contacting Paragon Technology GmbH

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

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

Minimal System Requirements

- IBM AT compatible computer with i486 or higher CPU
- 256 MB of RAM
- SVGA-compatible monitor
- Mouse (recommended)

Booting from the Linux/DOS Environment

With our Linux/DOS bootable environment (delivered as an ISO image) you can boot a virtual machine into Linux or PTS DOS to get access to its hard disk(s) for maintenance or recovery purposes. It also has the PTS DOS safe mode, which may help in a number of non-standard situations such as interfering hardware settings or serious problems on the hardware level. In this case, only basic files and drivers (such as hard disk drivers, a monitor driver, and a keyboard driver) will be loaded.

In general the operation involves two actions:

- Connecting our environment to a virtual machine;
- Booting from our environment.

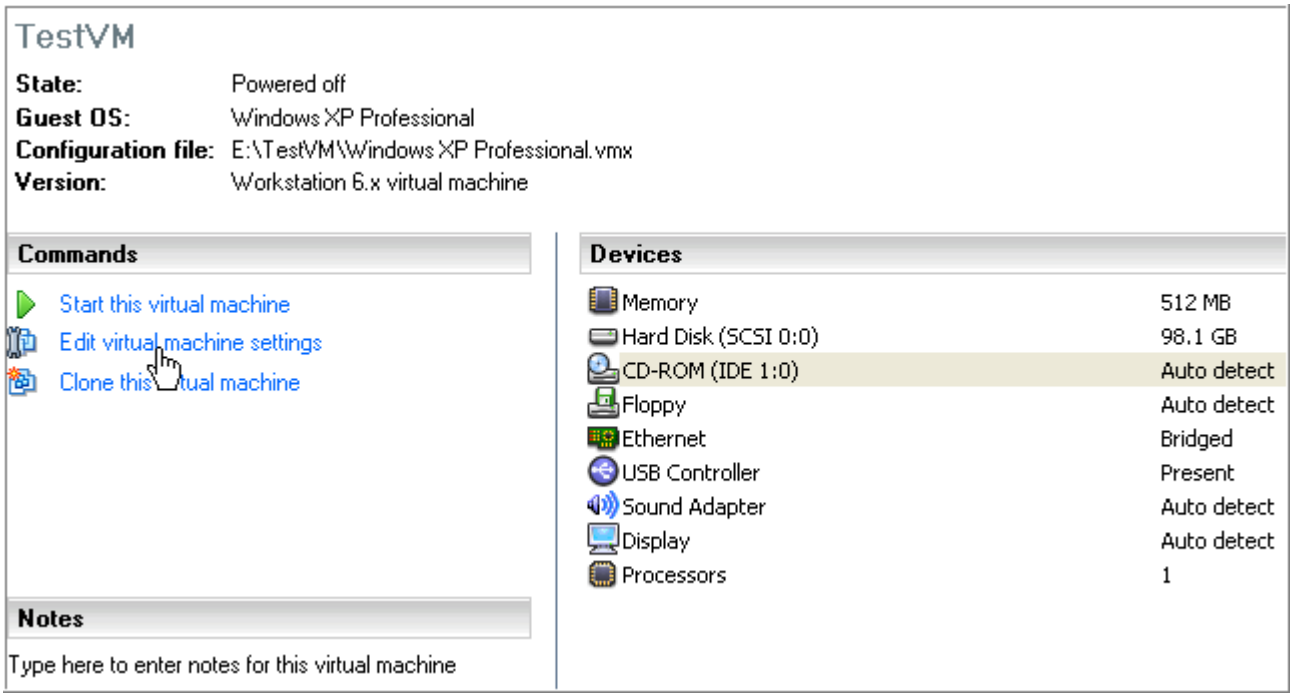
Connecting our environment to a virtual machine

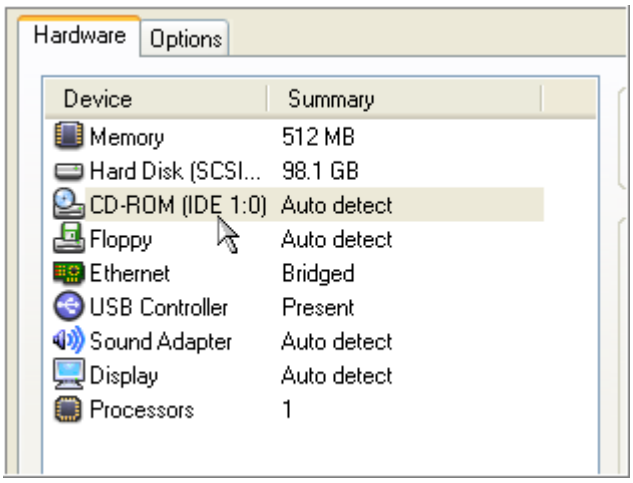
There are many different virtualization software vendors presented on the market today. The most popular are VMware, Microsoft, Citrix, and Sun. Each of them enables to connect a bootable ISO image to a virtual machine to start it up from it. Although the operation scenario is quite similar for different vendors, there are some peculiarities.

For VMware Workstation

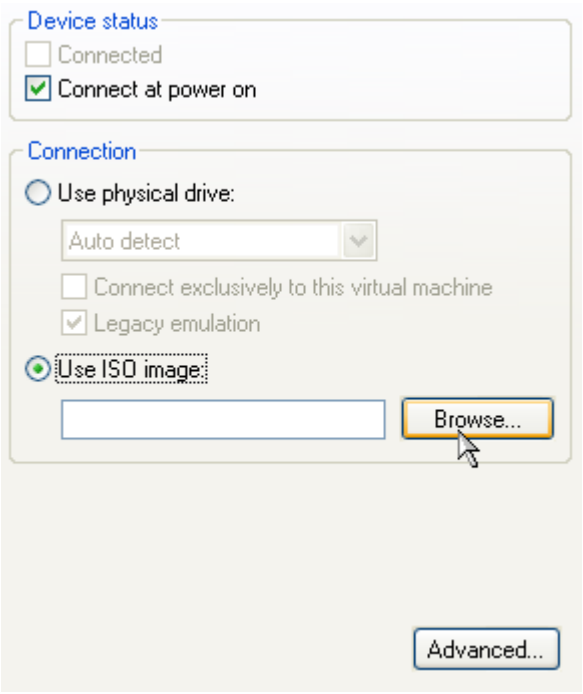
1. Open a virtual machine.

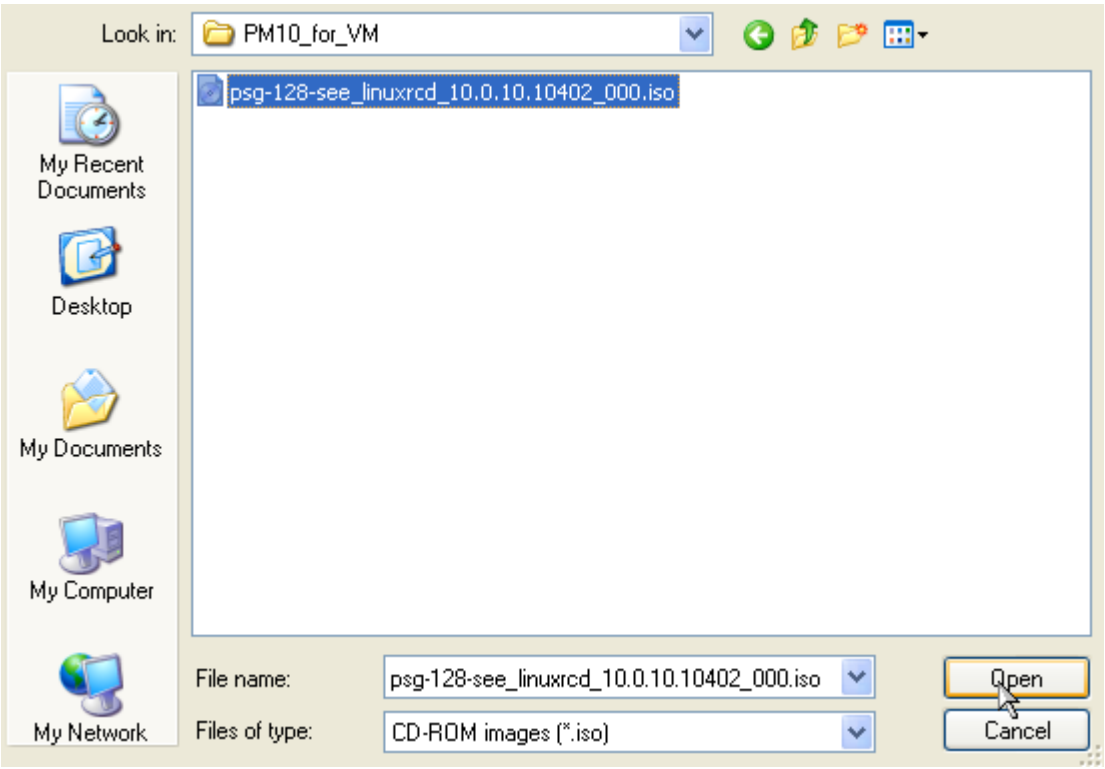
2. Click on **Edit virtual machines settings**, then select **CD-ROM…**, or just double click on **CD-ROM…**





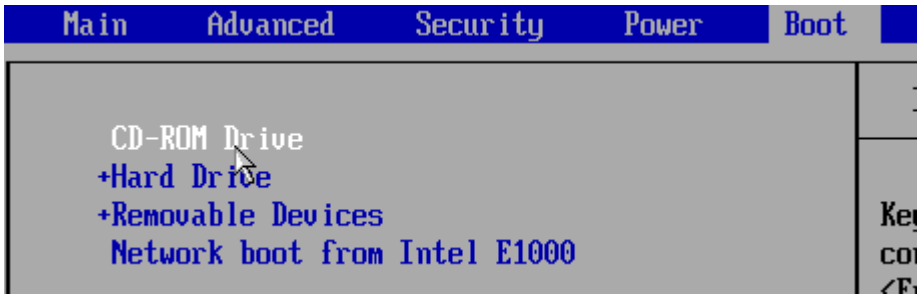
3. Select **Use ISO image**, and then click **Browse** to browse for our bootable environment. Click **Open** when ready.



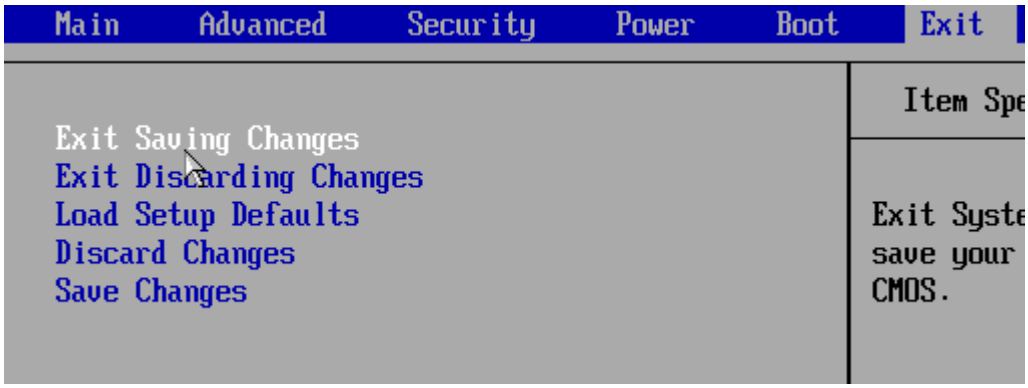


4. Click **OK** to finish.

5. Enter BIOS of the virtual machine by pressing **Esc** during the startup, and then select **CD-ROM Drive** as the first boot device. So you make sure the virtual machine will automatically start up from our environment.

