

- 1.3.3. System maintenance and performance -

Keeping Windows up to date

In Windows 10, the Windows Update service delivers security fixes, performance and reliability improvements, and updated device drivers, just as its predecessors have done for two decades.

But this release also assigns a crucial new role to this core Windows feature.

In the “Windows as a Service” model, Windows Update delivers regular upgrades to Windows 10, with new and improved features alongside the bug fixes.

Windows Update and its associated services, such as the Background Intelligent Transfer Service (BITS), should run automatically, with little or no attention required from you.

We strongly suggest checking in at regular intervals to confirm that updates are being delivered as expected and that the various Windows Update services are working properly.

To do this, go to Settings > Update & Security > Windows Update.

The text below the Update Status heading tells you whether your system was up to date as of the most recent check.

If an update has recently been delivered but your device needs to be restarted to complete the update process, you’ll see words to that effect.

Windows Update will restart your system at a time outside of your active hours, but you can go ahead and restart manually if you want.

Don't fear automatic updates

Over the past decade, Microsoft and other software companies, large and small, occasionally delivered updates that caused new problems.

Among conservative IT pros and Windows experts, it became practically dogma to stand out of the line of fire when updates were first released.

Historically, problematic updates are usually identified within the first week or two and either pulled or fixed, making it safe to deploy them after a suitable delay.

So why are things different this time around?

Are monthly updates in Windows 10 more trustworthy than their predecessors?

The crucial difference is the introduction of the Windows Insider program, which allows a large group of early adopters to test updates in the Fast and Slow Insider tracks before updates are released to the general population.

Yes, it's still possible for a seemingly innocuous update to cause problems for some users, but the risk is much lower now because those updates will have been tested more fully than ever before.

How updates are delivered

If you're accustomed to using Windows Update in earlier versions of Windows, you might be startled by one major change in Windows 10.

Whereas Windows 7 and Windows 8.1 users were offered a menu of updates periodically and could pick and choose which updates they wanted to install, Windows 10 bundles all its available updates into cumulative updates.

A cumulative update includes all fixes that Microsoft has previously released.

When you install the update, the system downloads and applies only those updates you have not previously installed.

This major change in the servicing model for Windows is likely to dismay traditionalists who want the option to sort through updates at their leisure, accepting some, delaying others, and rejecting still others.

Managing the update process

The level of control you have over how and when updates are installed depends on which edition of Windows you have and on settings controlled by your network administrator:

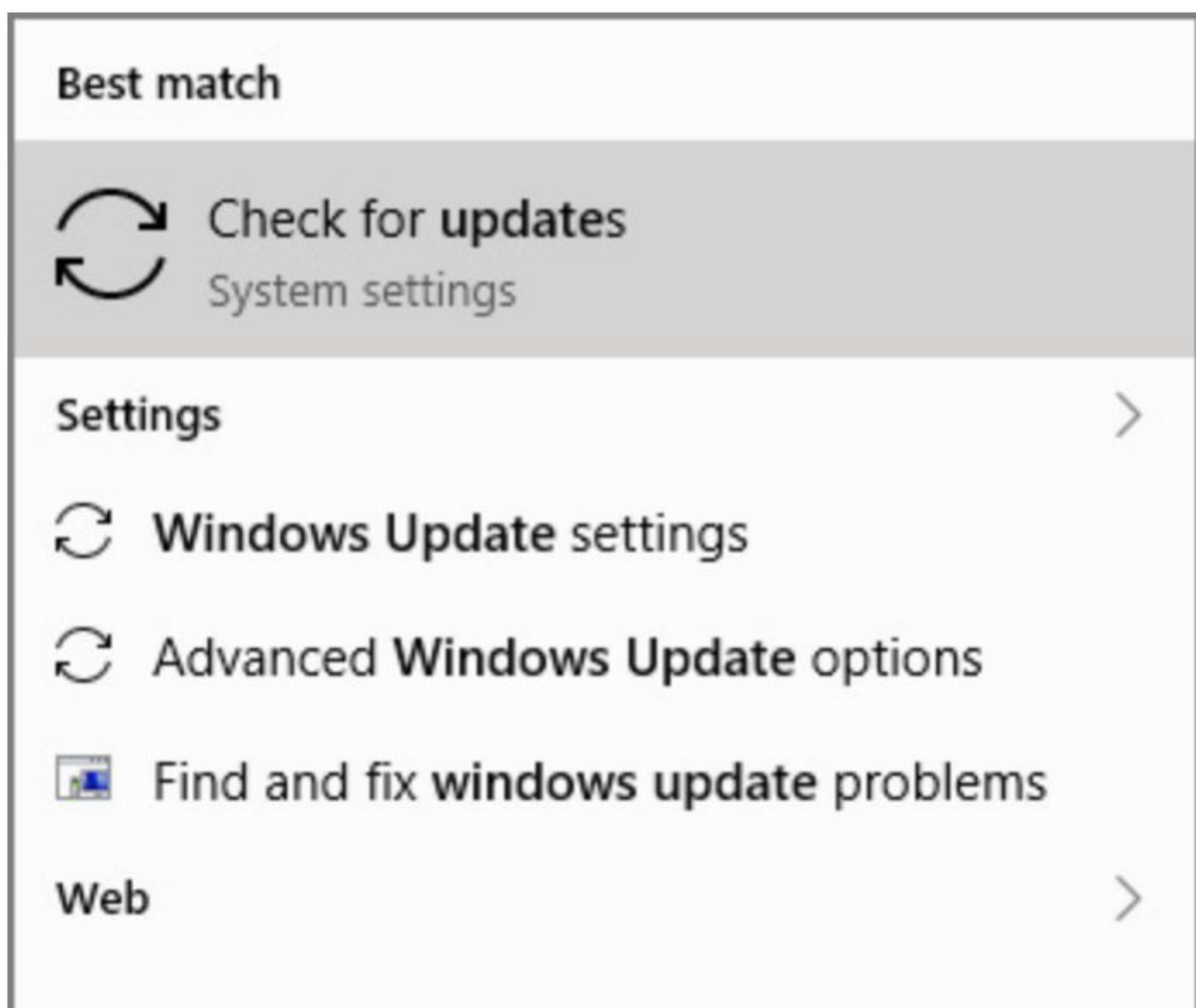
- With Windows 10 Home, new features, bug fixes, and security updates are pushed to your computer automatically. You don't need to take any additional action aside from observing the occasional reminders to restart your computer. When Windows does require a restart, you can control when it occurs. As a result, Windows 10 Home systems are always up to date; users who want to skip or postpone certain updates do not have that option. In Microsoft parlance, this servicing "ring" is called the Current Branch.
- Users of Windows 10 Pro can use the default settings and receive Current Branch servicing. An additional option, not available in Windows 10 Home, allows you to select Defer Feature Updates from the Windows Update

Advanced Options page. This option shifts update delivery to the Current Branch for Business; definition updates arrive through Windows Update when they are released, but feature upgrades are delayed several months, until they have been thoroughly tested by users in the Windows Insider Program and by the general public in the Current Branch. Note that the Defer Feature Updates option does not affect security updates. Fixes for security issues, which are typically included in cumulative updates delivered around the second Tuesday of each month, are always automatically installed.

- Organizations that deploy Windows 10 Enterprise get the same servicing options as Windows 10 Pro, plus one significant extra: in addition to the Current Branch and Current Branch for Business, they can choose the Long Term Servicing Branch.
- Windows 10 Education, which most closely resembles Windows 10 Enterprise in terms of features, has the same update servicing options as Windows 10 Pro.

The tools for managing updates are no longer in the old-style Control Panel.

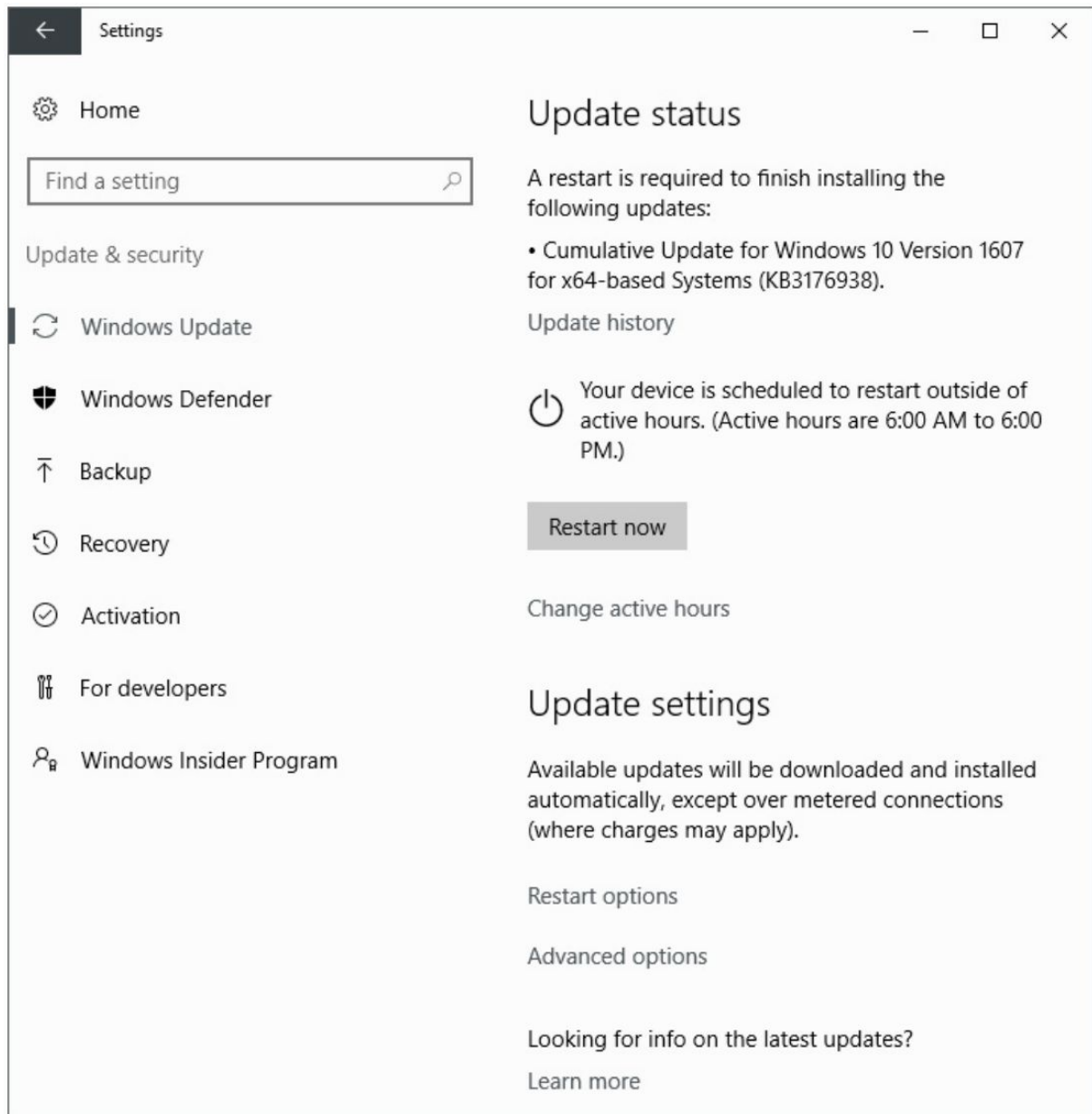
Search for Windows Update and the following results, all included as part of the modern Settings app, should appear at the top of the results list:



Click or tap Check For Updates to open the Windows Update page in Settings.

A list of available updates appears at the top of the page.

If the updates have been installed and require a restart, you might see a screen similar to the one shown in the next picture:



Windows proposes to restart your machine outside of your designated active hours.

If you need to change your active hours settings, click Change Active Hours.

