PARAGON INFRASTRUCTURE PACKAGE

QUICK USER GUIDE

CONTENTS

INTRODUCTION

Paragon Infrastructure Package is an add-on for the enterprise level products of the company that includes all the necessary facilities to help increase efficiency in managing complex environments of multiple servers and workstations:

❑ Scheduler and script generator to automate routine operations;

❑ Paragon Adaptive Restore™ to successfully restore a Windows 2000/XP/Server 2003 or Windows Vista/7/Server 2008 based computer to a different hardware configuration or a virtual machine and vice versa (available for custom WinPE 2.1 and Linux based bootable images as well as for the WinPE recovery environment);

❑ Paragon PXE Server (DHCP and TFTP servers) to boot client machines remotely;

❑ Handy tools to build a custom WinPE 2.1 or Linux based bootable image containing the main product where it's possible to configure the network and mount network shares, set for execution a program script as well as add any required files. This image then can be recorded to a CD/DVD/Blu-ray disc to make client machines boot directly or remotely through the PXE capabilities to carry out operations completely in the unattended mode.

PACKAGE CONTENTS

❑ **Extension Module** (coming as an MSI to update the Windows version of the product) that contains:

   o Task Scheduler;

   o Script generator.

This module is optional and is only offered when there's no functionality of this kind in the main product.

❑ **Network Module** (coming as an MSI) that contains:

   o Boot Media Builder to prepare Linux based images;

   o PXE Server.

❑ **WinPE Customization Package** (coming as a self-extracting archive) to prepare WinPE 2.1 based images.

GETTING STARTED

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

EXTENSION MODULE

After installing this module the Windows version of the product will be automatically updated. As a result you will be able to:

❑ Automate routine operations when you have to repeat a sequence of actions on a regular basis by setting a timetable for later execution;

❑ Make a script of any set of operations to execute them later in the unattended mode;

This module is optional and is only offered when there's no functionality of this kind in the main product.

TASK SCHEDULING

Automation of operations can really help you out when you've got to accomplish certain routine operations on a regular basis as it enables to execute them without your involvement while optimizing your computer's work-load.

SETTING A TIMETABLE

Thanks to the embedded Scheduler, you can set a timetable for execution of any operation. It has two categories for time settings (these correspond to appropriate items in the Schedule type menu):

❑ **Initiating the operation by an event**:

- One time only (i.e. the Once item)

- When the system starts (i.e. the At System Startup item)

- When the user logs on (i.e. the At Logon item).

❑ **Initiating the operation periodically (i.e. Daily, Weekly, Monthly)**.
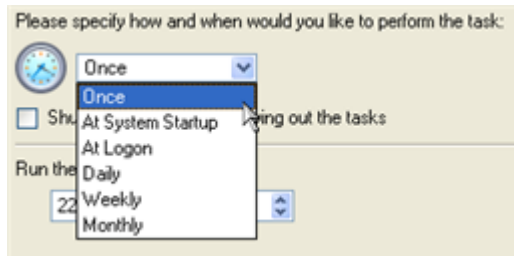
You need to select one of the variants. Depending on your choice, the scheduler displays a form that enables to set a timetable.

> **To run the task in the log-off mode, please specify administering login info by following the appropriate link in the left lower corner of the page.**
>
> **The Shutdown System on Complete option enables to automatically switch off the computer on the successful accomplishment of the operation.**

MANAGING TASKS

All scheduled tasks are placed in a separate list, which can be retrieved by clicking the Scheduled Tasks tab in the Explorer Bar:

On every task you can get in-depth information, including:

❑ The task name

❑ The full path to the generated script of the task

❑ Scheduled time of launch

❑ Statistics on the last launch

❑ Scheduled time of the next launch

❑ Used account information

❑ Comments to the task

To easily manage tasks, the program enables to arrange them according to a certain characteristic just by clicking on the required property.

> ⚠ **This feature can be particularly beneficial when the Scheduled Tasks list contains too many items.**

You can also enable/disable, rename, delete, refresh or modify properties of the selected task.

TASK EDITOR

With the Task Editor you can easily modify properties of scheduled tasks. To do that, you should take the following steps:

Launcher

1. Select a task on the Scheduled Tasks list.

2. Call the Task Editor dialog. There are several ways to do it:

   ❑ Click the **Properties** button on the Scheduled Tasks list.

