

## Disclaimer

The author of this document shall not carry responsibility for any damage to the computer software or hardware either direct or indirect as a result of following the instructions herein.

## Introduction

Building a new PC or rebuilding one for any maintenance or repair requirements is time consuming; OS, applications, tools, related updates, setup user profiles, etc.

This document covers how to capture an image of a custom PC build with a default local user profile on a bootable USB flash disk to use for future PC builds or rebuilds.

This document is intended for I.T. Professionals who build new, or rebuild existing Windows 7 on hardware computers alike in case of any maintenance or repair requirements for their users. However, other users may find this document useful and straight forward to follow, even to customize on different Windows editions and computers hardware.

Note: The steps herein have been tested using **Windows 7 Enterprise** 64-bit edition on Dell OptiPlex GX520, GX620, 745, 755, 380, 760, 780, 7010, 990 and proven working on a **Windows Server 2003 R2** domain environment.

## Requirements

- A computer to be used as a technician computer; this could be a virtual machine or the PC being used by the I.T. Professional
- A computer to be build/rebuild from scratch (presuming it is for an end user). Let's call this a reference computer
- The latest version of **Windows Automated Installation Kit (Windows AIK)** to be installed on the technician PC
- Two USB flash disks

## Brief

### On the technician computer:

- Download and install the **Windows AIK**
- Create a bootable **Windows PE** USB flash disk
- Create a few scripts to speed up the process and ensure accuracy
- Create **unattend.xml** answer file
- Create a bootable **CustomImg** USB flash disk

### On the reference computer:

- Install **Windows 7** and start in Audit mode
- Install necessary device drivers
- Install an antivirus, other protection tools and all other software, applications and tools needed as per firm policies
- Run Windows Updates multiple of times to install all critical updates, do not install optional updates
- Customize the default local user profile as per firm policies
- Copy the answer file to the appropriate path
- Uninstall the display driver
- Clean up the reference computer hard drive
- Unplug the network cable, and safely unplug all USB flash disks
- Restart PC and boot from the **Windows PE** USB flash disk
- Capture the reference computer to an image file

## Procedure

### On the technician computer:

1. Download **Windows AIK** for Windows 7 from the **Microsoft Download Center**:

<http://www.microsoft.com/en-ca/download/details.aspx?id=5753>

Note: The **Windows AIK** (file name **KB3AIK\_EN.iso**) provides the tools required to build custom Windows 7 images. In particular, it includes **ImageX**, which is used to capture an image of the reference computer, and the files necessary to build a **Windows PE** bootable disk. You may need to burn the **KB3AIK\_EN.iso** file on a DVD first or mount to a virtual machine to be able to install it

2. Install the **Windows AIK** by running **wAIKX86.msi** for a 32-bit computer or **wAIKAMD64.msi** for a 64-bit computer

3. Prepare **Windows PE** files:

- From the **Start** menu | **All Programs** | **Microsoft Windows AIK**, launch the **Deployment Tools Command Prompt** in elevated mode. Click **Yes**, if prompted, to open the **Deployment Tools Command Prompt** with elevated permissions

Tip: You may copy and paste commands from these instructions into the **Deployment Tools Command Prompt** window to save time and ensure accuracy

- In the **Deployment Tools Command Prompt** window, perform one of the following tasks:

If the reference computer will be a **32-bit** build, type these commands in order, press **Enter** after each line:

```
copy c:\winpe_x86 C:\winpe_x86
copy C:\winpe_x86\winpe.wim C:\winpe_x86\ISO\sources\boot.wim
copy "C:\Program Files\Windows AIK\Tools\x86\ImageX.exe" C:\winpe_x86\ISO\
```

If the reference computer will be a **64-bit** build, type these commands in order, press **Enter** after each line:

```
copy c:\winpe_amd64 C:\winpe_amd64
copy C:\winpe_amd64\winpe.wim C:\winpe_amd64\ISO\sources\boot.wim
copy "C:\Program Files\Windows AIK\Tools\amd64\ImageX.exe" C:\winpe_amd64\ISO\
```