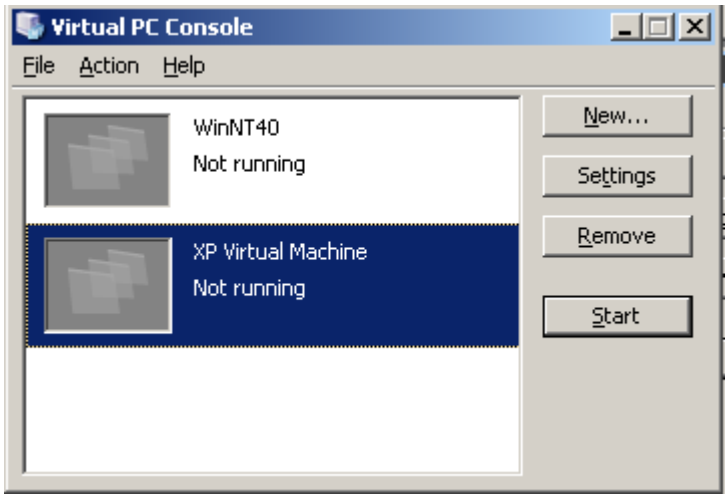


6. Save changes and exit BIOS.

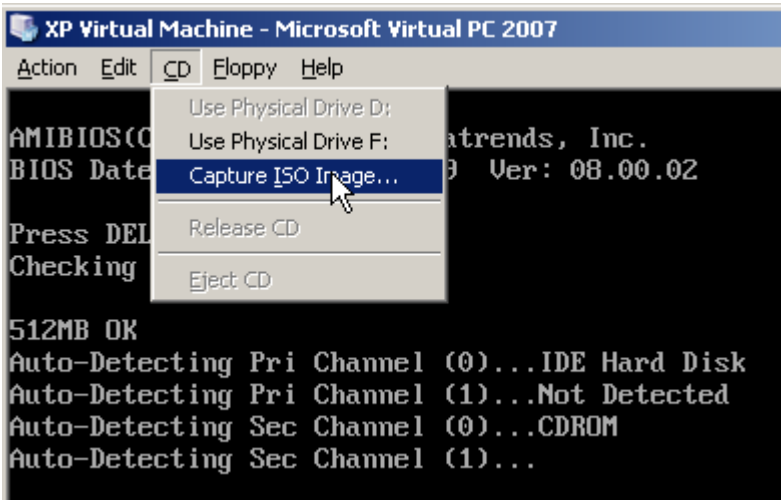


For Microsoft Virtual PC

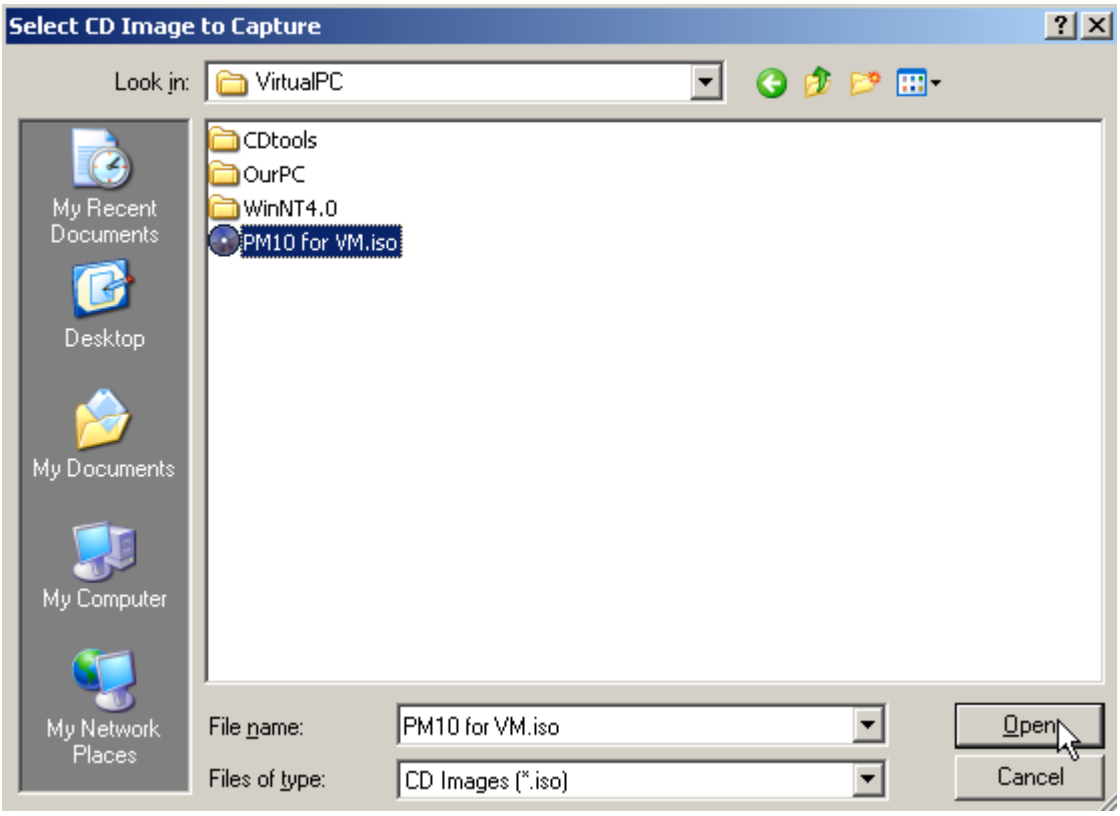
1. Select a virtual machine, and then click **Start**.



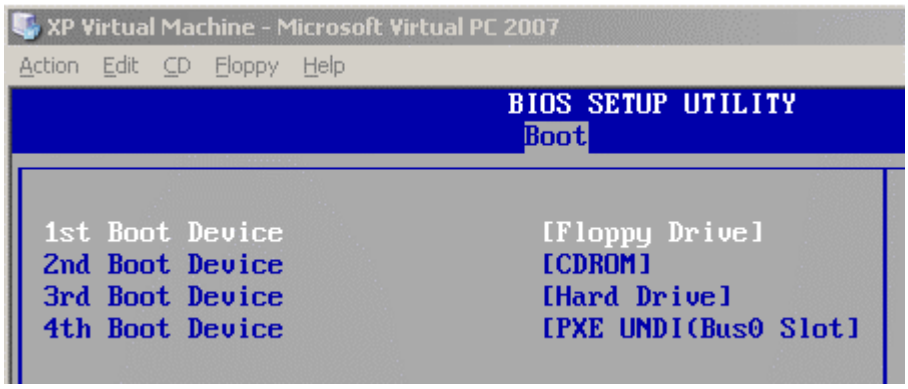
2. Select **Capture ISO Image…** in the CD menu.



3. Browse for our bootable environment. Click **Open** when ready.



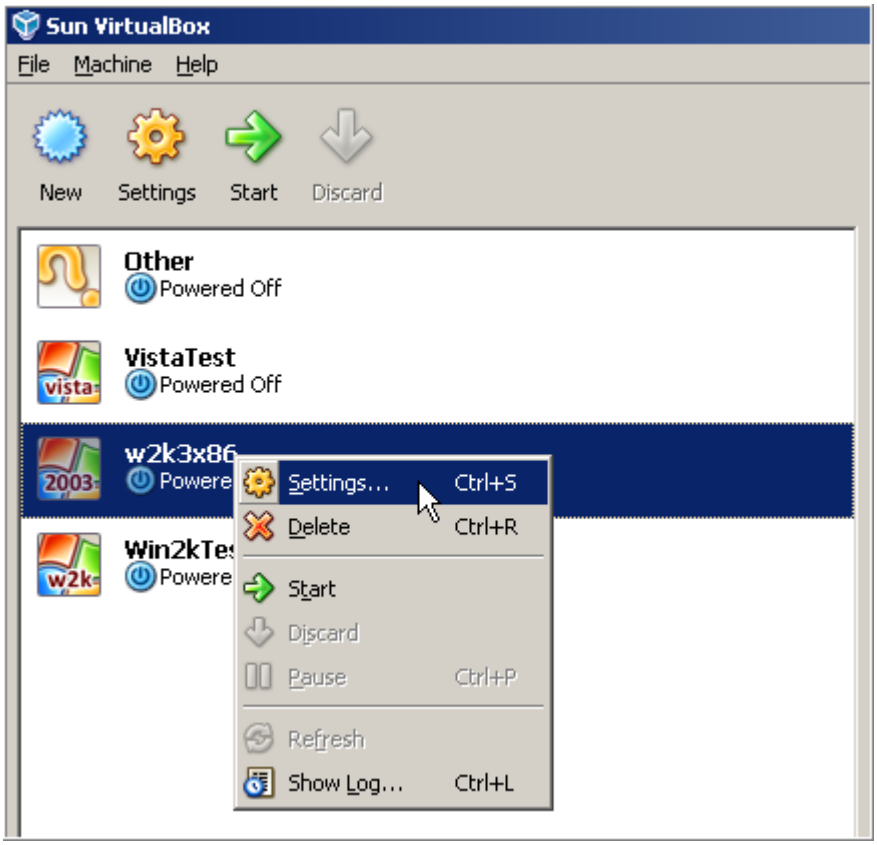
4. Enter BIOS of the virtual machine by pressing **Delete** during the startup, and then select **CD-ROM** as the first boot device. So you make sure the virtual machine will automatically start up from our environment.



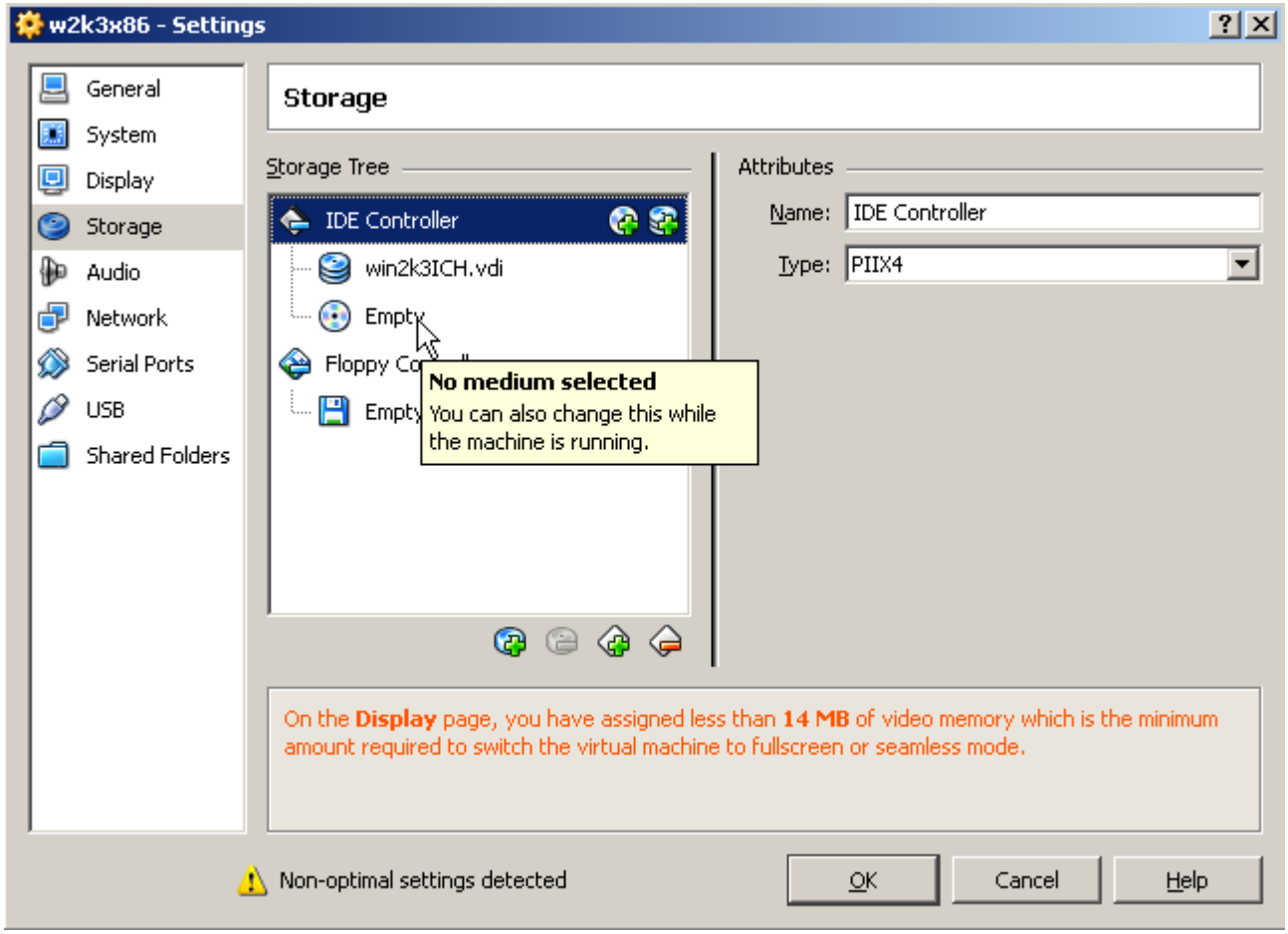
5. Press **F10** to save changes and exit BIOS.

For Sun VirtualBox

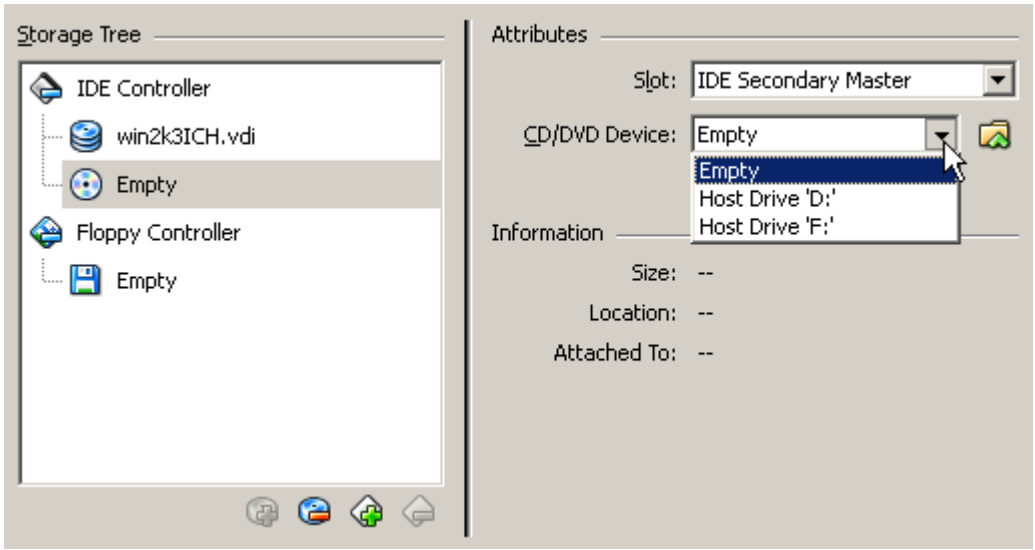
1. Right click of the mouse on a virtual machine, and then select **Settings…**

