

Use Windows for Automatic Backup System

What

Use Windows and its installed utilities to set up an Automatic Backup System that has both incremental backup of data files and drive images of the Windows drive.

Why

If you don't have a copy of your data files on another HD, you will lose them and may not be able to recover them. If you don't have an image of the drive that Windows is installed on, you will have to reinstall Windows, all updates, all applications, and make all adjustments and settings just like you did when you first got this version of Windows. Why? Because a HD *will* reach a point where you no longer can access files on the drive (not if, but when it will happen). This setup doesn't require third party software and is totally automatic (except for moving 1 file every 1 - 3 months).

How

Note: The instructions on how to set this up are broken in Stages. While the length of the following instructions make it appear to be a daunting task, the details and screen shots that make the instructions long also make it easy to follow and do. The time and effort you do now to set this system up will pay you back a thousand fold in the future.

Stage One – Planning

Step 1

The backups must be stored on a separate external hard drive. I recommend two external hard drives so one copy of the backups can be kept off site. You will also need a flash drive that is at least 16GB. The backup will be easier if you keep all your personal data files together (this includes email files) and even better if your personal data files are kept on a separate drive. Everything else you will need already comes installed in Windows 10 Home version.

The example I use will have Windows installed on C: drive, all data files kept on separate drive D:, and backups are stored on an external drive G:. You will need to change the Path addresses in my examples to match the Path addresses in your setup. The Path addresses to what to backup and where to put it must be exact. Test your addresses by entering them in the address bar of File Explorer and see if what displays is what you want to backup.

Step 2

On the external drive you plan to keep the backups on, create a folder and name it *Personal Bkup*.

Stage Two – Automatic Personal Data Backups

Step 1

Open Notepad to a new document. Enter the following lines of commands (with the changes indicated below) so there are no lines above the first line and no spaces to the left of each line.

```
%echo_off
```

```
robocopy_“SOURCE”_“STORAGE”_/B_/E_/IM_/R:5_/W:5_/MT:32_/LOG:“STORAGE\BkupLog.txt”
```

```
exit
```

Replace each underscore (_) with a space

Replace **SOURCE** with the exact Path address to the personal data you wish to backup – in my example below the SOURCE is D: for the entire D drive.

Replace **STORAGE** with the exact Path address to the external drive folder where the backup will be stored – in my example it will be Personal Bkup folder on my G: drive ("G:\Personal Bkup").

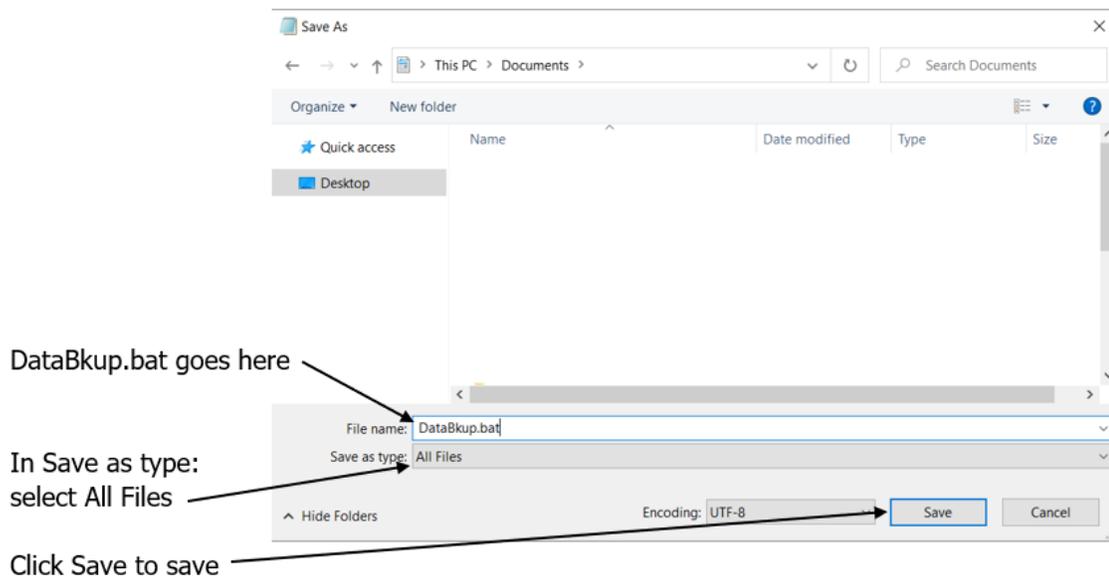
Be sure the Path addresses are inside quotation marks.