4. Create a **Windows PE** Bootable USB flash disk:

- Insert one of the USB flash disks into the computer, wait until it is recognized by the computer and assigned a drive letter by the Operating System (OS): (*you may consider to format this USB flash disk to **New technology File System (NTFS)** first and label it **Windows PE***)

If the reference computer will be a **32-bit** build, copy all the files in **C:\winpe\_x86\iso** to the **Windows PE** USB flash disk using Windows Explorer. Alternatively, you can use the following command in the **Deployment Tools Command Prompt** window, where **D** is the drive letter of the **Windows PE** USB flash disk:

```
xcopy /s C:\winpe_x86\iso\*.* D:\
```

If the reference computer will be a **64-bit** build, copy all the files in **C:\winpe\_amd64\iso** to the **Windows PE** USB flash disk using Windows Explorer. Alternatively, you can use the following command in the **Deployment Tools Command Prompt** window, where **D** is the drive letter of the **Windows PE** USB flash disk:

```
xcopy /s C:\winpe_amd64\iso\*.* D:\
```

- After completing the previous steps you have the tools necessary to capture a custom image. I decided to create the following few scripts on the **Windows PE** USB flash disk to save time and ensure accuracy. You may customize these scripts based on your needs and the Windows edition used:

Run the **Command Prompt** in elevated mode. Click **Yes**, if prompted, to open the **Command Prompt** with elevated permissions. In the **Command Prompt** window change to the **Windows PE** USB flash disk root directory by typing the following command, where **d** is the drive letter of the **Windows PE** USB flash disk:

```
d:
```

In the **Command Prompt** window type the following commands in order, press **Enter** after each line:

Note: The **^Z** characters shown below is to save the script. This command can be triggered using the **Ctrl** and **Z** keys on the keyboard

Script #1: This will create the **SetupComplete.cmd** script which deletes the **unattend.xml**, **oobe.cmd** and itself after the image creation is complete:

```
copy con SetupComplete.cmd
del /Q /F c:\windows\system32\sysprep\unattend.xml
del /Q /F c:\windows\system32\sysprep\oobe.cmd
del /Q /F c:\windows\panther\unattend.xml
del /Q /F c:\windows\setup\scripts\SetupComplete.cmd
^Z
```

Script #2: This will create the **imgprep.cmd** script which creates a new folder “scripts”, and copies the **unattend.xml**, **oobe.cmd**, and **SetupComplete.cmd** to the appropriate path on the **C** drive of the reference computer being imaged:

```
copy con imgprep.cmd
copy unattend.xml c:\windows\system32\sysprep
copy oobe.cmd c:\windows\system32\sysprep
md c:\windows\setup\scripts
copy SetupComplete.cmd c:\windows\setup\scripts
^Z
```

Script #3: This will create the **imgcreat.cmd** script which launches the **imageX** to capture the custom Windows image from the reference computer:

```
copy con imgcreat.cmd
imagex /compress fast /check /flags "Enterprise" /capture %1 %2\install.wim "Windows 7 Enterprise"
"Windows 7 Enterprise Custom"
^Z
```

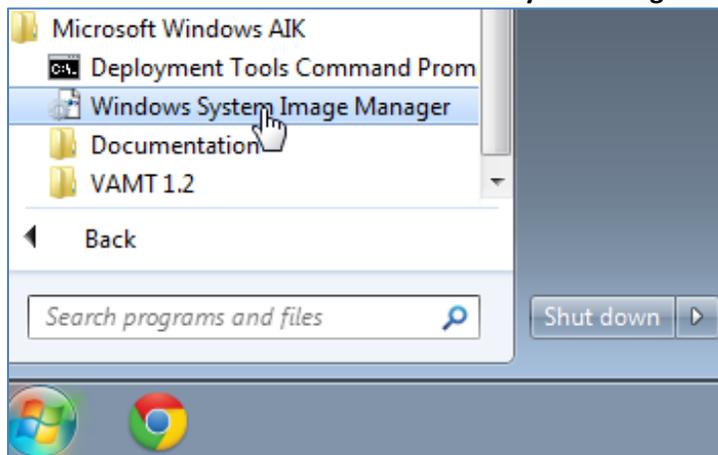
Note: After booting using this **Windows PE** USB flash disk and before launching this script on the reference computer, we will need to identify this reference computer’s drive letter, usually “**C**”, and the drive letter of the **Windows PE** USB flash disk where the custom Windows 7 image will be written to. Then replace the **%1** and **%2** parameters by these drive letters. For example if the reference computer’s hard drive is **C** and the USB flash disk is **H** you may use this syntax: **h:\imgcreat.cmd c: h:**