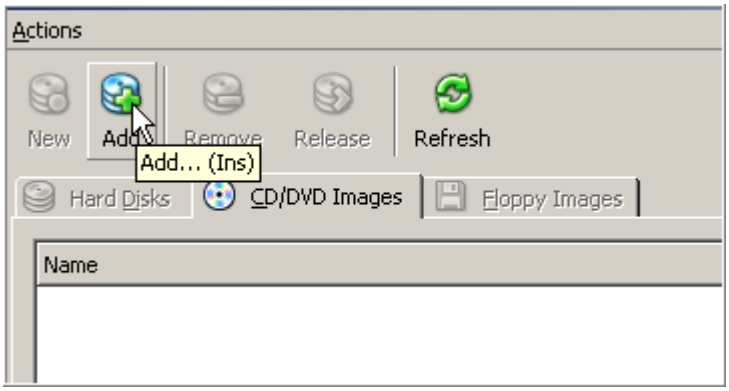


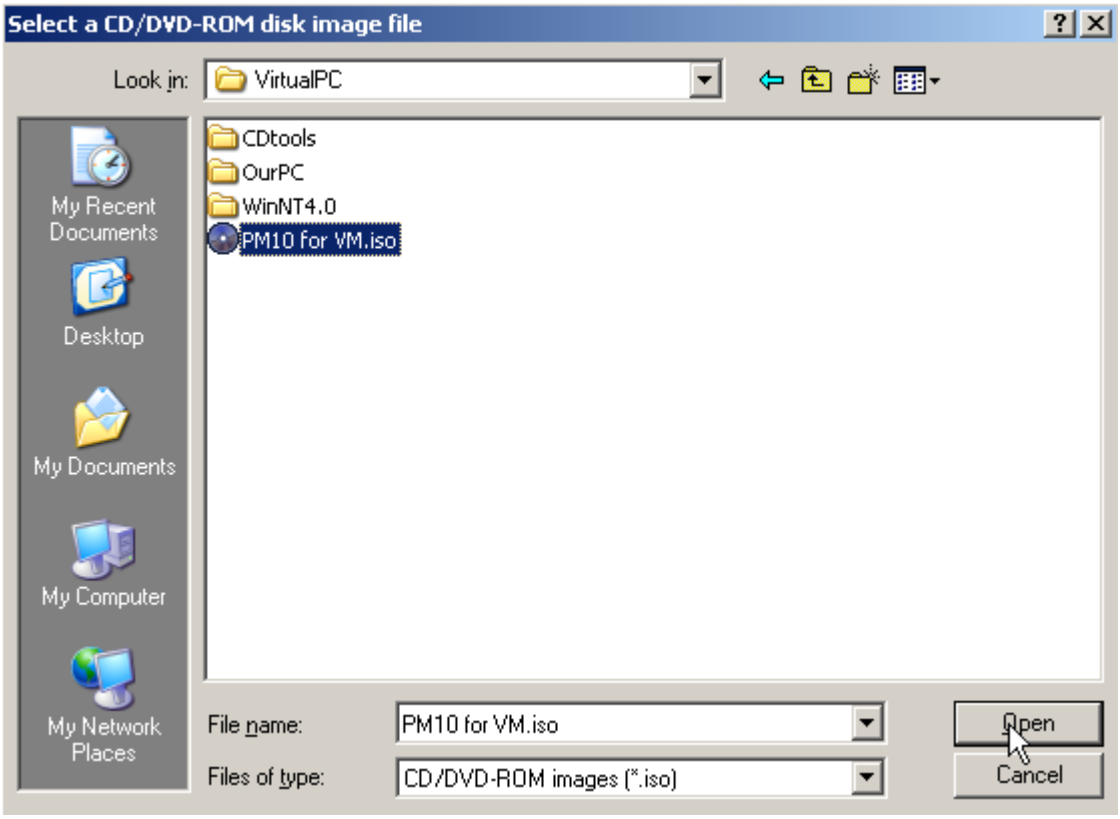
2. Go to the **Storage** section, and then click on the CD/DVD icon.

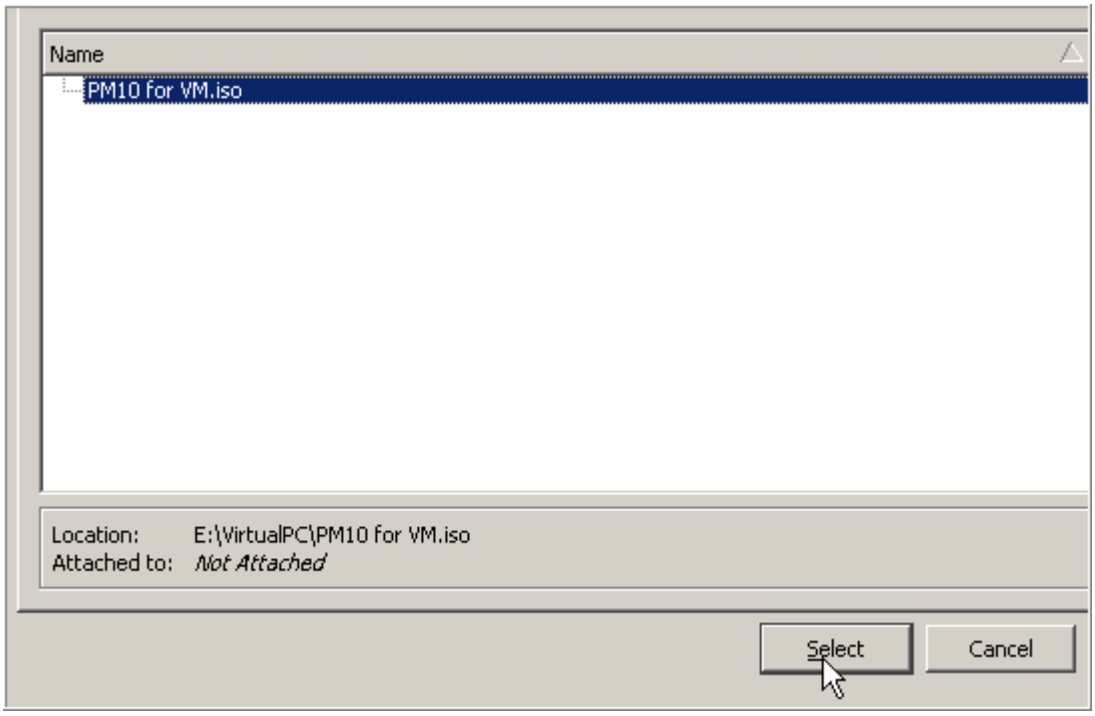


3. Browse for our bootable environment. Click **Select** when ready.

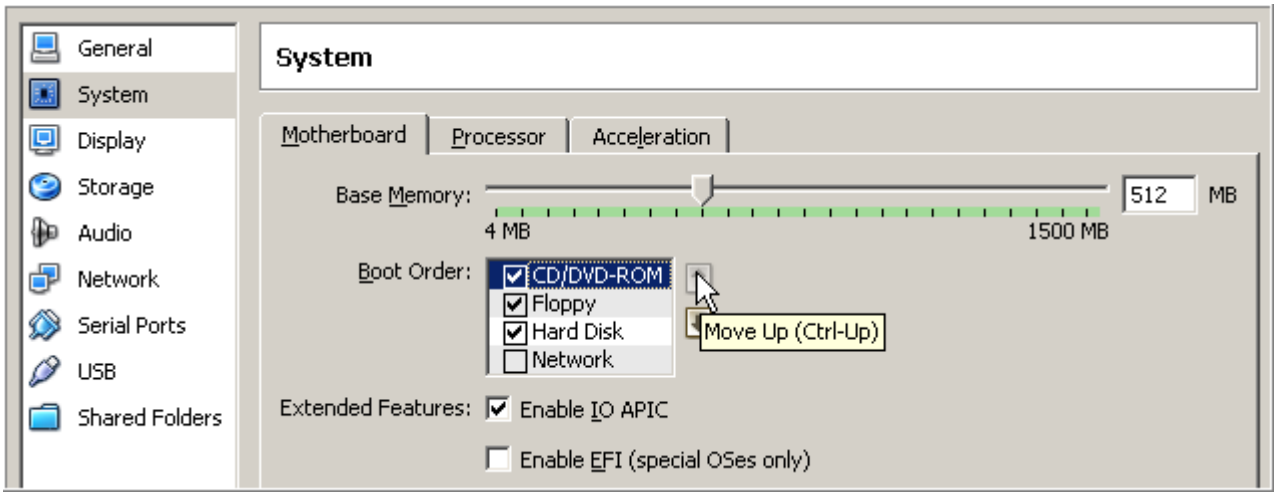








4. Go to the **System** section to select **CD/DVD-ROM** as the first boot device. So you make sure the virtual machine will automatically start up from our environment.

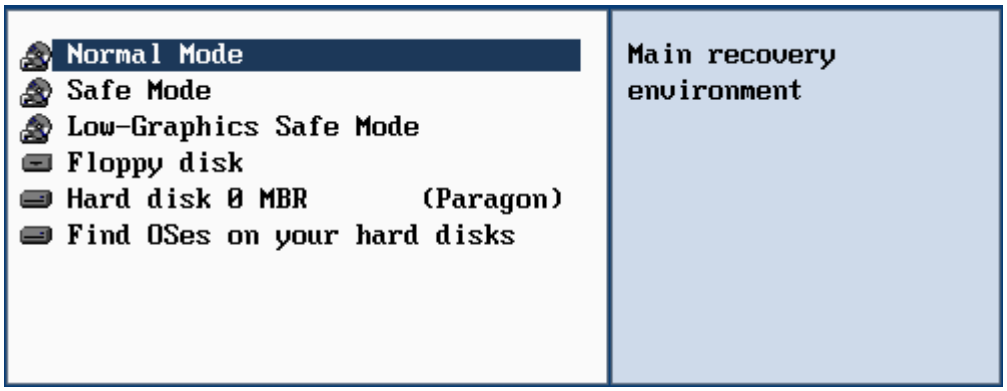


5. Click **OK** when ready.

Booting from our environment

1. Connect our environment to a virtual machine.
2. Start up the virtual machine from our environment. The operation procedure differs for virtual machines of different vendors, though it's quite obvious.
3. Select the required boot mode (Normal, Safe, Low-Graphics Safe). By default the Normal Mode will be automatically initiated after a 10 second idle period.
4. Click on an operation to start. Hints on the selected at the moment item will help you make the right choice.

Boot Menu



The Boot Menu contains the following commands:

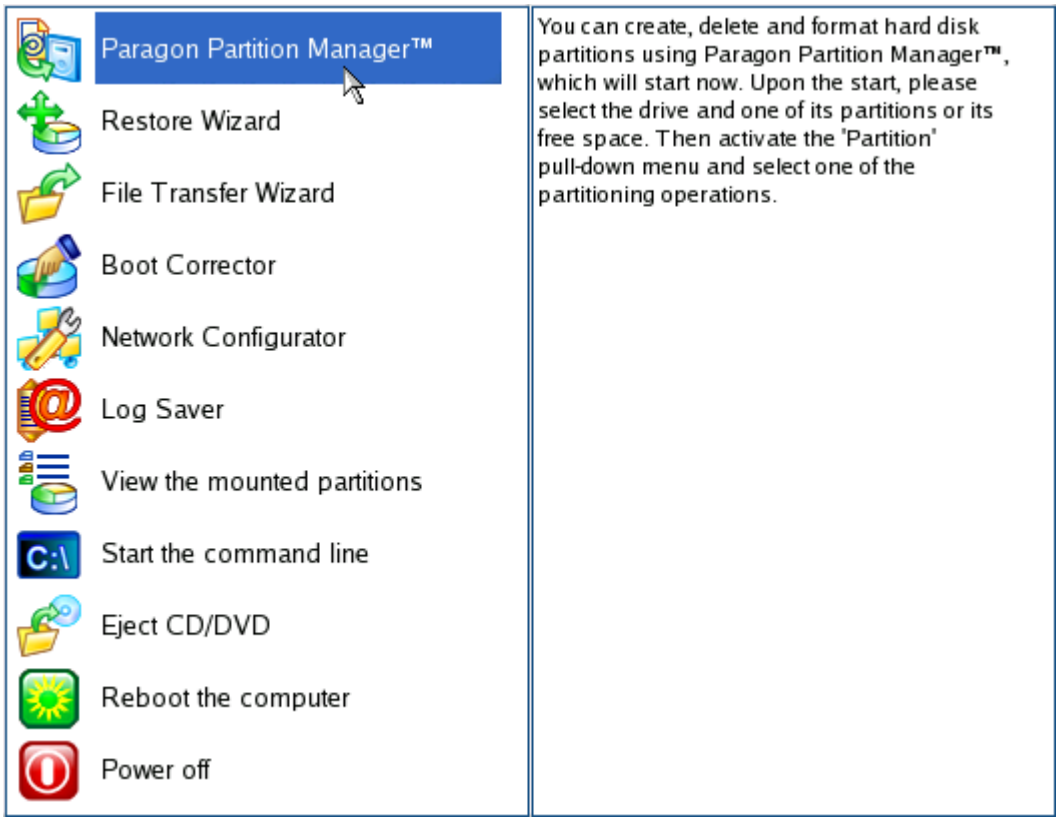
- **Normal Mode**. Boot into the Linux normal mode. This mode uses the full set of drivers (recommended);
- **Safe Mode**. Boot into the PTS DOS mode. This mode can be used as an alternative of the Linux normal mode if it fails to work properly;
- **Low-Graphics Safe Mode**. Boot into the PTS DOS safe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

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

While working with our bootable environment you might experience some inconvenience caused by possible video artifacts. It is just a result of changing video modes and in no way will affect the program functionality. If this is the case, please wait a bit and everything will be OK.

Normal Mode

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



- **Paragon Partition Manager** (enables to copy and back up separate partitions or entire hard disks, carry out partitioning operations, etc.);
- **Restore Wizard** (allows restoring hard disks and partitions);
- **File Transfer Wizard** (allows coping files/folders to another disk or a partition as well as recording them to CD/DVD);
- **Boot Corrector** (helps to correct the Windows System Registry without Windows being loaded);
- **Network Configurator** (enables to establish a network connection under Linux);

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

- **Log Saver** (helps to collect and send the necessary log files to the Technical Support);
- **View the mounted partitions** (the list of all mounted partitions will be displayed);

Our Linux/DOS environment assigns drive letters to partitions the way it is done in DOS, i.e. one after another, primary partitions at first. Thus mounted partitions may have different drive letters from Windows.

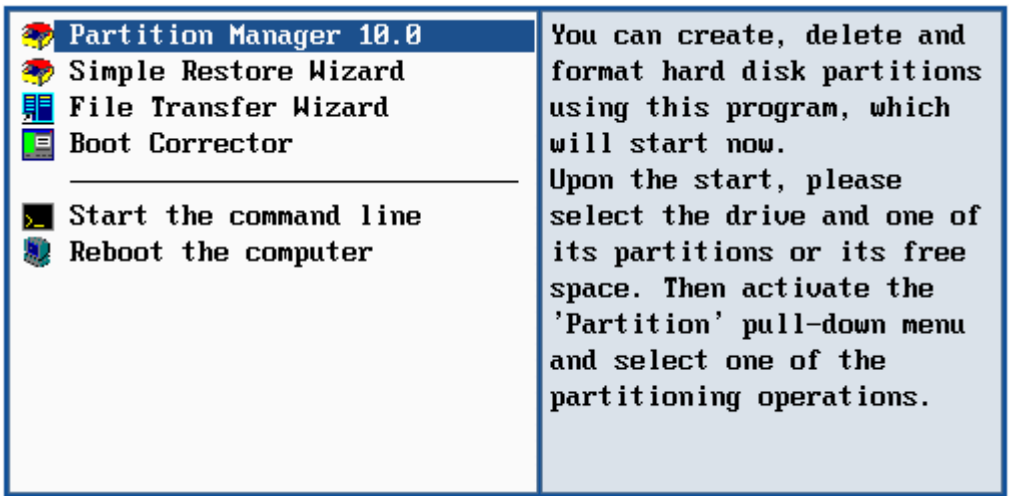
- **Start the command line** (allows experienced users to execute any operation);
- **Reboot the computer**;
- **Power off the computer**.