   ❑ Call the popup menu for the selected task (right click of the mouse button), then select the menu item: **Properties**.
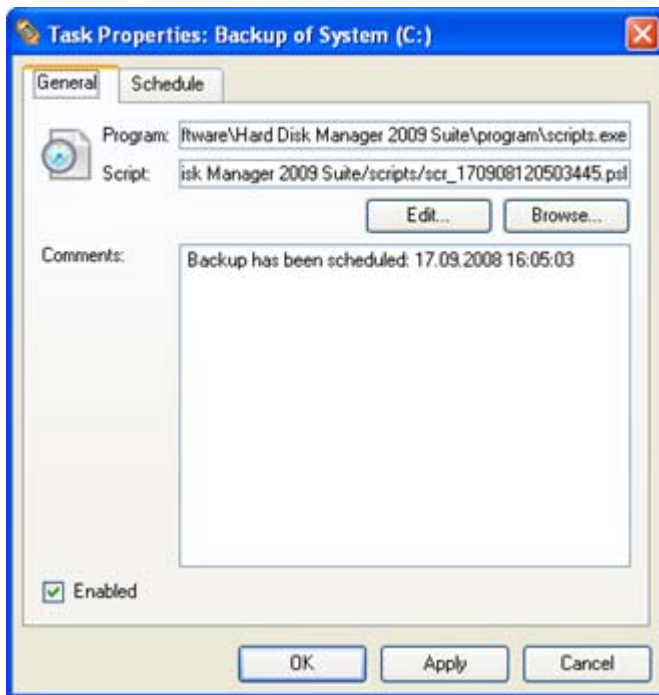
3. In the opened dialog window you can see two tabs - General and Schedule. Click the General tab to modify:

   ❑ Full path to the macro-command program-interpreter, which describes the scheduled task;

   ❑ Command line for starting the interpreter (i.e. the task described in macro-language)

   ❑ Comments referring to the task

   ❑ The option of enabling/disabling the task.

   By clicking the Schedule tab you can modify the task timetable.

In order to apply the changes, you need to click the Apply button at the foot of the dialog.

CREATING A SCHEDULED TASK

To create a scheduled task you should take the following steps:

Launcher

1. Make sure the virtual mode of execution is enabled;

2. Carry out with the program all operations you need to schedule;

3. Call the Save to Scheduler dialog in the Main Menu: **Changes > Save to Scheduler…**;
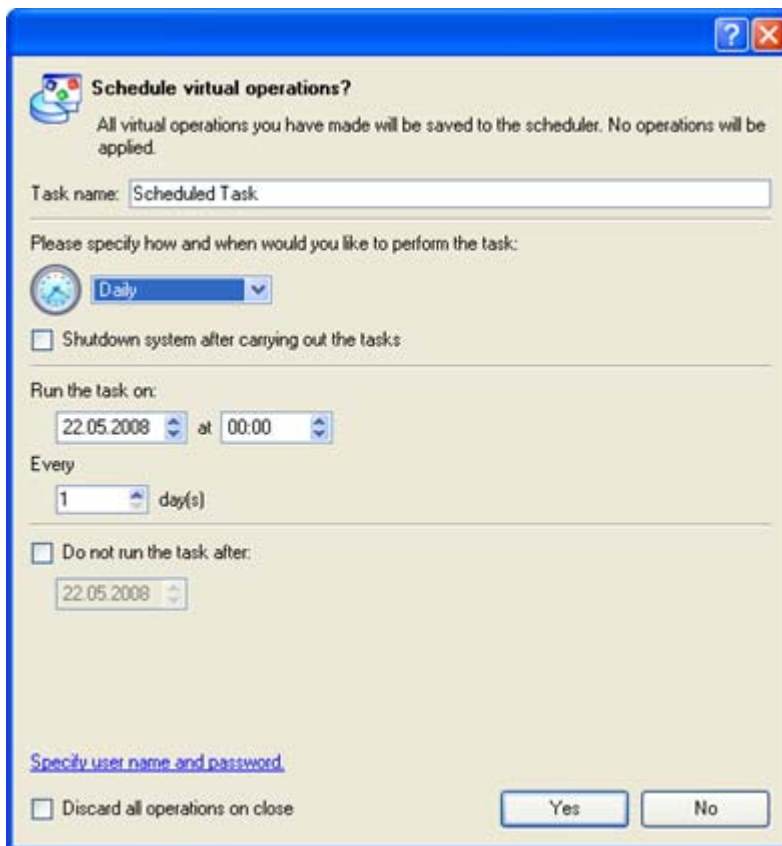
4. In the opened dialog enter the required task name and specify the task timetable;

5. The operation will be performed immediately after confirmation.

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

SCRIPTING

The program actions can also be represented in form of a script where all operations are described with macro-language commands. SCRIPTS.exe, an interpreter utility included in the program installation package, enables to carry operations automatically in the unattended mode.

STARTUP

You have no need to write a script since the program has a convenient interface for such a task. To generate a script on the required set of operations you should take the following steps:

Launcher

1. Make sure the virtual mode of execution is enabled;

2. Carry out with the program all operations you need to be scripted;

3. Call the Generate Script dialog in the Main Menu: **Changes > Generate Script…**.

SETUP

Initially the program suggests some consistent values for all parameters. In most cases, you can just press the Generate button to confirm the operation.
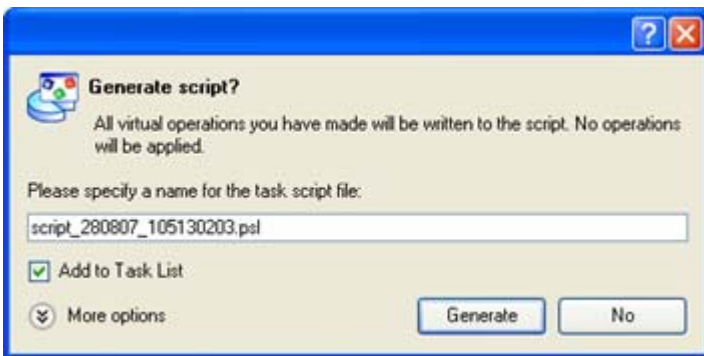
❑   **Script file name and location**. By default, the program offers to add the script to the Task List with a name containing its creation date and time. Unmark the Add to Task List checkbox to define an exact location and a filename for the script file. The default file extension that is reserved for scripting files is .psl, which however can be modified.