Script #4: This will create the **oobe.cmd** script which triggers the **system preparation tool (sysprep)** which enables us to capture a customized Windows image that we can reuse throughout the organization:

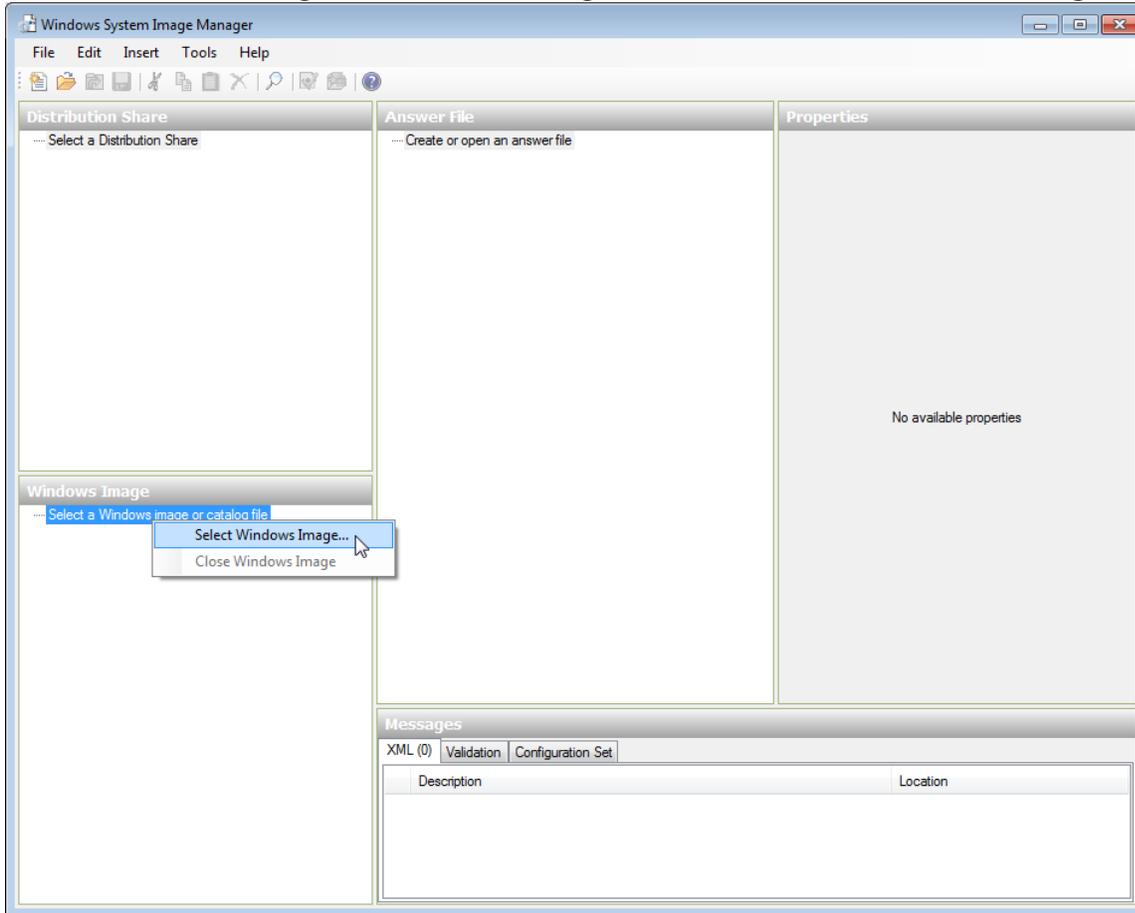
```
copy con oobe.cmd
sysprep /generalize /oobe /unattend:unattend.xml /shutdown
^Z
```