For my example the commands would look like this:

```
%echo off
```

```
robocopy "D:" "G:\Personal Bkup" /B /E /IM /R:5 /W:5 /MT:32 /LOG:"G:\Personal Bkup\BkupLog.txt"  
exit
```

Select *File > Save as* to open the *Save as* window as shown below. Choose a location to save this file, but don't store this file on the drive you are going to backup. In the **Save as type:** box click the dropdown arrow and select **All Files**. In the **File name:** box enter **DataBkup.bat** (be sure to include the .bat as part of the file name). Press *Save* to save the file.



Step 2

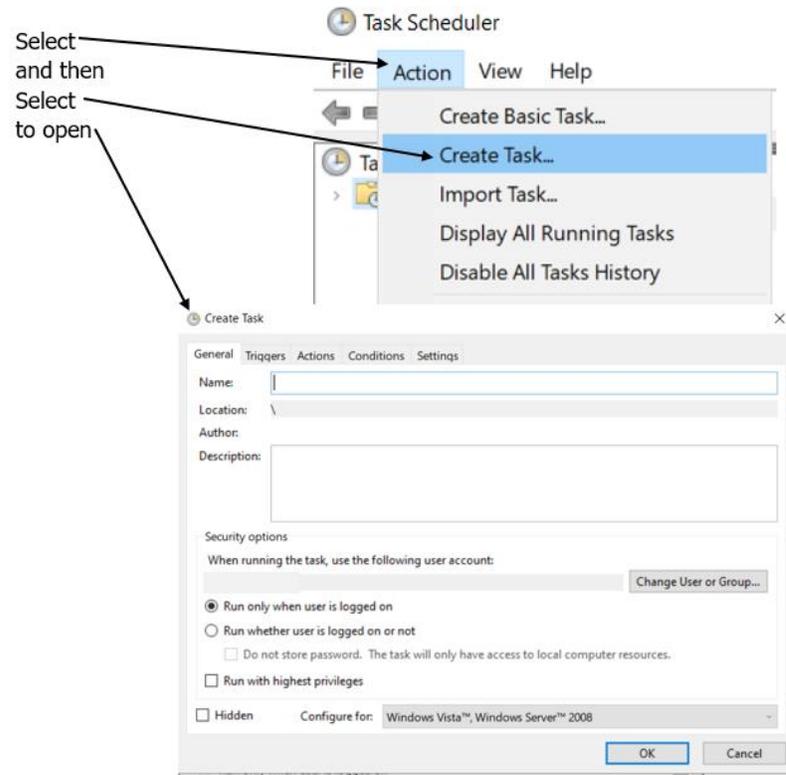
Next, you need to test the DataBkup.bat file. All the files that are going to be copied cannot be in use and the first backup will be copying all the files, so depending on how much data you have this could take a while and you should allow for this non-use backup time. To run the DataBkup.bat file: right click the file and select **Run as administrator** and then **Yes** to the UAC box. A detailed log of the backup is in the BkupLog.txt file in the G:\Personal Bkup folder.

After the first run, this backup will copy and replace only those files that have been added or changed since the last backup, which means future backups will be significantly quicker. In addition this backup command will copy and paste data 4 times faster than File Explorer. This "replace the file only when modified" means the backup folder will have only one copy of each file, but it is the latest version. No need to manage accumulated backup files.

Step 3

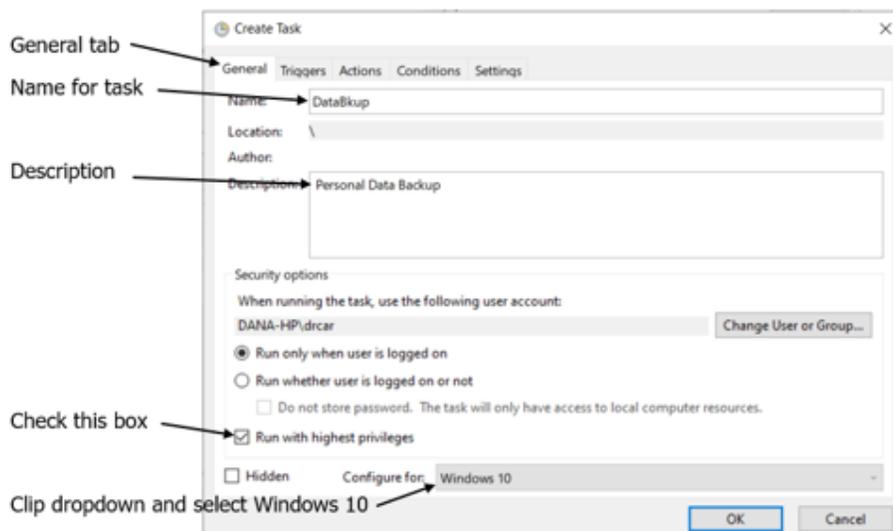
Now that you have a bat file that will backup all your personal data, its time to make these backups automatic and maintenance free. Open *Task Scheduler* by opening a Run box (*WinKey + R*), type in **taskschd.msc**, and press the *Enter* key.