Safe Mode

When the Safe mode is selected, the PTS DOS launch menu appears. It has nearly the same functionality as for the Normal mode except the **Network Configurator** and **Log Saver** commands. Besides due to certain limitations of the PTS DOS environment, there is no possibility to burn CD/DVD discs.

Low Graphics Safe Mode

When the Low Graphics mode is selected, the PTS DOS launch menu appears. It has the same functionality and looks similar to the Safe mode but graphically simpler.



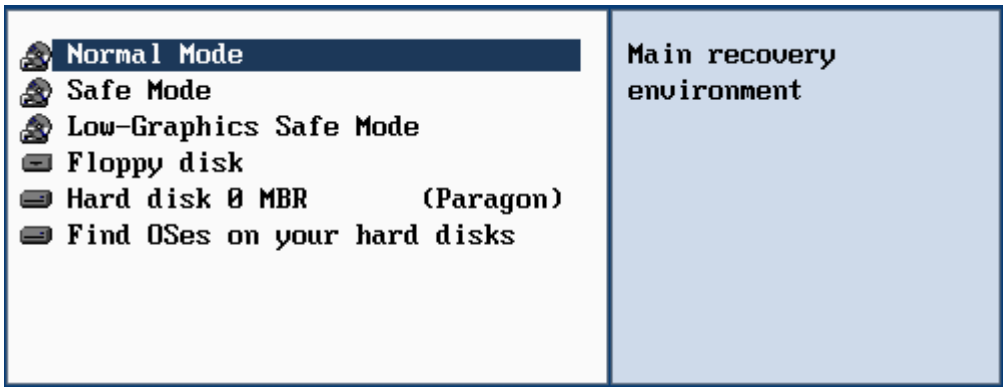
Typical Scenarios

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

Fixing MBR after a Boot Virus Attack

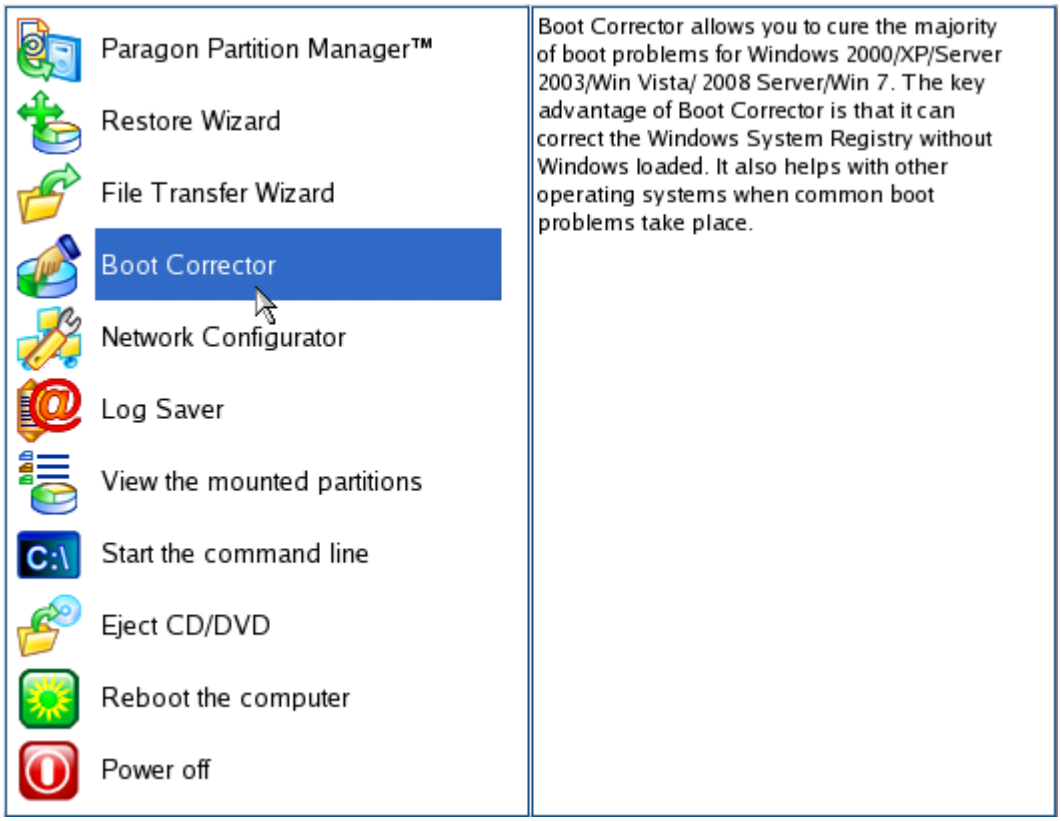
As a result of a boot virus attack the MBR (Master Boot Record) of your virtual system has been corrupted, thus it fails to boot. Our Boot Corrector will help you fix it up in a couple of minutes.

1. Connect our environment to a virtual machine.
2. Start up the virtual machine from our environment.
3. In the boot menu select **Normal Mode** to use the Linux environment (more preferable) or **Safe Mode** to use the PTS DOS environment (in case you've got problems with Linux).

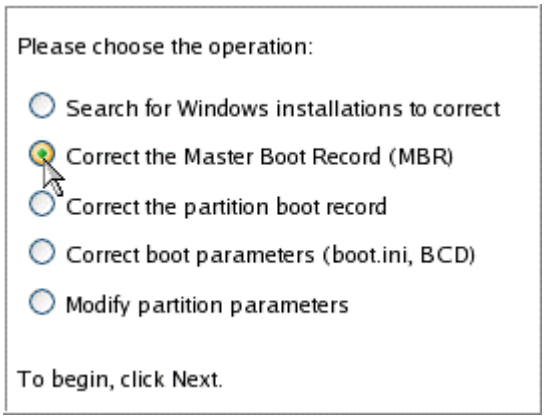


By default the Normal Mode will be automatically initiated after a 10 second idle period.

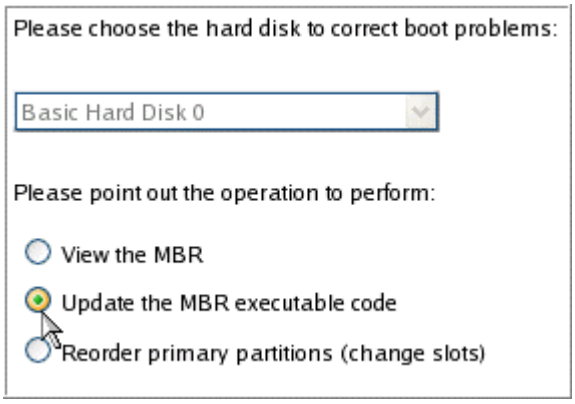
4. In the Linux launch menu select **Boot Corrector**. You can find it in PTS DOS as well.



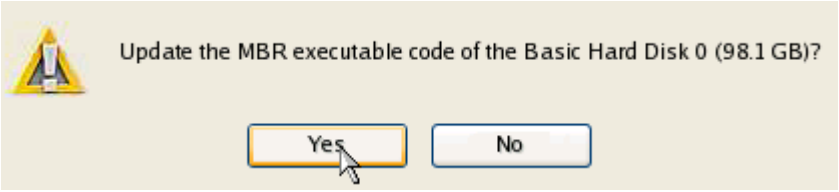
5. On the wizard's welcome page, select **Correct the Master Boot Record (MBR)**.



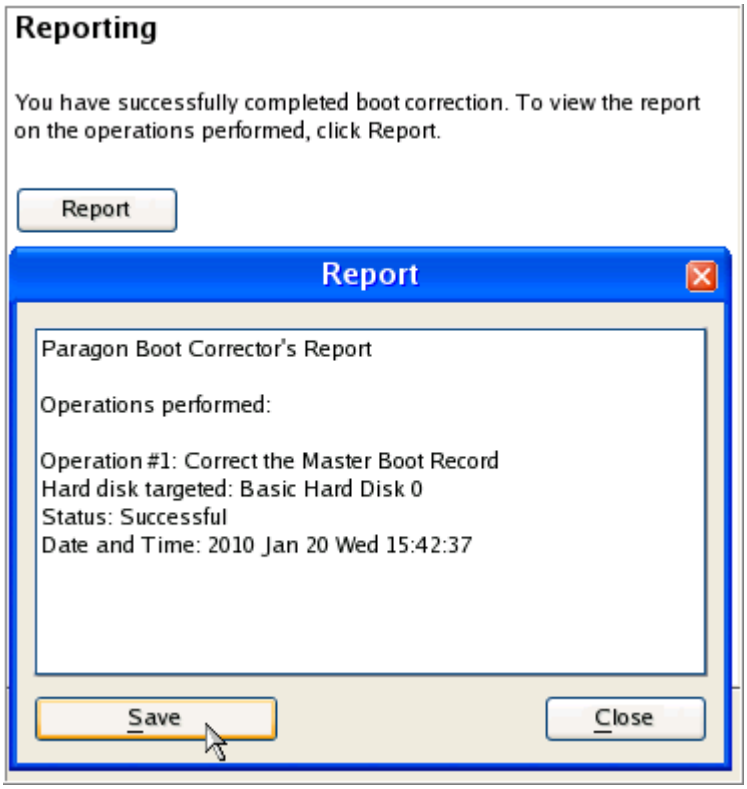
6. On the next page choose the required hard disk from the pull-down list (if several) and then select the **Update the MBR executable code** option.



7. Confirm the operation.



8. After the operation is completed click the **Report** button to see a well informative summary page. The program also enables to store the resulted report. To do that, just press **Save** and choose the exact location in the opened dialog.



9. Click **Finish** to close Boot Corrector.

10. Reboot the virtual machine from the hard disk.

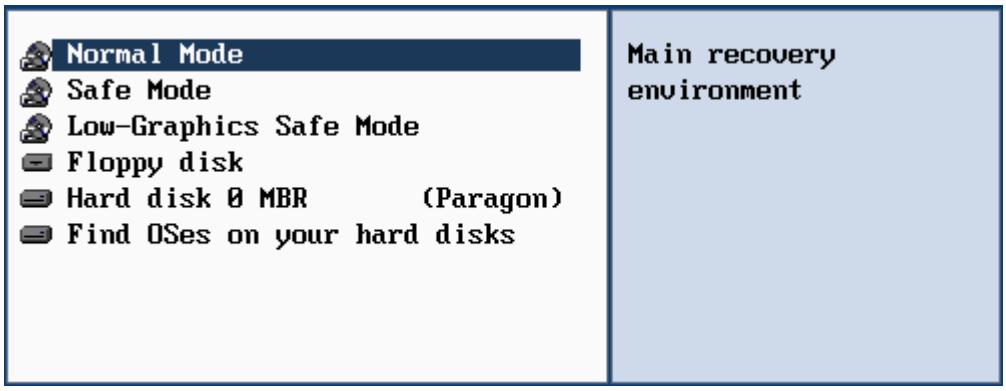
Copying Data from the Corrupted Virtual System to Network

Your virtual system is severely damaged and doesn't boot. With our solution you can easily retrieve valuable information and copy it to a network drive.

1. Connect our environment to a virtual machine.

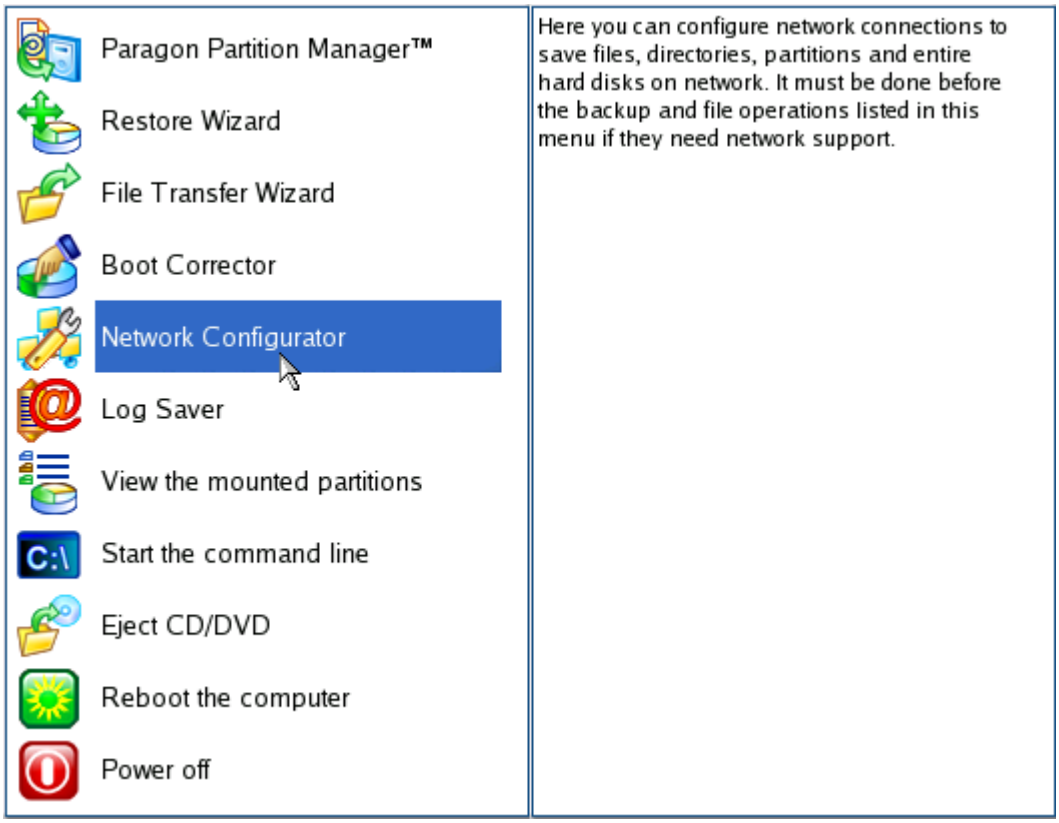
2. Start up the virtual machine from our environment.

