



Windows 7 RC Image Deployment

Step-By-Step Guide

This document provides instructions for implementing a basic image-based deployment of Microsoft® Windows 7 RC0 operating system. We recommend that you first use the steps provided in this guide in a test lab environment as a means to become familiar with new and updated deployment features and technologies available in Windows 7.

Migrating an Operating System is a major project that requires careful planning and guidance. To ease the process, Microsoft has provided a number of tools for automating Windows 7 deployments including the Windows Automated Installation Kit (WAIK).

There are many guides available on the internet, but we felt they all miss some steps. Therefore we decided to **share our internal documentation**.

The process for our deployment scenario includes:

- **Prepare an USB stick** with “Windows PE Boot Disk”
- Prepare a **master installation**
- Capture an **install image**
- Manually **deploy an image** on a single machine (ImageX)

This document does not cover automated deployment of images on multiple computers using tools as ADS.

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1. Introduction

1.1. Windows PE

Windows Preinstallation Environment (WinPE) is a lightweight version of Windows XP, Vista Windows Server 2008 or Windows 7 that is used for the deployment of workstations and servers. It is intended as a 32-bit or 64-bit replacement for MS-DOS during the installation phase of Windows, and can be booted via PXE, CD-ROM, USB flash drive or hard disk. Traditionally used by large corporations and OEMs (to preinstall Windows client operating systems to PCs during manufacturing), it is now widely available free of charge via the Windows Automated Installation Kit (WAIK). The Windows Automated Installation Kit helps you to install, customize, and deploy the Microsoft Windows 7™ family of operating systems.

1.2. Sysprep

Sysprep is the name of Microsoft's System Preparation Utility for Microsoft Windows operating system deployment. It has been used for years, but this tool has changed significantly for Windows Vista. In previous versions of Windows (Windows XP and 2000), Sysprep was made available in the Windows OPK, Windows CD Deploy.cab file, or, in the latest service pack. With Windows 7 and Vista there is no longer a Deploy.cab file on the CD and no longer Setup Manager for creating answers files because Vista uses a new set of deployment tools (It's all available in the OS itself). Sysprep can be used to prepare an operating system for disk cloning and restoration via a disk image. If you don't use sysprep before you clone an OS you shall have problems with the unique SID (Security Identifier).

1.3. OS Licensing

It's very important to choose the right OS license (OEM, Volume License, MSDN, Action Pack,...) if you want to prepare an operating system for disk cloning. Once you made an image of an OEM OS, you can use only OEM keys to activate the OS!

2. Create winPE boot disk

2.1. Requirements

Before you begin, you need to download Windows Automated Installation Kit (AIK) for Windows 7 RC from the Microsoft site (see below). You also need a disk to store the OS (an USB stick for example).

<http://www.microsoft.com/downloads/details.aspx?familyid=60A07E71-0ACB-453A-8035-D30EAD27EF72&displaylang=en>



2.2. Step-by-step

- Install the WAIK (it is delivered as an .ISO file from the download site – either burn this to a CD or mount it using a tool such as VirtualClone CD)
- In the start menu – navigate to “All Programs” > “Microsoft Windows AIK” and run the Windows PE Tools Command prompt as an Administrator
 - Don't copy/paste the commands to the cmd, because word changes some characters like “!!!!
- Create a directory f.e. C:\PE\winpe_x86

- At the command prompt run
 - Cd "c:\program files\windows aik\tools\petools"
- At the command prompt run
 - Call copye.cmd x86 c:\PE\winpe_x86
- Copy winpe.wim from c:\PE\winpe_x86 to c:\PE\winPE_x86\iso\sources\boot.wim
- At the command prompt run
 - Dism.exe /mount-wim /wimfile:c:\PE\winPE_x86\iso\sources\boot.wim /index:1 /mountdir:c:\PE\winpe_x86\mount
- Create winscript.ini file in c:\program files\windows aik\tools\x86 contains


```
[ExclusionList]
ntfs.log
hiberfil.sys
pagefile.sys
"System Volume Information"
RECYCLER
Windows\CSC

[CompressionExclusionList]
*.mp3
*.zip
*.cab
\WINDOWS\inf\*.pnf
```

