

Windows PE 2005 Boot Image Creator

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February 2009, first version

April 2009, version 1.1, minor modifications

Introduction

Overview

Windows PE 2005 Boot Image Creator is a Windows GUI program that assists in creating Windows PE 2005 Boot Images that can be used with the bootix BootManage Administrator.

It is possible to create both 32-Bit x86 and 64-Bit amd64 Windows PE 2005 Boot Images.

Windows PE 2005 Boot Image Creator performs the following tasks:

- Generate Windows PE 2005 Boot Images from the pristine sources
- Integrate the bootix BMDRV device driver
- Integrate a Ramdisk that provides temporary writeable storage for WinPE 2005
- Integrate the bootix utilities
- Integrate the BootManage Administrator scripts
- Control image build options (PNP, WMI, NOWF)
- Integrate optional components (ADO, HTA, WSH)
- Add third-party network drivers
- Add third-party mass storage drivers
- Adjust Windows PE 2005 startup command file

Prerequisites

You will need a Windows machine that acts as the technician computer, i.e. the computer that is used to run the Windows PE 2005 Boot Image Creator application.

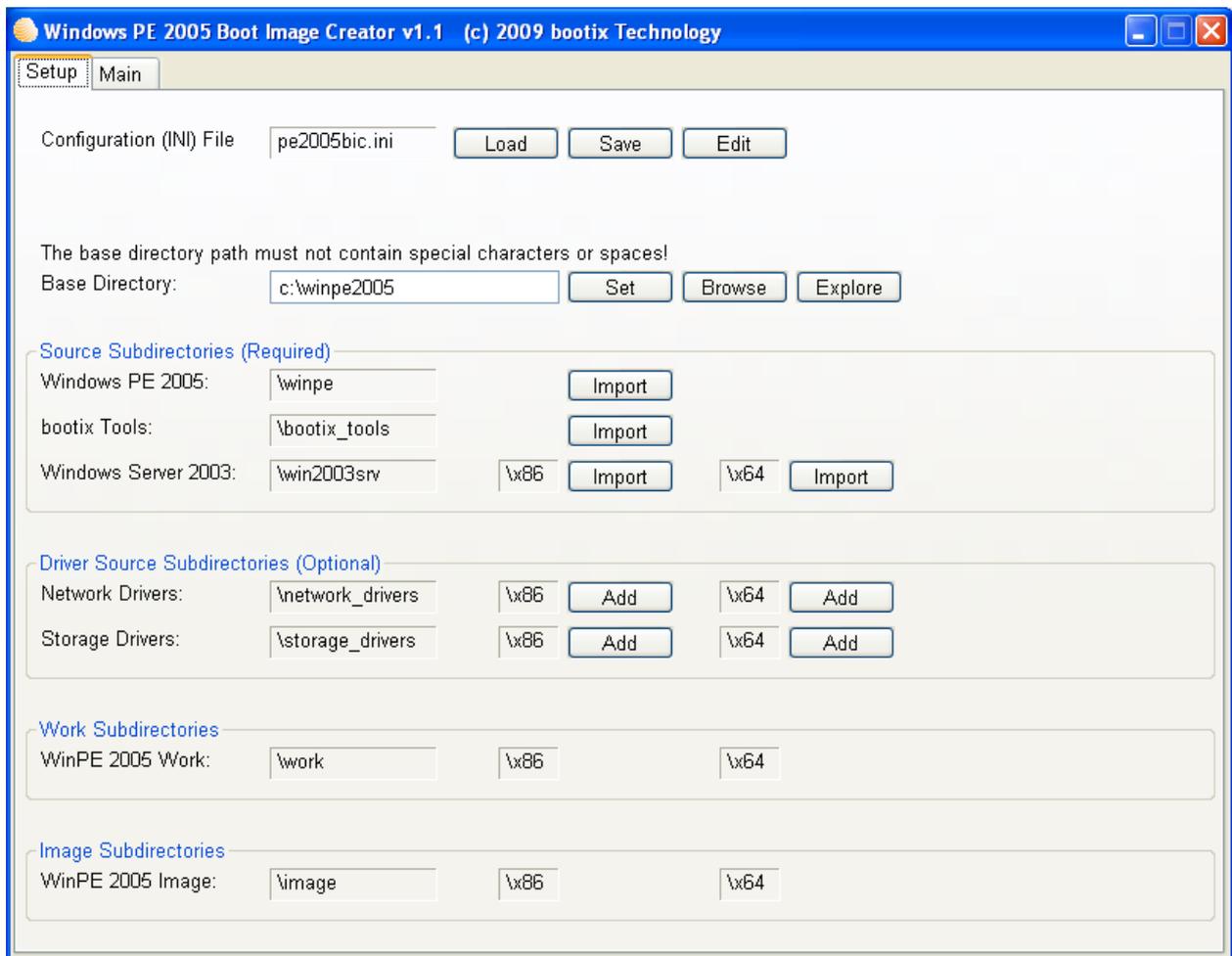
Also, a Windows PE 2005 product CD is required.