3. In the boot menu select **Normal Mode** to use the Linux environment, since it's the only mode that enables to work network.



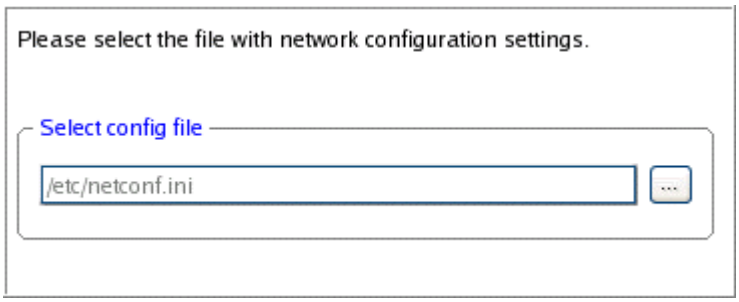
By default the Normal Mode will be automatically initiated after a 10 second idle period.

4. In the Linux launch menu select **Network Configurator**.

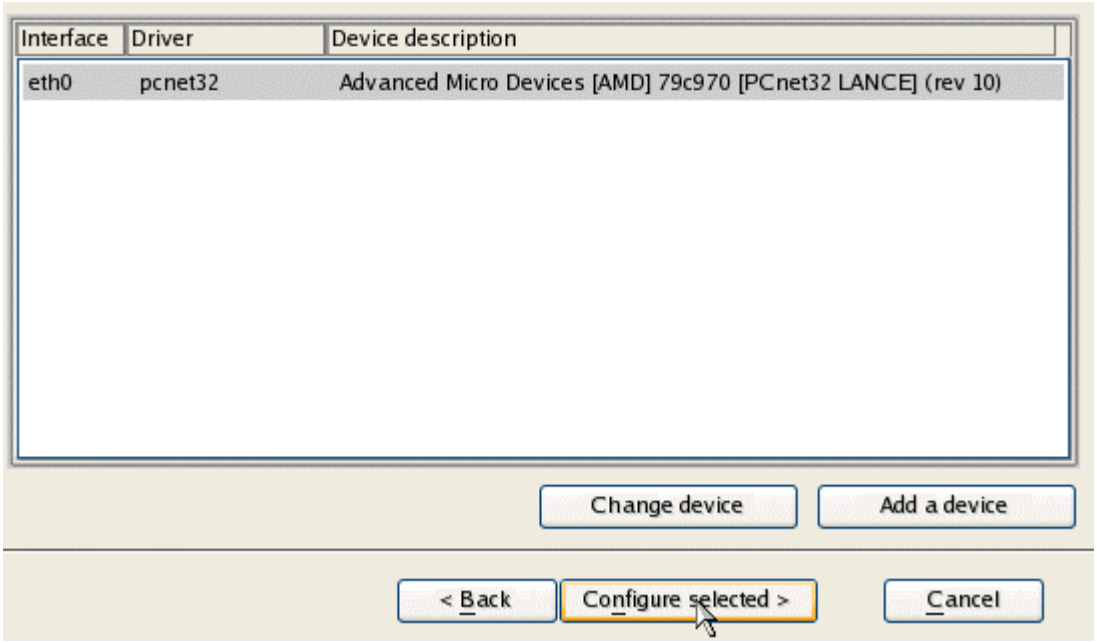


5. On the wizard's welcome page, click **Next**.

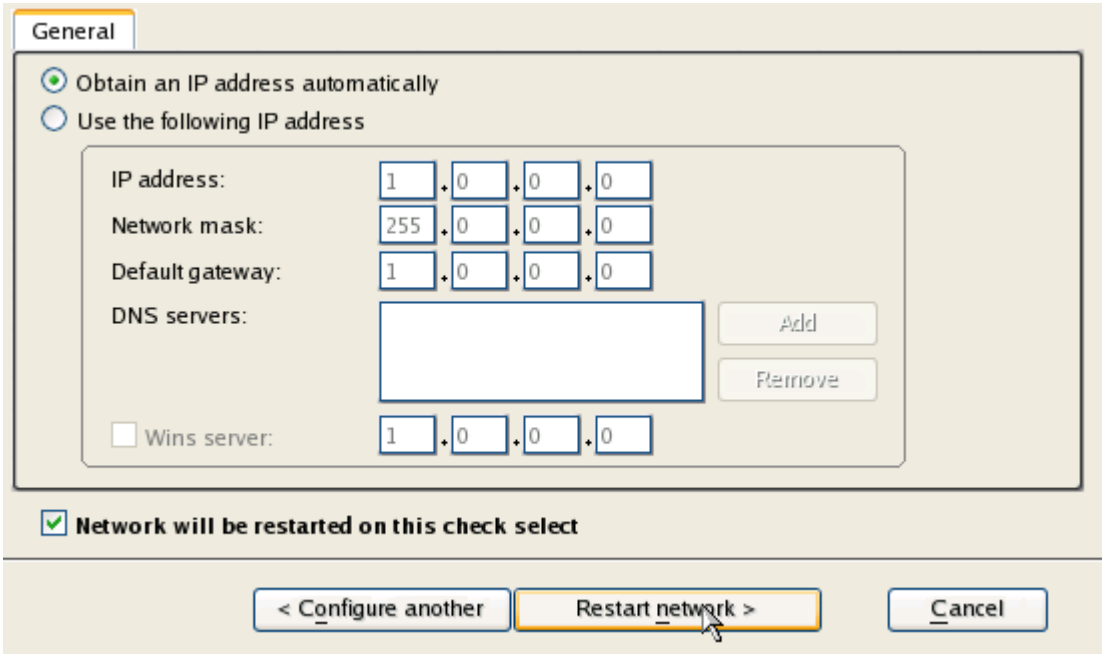
6. On the Load Config File page, click **Next**. By default, the wizard saves all network settings in the netconf.ini file located on the Linux RAM drive, thus it will only be available until restart of the virtual machine. However, you can just once configure your network device and then save this file to some other destination, for instance a local drive, and this way avoid constant re-configuration, just by providing a path to it.



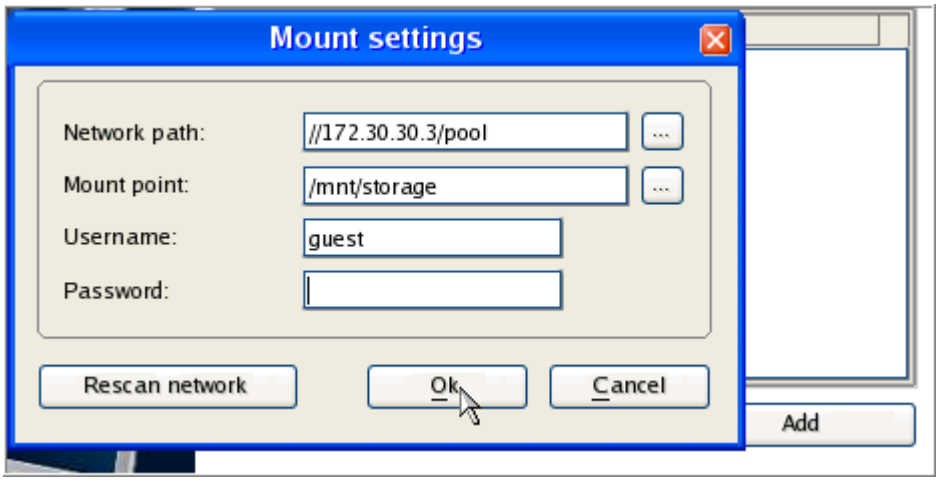
7. The wizard automatically attempts to detect all available network devices and then displays them (if any) in form of a list. On every found device there's information about its interface and used driver as well as a brief description. You can manually add a network device in case it hasn't been found automatically by clicking **Add a device** and selecting a device you need from the list. Do not forget to check it by clicking **Probe**.

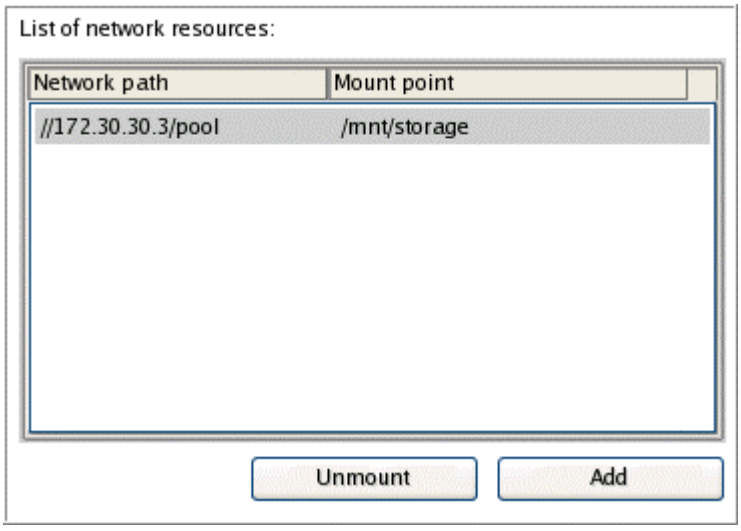


8. You need to properly set up the selected network device. If your local network has a DHCP, you can just leave everything as is, otherwise manually type in an IP address, a network mask, default gateway, etc.

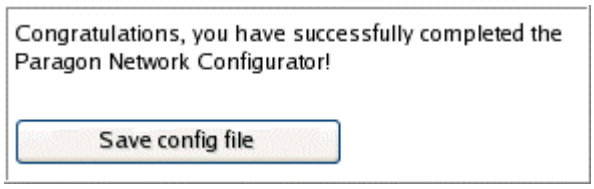


9. On the next page, click **Add** and provide all the necessary information to map a network share in the opened dialog. Click **Unmount** to delete an existing network connection if necessary.

