

# Methods to Create Bootable Images, DVDs, and Drives

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X64 Only Edition  
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```
*****  
* Methods to Create Bootable Images, DVDs, and Drives *  
*****
```

It is important that you understand the purpose of each of the sub-sections that follow before you proceed.

[Bootable ISO Image](#) - This process will take a set of Windows distribution files located in a folder and create an ISO image from these files. It does not matter if the folder contains a single edition of Windows or multiple editions. This procedure will not alter that. It merely makes an ISO image out of these files and folders.

[Multiple Windows Editions in One Image Using Only MS Tools](#) - This procedure will allow you to take Windows editions from one or multiple ISO images and combine them all into one ISO Image. This can include customized images created using sysprep. Note that Windows retail images contain multiple editions of Windows. For example, the US, English, consumer images from Microsoft currently contain 11 editions of Windows including Home, Pro, etc.

[Bootable DVD](#) - This procedure will allow you to take a Windows ISO image and create a bootable DVD or Blu-Ray from that image. Note that Windows installation media will now require a minimum of a double-layer DVD to have sufficient space.

[Bootable Flash Drive Using Only Native MS Tools](#) - Allows you to take a Windows ISO image and create a bootable flash drive, HDD, SSD, SD card, etc. from that image.

```
*****  
* Bootable ISO Image *  
*****
```

Either copy the contents of a Windows ISO to a folder on a HDD, SSD, thumb drive, etc. and note the path to the folder, or, if you already have Windows files extracted to a folder, note the path to that folder. In this example, I'll assume **C:\ISO\_Files**.

Make sure you have the **Windows ADK** installed as described in [Prerequisites](#).

Go to **Start > All Apps > Windows Kits** and open **Deployment and Imaging Tools Environment** in elevated mode (as Admin).

You will end up at a command prompt with a long path. Type **cd\** and hit **Enter** to go back to the root. This simply makes the prompt shorter and the command line less cluttered.

Enter the following command. Note that this is a single long command. Be careful - there are no spaces in some of the places you might expect a space to be present:

```
oscdimg.exe -m -o -u2 -udfver102 -L"VolumeName" -  
bootdata:2#p0,e,bc:\iso_files\boot\etfsboot.com#pEF,e,bc:\iso_files\efi\micro  
soft\boot\efisys.bin c:\iso_files c:\Win11PRO.iso
```

Replace the 3 occurrences of **c:\iso\_files** with the correct path to where your files are located. Also, replace the **c:\Win11PRO.iso** at the end of command with the correct path and name for the output file that you want to save. For paths with spaces, include them inside of double quote marks ("). You can use any volume name or omit it completely.

**IMPORTANT:** If you have an **autounattend.xml** answer file on the root of your image, I strongly suggest noting this somewhere obvious. If you boot a VM from this image, or if you boot a system from media created with this image, setup will begin without warning and can wipe out your HD depending upon the selected options! As a safety feature, you might consider creating your media without a disk to install onto being specified. This will cause setup to pause just once at the point where you need to select a drive to install to, possibly preventing a major accident. How to do this is described in [Unattended Installation of Windows with a Single Answer File.docx](#) and [Creating and Deploying a Custom Windows Image from a Reference System.docx](#).

```
*****  
* Multiple Windows Editions in One Image *  
*       Bootable from BIOS and UEFI       *  
* Created Using Only Native Windows Tools *  
*****
```

**IMPORTANT NOTE:** When you have finished this section and are ready to deploy to a thumb drive, I suggest using this procedure: [Bootable Thumb Drive Using Only Native MS Tools](#). The advantages of using this method are outlined in that section.

#### END OF NOTE

This procedure will allow you to create an ISO image from which multiple editions of Windows can be installed. As an example, you might create a single ISO image that allows installation of all the following Windows editions:

```
Windows 11 Pro (Original)  
Windows 11 Pro with the Latest Updates  
Windows 11 Home (Original)  
etc.
```

You can include syspreped images and unattended installation can be setup easily.

Create the following folders:

```
C:\ISO_Files      < Used to store base image  
C:\WIM            < Will hold WIM with all editions of Windows in image
```

**NOTE:** You can use any folder names you want, just be sure to change them in the commands below as well.

### Create a Base Image:

Extract the contents of a Windows image to the **C:\ISO\_Files** folder.  
Delete the **C:\ISO\_Files\Sources\install.wim** file.

This is your base image. Go to [Extracting Windows editions](#) (below).

### Extracting Windows editions:

You will now extract all Windows editions and copy them into a single **install.wim** file located in **C:\WIM**.

Mount an ISO image that contains one of the Windows editions that you want to add to this compilation. In this example, I've mounted the ISO image to drive **E:**.

Run the following command to get a list of editions in this ISO image:

```
dism /Get-WimInfo /WimFile:E:\Sources\install.wim
```

Note the index number associated with the edition of Windows you want to use. As an example, I'm going to assume index #6 applies to Win 11 Pro and will use that in my command below.

Run the following command:

```
DISM /Export-Image /SourceImageFile:E:\Sources\install.wim /SourceIndex:6  
/DestinationImageFile:C:\WIM\install.wim /DestinationName:"W11 PRO version  
21H2"
```

**DestinationName** in the above command is the same as **Name** in the ImageX command shown below. This is the name displayed on the boot menu for this image. The **Description** appears below the menu for the currently highlighted image name in the menu. Both the **NAME** and **DESCRIPTION** are MANDATORY! You can, however, omit the **/DestinationName:** option above and the already existing name will then be kept. Just be certain that there is an already existing name. The above command does not have an option to change the **DESCRIPTION** so if one needs to be added you will need to run the command below. If a **DISM /Get-Wiminfo** (as shown above) indicates that **DESCRIPTION** is not defined, then you must add one! To do so, extract the contents of the ISO image (you should have already done this with the **DISM /Export-Image** command above), make sure the **install.wim** is not read-only, then run the following ImageX command:

```
ImageX /info <path to install.wim> <index_number> "Name" "Description" /check
```

Note that as you export images to **C:\WIM**, the first export will be index 1, the second will be index 2, etc. It does not matter what the index was in the source! For example, if you export index 6 first, then it will become index 1 in the new image since you exported it first.

Again, you can run the **DISM /Get-WimInfo** command at any time to see the info for the WIM file.

Remember, both **NAME** and **DESCRIPTION** are necessary.

**TIP:** You can just leave off the **DestinationName:** option in the **DISM /Export-Image** command and then set both the **NAME** and **DESCRIPTION** with the ImageX command.

You can keep exporting additional Windows editions. They do not all need to come from the same image file. Use of multiple different ISO images is perfectly fine, however, **they should be the same Windows version and build number.**

You should now end up with all editions of Windows in the **C:\WIM\install.wim** file.

When done, copy the **install.wim** file to **C:\ISO\_Files\sources**, overwriting any **install.wim** file located there.

### **Final Preparations:**

Create a text file called **ei.cfg**. Place the following two lines in that file:

```
[Channel]
Retail
```

**NOTE:** Use something like notepad to create this file. Don't use a program like Word that can insert special formatting characters into the file.

Place the **ei.cfg** file in **C:\ISO\_Files\sources**.

Notes about **ei.cfg**: Let's say that you have a computer that shipped with Windows 11 Home, but you upgraded to Pro. You may find that when you try to perform a clean install, Windows simply starts installing Home and doesn't even show you the menu from which you can select other editions. By placing this file in the sources folder, we prevent that from happening. This happens because Windows setup reads a signature in the BIOS that tells setup which edition of Windows the system was shipped with.

Note that when doing an unattended install, this file is not needed because the **autounattend.xml** specifies the edition of Windows to install, but you can leave the **ei.cfg** in place as it won't hurt anything. My preference is to always include an **ei.cfg** file.

### **Creating the Final ISO image:**

Open **Deployment and Imaging Tools** in elevated mode from the Windows ADK.

Run the following command to create the final ISO image. Be careful! There are spots in this command where you may expect a space, but no space is present:

```
oscdimg.exe -m -o -u2 -udfver102 -L"VolumeName" -
bootdata:2#p0,e,b"c:\iso_files\boot\etfsboot.com"#pEF,e,b"c:\iso_files\efi\mi
crosoft\boot\efisys.bin" "c:\iso_files" "C:\ISO Images\My Image.iso"
```

In the above example, **VolumeName** is the optional name to give the volume. Just specify "" if you want no volume name or leave off the **-L"VolumeName"** parameter entirely.

To create a bootable thumb drive from the image you just created, I suggest following this method: [Bootable Flash Drive Using Only Native MS Tools](#).

