Building a Standard Image and Automated Installation of Windows7

Last Updated: October 2012

Student ID: 08080009

Name: Byeongnam Cho

Note: This document covers a basic auto unattended installation of Windows 7 using WAIK (Windows Automated Installation Kit). Create answer file, capture image and deploy windows 7 over the network or local machine.

Contents

Introduction

The Windows® Automated Installation Kit (Windows AIK) is a set of tools and documentation that support the configuration and the deployment of Windows® operating systems. This guide describes the current methods, tools, and requirements for deploying Windows. More information the *Windows Automated Installation Kit User's Guide* (Waik.chm).

Background

You work for ABC University IT Department which has decided to upgrade two of the University classrooms with 20 new PC's per classroom. You have to create an image that can be deployed to the computers in the 2 upgraded classrooms using the network. He has also requested you write a "How to" document detailing the process. The Department does not want to pay for a third party imaging tool so you are to use the Windows Deployment tool called Windows Automated Installation Kit available from Microsoft. The latest Windows Automated Installation Kit (Windows AIK) will allow you to install, customize, and deploy the Microsoft Windows 7™ family of operating systems.

Requirement

You need to prepare the following:

- Windows 7 product DVD.
- Windows AIK Download
- Technician computer
- Reference computer
- Built a network Lab environment
- USB Stick / Blank DVD disks

You need two computers to build the custom image for this task.

Technician computer: install the windows automated installation kit and make an answer file for this task

Reference computer: install clean windows 7 and application what you need and capture the reference computer to an image file by using ImageX.

Step by step Scenario

This scenario describes how to create and deploy an image of a custom Windows® installation using a network. You will create and deploy the image using a combination of the ImageX tool and Windows PE. The ImageX tool provides imaging technology to capture and apply your custom Windows installation. Windows PE provides a stand-alone pre installation environment, including network connectivity and disk configuration. The process of creating the image and deploying the image you will use Windows System Image Manager (Windows SIM).
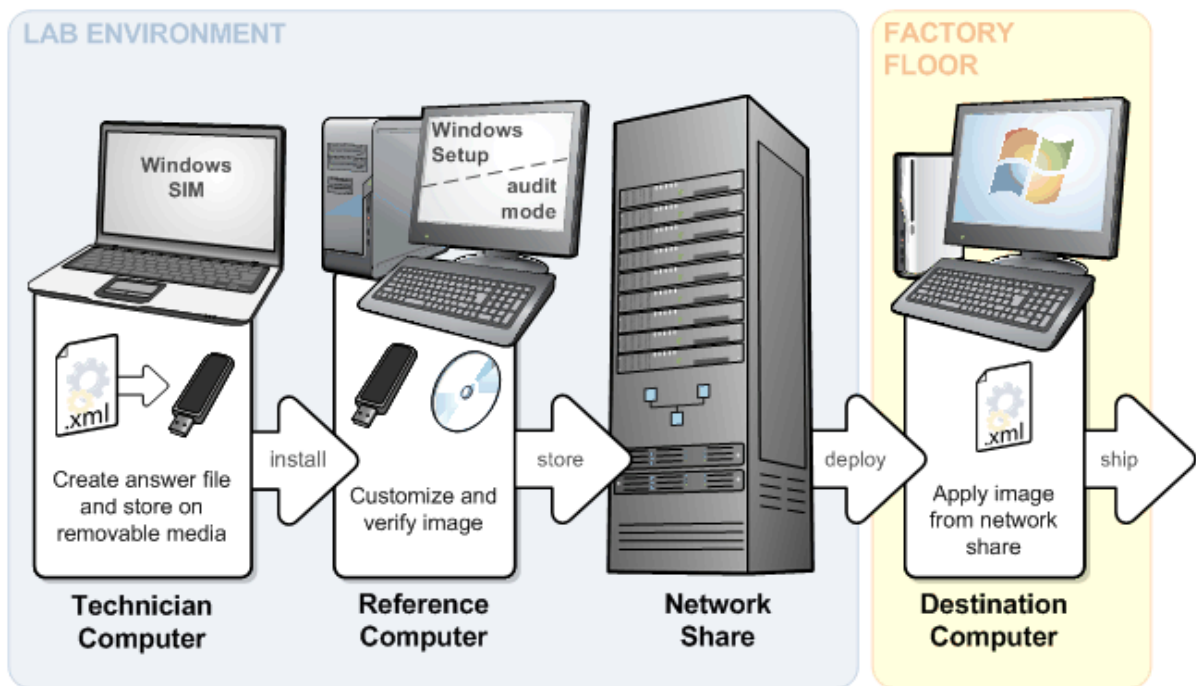
Technician Computer