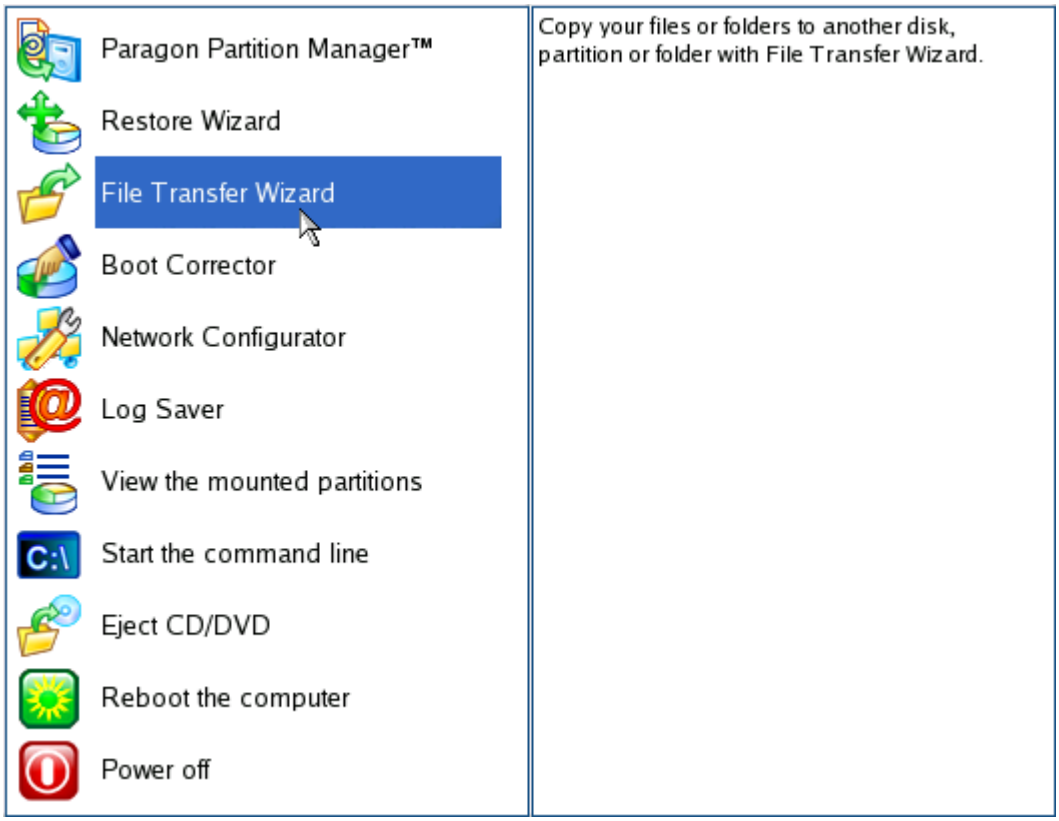




10. Save the netconf.ini file if necessary and click **Finish** to complete the wizard.

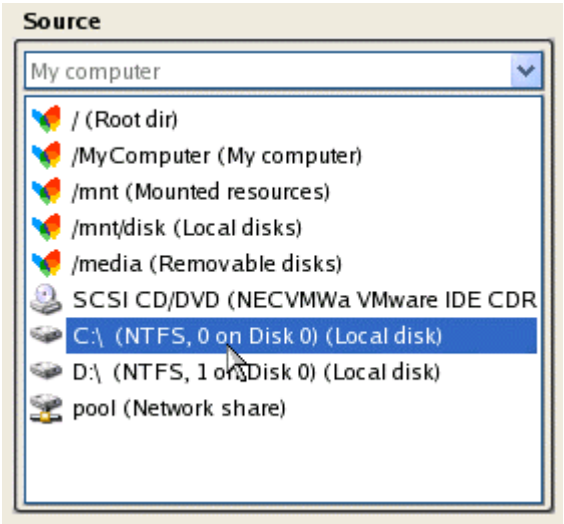


11. In the Linux launch menu select **File Transfer Wizard**.

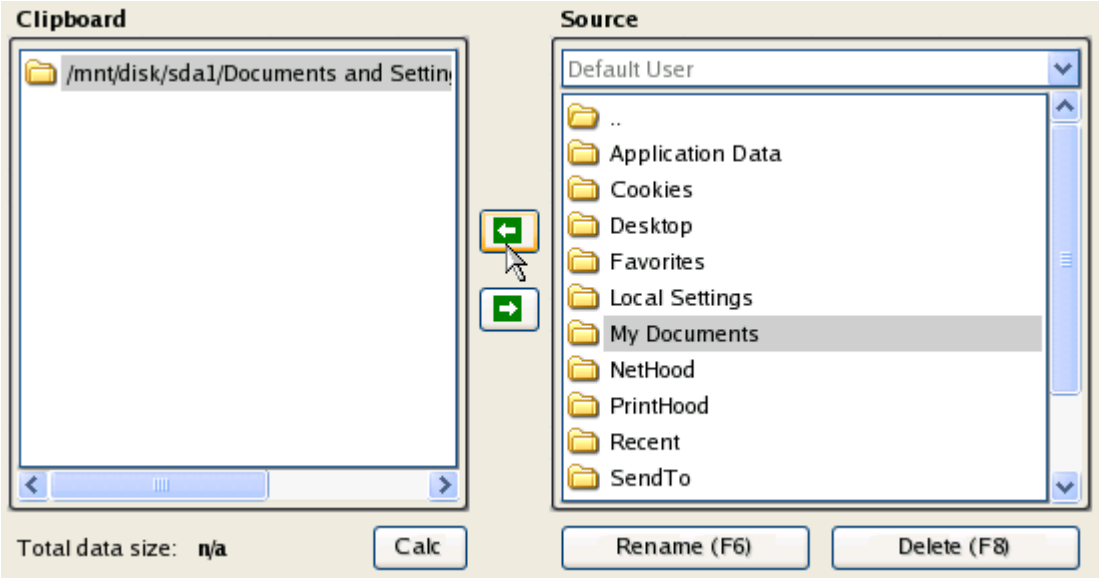


12. On the wizard's welcome page, click **Next**.

13. Select a disk where the files you need are stored from the pull-down list in the right pane of the page.

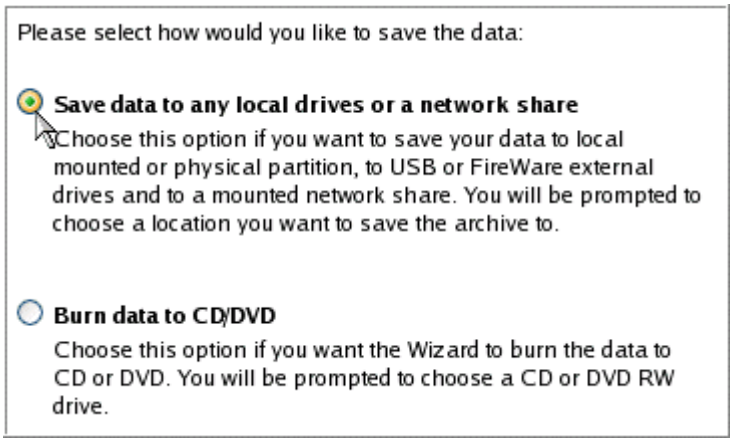


14. Select files you want to copy and place them to Clipboard by pressing the left arrow-button.

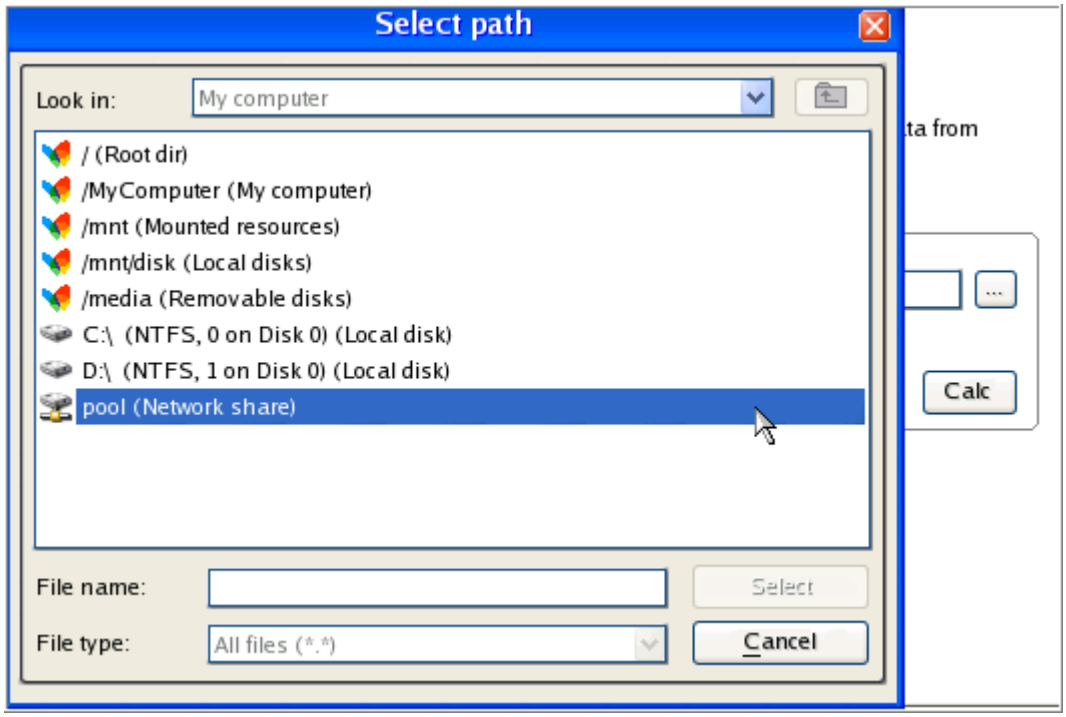


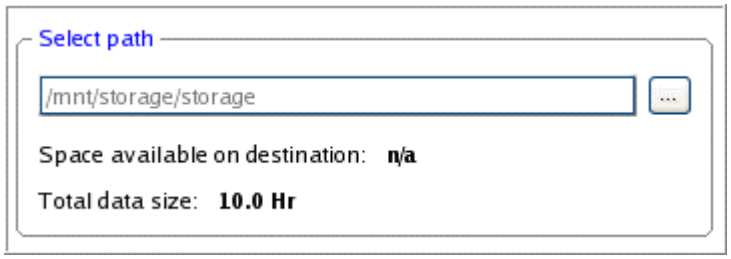
Click the Calc button to estimate the resulted data size.

15. Choose the way the data will be stored. Select **Save data to any local drive or a network share**.

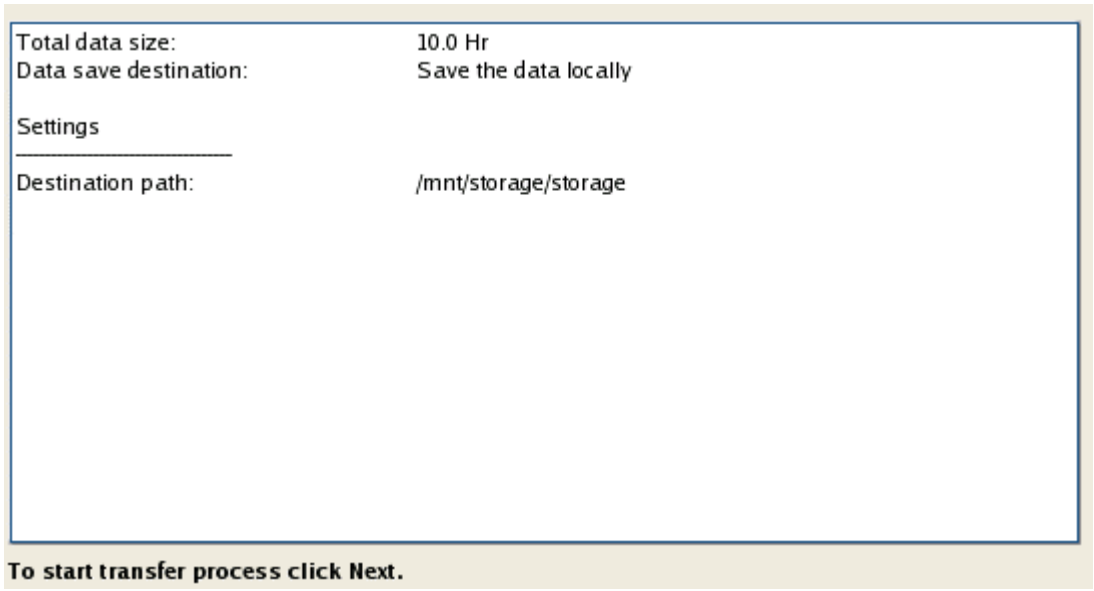


16. Select the previously mapped network share to copy the data to by pressing the standard browse button [...].

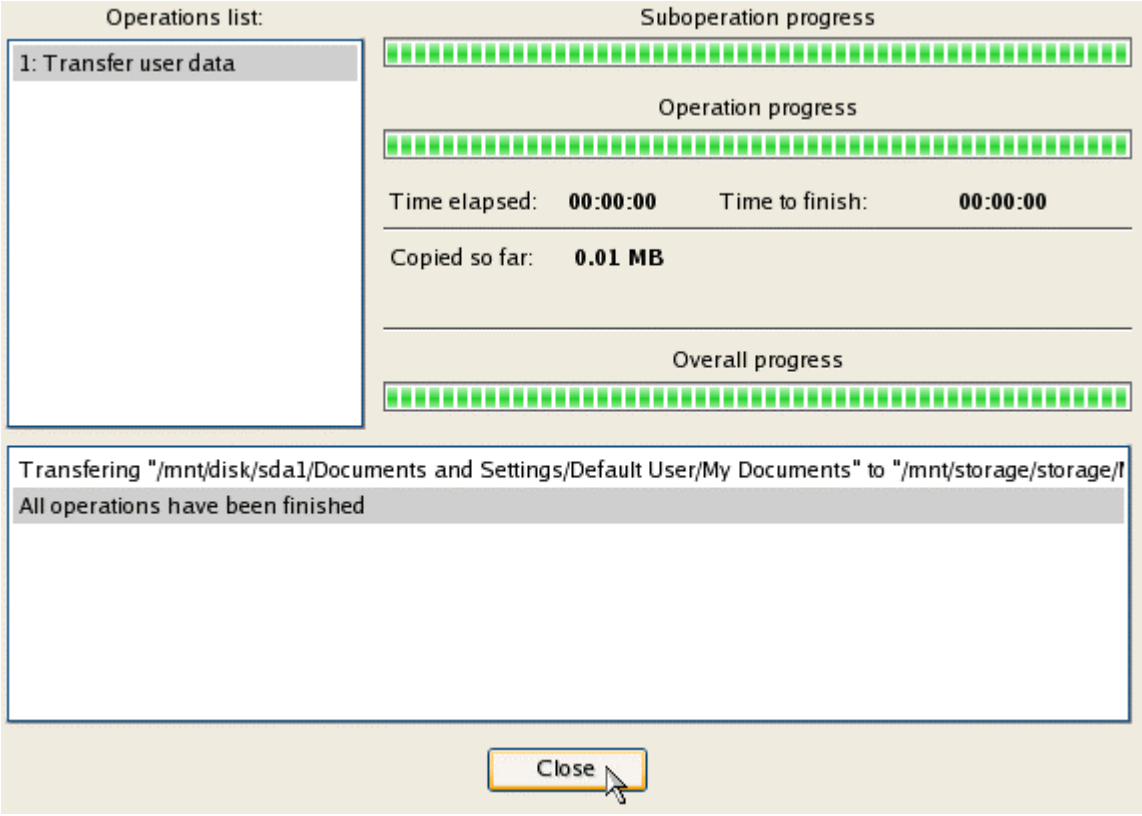




17. Check all parameters of the operation. Click **Next** to accomplish the operation.



18. In the Progress window you can see in real-time a detailed report on all actions carried out by the program.



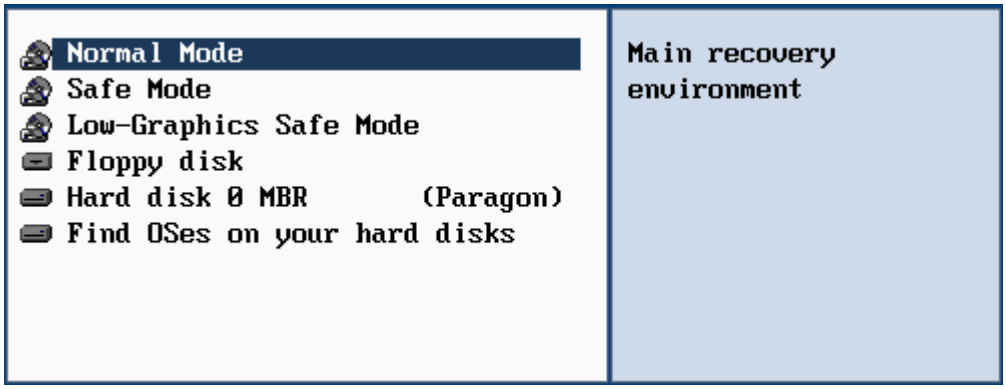
19. After the operation is completed, close the wizard by pressing the appropriate buttons.