However you set those active hours, Windows checks to see if your machine is actually idle before performing the reset.

You also have the option of restarting manually.

This option is ideal if you know you're going to be away from the PC for a meeting or lunch break that will last longer than the few minutes it takes to install a batch of updates.

But watch out for feature updates, which are equivalent to full upgrades and typically take an hour or more.

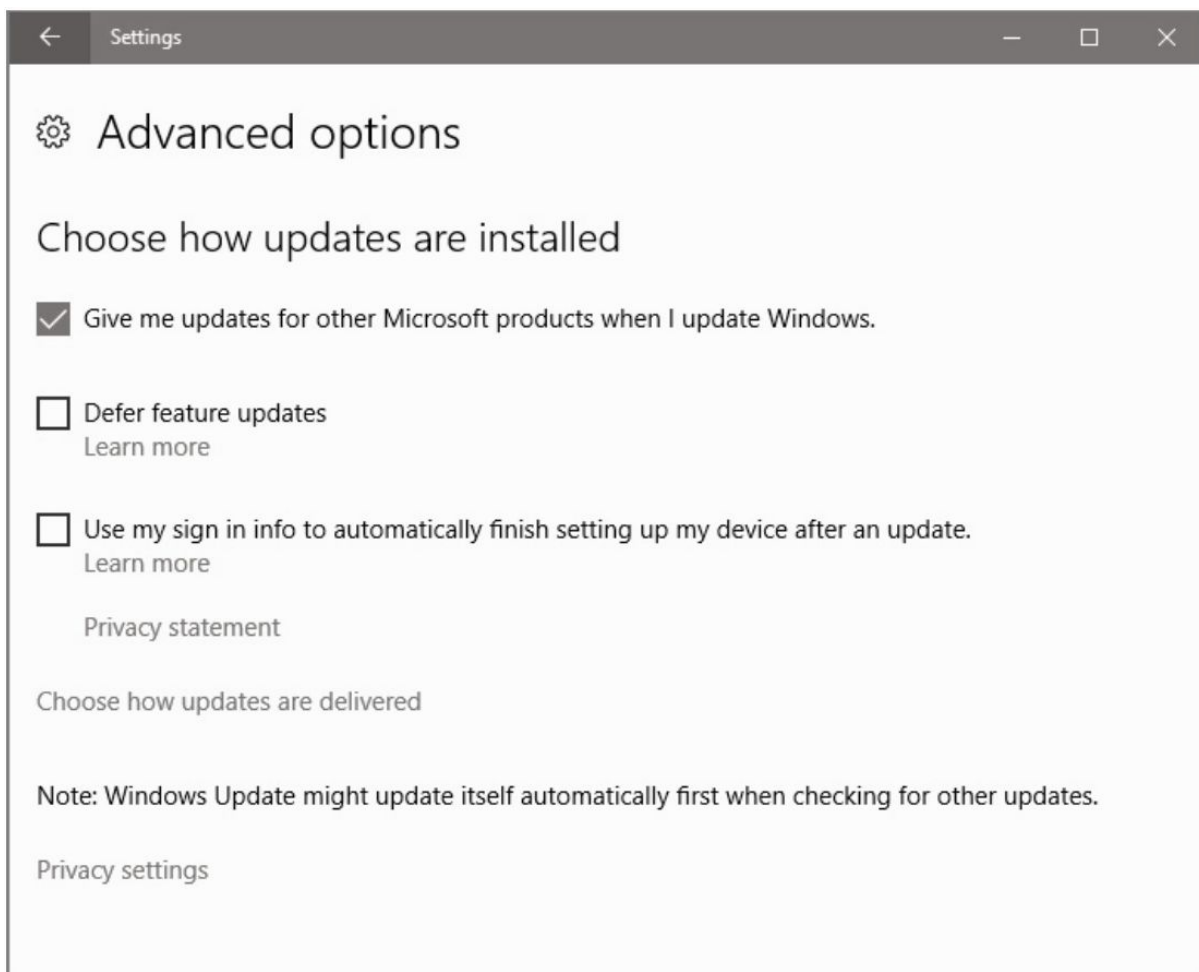
Save your existing work and close any open files, and then click Restart Now.

Be sure to wait for all open apps to close before you head out the door.

It's highly annoying (and a big drag on productivity) to come back from a meeting and discover that the restart hasn't taken place because a dialog box was open, waiting for your okay.

In previous Windows versions, you had a wide range of configuration options for Windows Update.

In Windows 10, the Advanced Options list contains the three items shown in the following image:



As we noted earlier, the default Windows Update settings allow Windows 10 to install updates and restart automatically if necessary.

If your edition of Windows 10 supports it, you can select **Defer Feature Updates**, as described earlier.

If you select that check box, Windows will automatically install security updates as they become available but will postpone feature updates.

You can select the check box above **Defer Feature Updates** to expand the scope of Windows Update to include other Microsoft products, such as perpetual-license versions of Microsoft Office.

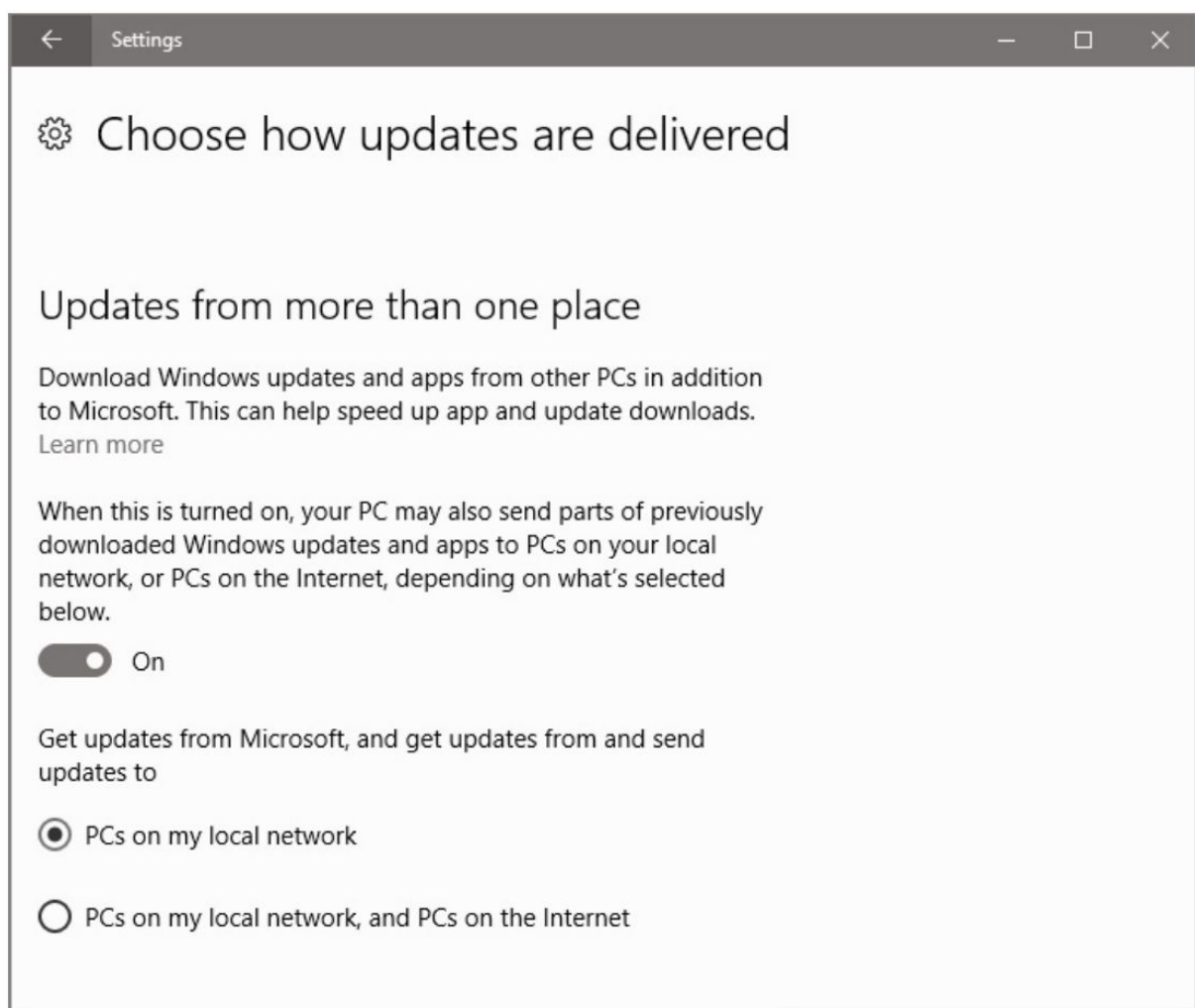
When installing an update entails a restart of your system, Windows normally requires you to sign in before the installation finishes.

If you're away from your machine while an upgrade is in progress, you might find the system waiting at the sign-in screen when you return.

You can streamline the process by selecting the third check box, **Use My Sign In Info To Finish Setting Up My Device After An Update**.

You can exert slightly more control over the upgrade process by clicking **Choose How Updates Are Delivered**.

This opens the page shown in the next image:



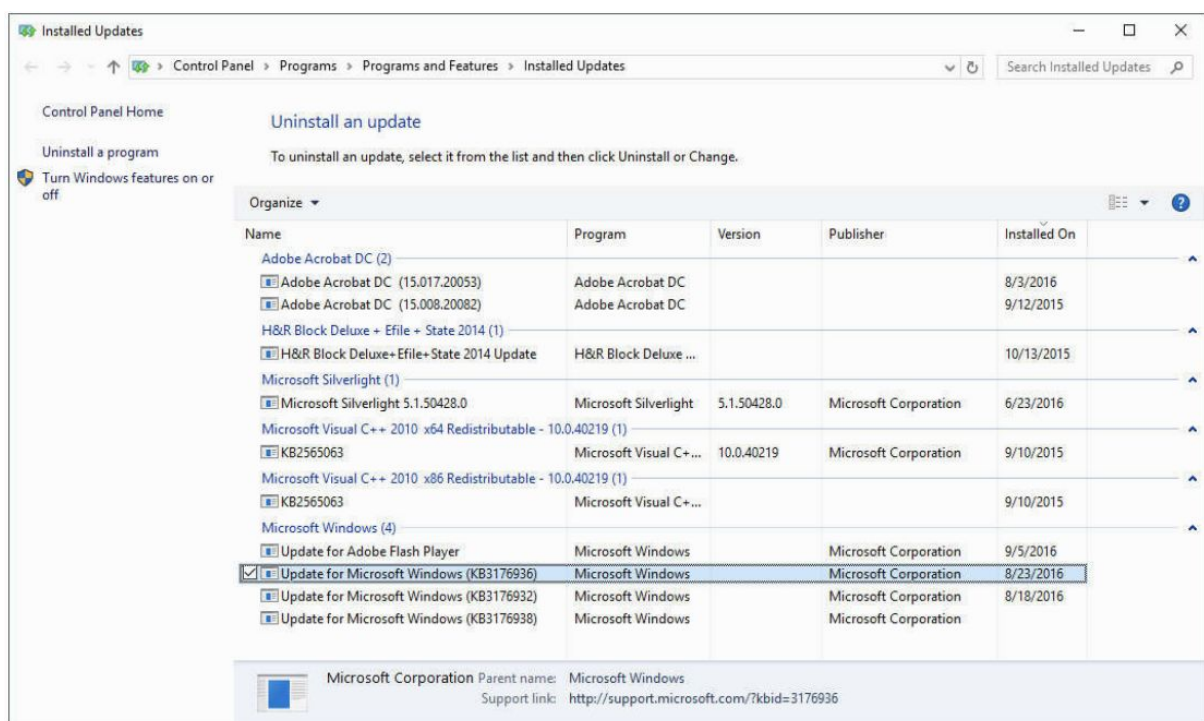
With this peer-to-peer feature, which is new in Windows 10, you can share updates with devices on your local network rather than requiring a connection to Microsoft's update servers.