In addition, there is the possibility to make further detailed settings (although the default values will do in most cases). To activate the advance mode, you need to click the More options button at the foot of the dialog page, so you will be able to define:
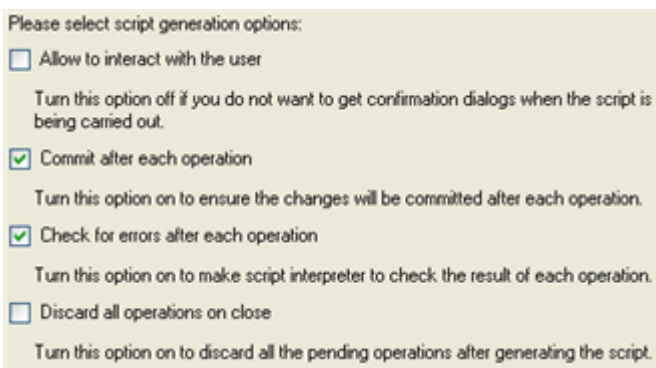
❑   **Interaction with the user**. Mark the option to pause the script interpreter during the execution to prompt the user's confirmation or other input. Otherwise the program will not stop using default values for parameters if needed.

❑ **Commit after each operation**. Mark the option to commit changes after each operation.

❑ **Check for errors after each operation**. Mark the option to insert a special code in script, which checks the status of the last executed operation and stops the script processing if there are errors of any kind.

❑ **Discard all operations on close**. Mark the option to empty the List of Pending Operations after generating the script.

RESULT

After the operation is completed you receive a new script file. It is placed into the specified destination, its features defined in the dialog.

Please note that in the current version of the program you cannot use scripts generated under Windows with custom WinPE 2.1 or Linux based bootable images. Please use the embedded script generator of these platforms instead.

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

To learn more about scripts please consult the Paragon Scripting Language manual which you can find in the Common Tasks Bar.

RESTORING TO DIFFERENT HARDWARE

Adaptive Restore is a special technology that enables to successfully recover Windows 2000/XP/Server 2003 as well as Windows Vista/Server 2008 to a different hardware configuration. As you probably know, Windows family operating systems are pretty much sensible to any hardware replacement, especially when you need to replace your motherboard - actually Windows will most likely fail to boot as a result of this operation.

With our technology you can now make your Windows bootable on some other computer or even a virtual machine. You can either use a previously made backup of your system to restore to a different hardware configuration or just fix your Windows installation with the Linux/DOS recovery environment (you can find the appropriate options in the main program or Boot Corrector). Anyway by activating one additional option, the program will automatically detect what kind of Windows it's dealing with as work algorithms for Windows 2000/XP/Server 2003 and Windows Vista/Server 2008 differ.

ADAPTIVE RESTORE FOR WINDOWS 2000/XP/SERVER 2003

It actually implies two operations:

❑ **Providing the ability to change the Windows kernel settings** to the most suitable for your new configuration. The program will automatically add all available Windows HAL and kernels to the boot menu (the boot.ini file) to choose the required platform in case your system fails to boot (Uniprocessor, Multiprocessor, or Old legacy PC without ACPI). You can later remove them from the menu either under Windows or with Boot Corrector.

> ⚠️ **If you've got a 64-bit operating system, no options will be added to the boot menu.**

❑ **Automatic replacement of the boot critical drivers** (HDD controller, PS/2 and USB mouse and keyboard) to the default Windows drivers to provide the maximum level of compatibility. Once your Windows starts up, it will initiate reconfiguration of all Plug'n'Play devices, so we do recommend you to provide the latest drivers for your motherboard and processor at this step, as it can considerably improve the overall performance of your system.

> ⚠️ **The current version of the program does not enable to add any 3rd party driver during the operation, which may lead to boot problems (relevant for SCSI and Serial ATA controllers mostly). In some cases however you can tackle the problem by switching the required device to the standard ATA compatible mode in BIOS (e.g. the Intel ICH8 controller can be set in the IDE mode, not AHCI). Moreover if you're going to upgrade your motherboard to one of the same manufacturer, just update the driver before the operation to guarantee successful startup of your system later.**

ADAPTIVE RESTORE FOR WINDOWS VISTA/SERVER 2008

It is based on the fact that these operating systems do not delete their distributive driver repositories after the setup, but simply make them inactive in the Windows Registry. So thanks to our technology these driver repositories can be made available during the restore procedure to let Windows Vista or 2008 Server automatically find and install any lacking driver with no action from your side required, what is very convenient.

However you might face a situation when no driver has been found in the driver repository. So in this case you will have to provide an exact location of the required drivers or insert the Windows distributive CD/DVD, besides it is expected extra system restarts. Anyway your system will most likely be operable once again.