- Install the Windows Automated Installation Kit
- Create a Windows Pre installation Environment
- Create an answer file(autounattended.xml)

Reference Computer

- Install and customize Windows 7
- Start the reference computer in Audit mode to clean the image.
- Generalize the reference computer to prepare the image for duplication.
- Capture the reference computer to an image file by using ImageX.

Network Share

- Create a share folder for deploying image
- Build a network environment

Destination computer

- Install windows 7 from network share

-
- You must have two USB flash disk that can use to start reference computer and test the answer file before burn DVDs of customized Windows 7.
- Caution: you will be formatting the reference computer's disk, so back up important files.
-

Build a Lab Environment

A lab environment is where you define and build your installation. A lab environment consists of three computers and Network environment: a technician computer and a reference computer.

To build a technician computer
- Download Windows Automated Installation kit(WAIK)
    - It included Windows SIM, Windows PE, User State Migration Tool and etc
- Go to Microsoft Download Center (WAIK file size is 1.7Gb)

To build a reference computer
- Assemble the new computer. The computer must have a DVD-ROM drive, network card, and USB support.
- Install any applications you want(you will capture a image)

To build a Network computer
- Create a share folder for network share
- The computer must be installed O/S and have network card
- You can use this technician computer as network share

To build a destination computer
- Blank hard drive and network card

Build an Answer File

This answer file is an XML-Based file that contains setting definition and values for using Windows Setup. You are going to use this file for auto unattended computing system. You can specified partitioning disks, product key to apply, location, time, language, username and password. The answer file for setup is typically called Autounattend.xml.
An answer file contained the custom settings that are applied during Windows Setup.

Create a new answer file

1. On your technician computer, insert the windows 7 DVD into the local DVD-ROM
2. Copy the install.wim file form DVD located(DVD-ROM drive:\sources\install.wim)
   Why: when you load this file from DVD on Windows SIM program you will meet the error.
3. Open **Windows SIM** on the **file** menu, click select windows image.
4. In **the Select a Windows Image** dialog box, navigate the Install.wim file where you copied.
5. On the **file** menu, click **New Answer File**
   Tip: you can use sample answer file which is already created from Microsoft.
   Open answer file navigate to **C:\Program Files\Windows AIK\Samples** and open **autounattended_sample.xml**

Add and configure Windows Settings

You may also create answer file using sample answer file provided in %WINDIR%\program files\Windows AIK>Samples

Now modify according to your need. You may delete unnecessary catalogs

All the settings you added must appear in the **Answer File** pane. Select and configure each setting as specified below.

Component	Value
Microsoft-Windows-International-Core-WinPE	InputLocale = en-AU SystemLocale = en-AU UILanguage = en-US UserLocale = en-AU
Microsoft-Windows-International-Core-WinPE\SetupUILanguage	UILanguage = en-AU
Microsoft-Windows-Setup\DiskConfiguration\Disk\CreatePartitions\CreatePartition	Extend = false Order = 1 Size = 15000 (Note: you can adjust Size accordingly; this example uses 15 gigabytes. Type = Primary
Microsoft-Windows-Setup \DiskConfiguration\Disk\ModifyPartitions\ModifyPartition	Active = true Extend = false Format = NTFS Label = OS_Install Letter = C Order = 1 PartitionID = 1
Microsoft-Windows-Setup\ImageInstall\OSImage\InstallTo	DiskID = 0 PartitionID = 1
Microsoft-Windows-Setup \UserData\ProductKey	Key = *<product key>* WillShowUI = OnError
Microsoft-Windows-IE-InternetExploer_nautral	Home_page = http://www.google.com.au
Microsoft-Windows-Shell-Setup-Neutral	RegisteredOrganization = Cho University TimeZone = AUS Eastern Standard Time
Microsoft-Windows-TapiSetup_neutral • **TapiUnattendLocation**	AreaCode = 0c09:00000c09
Microsoft-Windows-Shell-Setup\OOBE	ProtectYourPC = 1 NetworkLocation = Home
Microsoft-Windows-Deployment\Reseal	ForceShutdownNow = false Mode = Audit
Microsoft-Windows-Shell-Setup_neutral • **Local Accounts**	DisplayName = Cho Group = Administrators Name = Cho

