Windows 10 Backup and Recovery

Preparing for Trouble

Computer problems, like the proverbial death and taxes, seem to be one of those constants in life. Whether it's a hard disk giving up the ghost, a power failure that trashes your files, or a virus that invades your system, the issue isn't whether something will go wrong, but rather when it will happen. Instead of waiting to deal with these difficulties after they've occurred (what we call pound-of-cure mode), you need to become proactive and perform maintenance on your system in advance (ounce-of-prevention mode). This not only reduces the chances that something will go wrong, but also sets up your system to recover more easily from any problems that do occur.

A big part of ounce-of-prevention mode is the unwavering belief that someday something will go wrong with your computer. That might sound unduly pessimistic, but hey, this is a PC we're talking about here, and it's never a question of if the thing will go belly up one day, but rather when that day will come.

With that gloomy mindset, the only sensible thing to do is prepare for that dire day so that you're ready to get your system back on its feet. So, part of your Windows 10 maintenance chores should be getting a few things ready that will serve you well on the day your PC decides to go haywire on you. Besides performing a system image backup (which we describe a bit later), you should be setting system restore points and creating a system recovery disc. The next two sections cover these last two techniques.

Backing Up File Versions with File History

High-end databases have long supported the idea of the transaction, a collection of data modifications—inserts, deletions, updates, and so on—treated as a unit, meaning that either all the modifications occur or not one of them does. For example, consider a finance database system that needs to perform a single chore: transfer a specified amount of money from one account to another. This involves two discrete steps (I'm simplifying here): debit one account by the specified amount and credit the other account for the same amount. If the database system did not treat these two steps as a single transaction, you could run into problems. For example, if the system successfully debited the first account but for some reason was unable to credit the second account, the system would be left in an unbalanced state. By treating the two steps as a single transaction, the system does not commit any changes unless both steps occur successfully. If the credit to the second account fails, the transaction is rolled back to the beginning, meaning that the debit to the first account is reversed and the system reverts to a stable state.

What does all this have to do with the Windows 10 file system? It's actually directly related because Windows 10 includes an interesting technology called Transactional NTFS, or TxF, for short. (New Technology File System [NTFS] is the default Windows 10 file system.) TxF applies the same transactional database ideas to the file system. Put simply, with TxF, if some mishap occurs to your data—it could be a system crash, a program crash, an overwrite of an important file, or even just imprudent edits to a file—Windows 10 enables you to roll back the file to a previous version. It's kind of like System Restore, except that it works not for the entire system, but for individual files and folders.

Windows 10's capability to restore previous versions of files and folders comes from two processes:

- Once an hour, Windows 10 creates a shadow copy of your user account files. A shadow copy is essentially a snapshot of the disk's contents at a particular point in time. It doesn't necessarily take up a lot of extra disk space: Windows only has to allocate space to hold data changed made after the snapshot is taken.

- After creating the shadow copy, Windows 10 uses transactional NTFS to intercept all calls to the file system. Windows 10 maintains a meticulous log of those calls so that it knows exactly which files and folders in your user account have changed.

These processes enable Windows 10 to store previous versions of files and folders, where a “previous” version is defined as a version of the object that changed after a shadow copy was created. For example, suppose that you make changes to a particular document on two successive days. This means that you’ll end up with three previous versions of the document: today’s, yesterday’s, and the day before yesterday’s.

Taken together, these previous versions represent the document’s file history, and you can access and work with previous versions by activating the File History feature. When you turn on File History and specify an external drive to store the data, Windows 10 begins monitoring your libraries, your desktop, your contacts, and your Internet Explorer favorites. Once an hour, Windows 10 checks to see if any of this data has changed since the last check. If it has, Windows 10 saves copies of the changed files to the external drive.

Once you have some data saved, you can then use it to restore a previous version of a file, as described later in this chapter.

Selecting the File History Drive

To get started, connect an external drive to your PC. The drive should have enough capacity to hold your user account files, so an external hard drive is probably best. Now you need to set up the external drive for use with File History.

The easiest way to do this is to look for the notification that appears a few moments after you connect the drive. Click the notification, and then click Configure This Drive for Backup.

If you miss the notification, follow these steps instead. There are (of course) several ways to do the same thing. This is the way we do it:

1. In the taskbar’s Search box, type history and from the results select Backup Settings. (Or, click Start, Settings, Update & Security, Backup.) The Backup settings window appears.
2. If Automatically Back Up My Files is already turned on, you can skip the rest of these steps. Otherwise, click Add a Drive.