5. Create **unattend.xml** answer file:

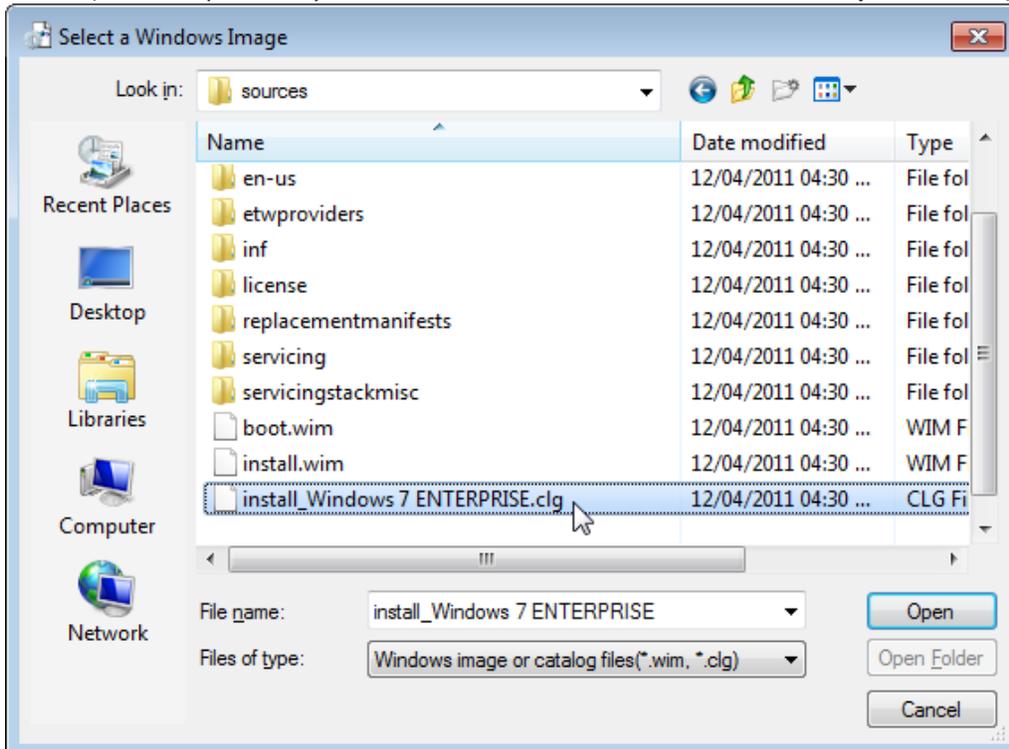
- Insert the Windows 7 installation DVD, wait until recognized
- From the start menu launch the **Windows System Image Manager**:



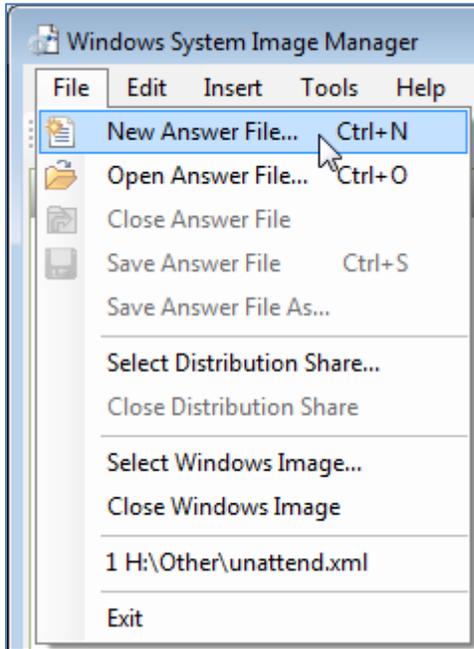
- Under the **Windows Image** header, locate and right-click and select **“Select Windows Image”**