20. Turn off the virtual machine.

Resizing a Virtual Disk

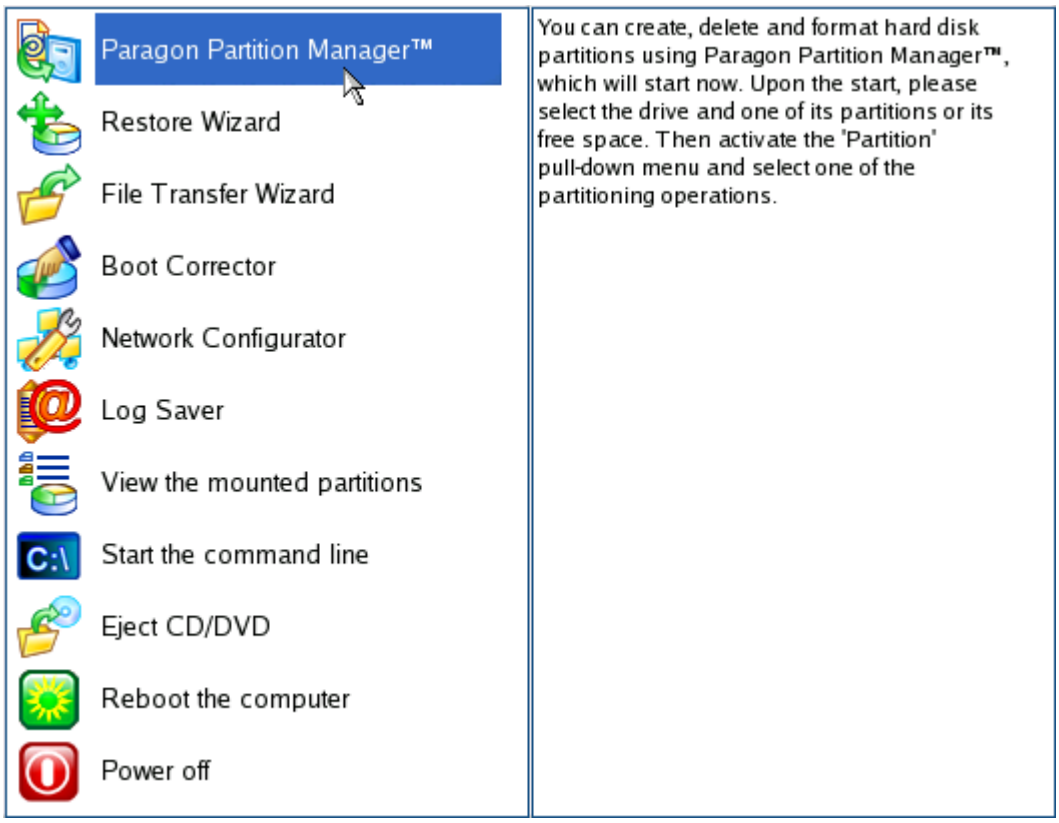
You've got several partitions on a virtual disk. After installing a number of resource-consuming applications and system updates the system partition has started to suffer from the lack of free space. But an adjacent partition has a plenty of redundant space. With our solution you can easily redistribute free space between partitions of your virtual disk with one operation only.

1. Connect our environment to a virtual machine.
2. Start up the virtual machine from our environment.
3. In the boot menu select **Normal Mode** to use the Linux environment (more preferable) or **Safe Mode** to use the PTS DOS environment (in case you've got problems with Linux).

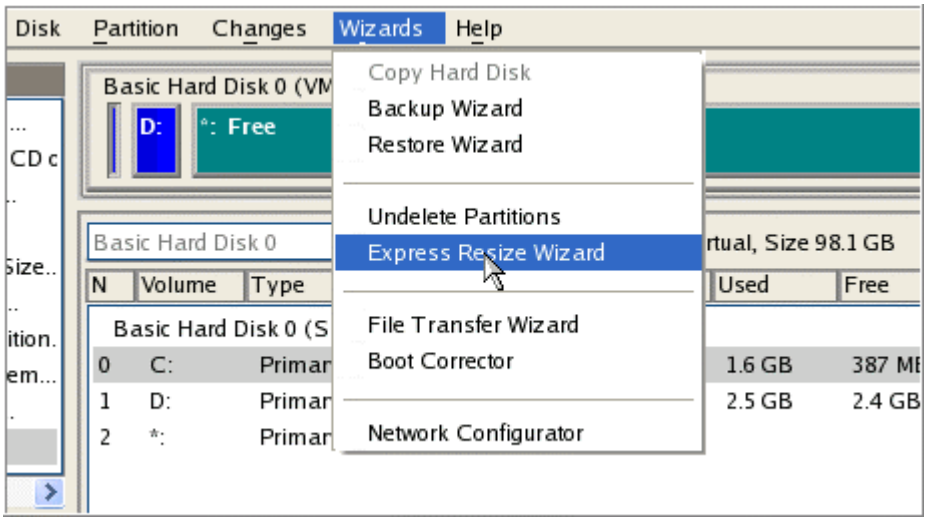


By default the Normal Mode will be automatically initiated after a 10 second idle period.

4. In the Linux launch menu select **Paragon Partition Manager**. You can find it in PTS DOS as well.

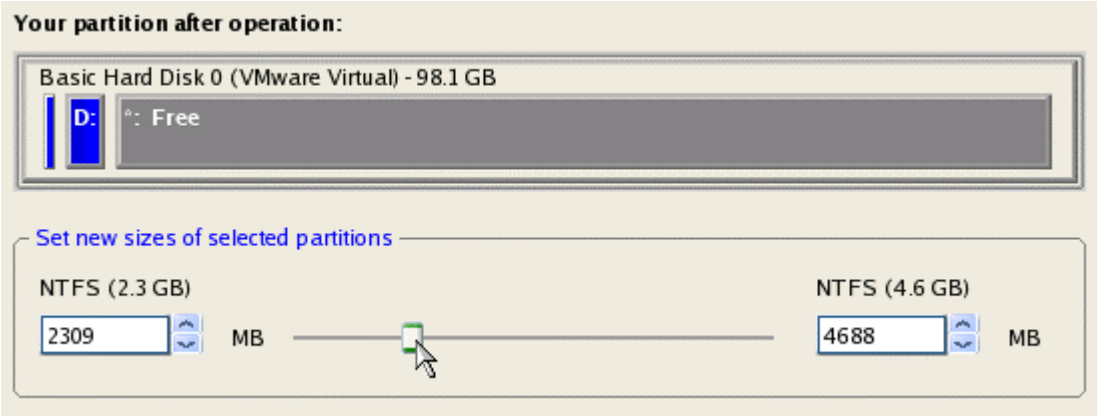


5. In the main menu of the program select: **Wizards > Express Resize Wizard**.



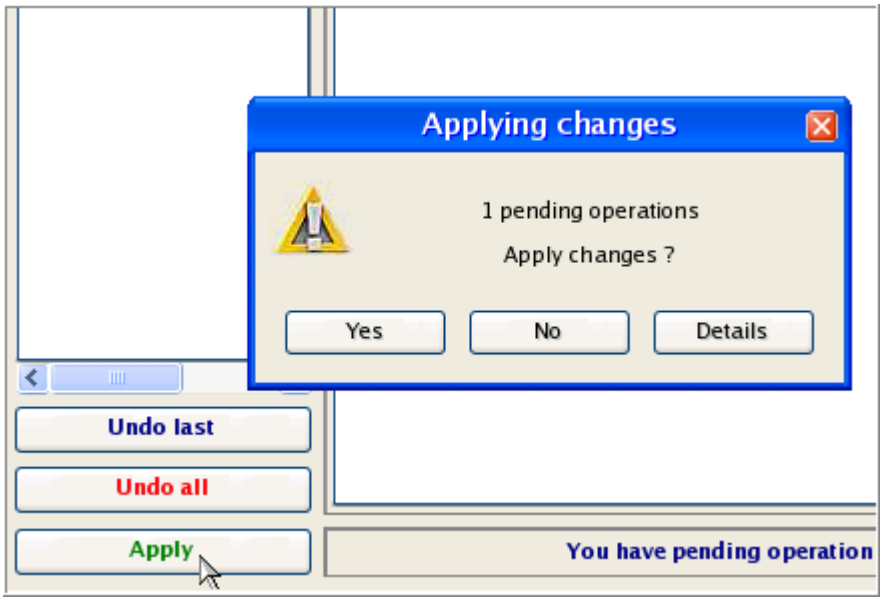
6. On the wizard's welcome page, click **Next**.

7. Increase size of the system partition with the slider or manually by entering the required value. Please note, when you change size of one partition the size of the other will be changed as well, thus redistributing unused space between the partitions.

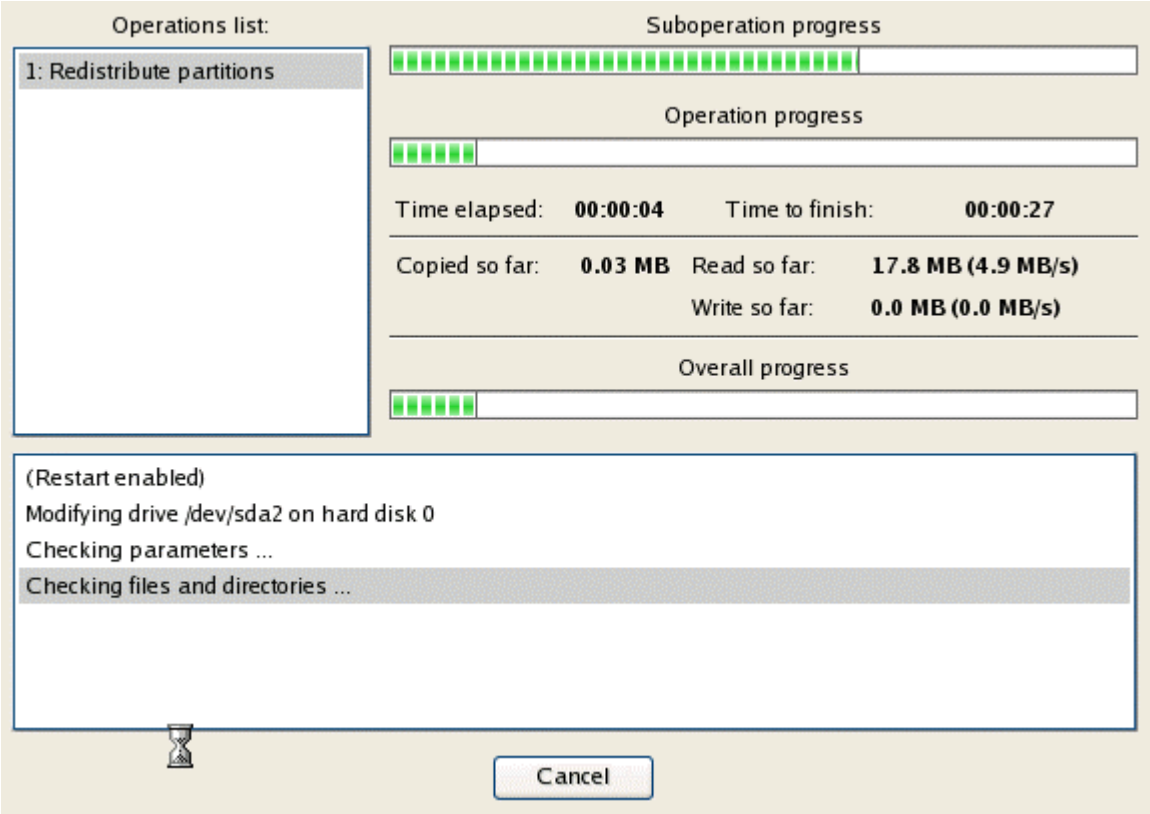


If you've got more than two partitions on your hard disk and a partition you need to increase is surrounded by other partitions, you've got the choice to choose which partition will act as a space donor. Just click on the left partition of the pair, as the right one will be selected automatically.

8. Click **Finish** to complete the wizard.
9. Click **Apply** to execute the operation.



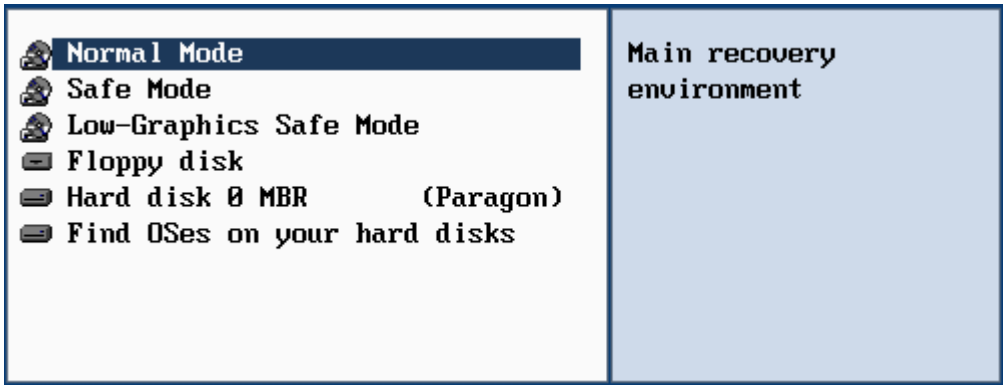
10. In the Progress window you can see in real-time a detailed report on all actions carried out by the program.