Copy the winscript.ini to c:\PE\winpe_x86\mount
- Install the following packages in the winpe mount directory
 - dism /image:c:\pe\winpe_x86\mount /Add-package /PackagePath:"c:\program files\windows AIK\tools\PETools\x86\WinPE_FPs\winpe.cab
 - dism /image:c:\pe\winpe_x86\mount /Add-package /PackagePath:"c:\program files\windows AIK\tools\PETools\x86\WinPE_FPs\winpe-wmi.cab
 - dism /image:c:\pe\winpe_x86\mount /Add-package /PackagePath:"c:\program files\windows AIK\tools\PETools\x86\WinPE_FPs\winpe-hta.cab
 - dism /image:c:\pe\winpe_x86\mount /Add-package /PackagePath:"c:\program files\windows AIK\tools\PETools\x86\WinPE_FPs\winpe-mdac.cab
 - dism /image:c:\pe\winpe_x86\mount /Add-package /PackagePath:"c:\program files\windows AIK\tools\PETools\x86\WinPE_FPs\winpe-scripting.cab

- `dism /image:c:\pe\winpe_x86\mount /Add-package /PackagePath:"c:\program files\windows AIK\tools\PETools\x86\WinPE_FPs\winpe-wds-tools.cab`
- **DO NOT ADD** `winpe-legacysetup.cab` and `winpe-setup.cab`
- At the command prompt run
 - `Dism /unmount-wim /mountdir:c:\PE\winpe_x86\mount /commit`
- Create the iso file to burn on a cd with the following command
 - `Oscdimg -n -bc:\PEwinpe_x86\etfsboot.com c:\pe\winpe_x86\ISO c:\PE\winpe_x86\winpe_x86.iso`
- Burn iso to a cd, now we have a bootable winPE cd-rom

2.3. USB boot disk

You can also create a bootable usb stick. When the motherboard of the pc supports it you can boot your win pe environment with the usb boot stick.

- Make usb stick bootable. Format the usb flash memory drive to FAT32 file system
- Start up diskpart
- Do a list disk to see which disk is the usb stick

```

ca. Administrator: Command Prompt - diskpart
Reply from 192.168.4.38: bytes=32 time<1ms TTL=63
Reply from 192.168.4.38: bytes=32 time<1ms TTL=63
Reply from 192.168.4.38: bytes=32 time<1ms TTL=63

Ping statistics for 192.168.4.38:
    Packets: Sent = 91563, Received = 91490, Lost = 73 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 453ms, Average = 1ms
Control-C
^C
C:\Users\averstra>diskpart

Microsoft DiskPart version 6.0.6002
Copyright (C) 1999-2007 Microsoft Corporation.
On computer: AUERSTRA-DESKTO

DISKPART> list disk

   Disk ###    Status         Size           Free           Dyn    Gpt
   -----    -
   Disk 0      Online         140 GB          0 B
   Disk 1      Online         932 GB          0 B
   Disk 2      Online         1917 MB         0 B

DISKPART>
  
```

For example my usb stick of 2GB is Disk 2

- In the example above do the following in diskpart
 - Sel disk 2
 - Clean
 - Create partition primary
 - Sel par 1
 - Active
 - Format fs=fat32 quick
 - Assign
 - Exit
- Copy WindowsPE DVD ROM content to the flash drive
Type in command to start xopying all the content from the windows PE mount iso to your newly formatted high speed flash drive.

- Xcopy d:*.* /s/e/f e:\

The source drive is D: and the drive letter of the usb stick is in this example E:

3. Prepare a “master” installation

Before you are able to capture an image, you need to prepare a “master” installation. Install all the software and drivers you need. **Don’t activate the OS or applications, the activation shall be cleaned by sysprep!**

We advise to carefully select and plan the tools and applications that will be included in the image as well as the number of images you need in your organisation:

- Organize meetings with the people in the departments in your organisation. Discuss what tools they frequently use. Make sure to identify older or incompatible apps.
- Try to limit the number of “master images” you need in your organisation. This will make the maintenance more transparent.

Check your licensing options. Sometimes you can include an application in the image without the need for a license, as long as it’s not activated.

Example: there is a web-design team in your organisation with 8 people. 3 of them use Adobe Photoshop and Illustrator. The other make use of a free HTML editor or web-based content management systems. Your company owns 3 user licenses of Adobe Creative Suite CS3. Instead of having to create 2 images for this team, just create 1. Include CS3 in the image, but only activate it for the 3 people that need it. Now you have the flexibility to de-activate a license on one computer and activate it on another.