In order to create 32-Bit x86 Windows PE 2005 Boot Images, a “Windows Server 2003 with integrated Service Pack 1” product CD is required.

In order to create 64-Bit amd64 Windows PE 2005 Boot Images, a “Windows Server 2003 x64 Edition” product CD is required.

Installation

Windows PE 2005 Boot Image Creator does not need to be installed. Instead, simply copy the file *pe2005bic.exe* to your technician machine. When the program is executed, the following tabbed dialog appears:

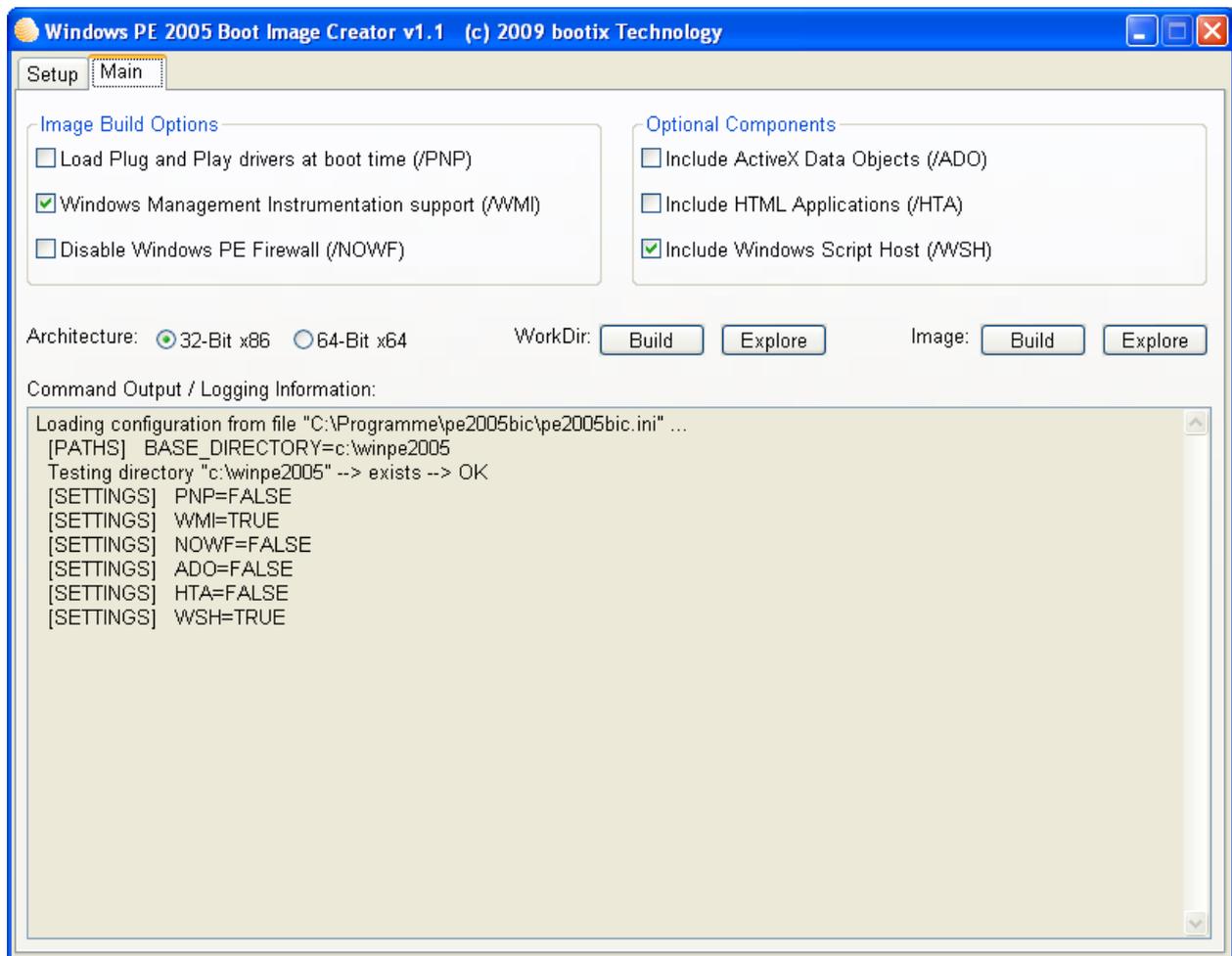


The “Setup” tab provides buttons to

- load, save, and edit the configuration file *pe2005bic.ini*
- set, browse and explore the base directory
- import the mandatory source files (WinPE files, OS files, bootix Tools)
- add the optional network and mass storage driver files

Note that (with the exception of the base directory) the names of all directories cannot be changed, and are only displayed for informational purposes.

Clicking the “Main” tab displays the following dialog:



The “Main” tab provides controls to:

- specify image build options
- select optional components
- specify the image architecture
- build and explore the work directory
- build and explore the image directory

The “Command Output / Logging Information” window provides detailed information about the background activities that Windows PE 2005 Boot Image Creator performs.

While the “Setup” tab is only used to populate the build directory structure, the “Main” tab is used to actually build Windows PE 2005 work and image directories.

The Configuration File

Windows PE 2005 Boot Image Creator uses a configuration file to store its configuration. This file is named *pe2005bic.ini* and located in the same directory as the program file.

If this configuration file is detected at program startup, the configuration information is automatically read from this file and applied to the program. Otherwise, program-internal default values are used instead.