   Figure 32.1

   Windows 10 should recognize your external drive and add it to the Select A Drive panel, on the left side of this figure.

3. Examine the list of available drives, shown in Figure 32.1, Click on the name of the drive you wish to use. You can select Show All Network Locations to choose a folder shared on the network by another computer or a Network Attached Storage (NAS) device. If you use a network folder, remember that your files on *this* computer are going to have to fit on the hard disk of *that* computer.
4. The Settings window should now show that Automatically Back Up My Files is turned on.

Using a Network Share as the File History Drive

If you want to back up to a drive shared on your network, where the share requires a username and password (that's not the same as the username and password for your Windows account), or, you want to use a folder *within* a network share, you will have to use the Control Panel version of the File History settings panel.

1. From the Backup settings panel, select More Options. Scroll down and select See Advanced Settings.

2. Click Add Network Location. Windows opens the Select Folder dialog box and displays the Network folder, but you can browse around to other locations or drives.
3. Locate the shared folder you want to use, digging down into subfolders if desired. If the share requires a password, you may need to type the UNC path into the Folder box. You will then be prompted to enter the required credentials, as shown in Figure 32.2. Be sure to check Remember My Credentials, so that Windows can connect to the shared folder every times saves files to the backup set. Make sure the network share is selected, and then click Select Folder. The shared folder now appears in the list of available backup drives and locations under Select a File History Drive.

   Figure 32.2

   The Control Panel version of File History settings lets you manually enter a network shared folder path, and password, if needed.

4. Select the shared file location, then click OK. This location will be used for future File History backups.

Including and Excluding Folders in Your File History

By default, File History stores copies of everything in your Windows 10 libraries—including Documents, Music, Photos, and Videos—as well as your desktop items, contacts, and Internet Explorer favorites. While the profile folders are the "correct" place for you to have stored all of your data, you might create folders in other parts of the hard drive, perhaps even in the root folder. You may well want these files to be backed up by File History. If you do, you have to manually add them to the backup list.

Likewise, in some situations you might not want every file to be included in your history. For example, if your external drive has a limited capacity, you might want to exclude extremely large files, such as recorded TV shows or ripped movies in your Videos library. Or, you might have sensitive or private files in your Documents library that you do not want copied to the external drive because that drive can easily be stolen or lost. (A similar caveat applies to storing sensitive files on a shared network folder that other people might also be able to access.)

Whatever the reason, you can configure File History to include and exclude particulars folder from being copied to the external drive by following these steps:

1. In the taskbar's Search box, type **backup** and then select Backup Settings. Then, select More Options.
2. To add additional folders to the backup set, scroll down to Back Up These Folder, and click Add a Folder. Browse to the desired folder (it might even be on a different internal drive), and select Choose This Folder. Repeat for any additional folders that you want to protect. All subfolders within the selected folder will also be backed up, unless you manually exclude them.
3. To exclude folders from being backed up, scroll down to Exclude These Folders. Click Add a Folder. Browse to the desired folder (it might even be on a different internal drive), and select Choose This Folder. Repeat for any additional folders that you want to exclude. All subfolders within the selected folder will also be excluded.

The listed folders will added to or excluded from future backups.

To later remove a folder you've added or excluded, click on its name, and select Remove.

Configuring File History

File History uses the following default settings:

tip

You don't have to wait until the next scheduled backup. If File History is turned on and you have important changes you'd prefer to save right away, open Backup Settings, select More options, and then click Back Up Now.

- File History looks for changed files every hour—If you are particularly busy, you might prefer a more frequent save interval to ensure you don't lose any data. On the other hand, if you are running out of space on the external drive, you might prefer a less frequent save interval to preserve space.
- File History does not delete any of the file versions it saves—To free up space on the external drive, you can configure File History to delete versions after a specified time or when space is needed on the drive.

Follow these steps to configure these settings:

1. In the taskbar's Search box, type history, and then click Backup Settings to open the settings panel. Then, click More Options.
2. To change the backup frequency, scroll down to Back Up My Files, and select a frequency from every 10 minutes to daily.
3. Under Keep My Backups, you can change the retention for back-up copies to Forever, Until Space is Needed, or one of the listed durations ranging from months to years.
4. If you're using an external drive (or a second internal drive) and your computer is part of a homegroup, you can allow other homegroup users the chance to use the same drive for their backups. To do this, scroll the settings page *way* down and select Show Advanced Settings. Then, at the left, select Advanced Settings. As shown in Figure 32.3, under HomeGroup, check Recommend This Drive.