In the Task Scheduler window, select *Action > Create Task...* as shown below to open the *Create Task* window to the general tab.



On the General tab:

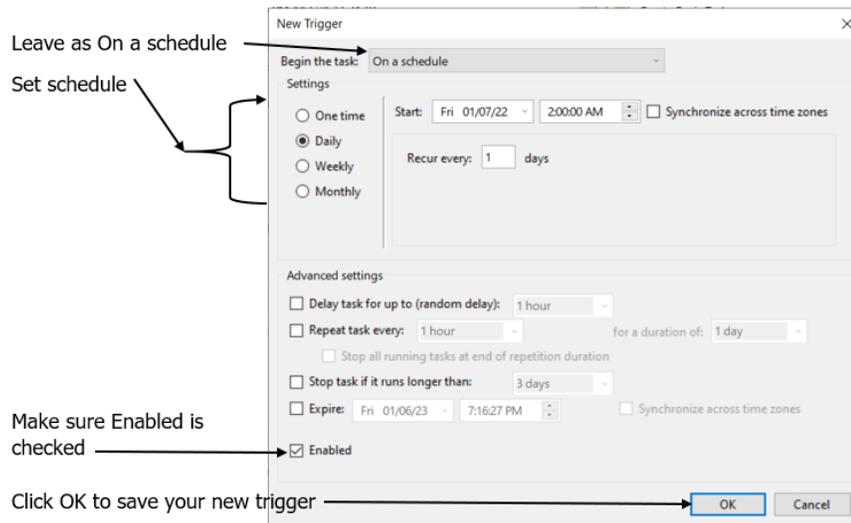
- ☞ Enter **DataBkup** for the Name (any name will do but the name must have no spaces in it).
- ☞ Enter *Personal data backup* in the Description box
- ☞ Place a checkmark in the box next to *Run with highest privileges*
- ☞ Click the dropdown arrow in the *Configure for:* box and select *Windows 10* as shown below.



Select the *Triggers* tab and on it:

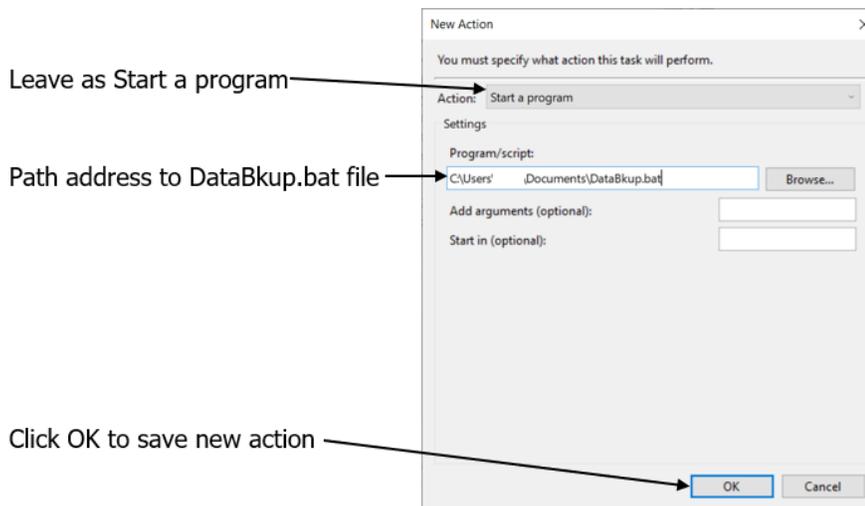
- ☞ Click the *New...* button to open the New Trigger window
- ☞ Leave *Begin the task:* set to **On a schedule**
- ☞ Set how often you want this backup to occur. I have my example set to Daily backups at 2:00 am
- ☞ Make sure the *Enabled* box is checked
- ☞ Click OK to save the new trigger and return to the Triggers tab

as shown below.