Use the “Load” button to load the configuration setting from the file.

Use the “Save” button to save the current configuration settings to the file.

Use the “Edit” button to open the configuration file in a text editor.

The contents of a sample configuration file looks as follows:

```
[PATHS]
BASE_DIRECTORY=C:\winpe2005
[SETTINGS]
PNP=FALSE
WMI=TRUE
NOWF=FALSE
ADO=FALSE
HTA=FALSE
WSH=TRUE
```

The Base Directory

Windows PE 2005 Boot Images must be created in two steps:

First, a work directory is built from the Windows PE 2005 sources and either the “Windows Server 2003 with integrated Service Pack 1” sources (for 32-Bit x86 WinPE images) or the “Windows Server 2003 x64 Edition” sources (for 64-Bit amd64 WinPE images).

Second, the actual Windows PE 2005 ISO image is generated from the contents of the work directory.

Base Directory Structure

The base directory contains all source files that are needed to build a Windows PE 2005 work directory and image. The structure of the base directory is as follows:

```
<base_directory>\

winpe\                (Windows PE 2005 files)
win2003srv\           (Windows Server 2003 files)
bootix_tools\         (bootix drivers, utilities, and scripts)

network_drivers\     (third-party network drivers)
storage_drivers\     (third-party storage drivers)

work\                 (WinPE 2005 work directory)
image\               (WinPE 2005 image directory)
```

Most of these directories have subdirectories named x86 and x64 that hold the files for the corresponding architecture.

The first group of directories (winpe, win2003srv, and bootix_tools) hold the mandatory source files from which the Windows PE 2005 images are built. So, before the first Windows PE 2005 image can be built, these directories must first be populated. The Windows PE 2005 Boot Image Creator assists in populating these directories.