ADAPTIVE RESTORE APPLICATION

Let's consider a number of situations when the Adaptive Restore feature can help you out:

❑ If you need to upgrade to newer hardware while keeping all your programs and settings intact;

❑ If you need to replace failed hardware and cannot find an exact match for your original system specifications;

❑ If you need to do a system testing to deploy a system backup image to a virtual machine or vice versa.

> ⚠️ **This feature is only available for custom WinPE 2.1 and Linux based bootable images as well as for the WinPE recovery environment.**

NETWORK MODULE

INSTALLATION PECULIARITIES

Unlike the previous one, this module will be installed independently in the system. You've got the option to install its components either on the same computer or separately on different computers. Despite the fact that the installation procedure is quite easy to follow, let's take a closer look at the PXE Server component as depending on your LAN configuration the work algorithms of its setup differ:

❑ Click the Yes button if you've got no DHCP server to make the program install both DHCP and TFTP servers. To work properly you will also need to define several DHCP parameters.

❑ Click the No button if you've got an active DHCP server to make the program only install a TFTP server and then configure an existing DHCP server to work with it.

Please make sure there's only one DHCP server in the LAN.

CONFIGURING PARAGON PXE SERVER

With Paragon PXE Server you can remotely boot a PXE compatible computer with no operating system installed. This procedure implies that a networked client PC is able to enter a network, acquire a network address from a DHCP server and subsequently, download from a TFTP server a NBP (Network Bootstrap Program) to set itself up, thus saving from the need of bootable media.

PXE Server works as a service in the system. To make the process of its configuration and management easy and understandable there's a convenient dialog. To start it up you need to launch it from the application's program group of the Start Menu. By default, it will be:
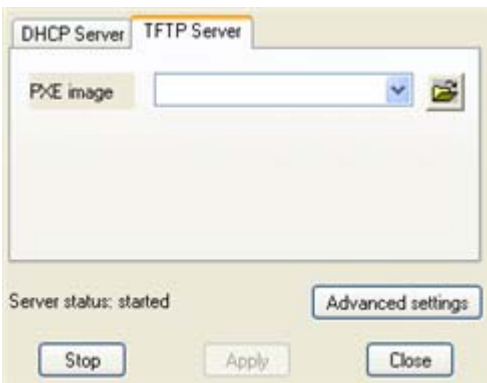
Start > Programs > Paragon Network Module > PXE Server Settings

Depending on whether you decided to use the Paragon's DHCP server or not (defined during the installation) the dialog enables to set the following parameters:

DHCP + TFTP

- ❑ Start IP address;

- ❑ Number of available IP addresses;

- ❑ Subnet Mask.

- ❑ A PXE image used to remotely boot client computers (created either with Boot Media Builder or with the WinPE customization package).

You can start/stop Paragon PXE Server by clicking the appropriate button. Please note that if you click the Apply button when the service is active, it will lead to its restart with new parameters (if any).

By clicking the Advanced Settings button you can modify a number of additional parameters of TFTP as well as see some operation statistics.

TFTP ALONE

In this case only parameters of TFTP will be available:
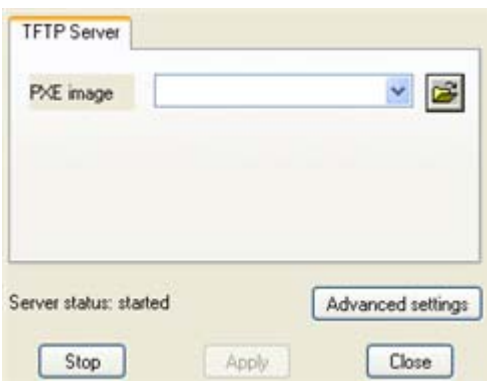
> ⚠️ **Client computers must be PXE compatible in order to use PXE Server.**
>
> **To know more on the subject, please consult the <u>Glossary</u>.**

CONFIGURING MICROSOFT DHCP SERVER

As an example let's study how to configure the DHCP server of Microsoft Windows Server 2003 to work with Paragon PXE Server:

1. Run the DHCP management console. There are several ways to do that:

   ❏ Select **Start > Run…**, then execute the "DHCPMGMT.MSC /S" command;