Select the *Actions* tab and on it:

- ☞ Click the *New...* button to open the New Action window
 - ☞ Leave the *Action* box with *Start a program* selected
 - ☞ In the *Program/script* box put the Path address to the *DataBkup.bat* file you made. You can also use the browse to go to the bat file
 - ☞ Press *OK* to save your new action and return to the Actions ta
- as shown below:

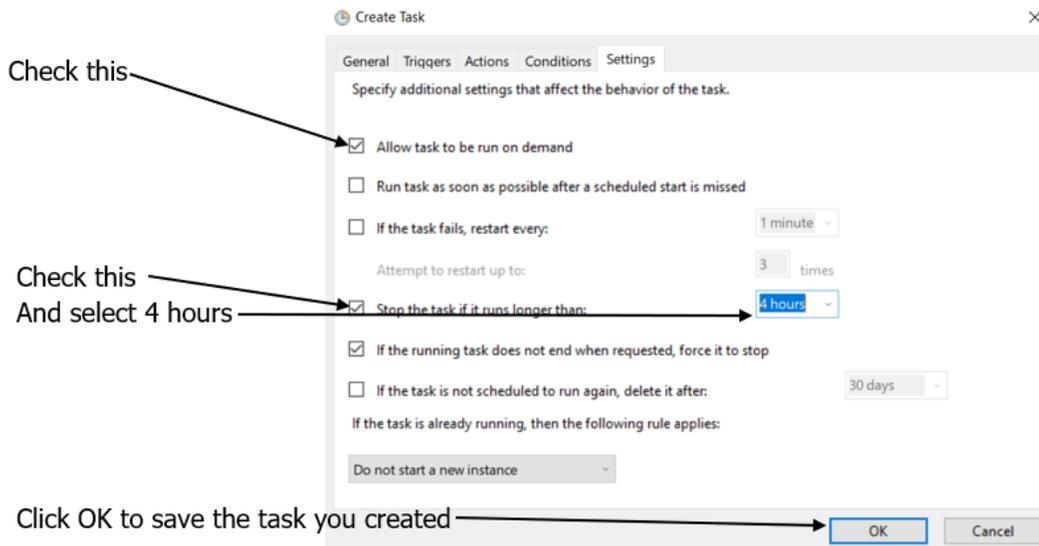


Select the *Conditions* tab and on it:

- ☞ Make sure *Wake the computer to run this task* is checked so this bat file in the middle of the night, if you have Windows set to go to sleep mode.

Select the Settings tab and on it:

- ☞ Make sure *Allow task to be run on demand* is checked
- ☞ Check *Stop the task if it runs longer than:* and enter *4 hours*.
- ☞ Click *OK* to save the new Task and close the Create Task window as shown below



Step 4

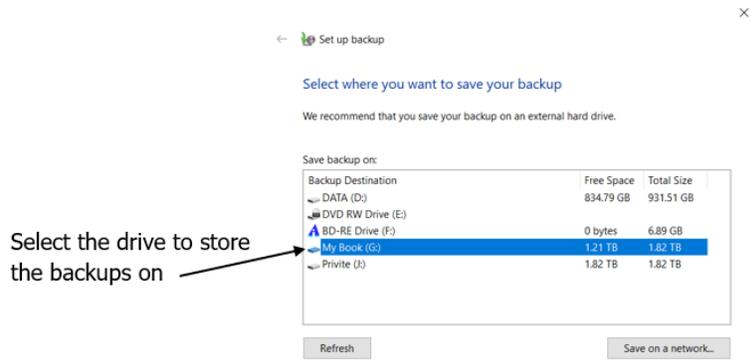
Automatic Personal data backup is set up. Check the *Bkuplog.txt* file for a report of the last backup to make sure the backups are occurring when you scheduled them. Anytime you need a copy of personal data, the latest copy is there in that backup folder on a separate drive.