Import Windows PE 2005 Files

Insert a “Windows PE 2005” CD and click the corresponding “Import” button. In the folder select box that opens, navigate to the “winpe” folder on the “Windows PE 2005” CD.

After clicking “OK”, the required Windows PE 2005 files are copied from the CD to the “winpe” subdirectory in the base directory structure.

Import Windows Server 2003 Files

The Windows Server 2003 files are architecture dependent.

For building 32-Bit x86 Windows PE 2005 images, a “Windows Server 2003 with integrated Service Pack 1” CD is required. Insert this CD and click the “Import” button next to “\x86”. In the folder select box that opens, navigate to the CD’s root directory.

For building 64-Bit x64 Windows PE 2005 images, a “Windows Server 2003 X64 Edition” CD is required. Insert this CD and click the “Import” button next to “\x64”. In the folder select box that opens, navigate to the CD’s root directory.

After clicking “OK”, the required Windows Server 2003 files are copied from the CD to the “win2003srv\x86” respectively the “win2003srv\x64” subdirectory in the base directory structure.

Import bootix Tools, Utilities and Scripts

BootManage Administrator 7.4

Insert the “BootManage Administrator 7.4” CD and click the “Import” button next to “\bootix Tools”. In the folder select box that opens, navigate to the “pe2005tools” folder on the “BootManage Administrator 7.4” CD.



Note that, at the time of this writing, BootManage Administrator 7.4 is not yet released.

After clicking “OK”, the required bootix tools, utilities and scripts are copied from the CD to the *bootix_tools* subdirectory in the base directory structure.

BootManage Administrator 7.3

The “BootManage Administrator 7.3” CD does not contain a “pe2005tools” folder. Instead, you will want to use the bootix tools that come with the Windows PE 2005 Boot Image Creator distribution package.

Click the “Import” button next to “\bootix Tools”. In the folder select box that opens, navigate to the folder that contains the downloaded and extracted bootix Tools files.

After clicking “OK”, the required bootix tools, utilities and scripts are copied from this folder to the *bootix_tools* subdirectory in the base directory structure.

Add Windows PE 2005 Network Drivers

Adding network drivers to Windows PE 2005 is optional and only necessary if the target hardware requires special drivers that are not included in the standard distribution.

Since network drivers are architecture specific, different drivers are required for x86 and x64 architectures.

To add a network driver, click the “Add” button next to “\x86” or “\x64” depending on the driver’s architecture, and then navigate to directory that contains the driver’s files (*.inf, *.sys, *.cat, etc.), and click “OK”

In the text box that opens next, type a short name for the driver, using only alphanumeric characters. This will be used as the driver’s subdirectory name within the base directory, i.e. the driver files will be stored in <base_directory>\network_drivers\x86*<driver_name>* for 32-Bit x86 drivers, and <base_directory>\network_drivers\x64*<driver_name>* for 64-Bit x64 drivers.

Add Windows PE 2005 Storage Drivers

Adding storage drivers to Windows PE 2005 is optional and only necessary if the target hardware requires special drivers that are not included in the standard distribution.

Since storage drivers are architecture specific, different drivers are required for x86 and x64 architectures.

To add a storage driver, click the “Add” button next to “\x86” or “\x64” depending on the driver’s architecture, and then navigate to directory that contains the driver’s files (*txtsetup.oem*, *.inf, *.sys, *.cat, etc.), and click “OK”

In the text box that opens next, type a short name for the driver, using only alphanumeric characters. This will be used as the driver’s subdirectory name within the base directory, i.e. the driver files will be stored in <base_directory>\storage_drivers\x86*<driver_name>* for 32-Bit x86 drivers, and <base_directory>\storage_drivers\x64*<driver_name>* for 64-Bit x64 drivers.