   ❏ **Start > Settings > Control Panel > Administrative tools > DHCP**.
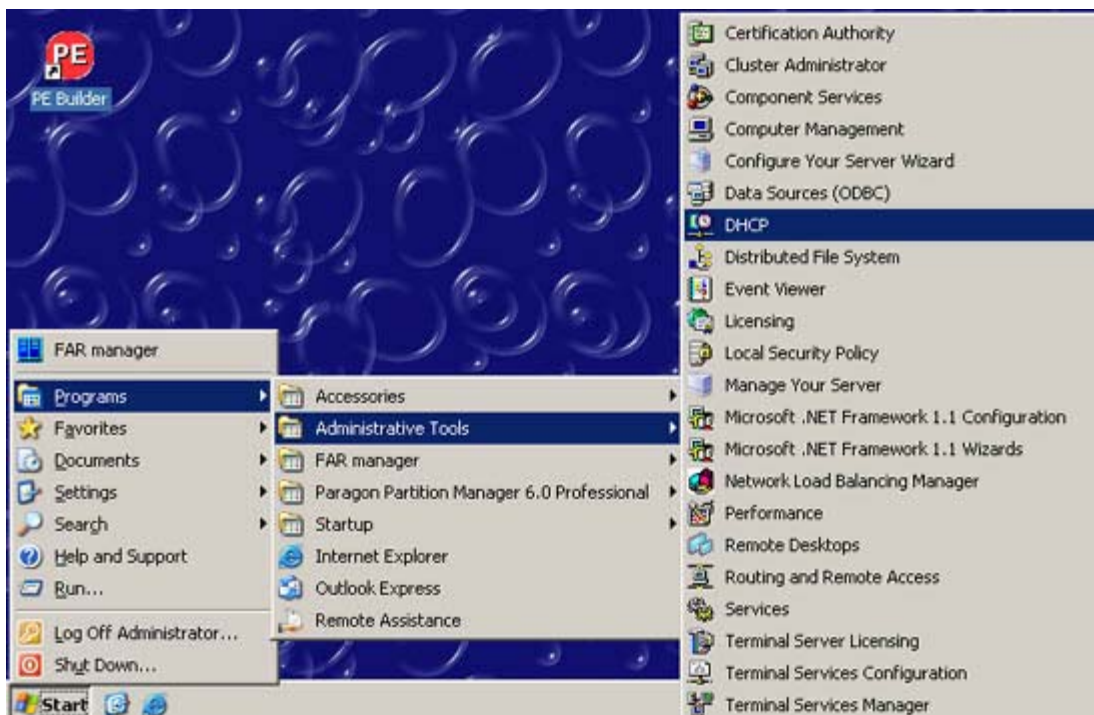
The DHCP management console will be launched.
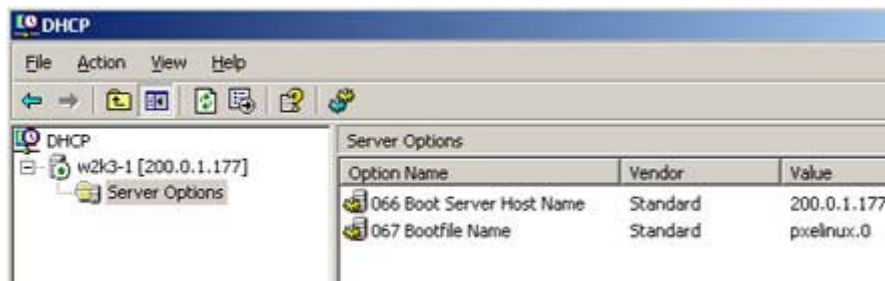
2. Set up your DHCP server correctly. Windows Server 2003 provides a bunch of services and settings for the DHCP service. You are to set up the global settings of the DHCP server.

There are two DHCP options that need customization that is **Option 066 - Boot Server Host Name** and **Option 067 - Bootfile Name**.

❑ Select the **Server Options** item in the DHCP management console and click the **Server Options** item;

❑ In the **Server Options** dialog, click the **Advanced** tab;

❑ Select the **DHCP Standard Options** vendor class;

❑ Select the **Default BOOTP Class** user class;

❑ Find the **Option 066** named **Boot Server Host Name:**
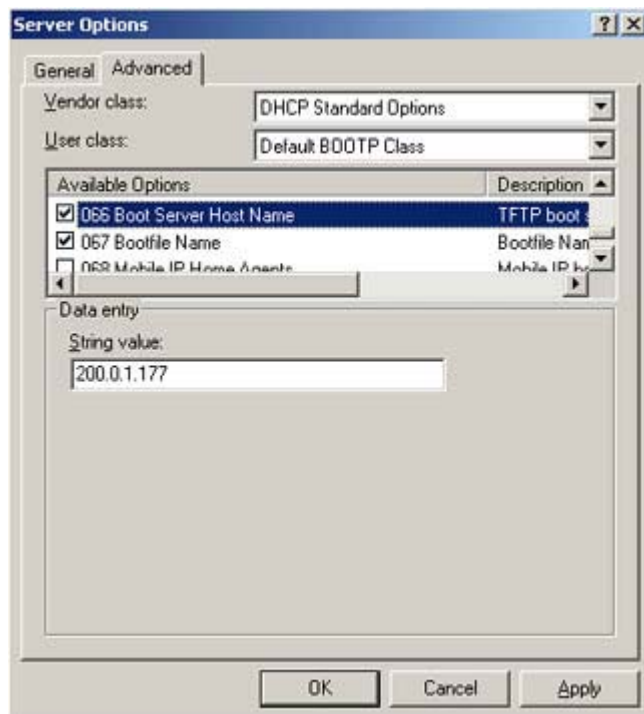
- Mark the **Option 066**;

- Enter an IP address or a network name of a <u>TFTP server</u> that is used for dispatching PXE bootable images.

⚠ **In case both TFTP and DHCP servers run on the same computer, enter the computer network name or its IP address as it seen from the other computer of your LAN.**

Do not use a Localhost alias or its IP equivalent 127.0.0.1.