Optimizing a Virtual Disk

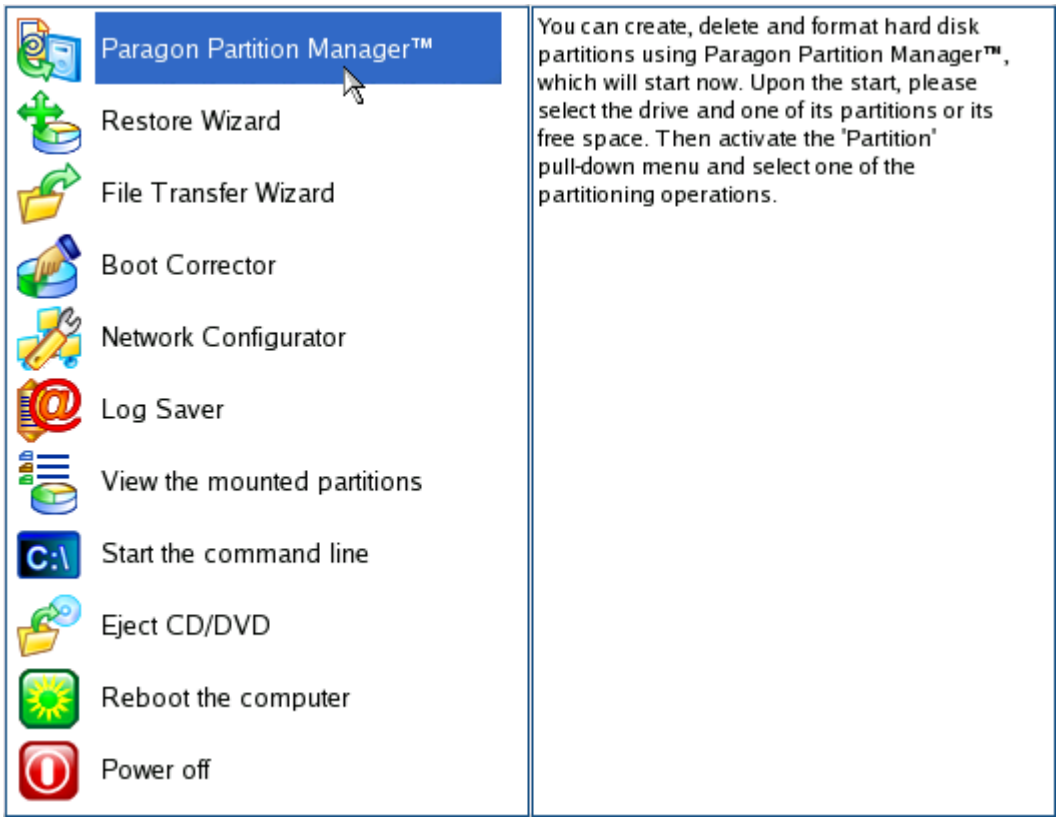
You've noticed that performance of your virtual system has been significantly decreased due to heavy fragmentation of files on its disks formatted to NTFS. With our solution you can effectively fight against this problem with no fear of data loss even in case of a power outage or an OS failure.

1. Connect our environment to a virtual machine.
2. Start up the virtual machine from our environment.
3. In the boot menu select **Normal Mode** to use the Linux environment (more preferable) or **Safe Mode** to use the PTS DOS environment (in case you've got problems with Linux).

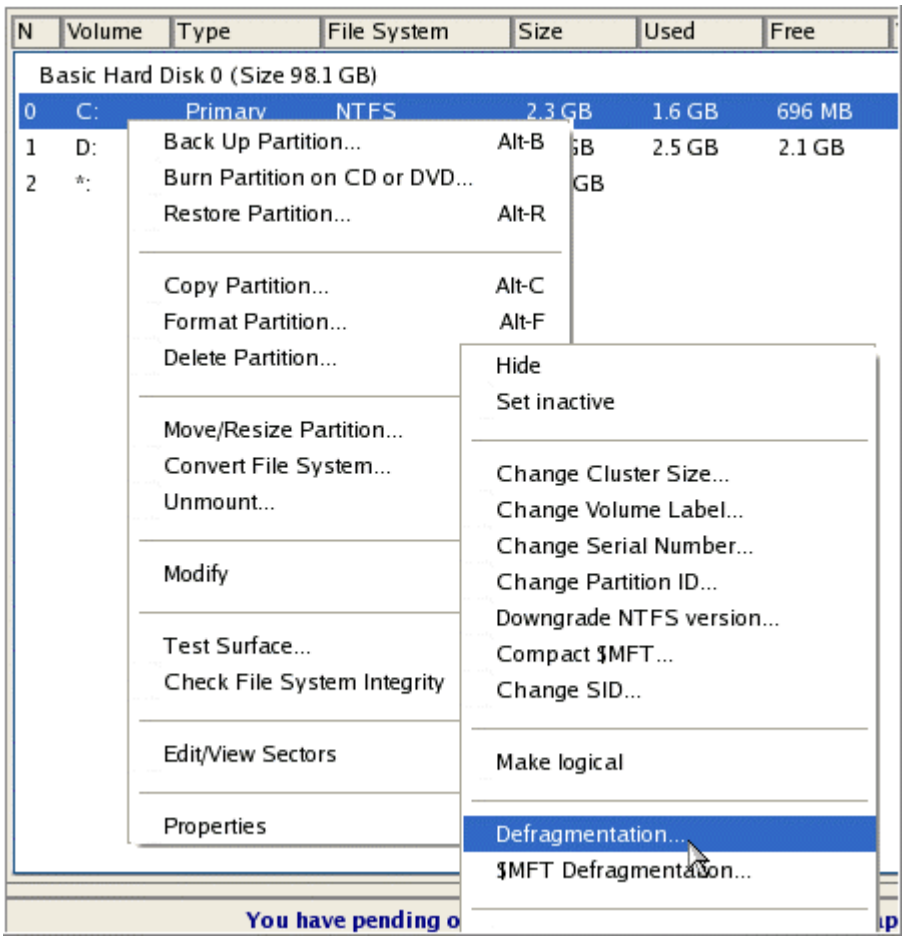


By default the Normal Mode will be automatically initiated after a 10 second idle period.

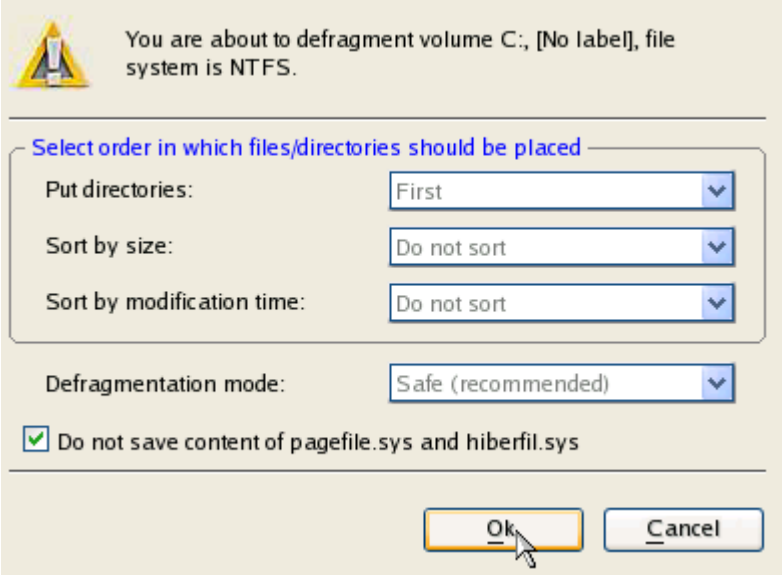
4. In the Linux launch menu select **Paragon Partition Manager**. You can find it in PTS DOS as well.



5. In the main window of the program right click of the mouse on an NTFS partition, and then select: **Modify > Defragmentation…**



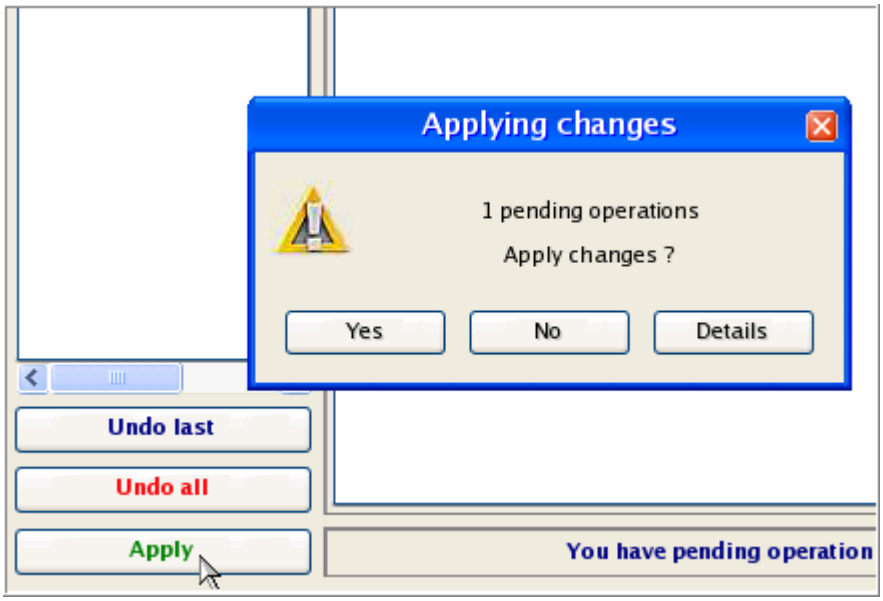
6. In the opened dialog define settings of the operation. To improve the performance we recommend you to mark the **Do not save content of the Pagefile.sys or (and) Hiberfile.sys** checkbox as these files are only needed for the current Windows session.



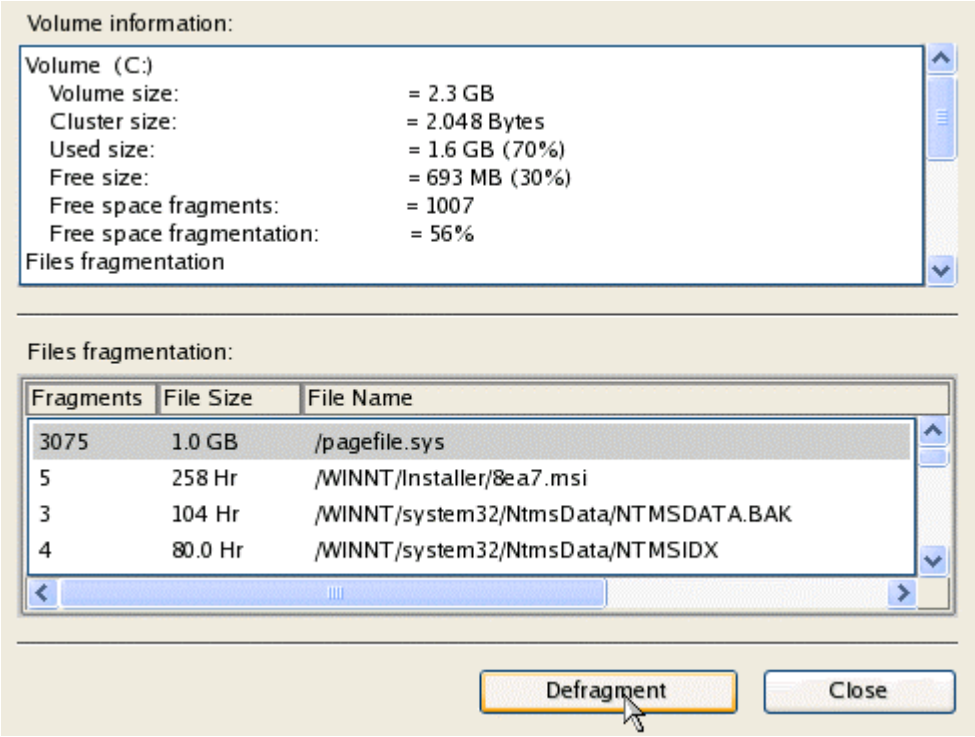
The Defragment Partition dialog offers a number of additional parameters that can also be of help. However here we pay attention to the most relevant to fulfill our task.

7. Click **OK** to complete the dialog.

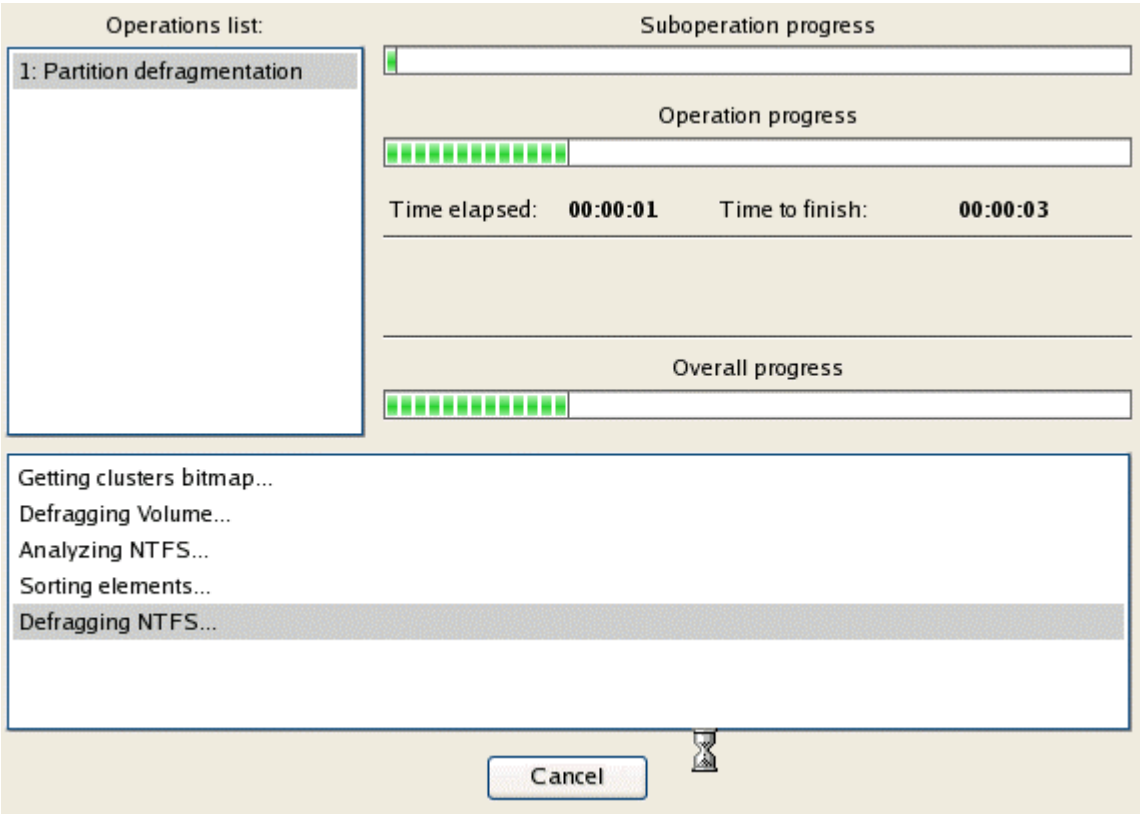
8. Click **Apply** to execute the operation.



9. At first the program will analyze the selected partition for data fragmentation and report on the results. Click **Defragment** to confirm the operation.



10. In the Progress window you can see in real-time a detailed report on all actions carried out by the program.



The operation needs time to complete, so please be patient and do not turn off the machine until it completes.