   Figure 32.3

   Use the Advanced Settings window to recommend your backup drive to other homegroup users, and to examine backup error logs.

5. If you want to keep an eye on what File History is doing, in this same Advanced Settings page click Open File History Event Logs to View Recent Events or Errors. This launches the Event Viewer and displays the File History Backup Log.
6. Click Save Changes to put the new settings into effect.

Cleaning Up History to Save Disk Space

If your external drive is running low on free space, you can delete some older versions right away. Open the File History backup settings page, select More Options, scroll *way* down to See Advanced Settings, then, at the left, click Advanced Settings. Click Clean Up Versions to open the File History Cleanup dialog box, select a time frame for the files you want to remove (from Older Than 1 Month to Older Than 2 Years, or All But the Latest One), and then click Clean Up. (Note that you only see the Clean Up Versions link if File History has at least one set of file versions stored on your PC.)

note

If you need to remove the external drive temporarily (for example, if you need to use the port for another device), you should turn off File History before disconnecting the external drive. In the taskbar's Search box, type history and then click Backup Settings. Turn Automatically Back Up My Files off.

Restoring a Previous Version of a File

When you enable File History on your PC, as described earlier in this chapter, Windows 10 periodically—by default, once an hour—looks for files that have changed since the last check. If it finds a changed file, it takes a "snapshot" of that file and saves that version of the file to the external drive that you specified when you set up File History. This gives Windows 10 the capability to reverse the changes you have made to a file by reverting to an earlier state of the file. An earlier state of a file is called a previous version.

note

Windows 10 also keeps track of previous versions of folders, which is useful if an entire folder becomes corrupted because of a system crash.

Why would you want to revert to a previous version of a file? One reason is that you might improperly edit the file by deleting or changing important data. In some cases, you might be able to restore that data by going back to a previous version of the file. Another reason is that the file might become corrupted if the program or Windows 10 crashes. You can get back a working version of the file by restoring a previous version.

There are two ways to restore a previous version of a file.

If you can locate the file that you want to restore in File Explorer, follow these steps:

1. In File Explorer, right-click the file and select Restore Previous Versions.
2. From the list of saved version, select the version you want to get back.
3. At the bottom of the dialog, make one of the following selections:
    - **Open**—Click Open to view the file as it was at the time it was backed up. Once opened, you can copy needed information out of file and simply close it, or, if you wish, use Save As to save it with a new name or location. (The saved file will have today's date.)
    - **Open in File History**—Click the arrow on the Open button and select Open in File History. You can preview the file and if desired click the "Restore" button to recover it.
    - **Restore**—Click the Restore button to recover the file as it was when it was backed up. The present version of the file will be lost.
    - **Restore To**—Click the arrow on the Restore button and select Restore To. Select a new location to store the recovered file. The present version will stay as and where it is.

Another way to recover files, and the easiest way if the file you want to recover has been deleted, is to follow these steps:

1. In the taskbar's Search box, type history and then click Backup Settings to open the File History settings panel. Select More Options, scroll *way* down, and then select Restore Files from a Current Backup
2. The Home - File History window appears, as shown in Figure 32.4. The most recent backup is selected, but you can scroll through different backups by clicking the previous and next backup buttons at the bottom of the window, on either side of the round green Restore button. (You can use these buttons at any time, even after you've delved into subfolders).

    Figure 32.4

    Use the Home - File History window to choose which previous version you want to restore.

3. Delve into the folders to find the file(s) and/or folder(s) you wish to return to their previous state. You can select more than one object. Note that if you select a folder, all of the files and subfolders in it will be restored to their previous state at the time of the backup.

4. Click the green Restore to Original Location (pointed out in Figure 32.4). If the original folder has a file with the same name, File History asks what you want to do. Select an option:
    - Replace the File in the Destination Folder—Click this option to overwrite the existing file with the previous version.
    - Skip This File—Click this option to skip the restore and do nothing.
    - Compare Info for Both Files—Click this option to display the File Conflict dialog box (see Figure 32.5), which shows the original and the previous version side by side, along with the last modification date and time and the file size. Check the box beside the version you want to keep, and then click Continue. To keep both versions, check both boxes. File History restores the previous version with (2) appended to its filename.

    

    Figure 32.5

    If the original folder has a file with the same name and you're not sure which one to keep, use the File Conflict dialog box to decide.