❑ Find the **Option 067** named **Bootfile Name**:

- Mark the **Option 067**;
- Specify a relative path to a bootable image and its file name to boot remote computers from.

⚠ **The specified path should exist and be configured on the TFTP server.**

BUILDING LINUX BASED MEDIA

With Boot Media Builder you can prepare a Linux based bootable image containing the main product where it's possible to configure the network and mount network shares, set for execution a program script as well as add any required files. This image then can be recorded to a CD/DVD/Blu-ray to make client machines boot directly or remotely through the PXE capabilities to carry out operations completely in the unattended mode.

STARTUP

To start Boot Media Builder you need to launch it from the application's program group of the Start Menu. By default, it will be:

Start > Programs > Paragon Network Module > Boot Media Builder

SETUP

The wizard offers the following steps to build bootable media:

❑ **Boot Media Configuration**. The wizard enables to create a new boot media configuration, besides it is possible to modify an existing configuration (you can see all the previously set parameters to make the necessary modifications) or use some custom CD/DVD image.

❑ **Boot Media Menu Customization**. You can define the menu contents and some more additional parameters that will be taken into account during the boot media startup:


By marking/unmarking a checkbox opposite the required item of the menu you can choose whether that particular component will be available or not.

Shadowed items of the menu are not allowed to customize.

You've also got the option to make a dual platform bootable media (Linux and DOS) by providing a path to the required DOS image.

Besides it is possible to create a new item just by pressing the Add button in the right corner of the dialog:
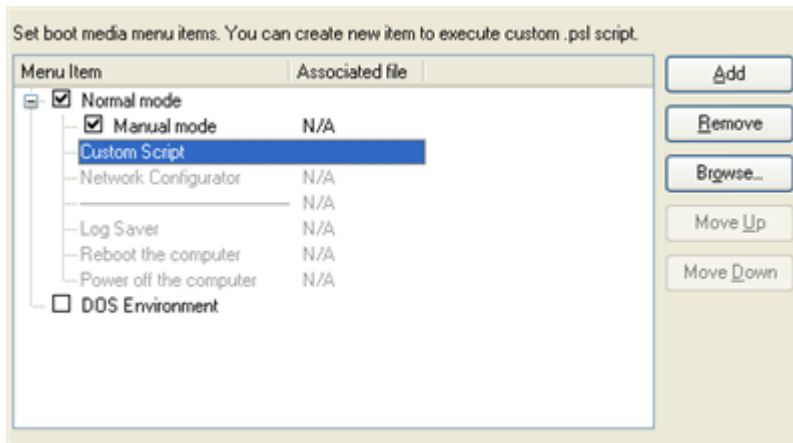
This feature can be of great use since it enables to set for execution a program script or any other program. Once it's been created you need to select a program script or a program to execute by clicking the Browse button to find the required object:
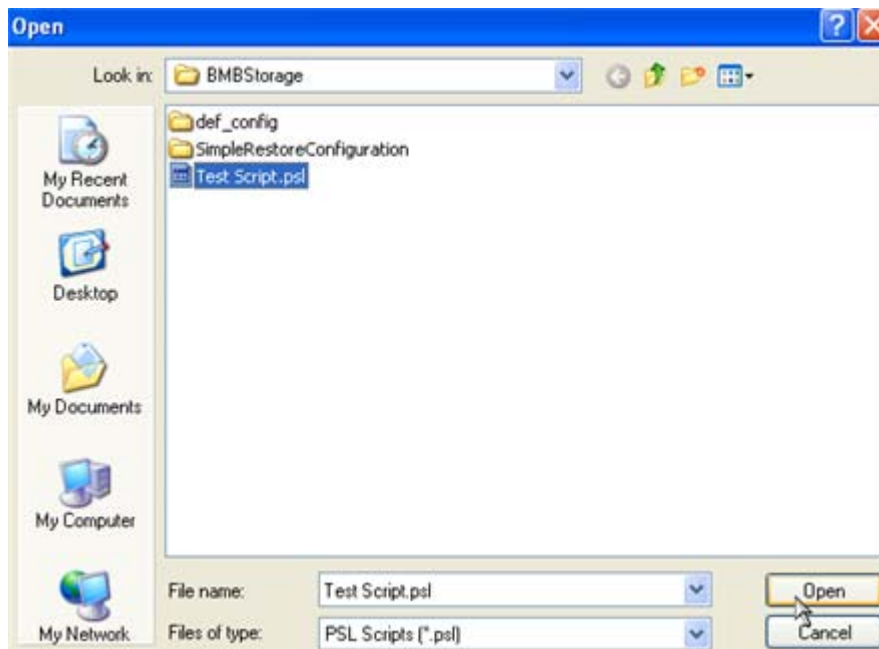
You can set the newly created item active/inactive, define its position in the menu or remove it by pressing the appropriate buttons.

Moreover you can choose what component of the menu will be automatically selected on the expiry of a certain time limit.

Please note that in the current version of the program you cannot use scripts generated under Windows with a custom WinPE 2.1 or Linux based bootable image. Please use the embedded script generator of these platforms instead.