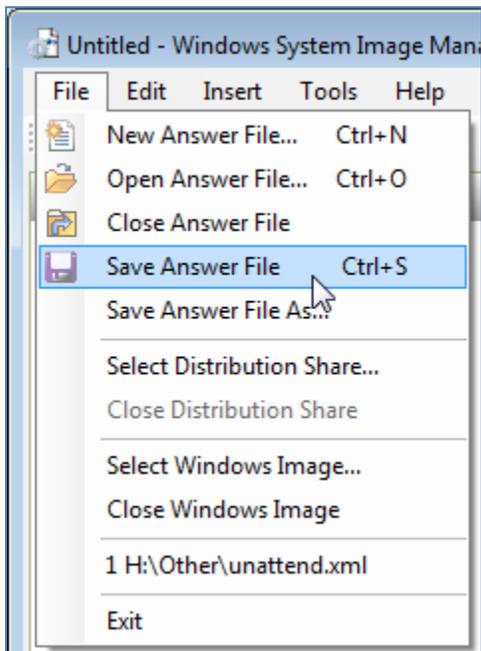
- Browse to and open the **.clg** file located on the **Windows 7 installation DVD**. This file is located in the **“Sources”** folder: *(as noted previously, this document is based on Windows 7 Enterprise edition)*



- From the **File** menu select “**New Answer File**”:



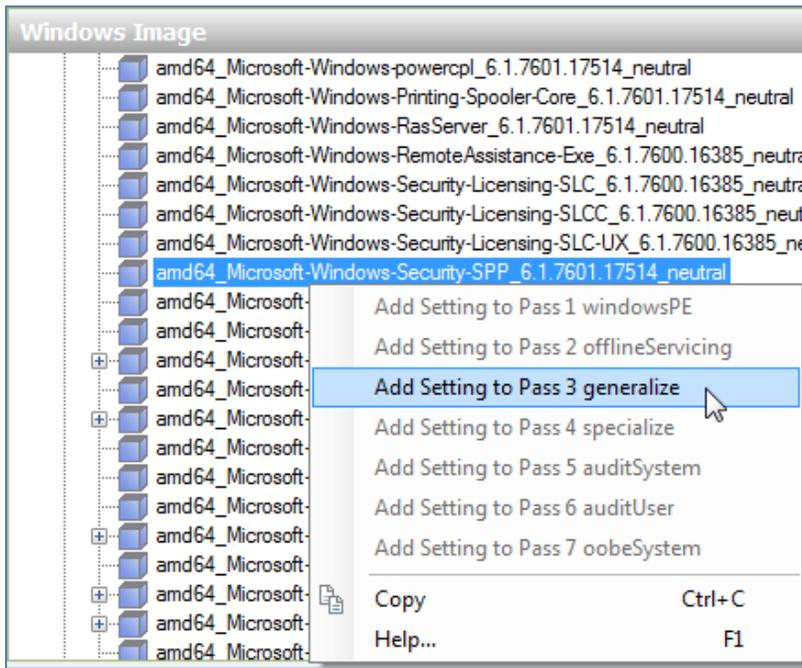
- From the File menu select “**Save Answer File**”, save this .xml file on the **Windows PE** USB flash disk, name the file **unattend**:



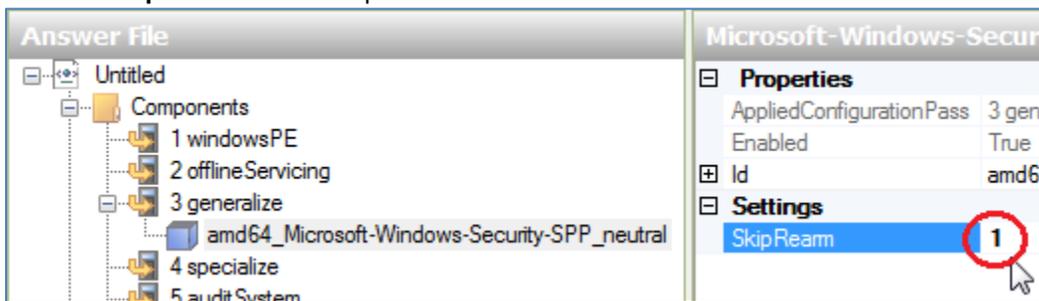
- Under the **Windows Image** header, **Windows 7 Enterprise(Catalog)**, the **Components**, personally I selected the following: *(you may customize as desired)*