In a small office or lab, this option can significantly reduce the amount of data you download through your internet connection.

You can use the last option to share updates over the internet at large, using Microsoft's peer-to-peer service.

Most options for Windows Update have been moved to the modern Windows 10 Settings app.

Clicking the Uninstall Updates option on the Update History page reveals a noteworthy exception, as shown in the next picture:



This list, which uses the old-style Control Panel interface, displays an inventory of everything that Windows Update has installed for Windows itself, for other Microsoft products, and for compatible third-party updates.

From this page, you can confirm a particular update has been installed by referring to its KB number in the list of installed items.

If you click the support link at the bottom of the page, you can see details about the selected update.

The Uninstall option appears above the list and allows you to remove an update.

This option should be a last resort for troubleshooting and used only when you suspect that a recently installed update is causing serious performance or reliability issues.

If a device driver is causing problems, you can uninstall it as follows: Right-click the Start button, click Device Manager, and double-click the device with the problem driver.

On the driver tab of the Properties dialog box, click Uninstall.

Hide troublesome updates so that Windows Update doesn't try repeatedly to install them

Suppose the latest update includes an unwanted driver or some other component that wreaks havoc on your system.

You can uninstall it, as just described.

But because of the way cumulative updates work, Windows Update will reinstall the unwanted item the next time it delivers a cumulative update.

You can interrupt this loop by "hiding" the item.

To do this, you need to run the Show Or Hide Updates troubleshooter package, which you can download from

<https://support.microsoft.com/es-es/help/3183922/how-to-temporarily-prevent-a-windows-update-from-reinstalling-in-windows>.

The troubleshooter presents a list of updates that can be hidden.

Select the item that you don't want to reinstall.

The ruse is temporary, but it should give you respite until an updated driver or component becomes available.

Mastering Task Manager

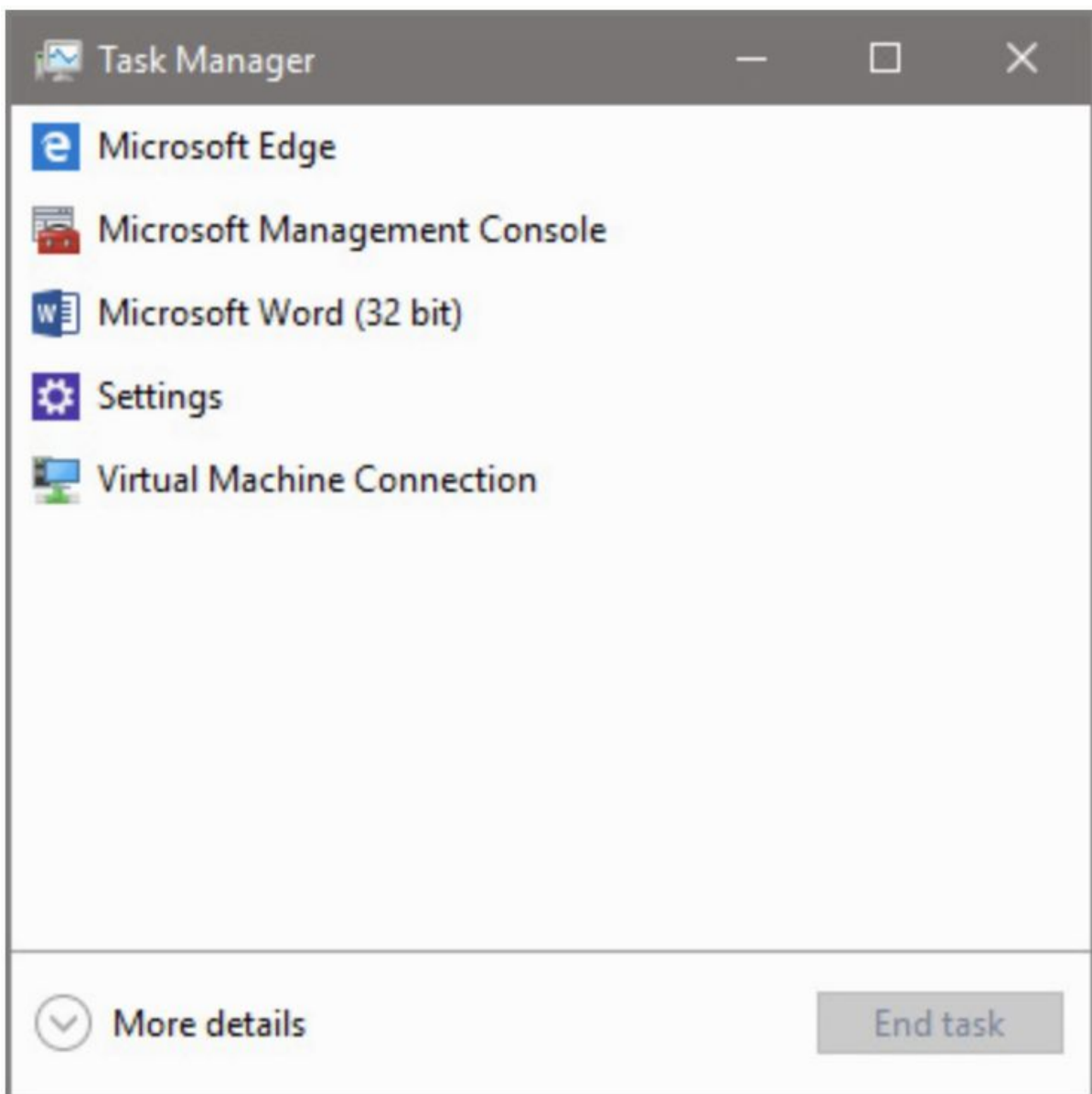
The easiest way to open Task Manager is with its keyboard shortcut, Ctrl+Shift+Esc.

You can also press Ctrl+Alt+Delete and then click or tap Task Manager.

Task Manager's instant accessibility is its most endearing trait, especially when something appears to have gone awry.

Its executable file, Taskmgr.exe, runs at a Base Priority of High, allowing it to kick into action even when another program running at Normal priority is refusing to surrender control.

When you need to stop an application (or process) that doesn't respond to the usual measures, or if your system suddenly slows down and you want to know who's eating your processor cycles, Task Manager is your best friend.



The short list shows only processes that were started by and can be directly controlled by the current user account.

If a program has stopped responding, you'll see "Not responding" after its entry in the list, and you can use the End Task button to kill the app and start fresh.

Click More Details to see Task Manager in all its multitabbed, information-rich glory.

The next picture shows this dramatically expanded display, with the Processes tab selected:

Name	CPU	Memory	Disk	Network
Microsoft Edge	0.2%	323.1 MB	0 MB/s	0 Mbps
Microsoft Word (32 bit) (2)	0%	94.2 MB	0 MB/s	0 Mbps
Virtual Machine Connection	0%	70.0 MB	0 MB/s	0 Mbps
Service Host: Local System (Net...	2.2%	60.1 MB	0 MB/s	0 Mbps
Snagit Editor (32 bit)	0.1%	53.3 MB	0 MB/s	0 Mbps
Snagit (32 bit)	0%	53.0 MB	0.1 MB/s	0 Mbps
Microsoft Edge	0.1%	52.6 MB	0 MB/s	0 Mbps
Microsoft OneDrive (32 bit)	25.8%	45.3 MB	0.1 MB/s	0 Mbps
Desktop Window Manager	0%	31.6 MB	0 MB/s	0 Mbps
Windows Explorer	0%	29.6 MB	0 MB/s	0 Mbps
Antimalware Service Executable	0%	27.7 MB	0 MB/s	0 Mbps
Microsoft Office Document Cac...	0.1%	14.2 MB	0.1 MB/s	0.1 Mbps
Microsoft Office Document Cac...	0%	12.7 MB	0 MB/s	0 Mbps
Runtime Broker	0%	11.5 MB	0 MB/s	0 Mbps
Service Host: Local System (17)	0.3%	11.2 MB	0 MB/s	0 Mbps

In the More Details view, Task Manager includes a much longer list of running processes, with real-time performance information for each one

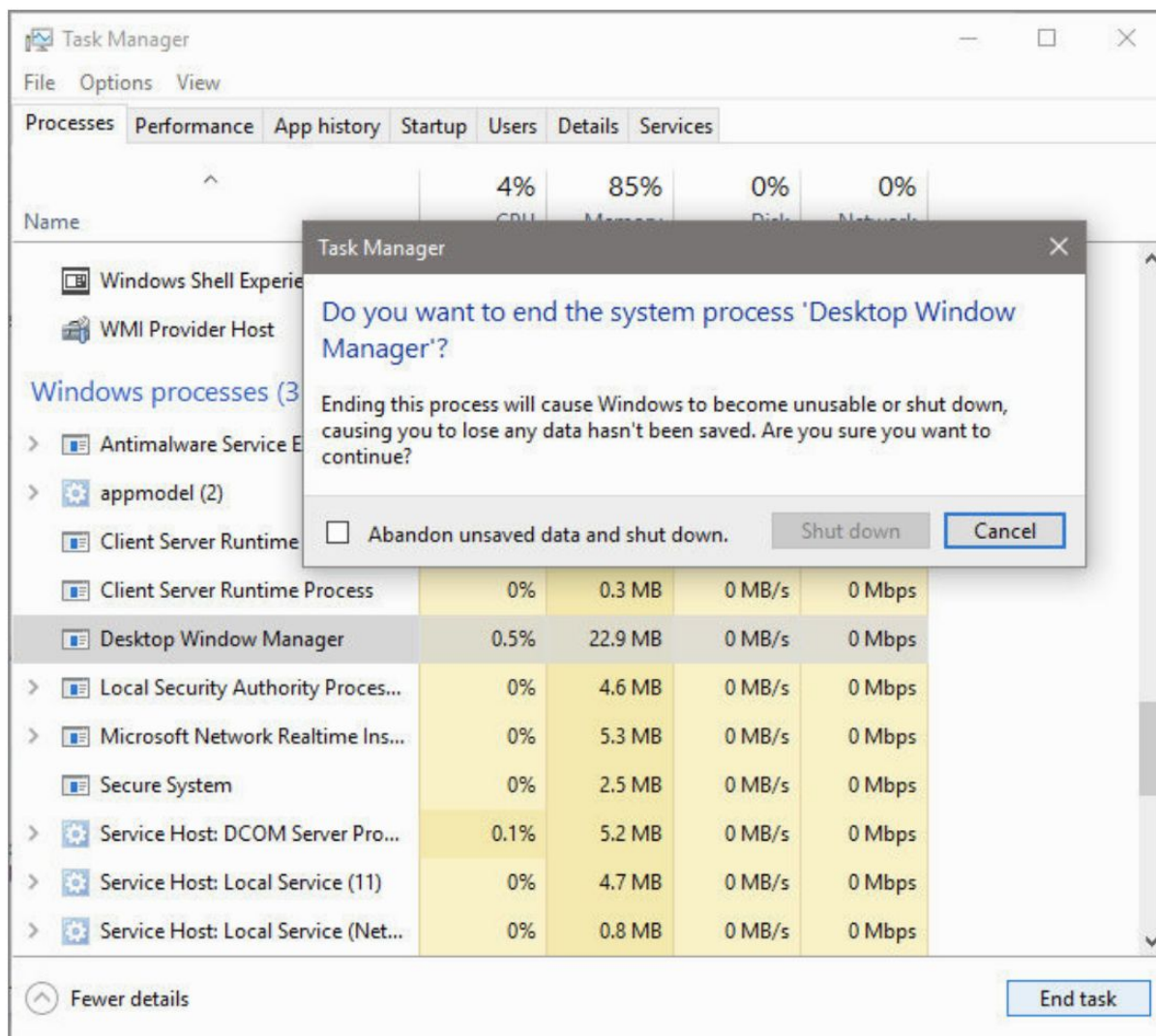
Although the list of running apps in looks similar to the one in the simpler view, scrolling down reveals a much longer list, grouped into three categories: Apps, Background Processes, and Windows Processes.