❑ **Linux Network Properties**. You can choose the way how to connect to the network:

- Automatically after booting. If you don't want to configure the network every time the client computer has been started up, this option is what you need. To make it work you're to set the following parameters:

o **Network adapter to use** to select an order number of the required network adapter;

o **IP address settings** to choose whether to get an IP address automatically from a [DHCP Server](#) or set it manually, thus bypassing the DHCP Server capabilities.

- **Manually after booting**. Select the option to manually connect to the network after the client computer has been started up.

- **No network support**. Select the option if you don't need network resources at all.

❑ **Network Mount Options** (if you've decided to use network resources). You can mount a backup storage after booting. Choose whether to mount it automatically (enables to set authentication parameters) or manually after the client computer has been started up.


❑ **Label** and **Extra Files**. You can set a label (Paragon by default) and also add files to the root of the bootable media just by pressing the appropriate buttons. The resulted list of files can be saved for further use.
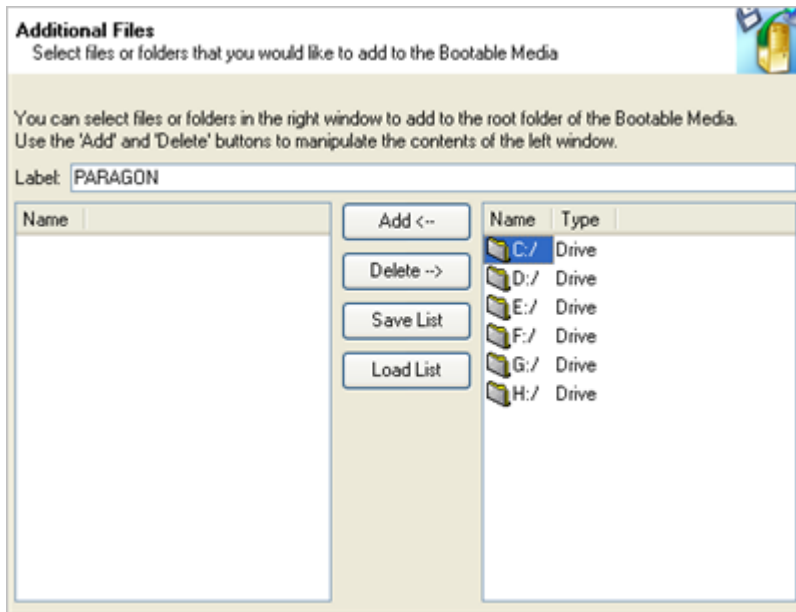
❑ **Save Boot Media Configuration**. By default, the wizard offers to save the current boot media configuration to avoid double work next time you're going to create new media.
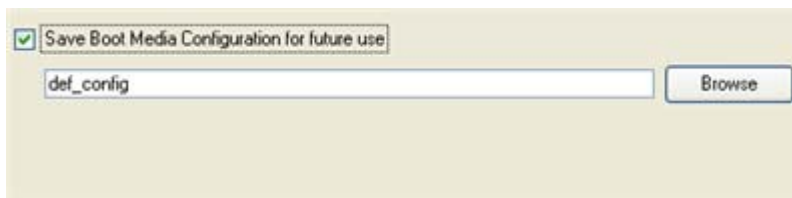
❑ **Target Drive**. You can choose whether to burn the resulted bootable image to a CD/DVD/Blu-ray disc right now or just save it in form of an ISO file. Besides you can make a PXE Server **.gz** image out of it.
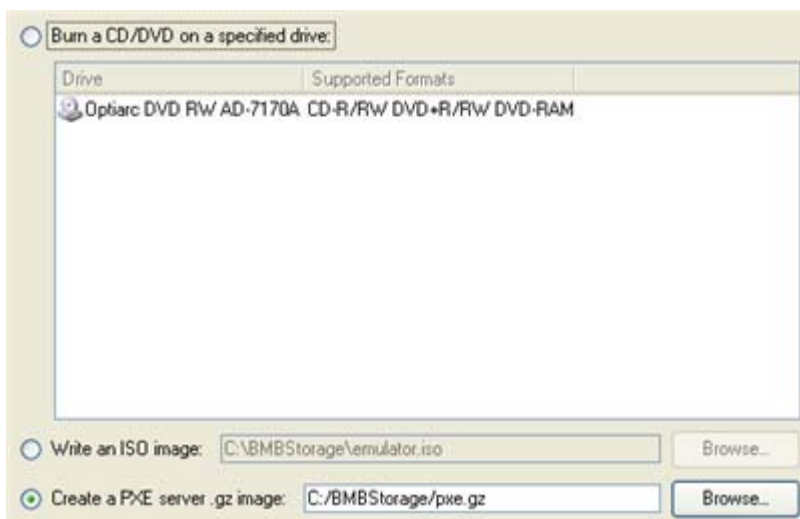
❑ **CD/DVD writing parameters** (if this kind of media has been selected). Writing parameters include writing speed (maximum or minimum) and the ability of ejecting the recorded disc after completing the operation.