Stage Three – Automatic Image Backups

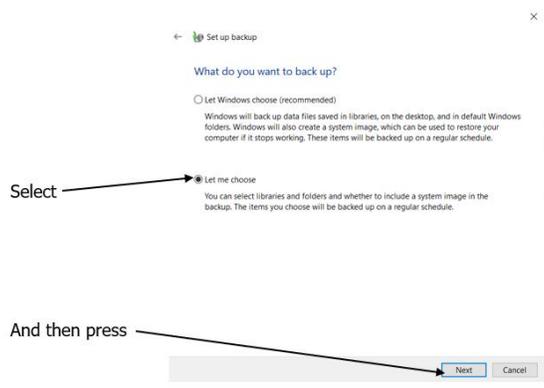
Note: Don't start this creating a backup image until you have the time to allow the PC to make the backup image and make sure the external drive you want to store the backups on is connected and accessible.

Step 1

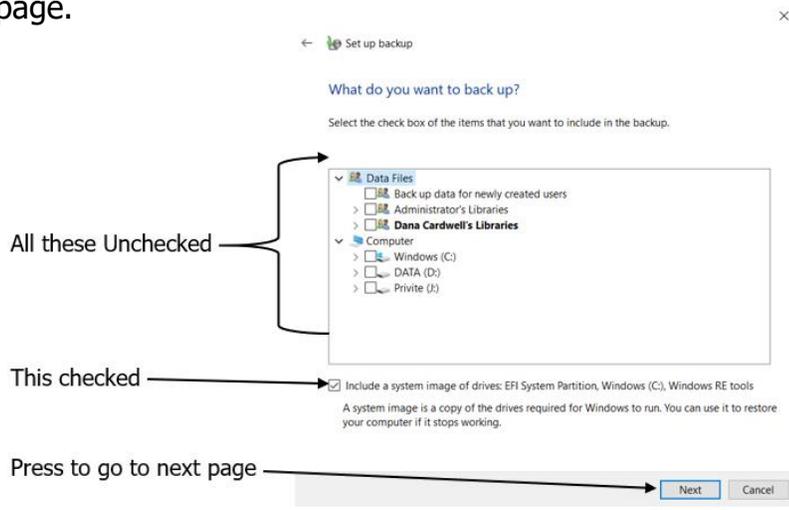
Open a Run box (*WinKey +R*), type in **sdclt**, and press the *Enter* key. This will open the *Control panel Backup and Restore (Windows 7)* window. This utility was introduced in Windows 7 and has remained the same thru Windows 10. If you have never used the Windows Backup Utility, press *Set up backup* to start the Windows Backup Utility. If you have used the Backup Utility before, under Backup press *Change settings* to start the Windows Backup Utility. The setup backup window will open displaying the drives Windows detects as shown below. Select the external hard drive where you want the backup images stored. Windows Backup Utility will backup up to the root of a drive which means Windows creates its own folders for the backups on the root directory of the drive the backups are stored on. Also notice that the list of drives does not show the drive Windows is installed on (usually C:), because you can't store backups on the same drive Windows is installed on. After you selected the drive to store the backup images on, press the Next button to open the next setup page.



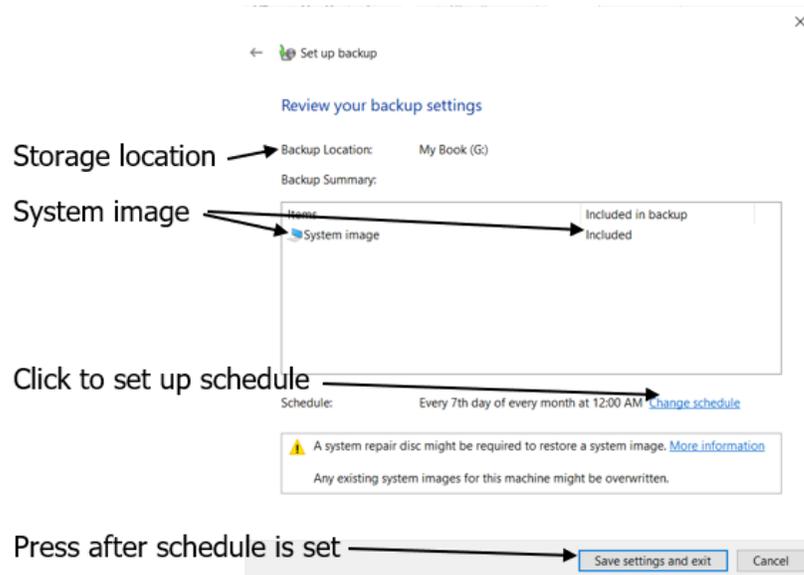
The next page asks *What do you want to back up?* to which you select *Let me choose* as shown below and then press the Next button to go to the next page.