Processes that have multiple child windows have an arrow at their left, which you can click to expand the entry and see the titles of Microsoft Office document windows, Skype sessions, and the like.

You can end a task in the Apps group with minimal consequences.

You'll lose any unsaved work.

However, attempting to end a task in the Windows Processes group is equivalent to pulling the plug on Windows, as the stern warning message, shown next, makes clear:



In the More Details view, the totals at the top of each of the four performance-related headings show total resource use for that category.

You can click any column heading to sort by that value, making it possible to see at a glance which program is hogging the CPU or using more memory than its fair share.

Why is the System process using so much memory?

Any experienced Windows user who has tracked per-process memory usage in previous versions of Windows might be startled to see the System process using far more RAM than it seemingly should.

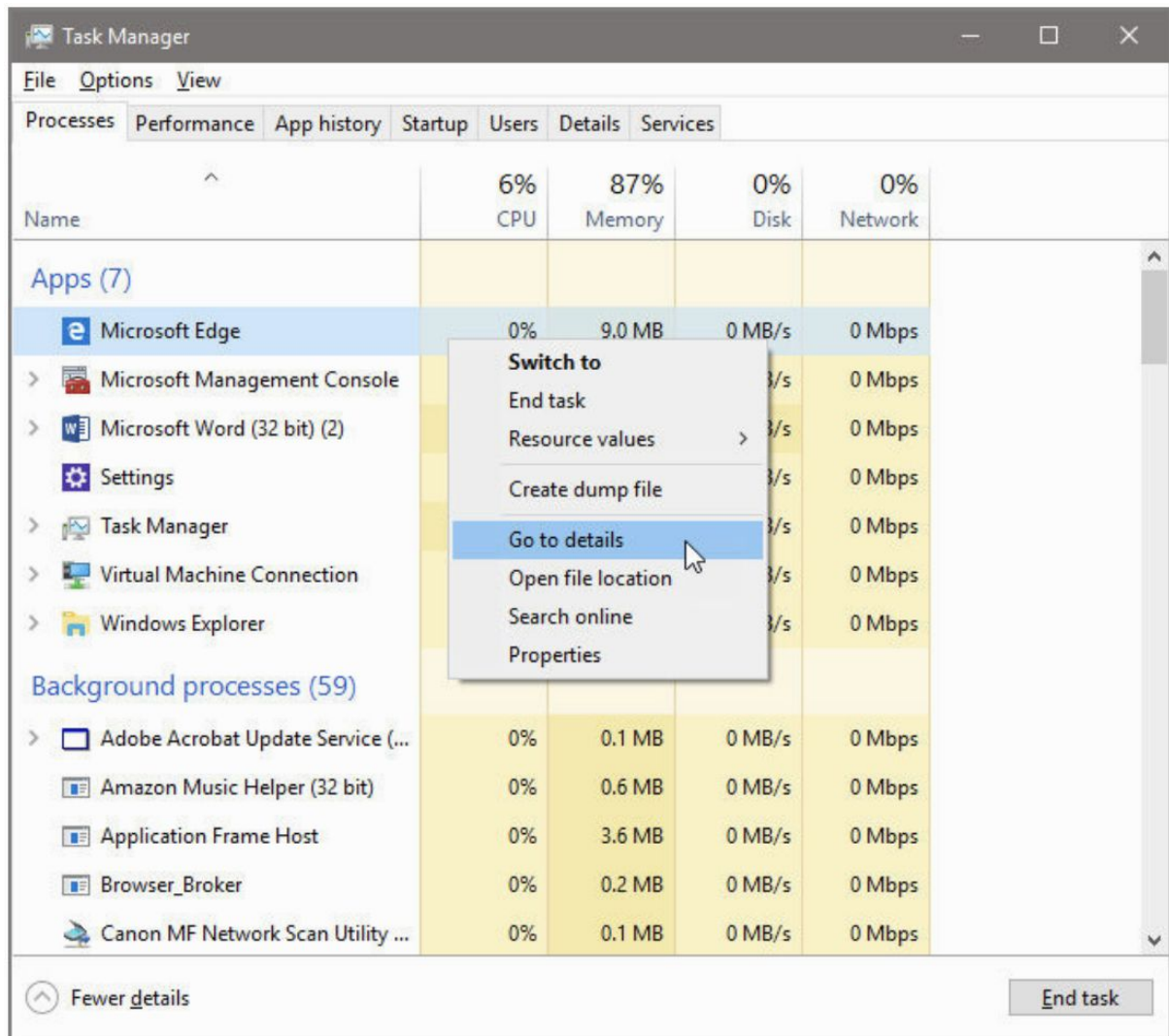
Relax.

That's not a bug; it's a feature, specifically a new memory-management subsystem that improves performance by compressing memory pages for processes you haven't used recently.

If the system needs the memory, it will reclaim it quickly by flushing those compressed pages to disk.

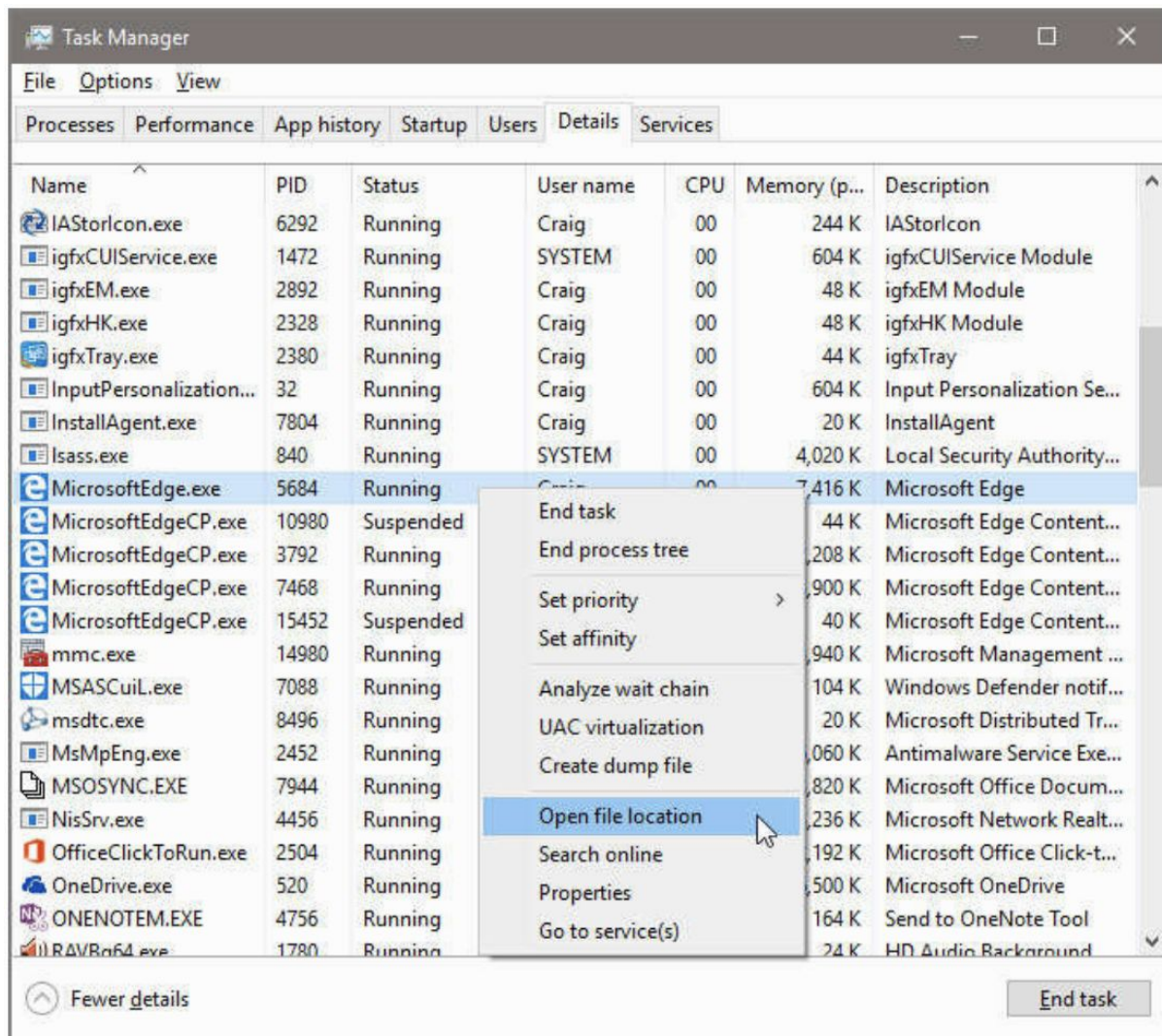
When you right-click any item in the Processes list, you see several choices on a shortcut menu.

Click Go To Details to jump to Task Manager's Details tab:



Windows veterans will feel right at home on the Details tab, which is a dense, data-rich list that was the default view in Task Manager in Windows 7 and earlier editions.

It shows the executable file for the original process, along with technical details like those shown in the next image:



To show an executable file in its parent folder, select the item on the Details tab and then use the Open File Location option on the shortcut menu.

As with the Processes tab, right-clicking any entry on this list displays a shortcut menu with some technical options.

The four options at the bottom of the menu are most useful for troubleshooting:

- Click Open File Location to locate the file responsible for the running process. Often, just knowing which folder this file appears in is enough to help ease your mind about a process with a name and description that don't provide useful details.
- Click Search Online to open a browser window and pass the name and description of the selected executable file to the default search engine. This is a useful way to get additional information about a mysterious file, but beware of information from unknown and untrusted sources—watch out for search results that lead to scam sites bent on convincing you to buy bogus security software.
- The Properties menu choice leads directly to the properties dialog box for the associated executable file, where the Details tab includes copyright