Setting System Restore Points

One of the biggest causes of Windows instability in the past was the tendency of some newly installed programs simply to not get along with Windows. The problem could be an executable file that didn't mesh with the Windows system or a Registry change that caused havoc on other programs or on Windows. Similarly, hardware installs often caused problems by adding faulty device drivers to the system or by corrupting the Registry.

To help guard against software or hardware installations that bring down the system, Windows 10 offers the System Restore feature. Its job is straightforward yet clever: to take periodic snapshots—called restore points or protection points—of your system, each of which includes the currently installed program files, Registry settings, and other crucial system data. The idea is that if a program or device installation causes problems on your system, you use System Restore to revert your system to the most recent restore point before the installation.

System Restore automatically creates restore points under the following conditions:

- Every week—This is called a system checkpoint, and it's set once a week during the automatic maintenance window as long as your computer is running. If your computer isn't running, the system checkpoint is created the next time you start your computer, assuming that it has been at least a week since that previous system checkpoint was set.
- Before installing certain applications—Some applications (notably Windows Live Essentials and Microsoft Office) are aware of System Restore and will ask it to create a restore point prior to installation.
- Before installing a Windows Update patch—System Restore creates a restore point before you install a patch either by hand via the Windows Update site or via the Automatic Updates feature.
- Before installing an unsigned device driver—Windows 10 warns you about installing unsigned drivers. If you choose to go ahead, the system creates a restore point before installing the driver.
- Before reverting to a previous configuration using System Restore—Sometimes, reverting to an earlier configuration doesn't fix the current problem or it creates its own set of problems. In these cases, System Restore creates a restore point before reverting so that you can undo the restoration.

It's also possible to create a restore point manually using the System Protection feature. Here are the steps to follow:

1. In the taskbar's Search box, type restore and then click Create a Restore Point in the search results. This opens the System Properties dialog box with the System Protection tab displayed, as shown in Figure 32.6.

Figure 32.6

Use the System Protection tab to set a restore point.

2. Sometimes Windows does not enable System Protection when it is installed. In the Protection Settings list, locate your System drive, usually drive C. If Protection is shown as Off, click this line to highlight it, then click Configure. Adjust the Max Usage slider to 10 to 15%, or at least 20GB of space, then click OK. The Protection Settings list should show drive C as On now.
3. To create automatic restore points for other drives (especially drives on which you install apps), click the drive in the Protection Settings list, click Configure, click the Turn on System Protection option, and then click OK.
4. Click Create to display the Create a Restore Point dialog box.
5. Type a description for the new restore point, and then click Create. System Protection creates the restore point and displays a dialog box to let you know the restore point was created successfully.
6. Click Close to return to the System Properties dialog box.
7. Click OK.

To learn how to revert your PC to an earlier restore point, see "Recovering Using System Restore," p. 624.

Creating More Room for Restore Points

Windows sets aside a certain amount of your hard disk space for restore points. (The percentage depends on the size of the disk.) When that space is used up, Windows 10 deletes the oldest restore points as new ones are added. If you use restore points frequently and you have lots of free space on your hard drive, consider increasing the amount of space allotted to restore points. Click the drive in the Protection Settings list, click Configure, and use the Max Usage slider to set the amount of disk space you want. If the hard disk is getting low on free space, you can also click the Delete button to remove all the restore points from the hard disk.

Creating a Recovery Drive

We all hope our computers operate trouble-free over their lifetimes, but we know from bitter experience that this is rarely the case. Computers are incredibly complex systems, so it is almost inevitable that a PC will develop glitches. If your hard drive is still accessible, you can boot to Windows 10 and access the recovery tools, as we described in Chapter 26, "Troubleshooting and Repairing Problems."

To learn how to boot to the Windows 10 recovery tools, see "Accessing the Recovery Environment," p. 614.

If you can't boot your PC, however, you must boot using some other drive. If you have your Windows 10 installation media, you can boot using that drive. If you don't have the installation media, you can still recover if you've created a USB recovery drive. This is a USB flash drive that contains the Windows 10 recovery environment, which enables you to refresh or reset your PC, use System Restore, recover a system image, and more.

Before you can boot to a recovery drive, such as a USB flash drive, you need to create the drive. Follow these steps:

1. Insert the USB flash drive you want to use. Note that the drive must have a capacity of at least 512MB (see the accompanying Caution). Also, Windows 10 will erase all data on the drive, so make sure it doesn't contain any files you want to keep.

caution

The 512MB capacity applies only if you don't also want to include your PC's Recovery partition on the recovery drive. If you do want to include this partition (it's a good idea), you'll need a flash drive with enough capacity to hold the system recover partition, which might be 5 to 15GB, or more. (To check, use the taskbar's Search box to type diskmgmt.msc, click Diskmgmt, and then use the Disk Management snap-in to view the size of the Recovery partition.)