- Only install recent applications with their latest updates/service pack.
- Do NOT join the machine in a domain. This will be done after you deploy an image.
- Do NOT activate any licenses of Windows Vista or Microsoft Office, these will be removed by sysprep.
- Keep an inventory of everything that you installed or configured on the image (applications, service packs, drivers, updates, custom configurations, ...)
- When your image is ready, deploy and put it on one computer and have a user work on it for a few days. Ask for feedback:
 - Did you need to install any drivers or new applications?
 - Did you need to configure/customize certain things.
 - Did you need to install updates or service packs?
 - Did you experience any crash or hiccups?

- Is the machine and applications running fast enough?
- Fine-tune your image until the test users are happy. This will greatly reduce your helpdesk calls when you deploy the new machines!
- Disable/Fine-tune the indexing and use the best performance (no aero glass look) If you want to increase Windows Vista

3.1. Add stuff to your existing image

Use “Deployment Image Servicing and Management” aka DISM to add software, drivers, or custom configs to an existing image.

DISM is new for Windows Vista. DISM is the cmd tool that is used to apply updates, language packs, and other updates that are provided by Microsoft.

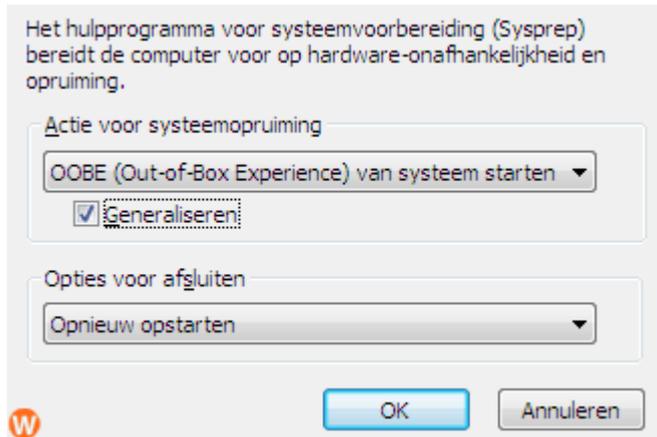
More info on:

[http://technet.microsoft.com/en-us/library/dd744382\(W5.10\).aspx](http://technet.microsoft.com/en-us/library/dd744382(W5.10).aspx)

4. Capture an Install Image

Capture Vista images:

- a) Run "sysprep" on your computer to clear the SID
- b) Choose OOBE (Generalize isn't necessary, !!Choose for shutdown)



- c) Restart and put cd Windows PE in
- d) Be aware the administrator account is always disabled by the sysprep procedure
- e) Boot with Windows PE CDROM
- f) Net use y: "\\server\share\"
- g) X:\imagex /compress maximum /capture d: y:\Windows7.wim "Windows 7 install" /verify

Install Vista images:

5. Deploying Images

5.1. Install an image

- a) Boot met Windows PE CDROM
- b) Use the diskpart command to format the hard drive

```
Diskpart
Select disk 0
Clean
Create partition primary size=200
Select partition 1
Format fs=ntfs label="system" quick
Assign letter=c
Active
Create partition primary
Select partition 2
Format fs=ntfs label="Windows" quick
Assign letter=d
exit
```

- c) Net use y: "\\server\share"
- d) Authenticate
- e) X:\imagex /apply y:\windows7.wim 1 d:
- f) Use BCDboot to initialize the Boot Configuration Data (BCD) store and copy boot environment files to the system partition. For example at a command prompt, type

```
D:\windows\system32\bcdboot d:\windows
```

5.2. Complete the installation

- Follow the Windows Wizard
- Check for driver problems (e.g. different hardware then the one the image is based on)
- Join the computer to Active Directory domain
- Activate Windows, Office and other applications
- Fine-tune windows if this is necessary
- ...

6. Resources

- Windows 7 Deployment Step-by-Step Guide
[http://technet.microsoft.com/en-us/library/dd349348\(WS.10\).aspx](http://technet.microsoft.com/en-us/library/dd349348(WS.10).aspx)
- Windows AIK for Windows 7 RC
<http://www.microsoft.com/downloads/details.aspx?displaylang=en&FamilyID=60a07e71-0acb-453a-8035-d30ead27ef72>
- How to create Windows 7 PE bootdisk
[http://technet.microsoft.com/en-us/library/dd744537\(WS.10\).aspx](http://technet.microsoft.com/en-us/library/dd744537(WS.10).aspx)
<http://www.osattack.com/windows/commands-for-creatingworking-with-windows-pe-30/>
- General Information
http://en.wikipedia.org/wiki/Main_Page