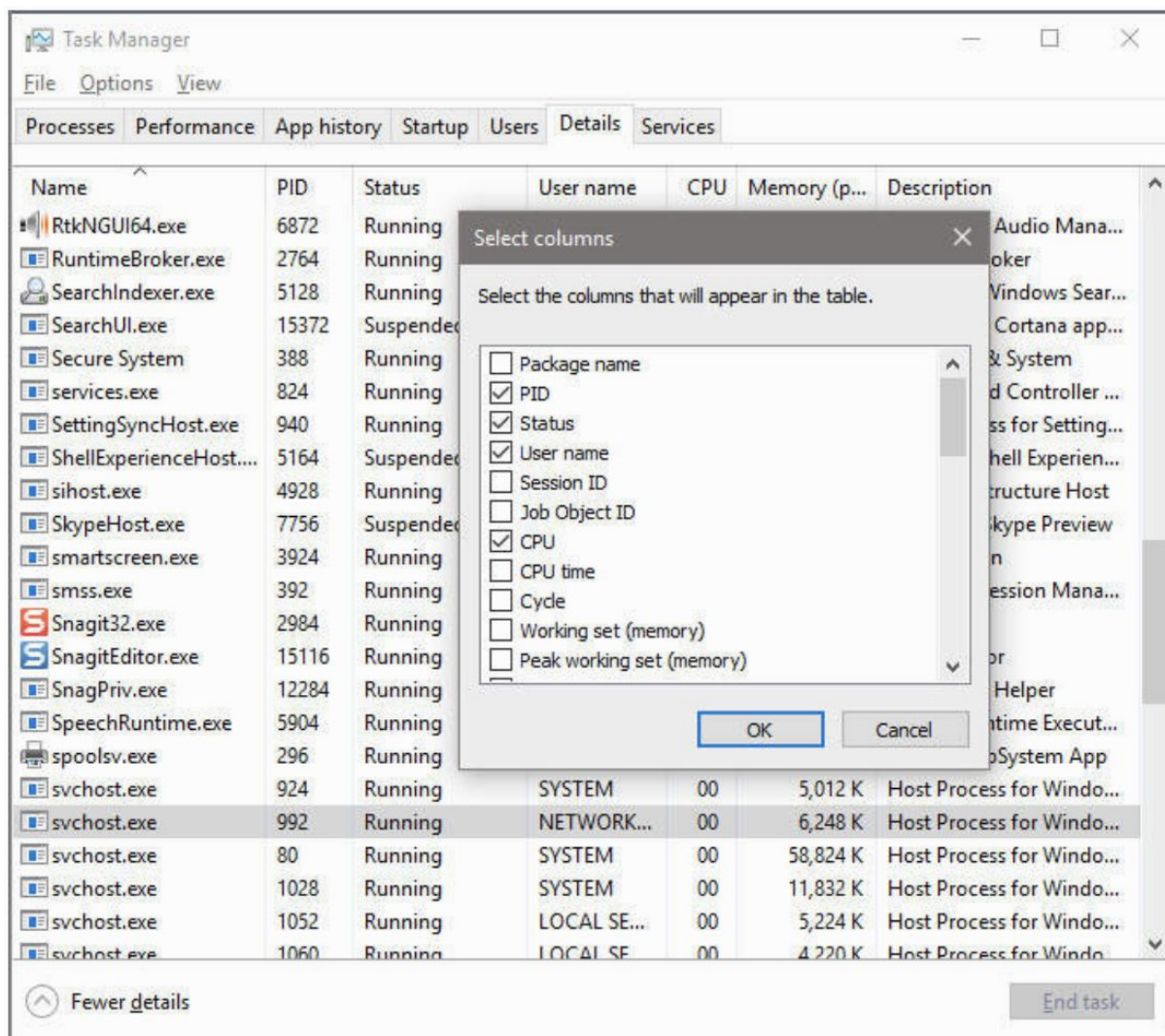
information and other relevant data drawn from the file itself. That information can help you decide whether a file is legitimate or needs further investigation.

- Finally, for processes that are running as Windows services, you can click the Go To Service(s) option, which takes you to the Services tab and highlights all the individual services associated with that process. For an instance of Svchost.exe, the list might number a dozen individual services.

As was true with its predecessors, the Task Manager Details tab includes the option to display many more columns than the handful that are shown by default.

To add or remove columns, right-click any visible column heading and then click Select Columns.

That action opens the dialog box shown in the following figure:



The list of available columns is overwhelming and highly technical.

Some provide interesting information you can't find elsewhere, though.

For example, on a device running 64-bit Windows 10, the Platform column lets you sort 32-bit and 64-bit processes quickly, while the Elevated column identifies processes that are running with full administrative privileges (usually in the context of the SYSTEM account).

If you're experiencing issues with display corruption, show the GDI Objects column and then sort its values in descending order to locate processes that might be to blame.

Managing startup programs and services

One of the most common performance problems occurs when Windows automatically loads an excessive number of programs at startup.

The result, especially on systems with limited resources, can be unpleasant: startup takes an unnecessarily long time, applications you never use steal memory from programs you use frequently, and the page file, which swaps programs and data from memory to disk when RAM fills up, gets more of a workout than it should.

Some programs, such as antivirus utilities, need to start up automatically.

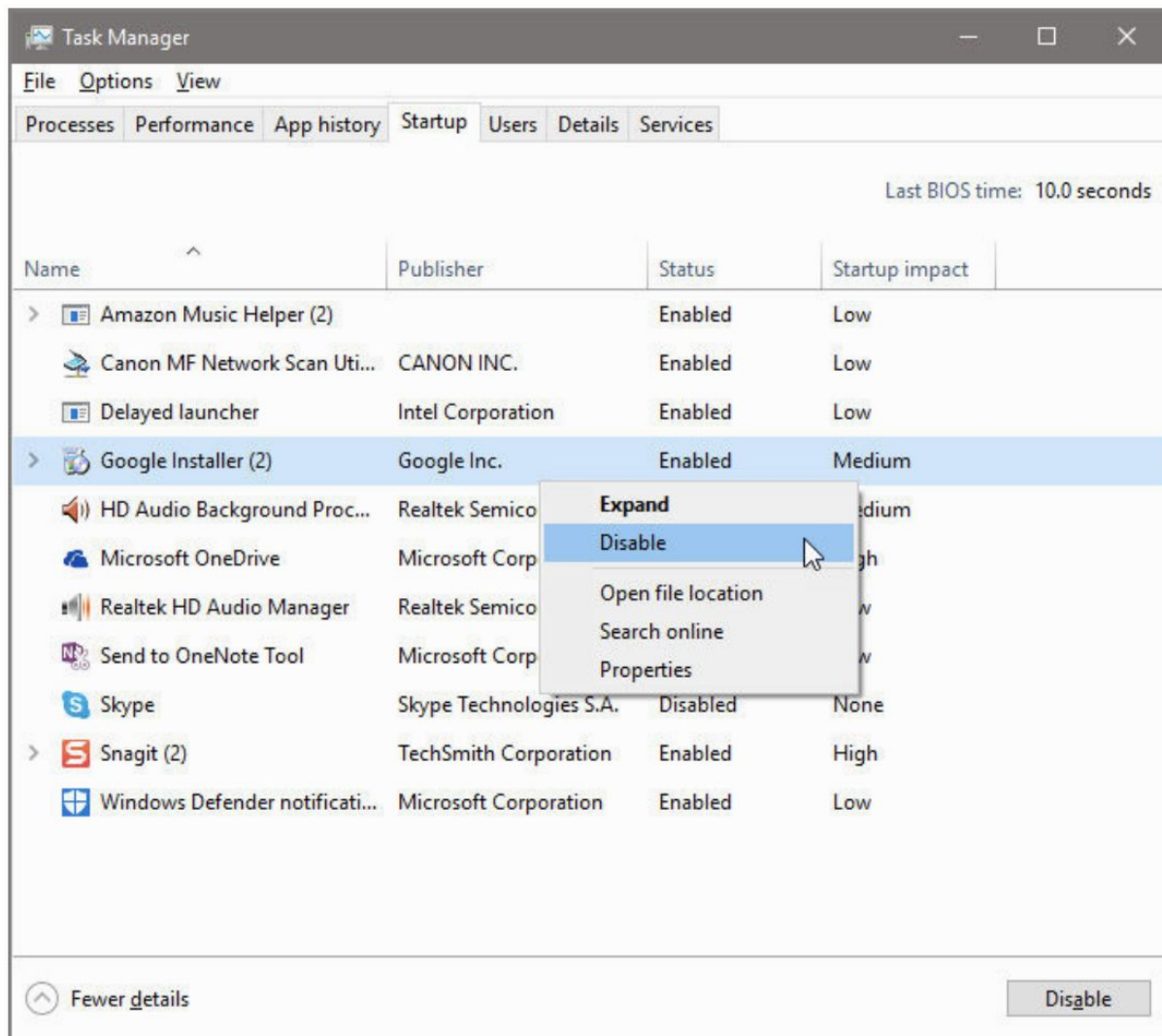
But in many cases, you're better served by running programs when you need them and closing them when they're not needed.

An overstuffed auto-start list is often a "feature" on computer systems sold in retail outlets, where Windows is preinstalled along with a heaping helping of applications.

In some cases, the bundled programs are welcome, but a free software program is no bargain if it takes up memory and you never use it.

On the Task Manager Startup tab, shown in the next picture, you can see at a glance which programs are starting automatically.

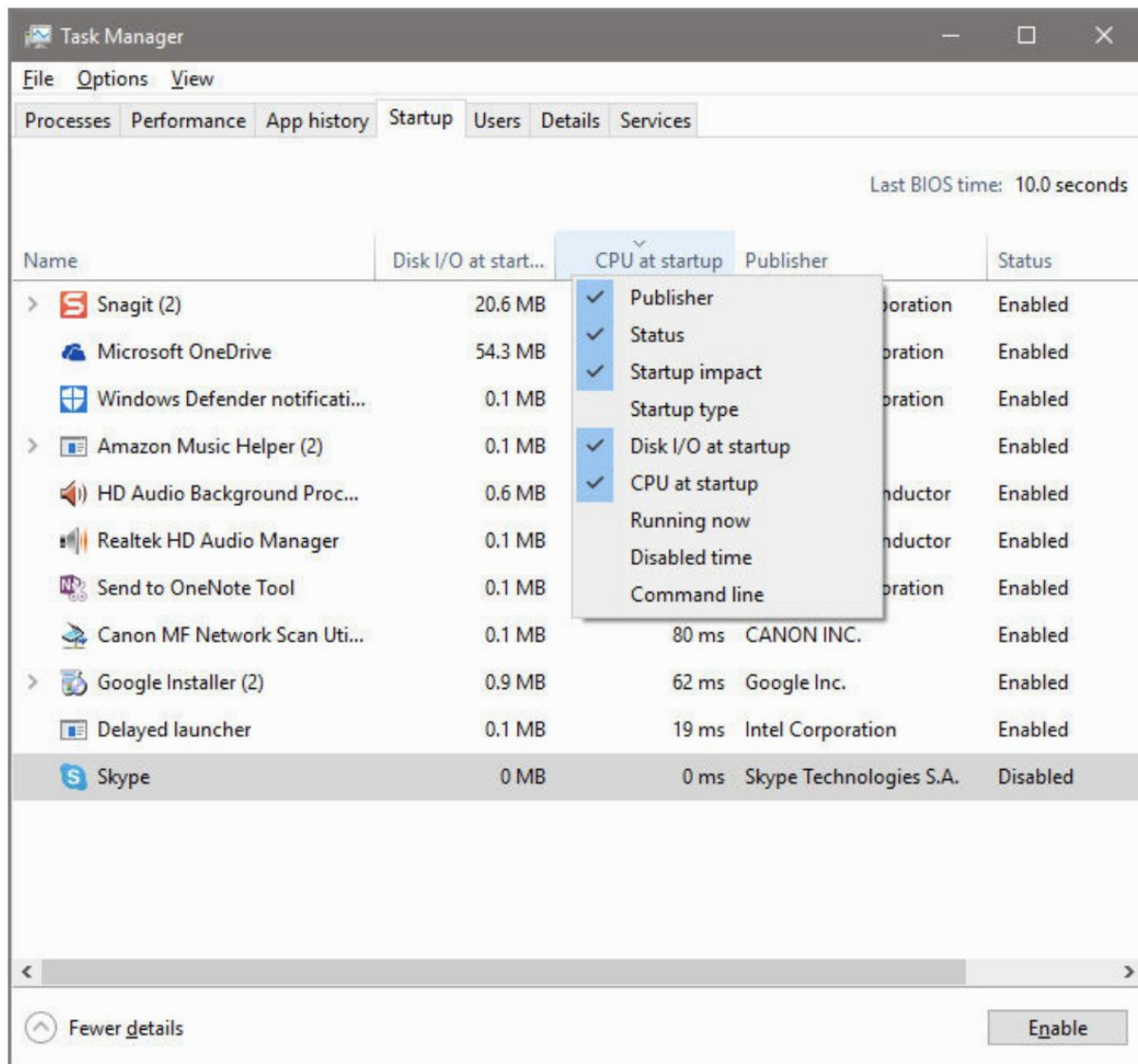
Using the Disable button or the equivalent option on the shortcut menu, you can disable any option that you determine is slowing down your system:



By default, the Startup tab shows only a gross measurement of the effect of a program on startup time.