```
*****
* Performing an Unattended Setup with the Multi Edition Media *
*****
```

```
*****
* How Windows Behaves When Booting from a Multi Edition Image *
*****
```

Let's suppose that you place an **autounattend.xml** answer file on the root of the image or boot media and that the answer file was made for Windows 11 Pro. When you boot, if only a single edition of Windows in the image is based upon Windows 11 Pro, that edition will be the one that is installed. However, let's say that you have a standard Win 11 Pro edition and a Win 11 Pro Sysprep edition on that media. Let's also assume that you have an autounattend.xml answer file that has a generic key for the Windows Pro edition. When you boot from that media to install Windows, you will be presented with a menu showing only these two Win 11 Pro based editions and you will need to choose one or the other because setup cannot determine which of the two Windows Pro editions to install. In this situation, follow the steps below if you want to automate the selection of the correct Windows edition.

```
*****
* Automating Installation for a Multi Edition Boot *
*****
```

To select which edition to have unattended setup install when there are more than one of the same edition (for example, multiple Win 11 Pro editions), you will need to modify your **autounattend.xml** answer file like this:

Load your **autounattend.xml** answer file in the Windows System Image Manager. In the Windows Image pane, expand the following tree:

**Setup > ImageInstall > OSImage > InstallFrom**

Right click on **MetaData** and select **Add Setting** to **Pass1 windowsPE**

In the Answer File pane, click on **MetaData** in the tree and set these values:

**Key:** /IMAGE/INDEX  
**Value:** <the index number of the Edition you want to install>

**NOTE:** Each Windows edition will have a unique index number: 1, 2, 3, 4, etc.

To determine the index number for the value above, run this command (assuming the image is mounted as **E:**):

```
dism /Get-WimInfo /WimFile:E:\Sources\install.wim
```

Example:

If you want to install the edition with an index of 6, set these values:

**Key:** /IMAGE/INDEX  
**Value:** 6

Note that you can also choose the edition of Windows by specifying the **NAME** or **DESCRIPTION** of the Windows edition like this rather than the index number:

```
/IMAGE/NAME
or
/IMAGE/DESCRIPTION
```

The same command shown above that lists the index also shows the **NAME** and **DESCRIPTION** for each Windows edition.

As always, perform a validity check on your answer file, and save it as **autounattend.xml** on the root of your media.

**NOTES:** If you are installing to a VM, see the note below called [Special Considerations for Virtual Machines](#) that can make things much easier for you. In addition, note that if you use a metadata entry noted above, you can omit the generic license key if you wish, but you can also leave it in place.

```
*****
* Special Considerations for Virtual Machines *
*****
```

The above steps are super easy to accomplish on writable media such as a thumb drive because you can simply drop your answer file onto the physical media, but for an ISO image, you probably don't want to have to recreate the image every time to automate installation of different Windows editions.

Consider creating a separate small ISO file with nothing but your answer file. Creating that ISO can take only seconds. Simply attach it as a second DVD-ROM drive to your VM. This works because Windows setup will search each drive for an answer file, not just the drive that has your Windows installation files.

```
*****
*                               *
*           END OF SECTION      *
* Multiple Windows Editions in One Image *
*       Bootable from BIOS and UEFI      *
* Created Using Only Native Windows Tools *
*****
```

```
*****
* Create a Bootable DVD *
*****
```

Follow the steps in the section [Bootable ISO Image](#), then use your favorite DVD burning application to burn that ISO image to disc. As an alternative, in Windows, right-click on the ISO image and choose "Burn disc image". If you have a Blu-Ray writer, you can also use Blu-Ray media.

Because every program has its own procedures for making an image or disc bootable, I cannot provide precise steps here. If you want a proven known reliable way of creating your images or media, I suggest using the [Bootable Flash Drive Using Only Native MS Tools](#) option. This has never failed me.