2. In the taskbar's Search box, type recovery and then click Create a Recovery Drive. User Account Control appears.
3. Click Yes or enter administrator credentials to continue. The Recovery Drive Wizard appears.
4. If you don't want to add your PC's Recovery partition to the recovery drive, uncheck Back Up System Files to the Recovery Drive. Click Next. The Recovery Drive Wizard prompts you to choose the USB flash drive, as shown in Figure 32.7.

   Figure 32.7

   Select the flash drive that you inserted in step 1.

5. Click the drive, if it isn't selected already, and then click Next. The Recovery Drive Wizard warns you that all the data on the drive will be deleted.
6. Click Create. The wizard formats the drive and copies the recovery tools and data.
7. Click Finish.

tip

To make sure your recovery drive works properly, you should test it by booting your PC to the drive. Insert the recovery drive and then restart your PC. How you boot to the drive depends on your system. Some PCs display a menu of boot devices, and you select the USB drive from that menu. In other cases, you see a message telling you to press a key.

Remove the drive, label it, and then put it someplace where you'll be able to find it later, just in case.

Creating a System Image Backup

The worst-case scenario for PC problems is a system crash that renders your hard disk or system files unusable. Your only recourse in such a case is to start from scratch with either a reformatted hard disk or a new hard disk. This usually means that you have to reinstall Windows 10 and then reinstall and reconfigure all your applications. In other words, you're looking at the better part of a day or, more likely, a few days, to recover your system. However, Windows 10 has a feature that takes most of the pain out of recovering your system. It's called a system image backup, and it's part of the system recovery options that we discussed in Chapter 26.

To learn how to restore your PC from an image, see "Restoring a System Image," p. 626.

The system image backup is actually a complete backup of your Windows 10 installation, virtually every byte on your hard drive. It takes a long time to create a system image (at least several hours, depending on how much stuff you have), but it's worthwhile for the peace of mind. Here are the steps to follow to create the system image:

1. In the taskbar's Search box, type **backup**, and then select Backup and Restore (Windows 7). If this search result doesn't appear, search instead for history and then select Backup Settings, More Options. Scroll *way* down, and then select See Advanced Settings. This will also get you to the Windows 7 backup settings screen.

2. At the left, select System Image Backup. The Create a System Image Wizard appears.
3. The wizard asks you to specify a backup destination. You have three choices, as shown in Figure 32.8. (Click Next when you're ready to continue.)

   Figure 32.8

   You can create the system image on a hard drive, on DVDs, or on a network share.

   - On a Hard Disk—Select this option if you want to use a disk drive on your computer. If you have multiple drives, use the list to select the one you want to use.

     caution

     Many people make the mistake of creating the system image once and then ignoring it, forgetting that their systems aren't set in stone. Over the coming days and weeks, you'll be installing apps, tweaking settings, and of course creating lots of new documents and other data. This means that you should periodically create a fresh system image. Should disaster strike, you'll be able to recover most of your system.

   - On One or More DVDs—Select this option if you want to use DVDs to hold the backup. Depending on how much data your PC holds, you could be talking about using dozens of discs for this (at least!), so we don't recommend this option.
   - On a Network Location—Select this option if you want to use a shared network folder. Either type the address of the share or click Select and then click Browse to use the Browse for Folder dialog box to choose the shared network folder. Make sure it's a share for which you have permission to add data. Type a username and password for accessing the share, and then click OK.
4. The system image backup automatically includes your internal hard disk in the system image, and you can't change that. However, if you also have external hard drives, you can add them to the backup by clicking their check boxes. Click Next. Windows Backup asks you to confirm your backup settings.
5. Click Start Backup. Windows Backup creates the system image.
6. Click OK.

If you used a hard drive and you have multiple external drives lying around, be sure to label the one that contains the system image so you'll be able to find it later.

We strongly recommend that if you have a recording CD or DVD drive, you also get a blank, recordable CD or DVD, and use the Create a System Repair disc option on the same Windows 7 Backup screen. You can boot from this disc if you ever need to restore your hard disk from the system image backup. It can be *very* difficult to get Windows to restore an image backup if your computer's hardware configuration changes. It's all the more difficult if you don't have this System Repair disc.