This value is displayed under the Startup Impact heading as High, Medium, or Low.

To discover more details about the precise impact of an app that runs at startup, right-click the column headings on the Startup tab and add the two columns shown next—Disk I/O At Startup and CPU At Startup—which quantify just how much disk activity and CPU usage occur when the program starts:



For complete control of startup items, download Autoruns

The Startup tab in Task Manager gives you the ability to inspect, disable, and reinstate programs and services that are launched from certain common locations, such as your startup folder and the Run and RunOnce registry keys.

For much more comprehensive control over items that run automatically, check out the Autoruns utility, available free at

<https://technet.microsoft.com/sysinternals/bb963902.aspx>.

In addition to controlling programs launched at system startup or sign-in, Autoruns reports such items as browser helper objects, toolbars, and Windows Explorer shell extensions.

As in Task Manager, you can disable items you don't think you need, but once you're sure you don't need something, you can also use Autoruns to remove it from the list of programs that start automatically, without having to edit the registry yourself.

Managing disk space

At the dawn of the Windows 10 era, several long-term trends converged to make data storage more of a performance issue than it has been in years.

For many years, the trend with conventional hard disks was simple: more storage space at a lower cost per gigabyte.

Each new Windows version required more space than its predecessor, but the accompanying new generation of hardware meant there was plenty of room for system files and data.

The advent of solid state drives (SSDs) and flash memory changed all that.

SSDs are dramatically faster than conventional hard disks.

They're also more reliable than hard disks because they have no moving parts.

But SSDs are far more expensive per gigabyte than conventional hard disks, causing PC makers to choose smaller default disks for new PCs.

Couple that trend with the arrival of small, cheap tablets that run Windows 10 with 32 GB of total storage or less and you have a recipe for chronic space shortage.

On a desktop PC, you have the option to expand storage by replacing the primary drive with one that's faster, larger, or both; on most full-size desktop PCs, you can also install additional drives to make room for extra data files.

Many portable devices, on the other hand, provide built-in primary storage that is soldered to the system board and can't be replaced.

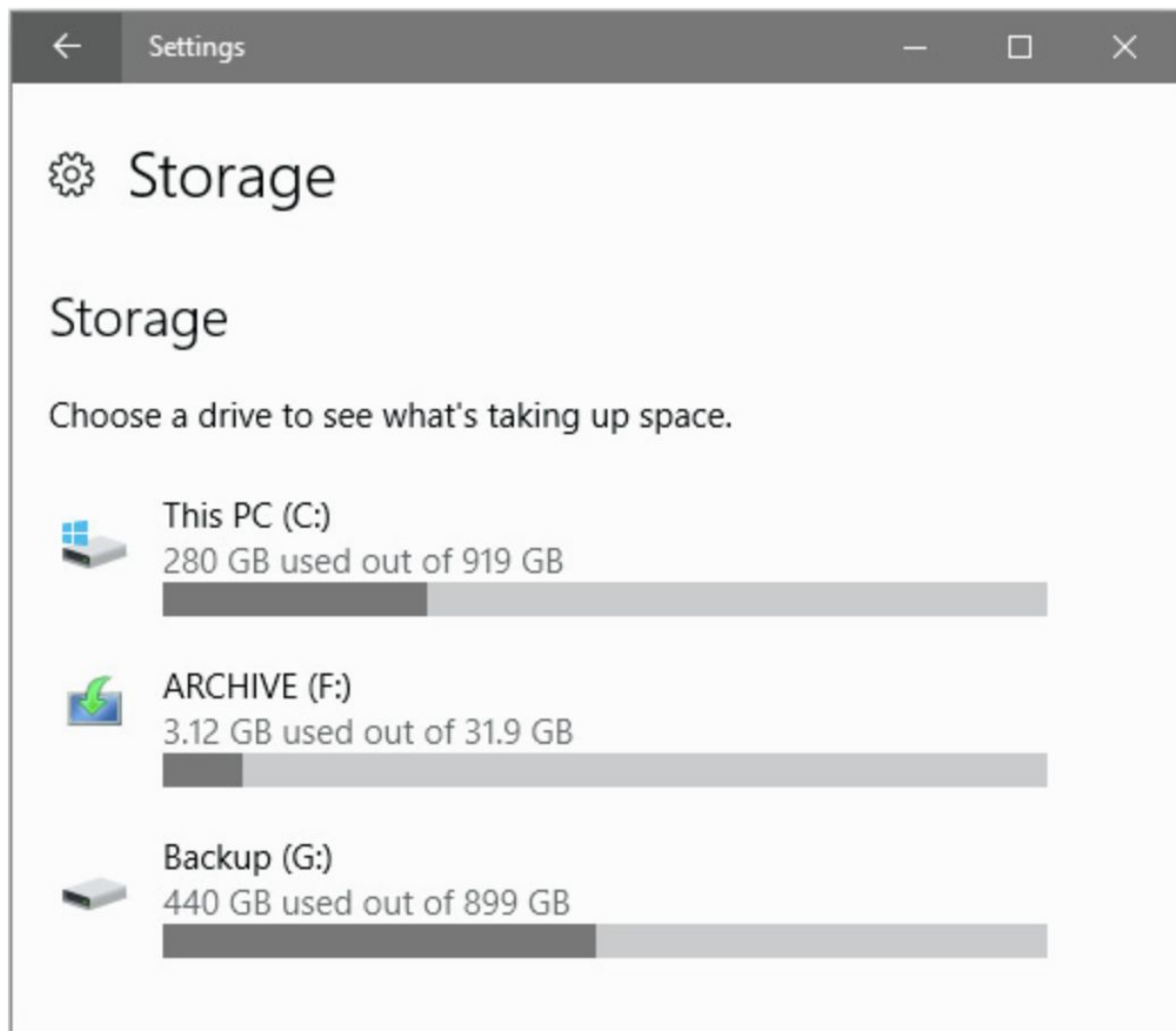
For some portable devices, the option to expand storage using inexpensive removable media is available.

Microsoft's Surface Pro PCs, for example, include a slot that accepts up to 128 GB of removable storage in the form of a MicroSD card, which can be treated as dedicated storage and used for File History.

Managing storage on a Windows 10 device involves two separate challenges:

- Setting default file locations to make best use of available storage.
- Performing occasional maintenance to ensure useful space (especially on the system drive) isn't being wasted with unnecessary files.

For an overview of how much total storage is available and what's in use on a Windows 10 device, open Settings > System > Storage to see a page like the one shown in the next picture:

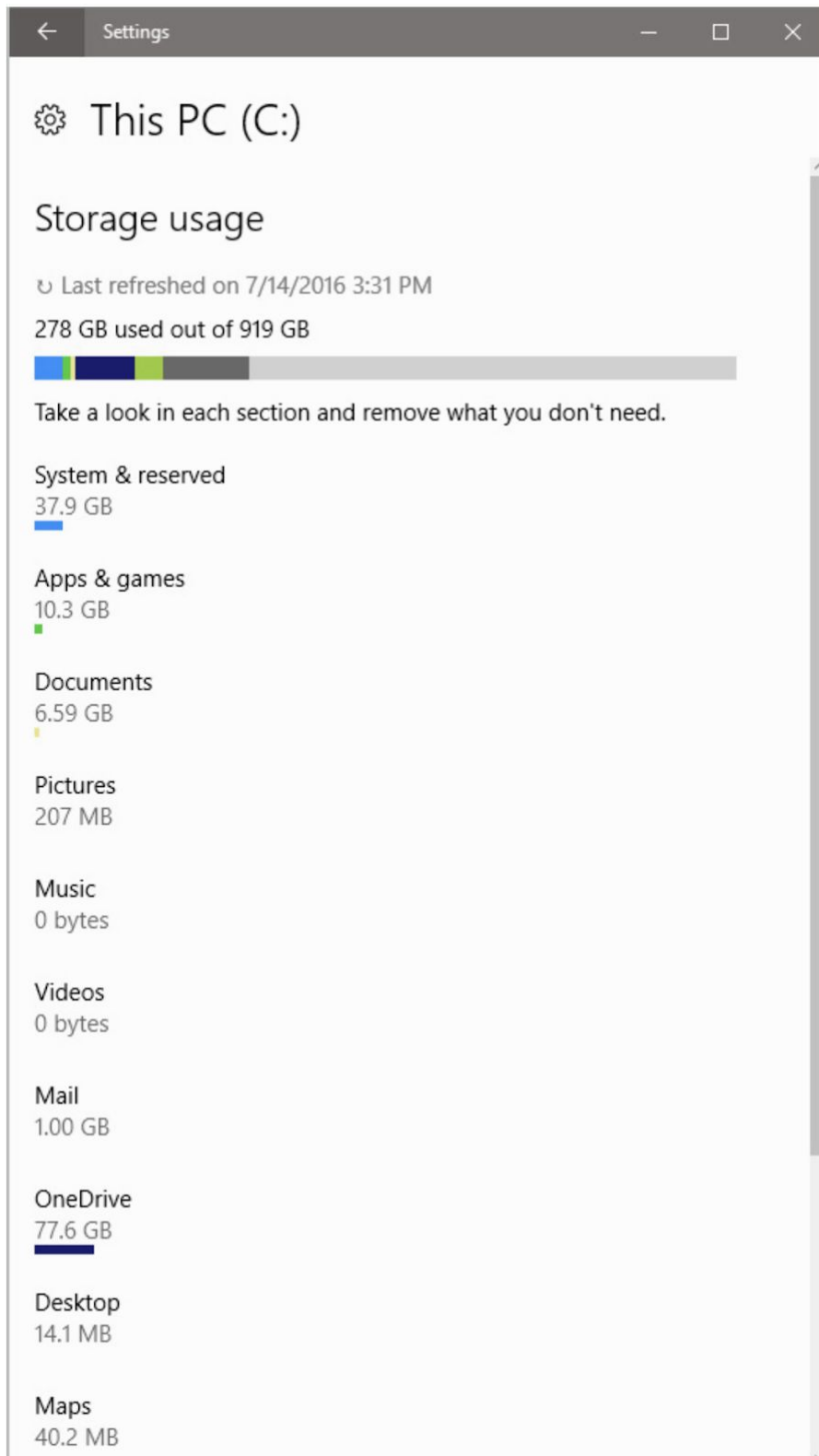


The Storage page in Settings shows all available volumes, with an indication of how much space is currently in use on each.

This example shows a desktop PC with a 1-TB system drive (C) and a second 1-TB external drive, on which a 32-GB partition has been created for archival purposes (F), with the remainder devoted to File History and image backups (G).

Regardless of how many drives are available, you can see which types of files are using that space, color coded by file type.

Open Storage in Settings and click any drive to show a breakdown of storage space in use, as in the following figure:



Click or tap any category to see more details about what's in it.