> ⚠️ **If the inserted disc is not empty, the wizard will suggest erasing its contents (if possible). Once the operation has been confirmed, the program will delete the re-writable disc's contents and begin the recording process.**

RESULT

As a result, you receive the required bootable media.

BOOTING FROM LINUX BASED MEDIA

After a client computer has been booted either from CD/DVD or through the PXE capabilities, you can see a convenient startup menu with the list of available operations on the left and a short description of the selected item on the right:
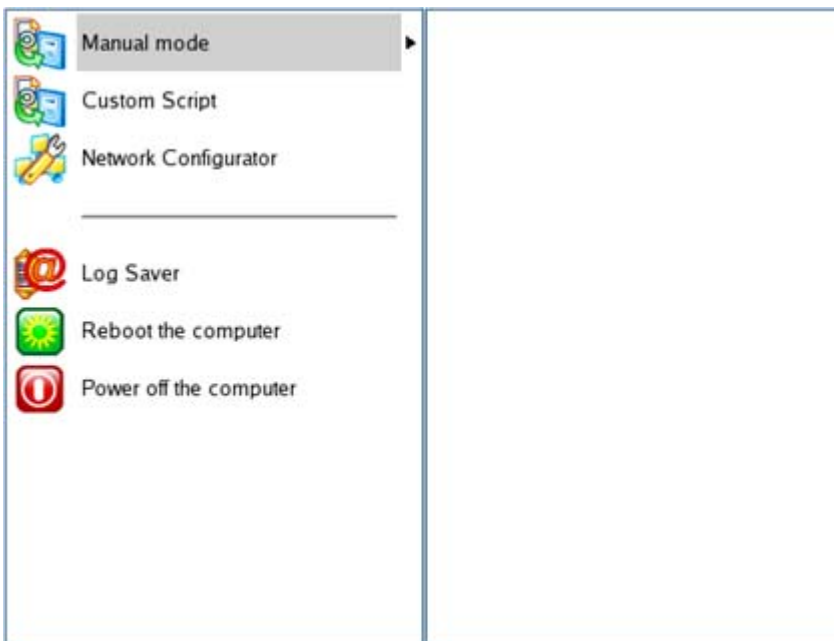
❑ **Manual Mode** to launch the main product and carry out backup/restore, copy or partitioning operations, create a program script, etc.;

> ⚠️ **To know more on the subject, please consult documentation that comes with the product.**

❑ **Network Configurator** to establish a network connection under Linux;

❑ **Log Saver** to collect and send the necessary log files to the Technical Support;

❑ **Reboot the computer**;

❑ **Power off the computer**.

> **Drive letters are assigned 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.**
>
> **The startup menu contents as well as the operation initiated by default <u>can be customized according to your needs</u>.**

WINPE CUSTOMIZATION PACKAGE

The customization package to prepare WinPE 2.1 based images comes as a self-extracting archive containing a directory with the default product components to place to the resulted image, several customization scripts, and the user documentation.

However you need Microsoft Windows Installation Kit (WAIK) or OEM Preinstallation Kit (OPK) installed on your computer to build this kind of images, as due to the license stipulations, Paragon has no rights to distribute Microsoft software.

> **To know more on the subject, please consult documentation that comes with the package.**

GLOSSARY

PXE (Preboot Execution Environment)

The advent of the Preboot Execution Environment PXE) has provided Altiris with the mechanism to rationalise the cost of installing a new operating system down to an acceptable level. It has enabled the use of Rapid Deploy (a component part of the Altiris eXpress Server which is used to remotely deploy images) over the network by allowing a computer, which has no working operating system to remotely boot from the network without any manual intervention at the machine by an engineer or user.

In short, by employing the abilities referred to above, a client PC should be able to enter a network, acquire a network address from a <u>DHCP server</u> and subsequently download a NBP (Network Bootstrap Program) to set itself up.

Wake-up on LAN

Wake-up on LAN is a technology that enables a network administrator to remotely power on a computer or to wake it up from the sleep mode, thus saving from the need to physically visit each computer on the network. Wake-up on LAN works by sending a wake-up frame or packet to a client machine from a server machine that has remote network management software installed. The Wake-up on LAN network adapter installed in the client receives the wake-up frame and turns on. The scheduled tasks then begin.

> **To use Wake-up on LAN you need a network adapter, motherboard, and remote management software compatible with that technology.**

ISO File

An ISO file contains the complete image of a CD/DVD disc in the ISO 9660 file system. That means that besides data files it includes all the file system metadata (bootstrap code and attributes). These properties make it an attractive alternative to physical media for the distribution of software over the Internet.

DHCP Server

DHCP (Dynamic Host Configuration Protocol) is a protocol for assigning dynamic IP addresses to devices on a network. With dynamic addressing, a device can have a different IP address every time it connects to the network. In some systems, the device's IP address can even change while it is still connected. DHCP also supports a mix of static and dynamic IP addresses.

TFTP Server

TFTP (Trivial File Transfer Protocol) is a simple form of the FTP (File Transfer Protocol). TFTP uses the User Datagram Protocol (UDP) and provides no security features. It is often used by servers to boot diskless workstations, X-terminals and routers.