Validate the answer file

1. In Windows SIM, click **Tools**, and then click **Validate Answer File**.

2. If the answer file validates successfully, a "success" message appears in the **Messages** pane. Otherwise, error messages appear in the same location.

3. If an error occurs, double-click the error in the **Messages** pane to navigate to the incorrect setting. Change the setting to fix the error, and then revalidate.
4. On the **File** menu, click **Save Answer File**. Save the answer file as **Autounattend.xml**.
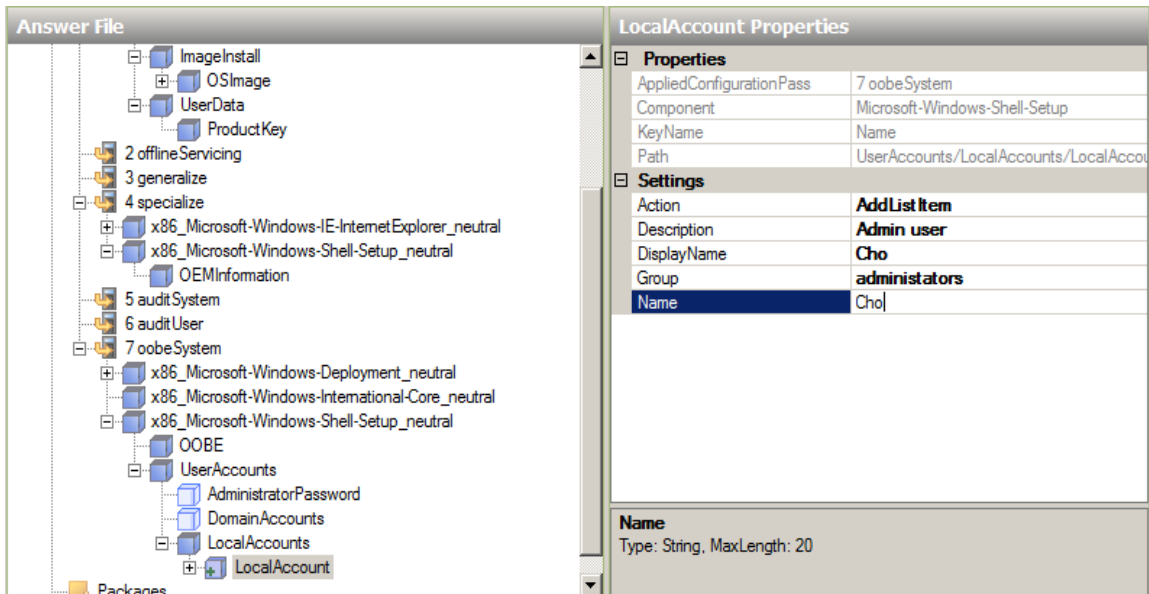
Create windows PE image

You have two way to make bootable image using UFD or burn to CD. In this step I will show you how to create the windows bootable PE image.

1. On your technician computer Click **Start**, point to **All Programs**, and then click **Microsoft Windows AIK.**

2. Right-click **Deployment Tools Command Prompt**, and then click **Run as administrator**.

3. If the reference computer is a 32-bit computer, type **copype.cmd x86 C:\winpe_x86**.
   If the reference computer is a 64-bit computer, type **copype.cmd amd64 C:\winpe_amd64**.
   (My computer is 32-bit computer so I will show you demonstration of 32bit system)