Building WinPE 2005

Image Build Options

The image build options control the image build process, and represent the command-line options that are passed to the *mkimg.cmd* script. Currently, three build options are available:

- Load Plug and Play drivers at boot time (/PNP)
- Windows Management Instrumentation support (/WMI)
- Disable Windows PE Firewall (/NOWF)

Note that Windows PE 2005 boot images for the BootManage Administrator must have WMI support enabled. It is recommended not to change these settings unless absolutely necessary.

Optional Components

Optional components provide additional functionality in Windows PE, and represent the commandline options that are passed to the *buildoptionalcomponents.vbs* script. Currently, three optional components are available:

- Include ActiveX Data Objects (/ADO)
- Include HTML Applications (/HTA)
- Include Windows Script Host (/WSH)

Note that Windows PE 2005 boot images for the BootManage Administrator must have the WSH components included. It is recommended not to change these settings unless absolutely necessary.

Select Image Architecture

When building a Windows PE 2005 work (or image) directory, the architecture needs to be specified. The following architectures are supported:

- 32-Bit x86
- 64-Bit x64

Since the architecture dependent files are kept separate in the build directory structure, one can build work and image directories for both architectures, one after the other, as follows:

Build Work Directory

Make sure that all mandatory source directories are populated, and that (if necessary) third-party network and storage drivers have been added. Check image build options and optional components, and select the desired architecture. Then, click the “Build” button next to “Workdir”.

Building a Windows PE 2005 work directory is a multiple-step process that includes:

- executing the `mkimg.cmd` command
- integrating the bootix drivers, utilities and scripts
- integrating optional components (ADO, HTA, WSH)
- adding third-party network and storage drivers
- adjusting the Windows PE 2005 startup command file

After clicking the “Build” button, several command windows appear to perform these tasks. This process is completely automated, but takes some time to complete. Logging and status information is written to the “Command output / Logging information” window.

As the result of this process, a Windows PE 2005 work directory structure is created in `<base_directory>\work\x86` respectively `<base_directory>\work\x64`.

Customize Work Directory

The just-created work directory can be directly used to build a Windows PE 2005 image, but it may also be further customized before the image is built from it.

Note that Windows PE 2005 Boot Image Creator already implements some common customization tasks “under the hood”. It is perfectly possible to further customize the work directory, but this is outside the control of the Windows PE 2005 Boot Image Creator.

Also, note that Windows PE 2005 Boot Image Creator always creates the work directory from scratch whenever the “Build” button is clicked, so all manually performed customizations of the work directory are lost.

Build Image Directory

Once a work directory was built, it can be used to create an actual Windows PE 2005 ISO image. This is what the “Build” button next to “Image” does. Along with the bootable ISO image, some additional files are placed in the in `<base_directory>\image\x86` respectively `<base_directory>\image\x64` directory. These files are required when booting the Windows PE 2005 ISO image over the network, and they will be needed when importing the WinPE 2005 boot image into the BootManage Administrator:

NTLDR

ntdetect.com

winnt.sif

WINPE2005_x86.ISO (for 32-Bit x86 WinPE 2005 versions)

WINPE2005_x64.ISO (for 64-Bit x64 WinPE 2005 versions)

BMA WinPE 2005 Image Import

Windows PE 2005 Boot Image Creator was designed to allow easy creation of Windows PE 2005 boot images that are suited to be used in the context of the BootManage Administrator.

Importing WinPE 2005 Boot Images in BMA 7.4

BootManage Administrator 7.4 provides an import wizard for boot images that allows to import and manage multiple types of boot images.



Note that, at the time of this writing, BootManage Administrator 7.4 is not yet released.

Start the BootManage Administrator and select the “Boot Image Management” dialog.

There, you can define and import Windows PE 2005 Boot Images. When the import wizard asks you to specify the actual Windows PE 2005 boot image, select the just-created image in the `<base_directory>\image\x86` respectively `<base_directory>\image\x64` directory.

Importing WinPE 2005 Boot Images in BMA 7.3

BootManage Administrator 7.3 does not provide an import wizard for Windows PE 2005 boot images, so that you must copy the contents of the image directory to the TFTP server as described in the BootManage Administrator 7.3 documentation.