```
*****
* Bootable Flash Drive Using Only Native MS Tools *
*****
```

1) Run diskpart.

2) From the diskpart> prompt, run this command:

```
list disk
```

3) From the size of the disks, try to determine which disk ID is your thumb drive. If that is not enough information, run these commands to get more detail on the disk. In this example, I want more info on disk 4:

```
select disk 4
detail disk
```

Here is some sample output:

```
DISKPART> list disk
```

| Disk ### | Status | Size    | Free    | Dyn | Gpt |
|----------|--------|---------|---------|-----|-----|
| Disk 0   | Online | 476 GB  | 0 B     |     | *   |
| Disk 1   | Online | 3726 GB | 0 B     |     | *   |
| Disk 2   | Online | 465 GB  | 1024 KB |     | *   |
| Disk 3   | Online | 7452 GB | 0 B     |     | *   |
| Disk 4   | Online | 238 GB  | 0 B     |     |     |

```
DISKPART> select disk 4
```

Disk 4 is now the selected disk.

```
DISKPART> detail disk
```

```
SanDisk Extreme Pro USB Device
Disk ID: DC727760
Type   : USB
Status : Online
Path   : 0
Target : 0
LUN ID : 0
Location Path : UNAVAILABLE
Current Read-only State : No
Read-only   : No
Boot Disk   : No
Pagefile Disk : No
Hibernation File Disk : No
Crashdump Disk : No
Clustered Disk : No
```

| Volume ###                  | Ltr | Label       | Fs   | Type      | Size   | Status  | Info |
|-----------------------------|-----|-------------|------|-----------|--------|---------|------|
| Volume 7                    | Z   | My Software | NTFS | Removable | 238 GB | Healthy |      |
| C:\MountPoints\My Software\ |     |             |      |           |        |         |      |

4) When you determine the correct disk, run these commands. I am assuming disk 5 in the following example:

```

select disk 5
clean (if you get an error running this command, run it again)
convert mbr
create partition primary size=2000
active
format fs=fat32 quick
assign
create partition primary
format fs=ntfs quick
assign
exit

```

**NOTE:** The **assign** commands will assign the next available drive letter. If you want to assign specific drives letters, for example **E:**, use the command **assign letter=E**.

- 5) We will now copy files from the source to the two partitions on the thumb drive. To be clear, all the files and folders that you are being asked to copy come from your source folder such as a folder on your hard disk that contains all the Windows files, or from a mounted Windows ISO image.

Start by checking to see if your original source has a file called **ei.cfg** in **\sources** folder. If that file is already present, skip to step 6.

Create a text file called **ei.cfg**. We will use that below. Place the following 2 lines into that file:

```

[Channel]
Retail

```

**Notes about ei.cfg:** Let's say that you have a computer that shipped with Windows 10 Home, but you upgraded to Pro. You may find that when you try to perform a clean install, Windows simply starts installing Home and doesn't even show you the menu from which you can select other editions. By placing this file in the sources folder, we prevent that from happening. This happens because Windows setup reads a signature in the BIOS that tells setup which edition of Windows the system was shipped with.

Note that when performing an unattended installation, this file is not needed because the **autounattend.xml** specifies the edition of Windows to install, but you can leave the **ei.cfg** in place as it won't hurt anything. I always include this file.

- 6) Follow these steps to copy files to your thumb drive:

- Copy all files and folders **EXCEPT** the **\sources** folder to the FAT32 partition (the first, smaller partition).
- If you are planning to use an **autounattend.xml** answer file, place it in the root of the first (FAT32) partition.
- Create a folder called **sources** on the FAT32 partition.
- Copy the file **\sources\boot.wim** to the FAT32 partition **\sources** folder.

- Create a folder called **sources** on the NTFS partition (the second, larger partition).
- Copy all files and folders from the **\sources** folder **EXCEPT** **boot.wim** to the **\sources** folder on the NTFS partition.
- If you created an **ei.cfg** file, copy it to the **\sources** folder of the NTFS partition.
- Copy the folders **boot**, **efi**, and **support** from the source to the root of the NTFS partition. Note that these three folders will now exist on both the first and second partitions. These are VERY small folders, so the duplication of data is very minor.

**NOTE:** The last bullet above becomes necessary with Windows 11 24H2+.

At this point, you should have a bootable thumb drive.

**NOTE:** When booting you may be presented with an option to boot either the FAT32 or the NTFS partition. Choose the FAT32 partition. If it is not clear which one the FAT32 partition is, simply try either. If it doesn't work, reboot and try the other.