4. Type **copy C:\winpe_x86\winpe.wim C:\winpe_x86\ISO\sources\boot.wim**.

5. Type **copy "C:\Program Files\Windows AIK\Tools\x86\ImageX.exe" C:\winpe_x86\ISO**.

Create bootable USB

1. Insult UFD on your computer port
2. Type **list disk** and select your UFD number
3. Type **clean**
4. Type **create partition primary**
5. Type **select partition 1**
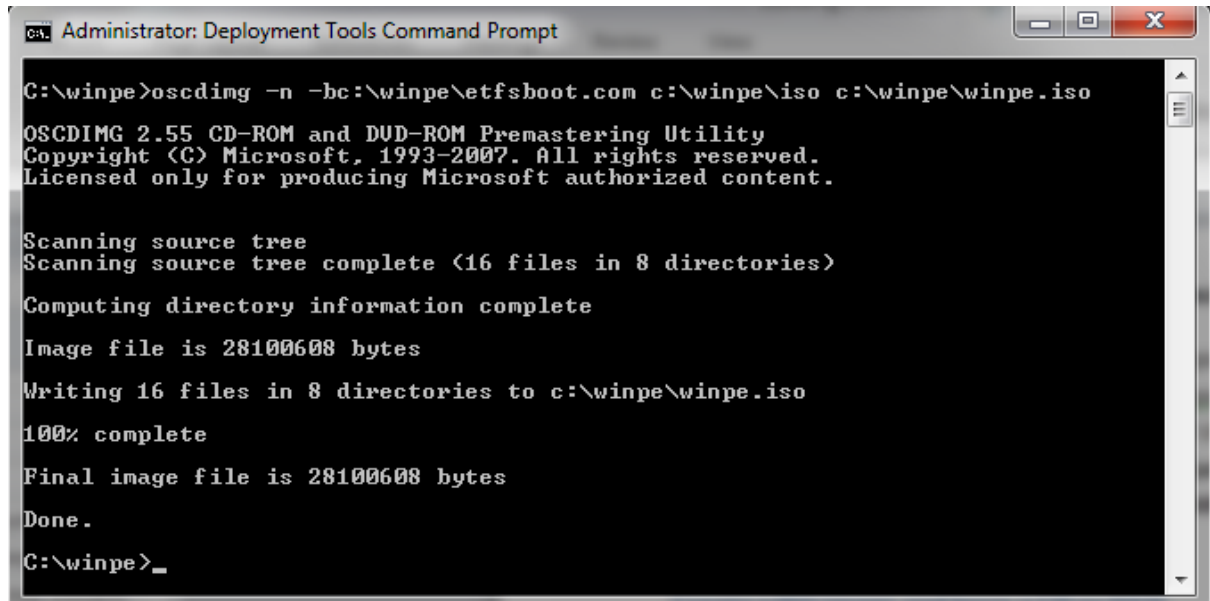6. Type **format fs=fat32 quick**
7. Type **active**

8. Type **exit**
9. Type **xcopy /s C:\winpe_x86\iso*.* D:** (D is your UFD drive letter)

Create a ISO image and burn a CD or DVD

Type **oscdimg –n –bc:\winpe_x86\etfsboot.com c:\winpe_86\ISO c:\winpe_86\winpe.iso**
Now you have winpe.iso file you can make a CD use this image file to boot reference computer
(Tip: if you use virtual machine you can simply add this file on the virtual cd-rom)

Build a Reference Installation

Now, you are going to build a reference computer for a customized installation of Windows. This reference computer will be reference for other computer on deployment.

On this step you can install any application on your reference computer in my case I installed an antivirus, Image burn, Picasa and Adobe PDF reader.

Now I am going to use SYSPREP that is a command-line too built into Windows that allows you to prepare and generalize a windows installation for deployment and cloning as a Windows Images File. SYSPREP prepare the image for capture by cleaning up various user and machine settings and log files