(1)

Right-click “**amd64\_Microsoft-Windows-Security-SPP\_6.1.7601.17514\_neutral**” then select “**Add Setting to Pass 3 generalize**” as illustrated in the snapshot example next page

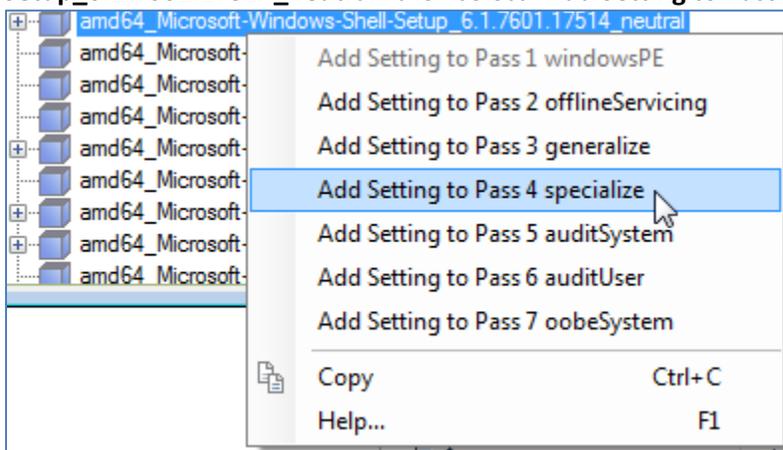


Set 1 for **SkipRearm** to allow up to 8 rearms:

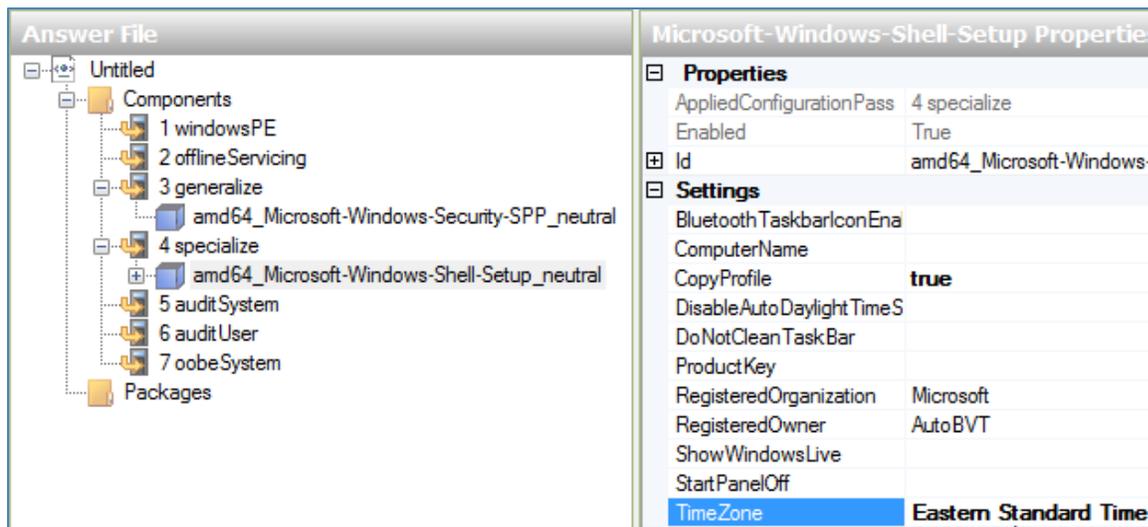


(2)

Under **Windows Image** header, locate and right-click “amd64\_Microsoft-Windows-Shell-Setup\_6.1.7601.17514\_neutral” then select “Add Setting to Pass 4 specialize”



Set **CopyProfile=true**, and set **TimeZone=Eastern Standard Time** as illustrated in the snapshot example next page



- From the File menu select “**Save Answer File**”

6. Insert the second USB flash disk, wait until recognized, format it to **NTFS**, and label it **CustomImg**
7. Use **Windows Explorer** to copy the contents of the **Windows 7 installation** DVD to the **CustomImg** USB flash disk
8. On the **CustomImg** USB flash disk, locate and delete the **install.wim** file under the **Sources** folder