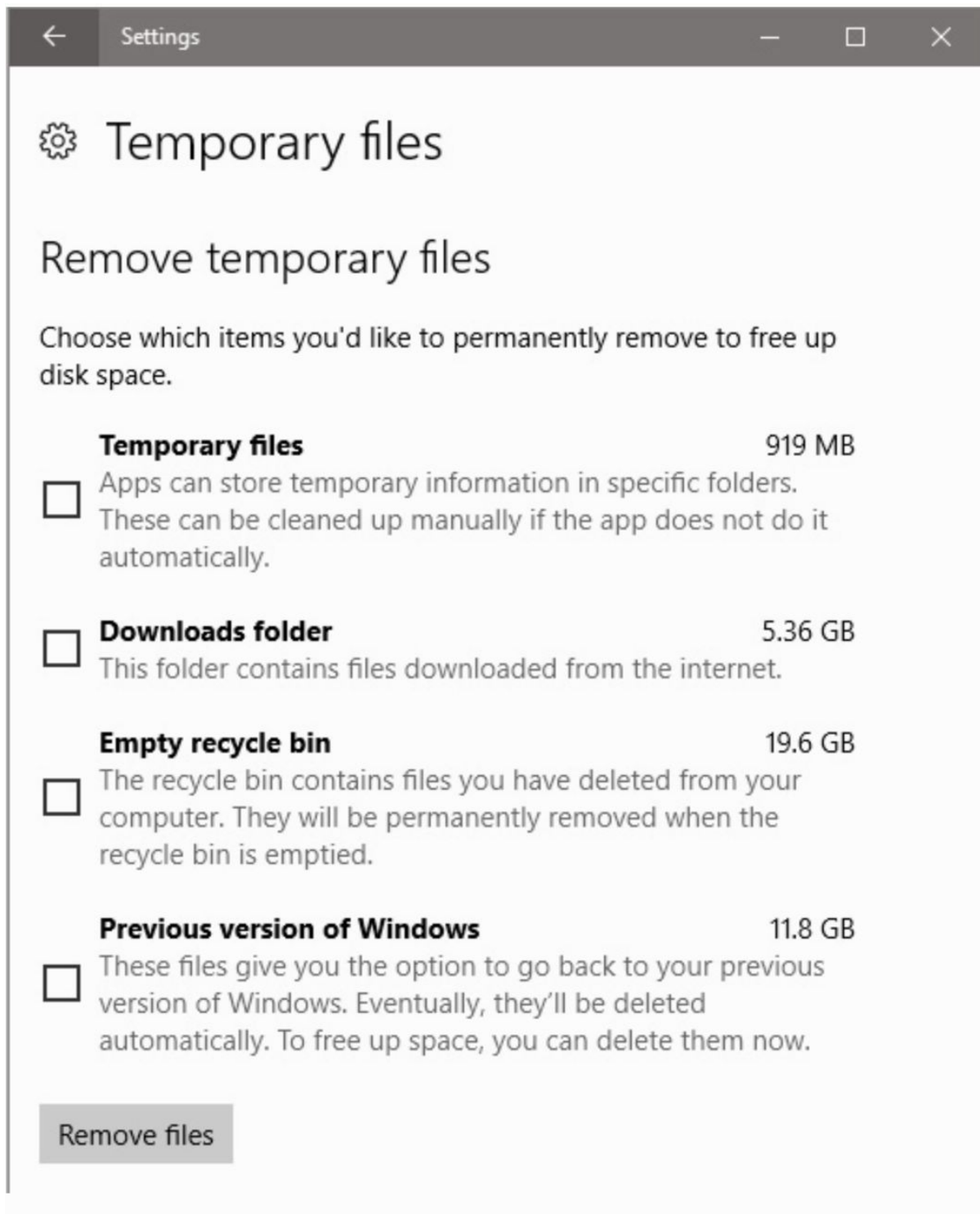
Here are some examples of what you'll find in each category:

- System And Reserved. This category is typically large and includes files that are essential to the operation of the system. The actual amounts of storage in use

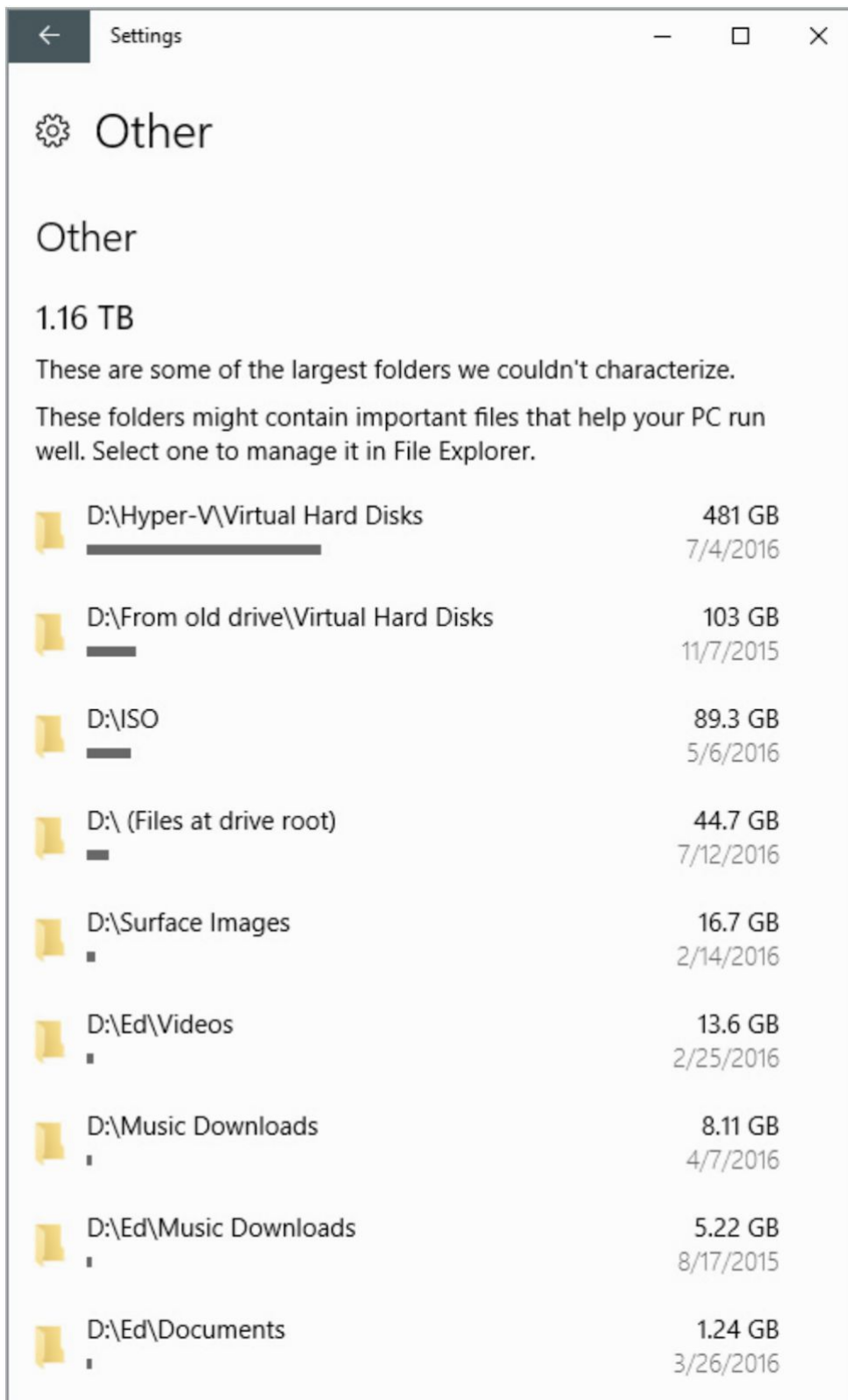
depend on the type of device and how much memory it contains. The System & Reserved category shows how much space is in use by Windows, space reserved for virtual memory, and hibernation files. The next figure, for example, shows the breakdown for this category on a Windows 10 desktop PC with 8 GB of RAM.



- Apps And Games. This category includes default apps as well as those you downloaded from the Windows Store.
- Documents, Pictures, Music, Videos. These separate categories show how much space is in use in the default save locations for the respective file types. Note that this value is not the total found in the libraries of the same names.
- Mail. This value measures the space used by local copies of messages saved using the default mail app. Clicking or tapping the Manage Mail button takes you to the default email app: Mail or Microsoft Outlook, for example.
- OneDrive. The total amount of space used by local copies of files synced from OneDrive.
- Desktop. This total should be small unless you use the desktop as a dumping ground for downloads and other potentially large files.
- Maps. If you have a large collection of offline maps, this category can get fairly large.
- Other Users. This category displays the total amount of space in use for data files from other user accounts, not broken down by file types.
- Temporary Files. This category includes files that are managed by Windows but are not typically necessary for the operation of a Windows 10 device. On the system shown in the next picture, with just a few clicks, you can recover almost 20 GB of storage space from the Recycle Bin.



- Other. If you have large collections of files that don't slot into the standard categories, you might see a very large Other category. The next image shows an example of the types of large files that might show up in this category, including Hyper-V virtual machines and associated VHD files, ISO files, and recorded TV programs.

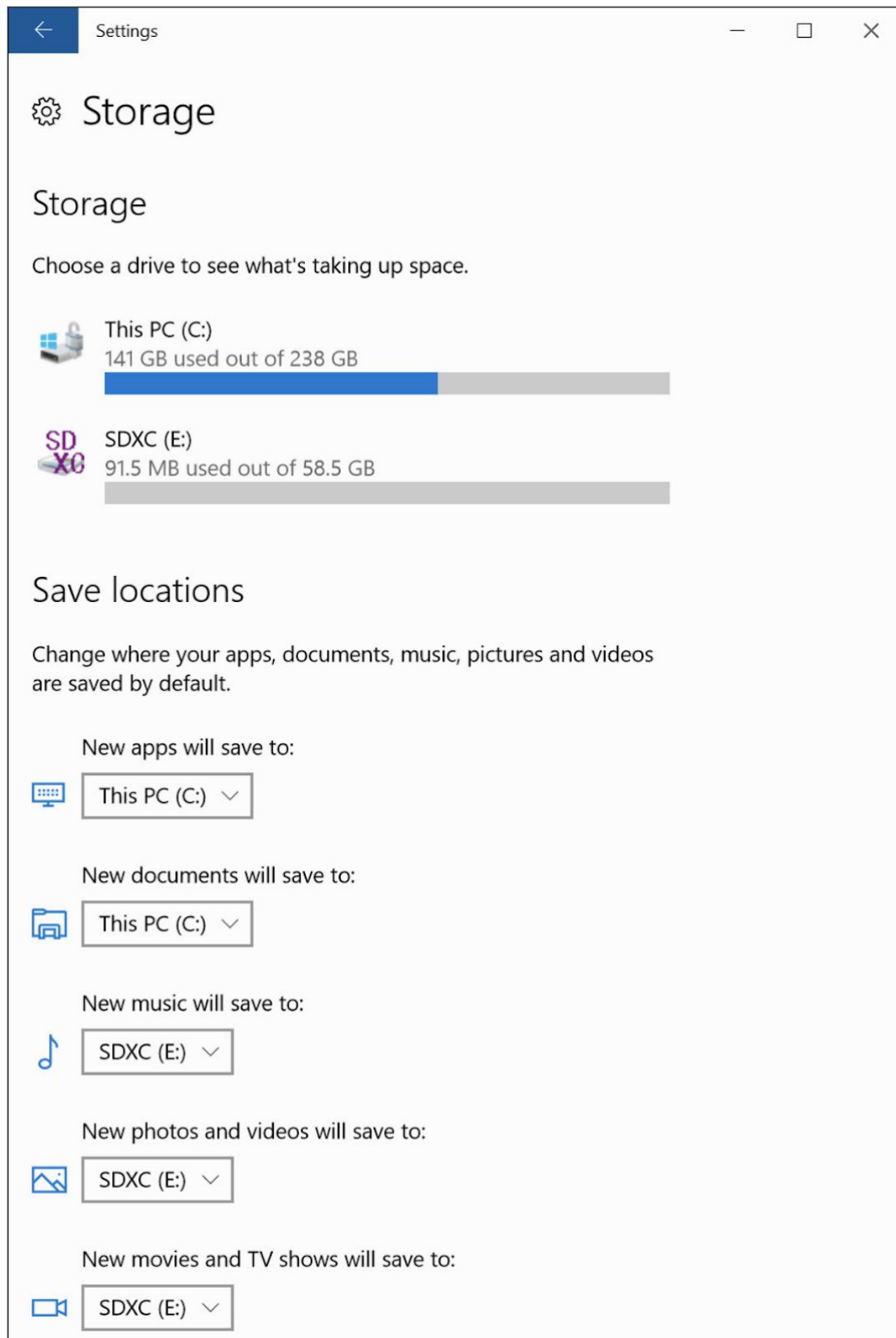


As you click to navigate deeper into the categories in the Storage section of Settings, you'll find buttons and links for managing files contained in that category by using File Explorer.