Option

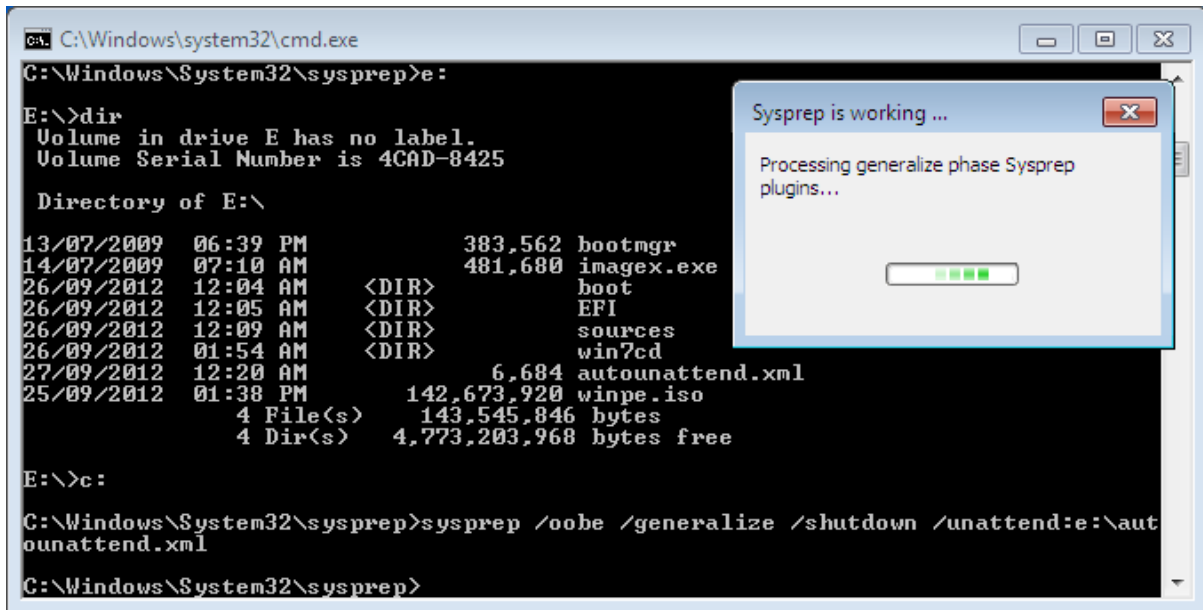- /generalize = removes specific information from the Windows installation allowing that information to be customized in a unique way every time Windows is installed from a Windows Image clone.
- /oobe = causes the Windwos setup wizard to run the first time Windows boots after running Sysprep.exe. This allows the user to customize their installation, even though it is deployed form an image file

To install applications and run SYSPREP

1. Install application what you want component.
2. Click start button and run cmd command.
3. Type "`c:\windows\system32\sysprep\sysprep.exe /oobe /generalize /shutdown`"
   This command will clean your computer and delete specific information

Once SYSPREP automatically shuts your computer down, it is ready for imaging with imagex.exe. Do NOT boot it from its hard drive again until AFTER you have imaged it. Otherwise, all SYSPREP's work will be undone.

```
C:\Windows\system32\cmd.exe

C:\Windows\System32\sysprep>e:

E:\>dir
 Volume in drive E has no label.
 Volume Serial Number is 4CAD-8425

 Directory of E:\

13/07/2009  06:39 PM           383,562 bootmgr
14/07/2009  07:10 AM           481,680 imagex.exe
26/09/2012  12:04 AM    <DIR>          boot
26/09/2012  12:05 AM    <DIR>          EFI
26/09/2012  12:09 AM    <DIR>          sources
26/09/2012  01:54 AM    <DIR>          win7cd
27/09/2012  12:20 AM             6,684 autounattend.xml
25/09/2012  01:38 PM       142,673,920 winpe.iso
              4 File(s)        143,545,846 bytes
              4 Dir(s)    4,773,203,968 bytes free

E:\>c:

C:\Windows\System32\sysprep>sysprep /oobe /generalize /shutdown /unattend:e:\aut
ounattend.xml

C:\Windows\System32\sysprep>
```

Sysprep is working ...

Processing generalize phase Sysprep plugins...

Capture the Image

You have installed Windows 7 on the reference computer, and you are ready to capture an image of it. You use the bootable UFD or CD of windows PE you created earlier to start the computer

You are going to capture reference computer over the Network or UFD media.

The imagex.exe tool allows you to create Windows Image Files of hard drives and partitions. And "image" file of a hard drive is a complete copy of all data on it. Imagex is like other tools we have used to image hard drives, such as "GHOST" and "Clonezilla". However, it has some features that are specific to the Windows Image format. Before you created a bootable ISO or UFD with "imagex.exe" on it and prepared a hard drive with SYSPREP for imaging. Now in part we will create the actual image with IMAGEX and back it up to a network file server.