The next page is the *What do you want to back up?* page. The list of files under *Data files* and *Computer* in this window are all for personal data backup, so make sure all these are **unchecked** as shown below. Below this window of personal data locations place a checkmark next to **Include a system image of drives:** The drives listed will be all part of the Windows install. With no personal files selected, this backup becomes a backup image of the drive Windows is installed on. Press Next to go to the next page.

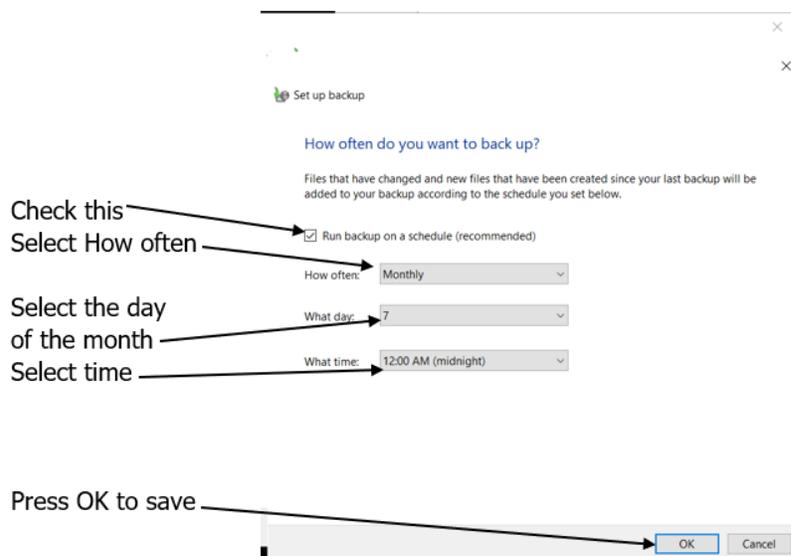


The next page is to *Review your backup settings* as shown below. Make sure the *Backup Location* is the drive you want the backups stored on and that the Backup Summary shows *System Image – Included* as shown below. Click *Change schedule* to set up the schedule for these backup images.



On the *How often do you want to back up?* page as shown below:

- ☞ Check the box next to *Run backup on a schedule*
- ☞ Choose how often from the dropdown list. I selected Monthly for my example which is good for most users
- ☞ Choose a day of the month for this scheduled backup to occur
- ☞ Choose a time of day the backup will be done on the date selected. It is best to choose a time that will not conflict with the daily backups of your personal data, so I choose 12 AM(Midnight).
- ☞ Click OK to save your schedule and return to the Review Settings page



Notice the warning statements at the bottom of the Review settings page above. Both of the issues are addressed below. If you never used the Backup Utility before then you press *Save settings and run backup* button which will run your first backup. You can still use Windows while it makes the backup image, but it will complete the job faster if you let it backup by itself. As a reference, it took my system 25 minutes to create the image for 55 GBs of an internal SSD backing up to a USB 3.0 external drive. Don't be alarmed if it appears to hang at 95-97%, be patient and let it finish on its own.

Step 2

When the backup image is finished go to the external drive the image is stored on. Windows created a folder on the drive named *WindowsImageBackup*. Click to open this *WindowsImageBackup* folder and you may receive a warning notice that you don't yet have permission to access this folder and to press *Continue* to gain permission. You will have to do that for all other folders in that folder. These backup images are accessible only by users with administrative rights and Windows is adding your user logon with administrative rights to the list of users with permission to access the files. Inside the *WindowsImageBackup* folder is another folder that is the name of the PC windows is installed on. Inside that folder is a folder labeled *Backup* with the date the backup was made followed by some numbers such as *Backup 2022-01-07 060029* which holds the backup image.

Step 3

Each time Windows makes a backup image it replaces the image in the *WindowsImageBackup* folder with the new one. This means you have only one image less than 30 days old to restore. Sometimes it may take you more than 30 days to discover a problem which a restore before it occurred can solve, but if the only image you have was taken after the problem occurred, then the restore has the problem too. I suggest you keep more than one image. I save the image every 3 months and keep a year's worth at a time. To do this does require the only non-automatic thing in this setup.

To save the backup image on that same external hard drive:

- ☞ Create a folder on the external drive and name it *CImage date* where date is the date the image was made such as *CImage1-7-2022*.
- ☞ Move the *WindowsImageBackup* folder into this *CImage1-7-2022* folder.
- ☞ The next time Windows makes a backup image it will create a new *WindowsImageBackup* folder and sub folders.
- ☞ I made a document with the message to *move image file* which Task Scheduler has been set to open every 3 months to remind me to perform this one task this backup system requires.