Now you have:

- A **Windows PE** bootable USB flash disk includes the **unattend.xml** and the other script files created earlier. This USB flash disk will be used to capture the reference computer after complete, and
- The **CustomImg** USB flash disk which will be used as the new customized Windows 7 installation disc to build computers

#### On the reference computer:

1. Install Windows 7
2. After installation complete and when you arrive at the welcome screen and prompted to create a username, press **Ctrl+Shift+F3** keys all together on the keyboard. This will reboot the reference computer and automatically be logged in under the built-in administrator account in audit mode. A sysprep graphical user interface (GUI) window will appear which can be put aside or closed
3. If not recognized by default, Install the Network Interface Card (NIC) driver (to access the network and Internet)
4. No other device drivers are necessary to be installed at this time, if not recognized by default
5. Install an antivirus and all other protection tools as per firm policies
6. Run Windows Update multiple of times until you install all updates available, deselect to not install any updates for hardware device drivers. Restart when prompted. The reference computer will automatically boot back into the built-in administrator account in audit mode until we run the **oobe.cmd** script. The **oobe.cmd** script triggers sysprep to delete and clean up the built-in administrator account unless we have the **CopyProfile=true** is set in the **unattend.xml** answer file, which will copy this built-in administrator account, after being customized, as the default profile before deleting it
7. You may activate Microsoft products if using a Key Management Server (KMS)
8. Install all other software, applications and tools needed as per firm policies
9. Customize the built-in administrator profile you automatically logging into as per firm policies, such as desktop background, theme, colors, etc. Refer to **Appendix A** for additional customization I personally found useful to apply (Note: depending on the number of users to support you may consider GPO for most of these additional customization)

10. Insert the **Windows PE** USB flash disk into an available USB port, wait until recognized and assigned a drive letter
11. Run the **Command Prompt** in elevated mode. Click **Yes**, if prompted, to open the **Command Prompt** with elevated permissions. In the **Command Prompt** change drive letter to where the **Windows PE** USB flash disk is located using the command below, where **x** is the drive letter of the **Windows PE** USB flash disk:  
**cd x**
12. Launch **imgprep.cmd** script; this will simply copy the **unattend.xml** answer file, the **oobe.cmd** and the **SetupComplete.cmd** scripts to the appropriate path on the **C** drive of the reference computer. If errors, check script correct syntax and try again
13. Run **Disk Cleanup**, click **Clean up system files**, under **More Options** tab, in **System Restore and Shadow Copies** click **Clean up**, when prompted click **Delete** then click **OK** to continue
14. Switch back to **Don't show hidden files, folders, or drives** if you have changed this option earlier
15. Unplug the network cable
16. Safely unplug USB flash disks
17. From Device Manager uninstall the display driver, if prompted to restart answer **No**
18. Run the **Command Prompt** in elevated mode. Click **Yes**, if prompted, to open the **Command Prompt** with elevated permissions. In the **Command Prompt** window type the following, press **Enter** after each line:  
**cd sysprep**  
**oobe.cmd**  
Note: The reference computer will shut down when finished
19. After the reference computer shuts down insert the **Windows PE** USB flash disk into an available USB port
20. Switch the reference computer back ON and boot from the **Windows PE** USB flash disk  
Note: Refer to the reference computer's manual for the appropriate keyboard key combination to boot from a USB key. At this step it is important to boot from the **Windows PE** USB flash disk to capture the image otherwise you will need to run the computer in the audit mode once more, step #2 above, and repeat steps 16, to 20
21. Identify the drive letter of the hard drive of the reference computer and the drive letter of **Windows PC** USB flash disk by a simple **dir** command to **C, D, E, F** etc. until you are certain which one is the reference computer hard drive (the source) and which one is the **Windows PE** USB flash disk (the destination)
22. Capture the reference computer to an image file by launching **imgcreat.cmd** script from the **Windows PE** USB flash disk. Presuming the reference computer hard drive is **C** and the **Windows PE** USB flash disk is **H**, type the following commands in order and press **Enter** after each line:  
**h:**  
**imgcreat.cmd c: h:**  
Note: Depending on the size of the custom installation ensure you have enough free capacity on the **Windows PE** USB flash disk before launching the above command. Alternatively, it might be faster to capture this image on an external hard drive or secondary partition you might have created on the reference computer earlier
23. After image complete, move the new captured **install.wim** image file from the **Windows PE** USB flash disk, external hard drive or partition to the **CustomImg** USB flash disk under the **Sources** folder