1. After booting form the ISO, map to a shared directory on the network with write permission. You will need this to copy your image file to. USE:
   Net use Z: \\hostname\sharename /user:username
   Type Z:
   Z: drive is your network share folder now you can access this folder and write

2. Gather information about your environment. What do you need to image? Where will you image it to? Where is the imagex.exe command?
   Use dir command your local hard drive and where imagex file is. Every system is different so you need to work out. Your command line sysntax!
3. Once you find out information use the IMAGEX command to image your system.
   For example my CD-ROM is d:
   D:>**imagex /capture c: z:\install.wim "win 7 Professional" /compress fast /verify**

   If you don't want use network share you can simply create this file on your UFD(you must have over 4G size usb)
   D:>**imagex /capture c: e:\install.wim "win 7 Professional" /compress fast /verify**
   You just simply change the drive letter from network drive to local UFD.

   It take over 20mins depend on your system.

```
Administrator: X:\windows\system32\cmd.exe - imagex  /capture c: e:\install.wim "windows7 professi...  _ □ ×
 Volume Serial Number is DC87-0F7B

 Directory of D:\

09/25/2012  12:35 PM    <DIR>          BOOT
07/13/2009  05:39 PM           383,562 BOOTMGR
09/25/2012  12:35 PM    <DIR>          EFI
07/14/2009  06:10 AM           481,680 IMAGEX.EXE
09/25/2012  12:36 PM    <DIR>          SOURCES
               2 File(s)        865,242 bytes
               3 Dir(s)               0 bytes free

D:\>imagex /capture c: e:\install.wim "windows7 professional" /compress fast /ve
rify

ImageX Tool for Windows
Copyright (C) Microsoft Corp. All rights reserved.
Version: 6.1.7600.16385

Files/folders excluded from image capture by default:

 \$windows.~bt
 \$windows.~ls
 \winpepge.sys
 \Windows\CSC
 \Recycled
 \Recycler
 \$Recycle.Bin\*
 \System Volume Information
 \pagefile.sys
 \hiberfil.sys


Scanning files and directories..._
```

Deploy an Image

After successfully capture a custom Windows 7 image that includes applications, you are going to make a deploy image. In this image is different with original Microsoft provides on the media.

First, I am going to show you how to create a bootable unattended Windows 7 media

1. On your technician computer
2. Create a folder at C drive "Windows7" and insult your windows 7 original image

3. If your DVD-ROM is letter D **xcopy d:*.* c:\Windows7**
4. In Windows Explorer, copy the install.wim file from the UFD or share folder you created to c:\Windows7\sources and replace the file install.wim.
5. Finally copy unattended.xml to c:\windows 7 root folder.
6. Create new customized windows 7 image
    a. Run Deployment tool command prompt.
       Type **oscdimg –n –m–bc:\winpe_x86\etfsboot.com c:\Windows7 c:\Windows7\win7_unattended.iso**
    b. Now you have win7_unattended.iso file you can make a CD use this image file to boot reference computer

Second, you can deploy that image over the network.

1. Boot form Windows PE UFD or CD on your destination computer.
2. In Windows PE, format the hard drive by using the DiskPart tool.
3. At a command prompt in Windows PE, map the network drive to your network share.
   Net use Z: \\hostname\sharefoldername /user:username.
4. Apply the image form the network share by using the ImageX tool.
   Imagex /apply Z: install.wim 1 c:
   The installation is complete and the computer is ready for delivery.

   Tip
   Also you can share the windows 7 DVD on the share folder and access the DVD-ROM to install windows 7
   For example
   1. net use Z: \\hostname\DVD-ROM /user:username.
   2. Cd z:
   3. setup

Reference

Microsoft Windows AIK Documents

1. Unattended Windows Setup Reference
2. Windows Automated Installation kit User's Guide
3. Windows PE User's Guide

Youtube

1. Windows 7 Unattended Installation #1~4
2. The Windows AIK_ Part 1 to 4
3. Install Windows 7 form the network
4. Create Answer File using Windows 7 AIK

Website

1. Microsoft Web site
   a. http://technet.microsoft.com/en-us/library/cc766485(v=ws.10).aspx
   b. http://www.technibble.com/windows-7-opk-and-the-windows-automated-installation-kit/

You can find most information from Microsoft Website or AIK Documents.