Stage Four – Using Your Backups to Recover

Step 1

The whole purpose in setting up this system is to use your backups to recover from disaster which this Stage explains how. Using your backups to recover is different for Personal data and the Windows image. Step 2 will explain recovering personal data and Step 3 and on explain how to recover Windows image.

Step 2 – Recover Personal Data

Recovering personal data files most often involves a single file or folder. Open the backup folder on the external drive and copy the file or folder to replace the lost or corrupt one on your data drive. If

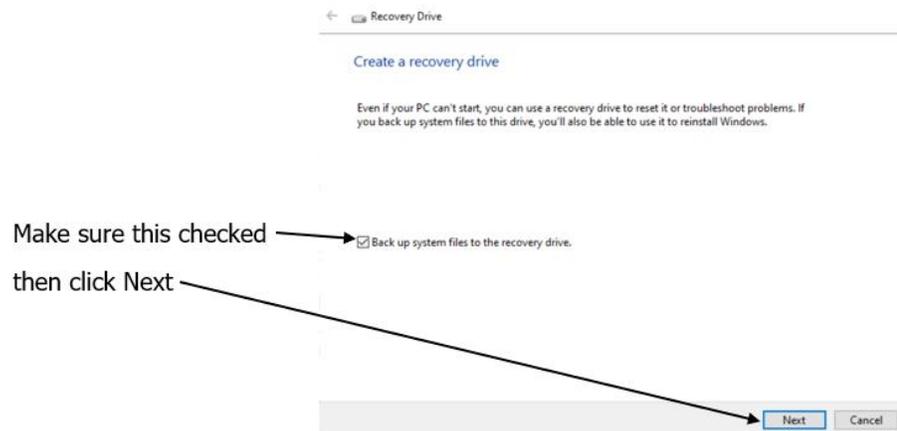
you lose your entire personal data drive, you can copy the entire backup folder and paste onto a new drive. Bingo, new drive with all personal files and folders like it was within the last 24 hours.

Step 3 – Create a Bootable Flash Drive

In order to restore a backup image to the Windows drive, you must boot the PC to another drive and command the image restore from that drive. Windows provides a utility to build a bootable flash drive.

Plug the flash drive into the USB port and make sure Windows recognizes the drive by seeing it listed in File Explorer and note the drive letter that Windows assigned to that flash drive.

Open a Run box (*Win Key + R*), type in **RecoveryDrive.exe**, and press the *Enter* key. Click *Yes* to the UAC box that opens. This will open the Recovery Drive Creation Tool as shown below. Make sure *Back up system files to the recovery drive* is checked and then click *Next*.^x



The next page scans the PC for drives that can be used to create a bootable drive. This may take a while. Once the scan is complete it will show the drives that it can use. Be careful and select the flash drive with nothing on it – it will have the drive letter you noted earlier. All data on the drive the creation tool is used on will be deleted. After you select the correct flash drive, press the *Next* button to start the creation of the recovery drive. This will take a long time, but you can use your PC for other things while the creation tool works in the background. When the creation tool is completed it will display a message that it is completed. Press the *Finish* button to close the tool.

Step 4 – Testing the Recovery Flash Drive

Now that you have created your Bootable Recovery Flash drive you need to test it and make sure it will boot when you need it. In order to get the flash drive to boot you must know how to enter your BIOS/UEFI settings and change the boot order to boot the flash drive. The procedure is different with different brands of PCs. A simple search for your "model PC" and "boot order" should provide you with web sites that have instructions on how to enter your BIOS/UEFI and change the boot order. Write these instructions down on a piece of paper.

To boot to the Recovery Flash Drive:

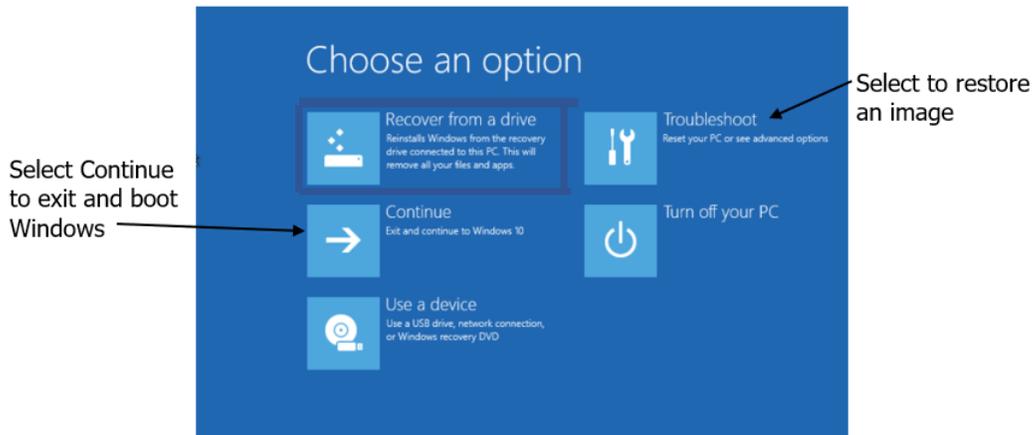
Plug the Recovery Flash Drive into the USB port

Reboot the PC

Enter BIOS/UEFI during the reboot process and change the boot order to the Recovery Flash Drive

It takes a while for the Recovery Drive to boot up. When the Recovery Drive has finished booting up, the screen will display asking you to select a keyboard language (usually with the correct one already

selected). This screen means the Recovery Drive booted the PC correctly. Press the *Enter* key to accept the chosen language and proceed to the next screen as shown below. Press *Continue* to exit and boot Windows 10.



Once you know the Recovery Flash Drive works and have the instructions on how to change the boot order for your PC, get an old DVD case. Remove the paper insert and write on the blank back side Windows Recovery Drive and place the insert back in the case with the new title showing. Tape the Recovery Flash drive inside the case, put your written instructions on how to change the boot order in the case, and put a copy of these Step 4 and 5 instructions into the case. Now you have a recovery system on your DVD shelf with instructions on what to do in case these instructions are in the dead PC when disaster strikes.

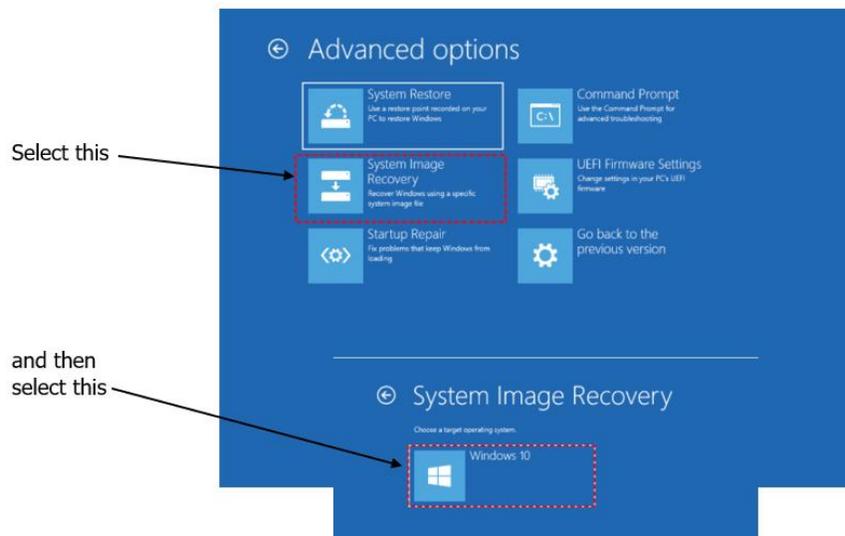
Step 5 – Restore a Windows Backup Image

To restore a backup image the external drive where the backups are stored on must be connected to the PC. Boot the Recovery Flash Drive according to the instructions in Step 4 above.

At the *Choose an option* screen as shown above, select *Troubleshoot* which will open the next screen.

Select *Advanced Options*.

Select *System Image Recovery* from the Advanced Option screen as shown below. Click Windows 10 image on the next screen as shown in insert below.



The *Re-image your computer* window will open with the image it found in the WindowsImageBackup folder on the external drive which is the last image you made (< 1 month ago). Click Next to use that image or click *Select a system image* to select another system image to restore. The re-imaging process will take more time than it took to make the image. When finish Windows will be like it was the day the image was made.

Comments

If you restore the image to a new drive, the drive must be as large as the drive the image was made from or the re-image will fail.

If the drive you restore the image to is larger than the drive the image was made from, the image may not recognize that part of the drive that is larger than the image drive was. This can be fixed by running the drive expand wizard in Computer Management.