Now you have a **CustomImg** USB flash disk ready to be used as the new bootable customized Windows 7 installation disc to build new computers

## Appendix A

- Set desktop **View** to **Small icons** and to **Auto arrange icons**
- Update the hosts file
- Set remote access rules
- Customize Chrome settings, if installed
- Customize IE options
- Customize screen saver and power options
- Customize start menu and notification area
- Customize Microsoft Office products
- Customize Control Panel view
- Customize folder and search options
- Install 7-Zip
- Install Microsoft EMET
- Add "Notepad" to the "Send to" menu
- Enable quick edit in cmd
- Disable auto play using gpedit.msc
- Disable Offline files
- Disable screen dim at remote assistance:  
HKEY\_LOCAL\_MACHINE\SOFTWARE\Microsoft\Windows\CurrentVersion\Policies\System\change "PromptOnSecureDesktop" DWORD value from 1 to 0
- Fix Windows 7 folder redirection rename the home folder in "My Documents":  
HKEY\_LOCAL\_MACHINE\SOFTWARE\Microsoft\Windows\CurrentVersion\Explorer\FolderDescriptions\{FDD39AD0-238F-46AF-ADB4-6C85480369C7} | change "LocalizedName" DWORD value from:  
"@%SystemRoot%\system32\shell32.dll,-21770" to "@%filename%". Personally I chose to delete the LocalizedName DWORD, as well as from the following registry paths:  
My Music: HKEY\_LOCAL\_MACHINE\SOFTWARE\Microsoft\Windows\CurrentVersion\Explorer\FolderDescriptions\{4BD8D571-6D19-48D3-BE97-422220080E43}  
My Picture: HKEY\_LOCAL\_MACHINE\SOFTWARE\Microsoft\Windows\CurrentVersion\Explorer\FolderDescriptions\{4BD8D571-6D19-48D3-BE97-422220080E43}  
My Videos: HKEY\_LOCAL\_MACHINE\SOFTWARE\Microsoft\Windows\CurrentVersion\Explorer\FolderDescriptions\{18989B1D-99B5-455B-841C-AB7C74E4DDFC}
- Set default user login picture: copy the new picture to C:\ProgramData\Microsoft\User Account Pictures, and in HKEY\_LOCAL\_MACHINE\SOFTWARE\Microsoft\Windows\CurrentVersion\Policies\Explorer | create a new DWORD (32-bit) value "UseDefaultTile" and set to "1"

## References:

- TheITBros: <http://theitbros.com/sysprep-a-windows-7-machine-start-to-finish-v2/>
- Microsoft TechNet: [https://technet.microsoft.com/en-us/library/ee523217\(v=ws.10\).aspx](https://technet.microsoft.com/en-us/library/ee523217(v=ws.10).aspx)
- Microsoft TechNet: <https://social.technet.microsoft.com/Forums/windowsserver/en-US/117d291f-4a2c-434e-ae6c-ee1ca52c33e7/bug-windows-7-folder-redirection-rename-the-home-folder-in-my-documents?forum=winservers>
- Microsoft article ID 973289: <https://support.microsoft.com/en-us/kb/973289>
- Microsoft answers: [http://answers.microsoft.com/en-us/windows/forum/windows\\_vista-security/login-with-a-single-user-icon-for-all/ac415b38-788e-4a9c-b12e-eebbb09a832b](http://answers.microsoft.com/en-us/windows/forum/windows_vista-security/login-with-a-single-user-icon-for-all/ac415b38-788e-4a9c-b12e-eebbb09a832b)
- How-To Geek: <http://www.howtogeek.com/howto/windows-vista/make-user-account-control-uac-stop-blackening-out-the-screen-in-windows-vista/>
- Trial and error

End of document.