On systems with multiple drives (including removable media), you can change the default location for specific file types.

If you have a large music collection, for example, you might prefer to store MP3 files on an SD card rather than on your main system drive.

To make that possible, open the Storage page in Settings and adjust the options under the Save Locations heading, as shown in the next figure:



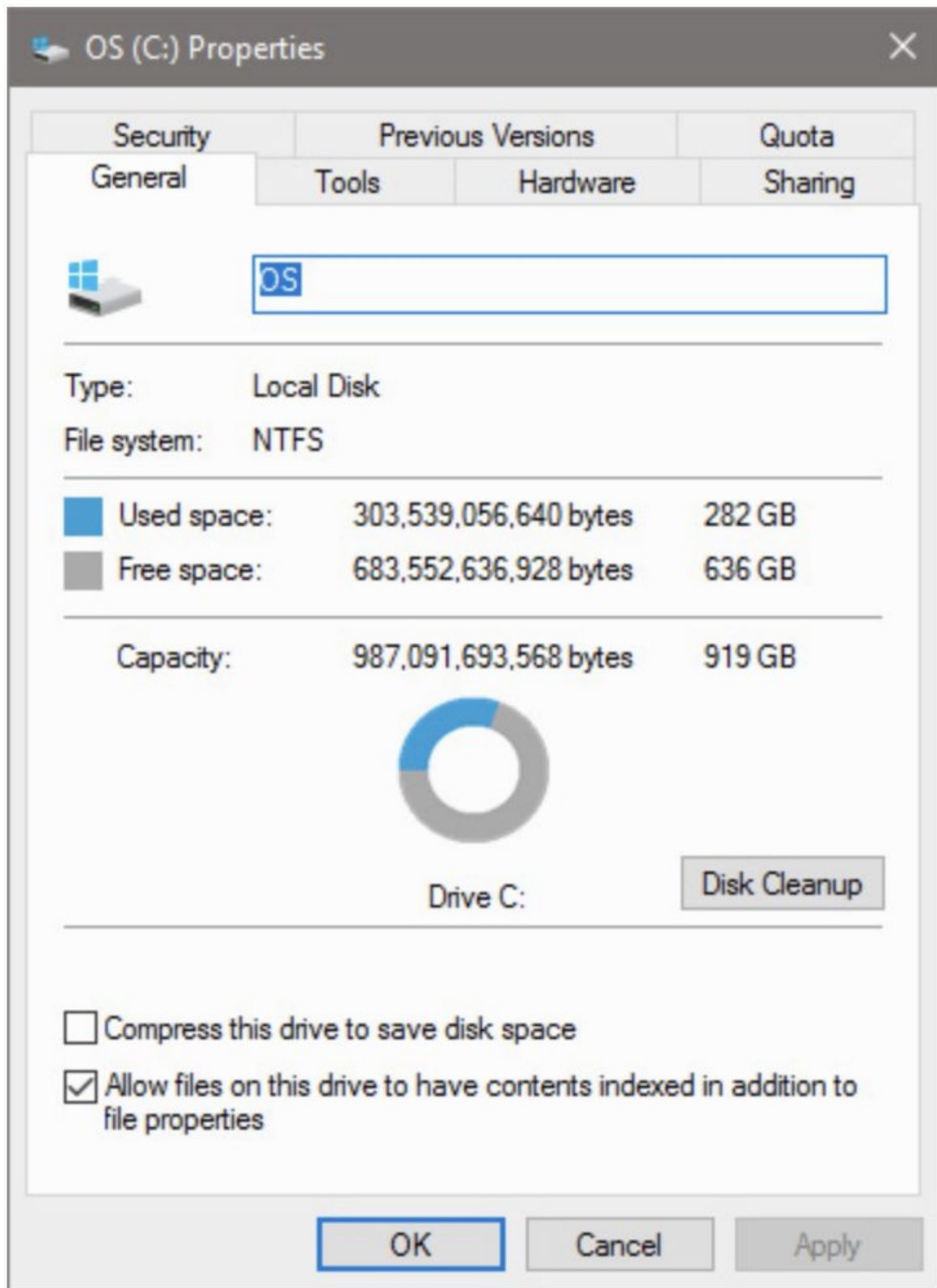
Changing the default location for a file type affects the storage of new items.

It does not move current items.

When you set the default save location for these categories to a secondary drive, Windows 10 creates folders on the secondary drive, with subfolders that correspond to the category name for each file type within a folder named after your user account name.

You can also examine how much storage is currently available and in use by opening File Explorer, right-clicking a disk icon in This PC, and then clicking Properties.

The following picture shows an example of what you might see:

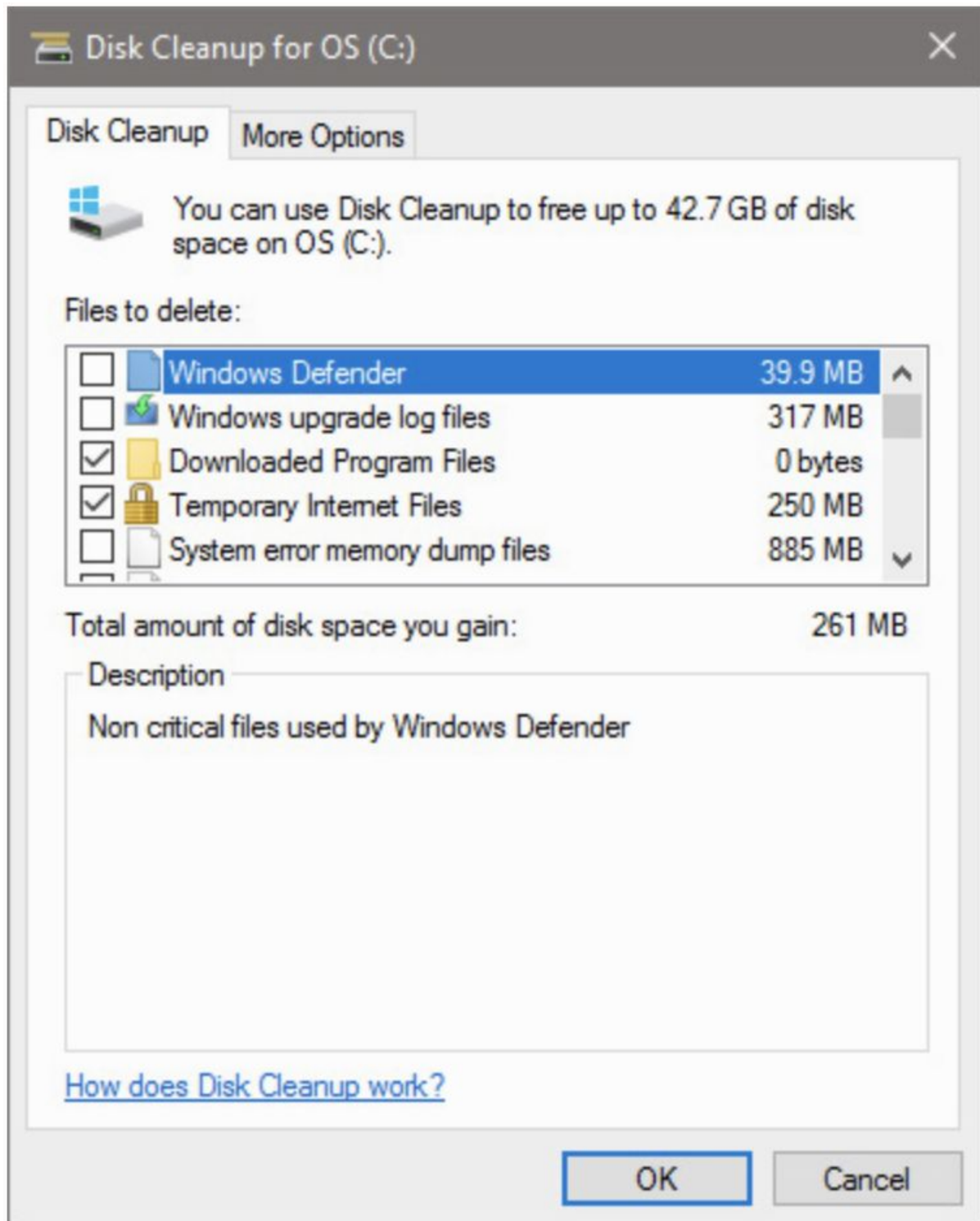


Click Disk Cleanup to run the utility of the same name (Cleanmgr.exe).

Note that this utility initially opens in standard user mode, allowing you to manage files available to your user account but blocking access to system files.

To enable the full range of Disk Cleanup options, click Clean Up System Files and enter the credentials for an administrator account if necessary.

That restarts the utility and unlocks access to the full range of cleanup options, as shown in the next figure:



Caution!

You might be tempted to obsess over disk space usage and use every trick to create as much free space as possible.

That strategy might come back to haunt you, however.

If you remove previous Windows installations, for example, you lose the ability to roll back to a previous version to recover from compatibility problems.

As a general rule, you should keep at least 20 percent of total disk capacity free.

That allows enough room to process temporary files properly without affecting performance dramatically.

Beyond that baseline, think long and hard before deleting what might be important files.

Monitoring and improving system performance

The out-of-the-box performance of a Windows 10 PC should be acceptable, assuming that the device you're using is capable of the work you're asking it to perform.

A small tablet with a low-power mobile processor will almost certainly struggle at a processor-intensive task like video processing, for example.

But even a workstation-class PC can perform poorly if you have a problem with a major subsystem or if Windows is configured incorrectly.

In our experience, the most common causes of poor performance are these:

- Defective hardware. Memory and disk errors are most obvious when they cause system crashes, but hardware-related problems can also cause performance to drag. Check with your hardware manufacturer to see what diagnostic tools are available.
- Outdated or flawed device drivers. PC and device makers are responsible for supplying drivers for the individual hardware components that go into their hardware. If you do a clean install, Windows might install a generic driver instead of one written specifically for that device. We have seen performance problems vanish immediately after a simple driver upgrade. Always be certain you're using the best possible drivers for all system devices. Don't assume that a newer driver is automatically better than an older one, however; any driver update has the potential to cause new problems.
- Inadequate hardware resources. Windows 10 should perform basic tasks well on even low-end hardware that was designed and built five or more years ago. But more demanding tasks, such as digital media encoding, can push some systems to the breaking point. The performance-monitoring tools we identify later should help you identify areas where hardware resources are being pushed to the limit.

- Out-of-control processes or services. Sometimes, a program or background task that normally runs just fine will spin out of control, consuming up to 100 percent of CPU time or grabbing increasing amounts of memory or other system resources. In the process, of course, performance of all other tasks slows down or grinds to a halt. Knowing how to identify and kill this sort of process or service and prevent it from recurring is a valuable troubleshooting skill.
- Malware. Viruses, Trojan-horse programs, spyware, and other forms of unwanted software can wreak havoc on system performance. Be sure to check for the possibility that malware is present on a system that exhibits otherwise unexplained performance problems.

Windows 10 offers two valuable tools for monitoring the performance of your system in real time, Task Manager and Resource Monitor.

Task Manager has been a mainstay of Windows through many versions.

We described its use for terminating recalcitrant processes and disabling unwanted startup programs.

It also includes valuable performance-monitoring tools, which we describe here.

For zeroing in on performance issues with even more detail, you can use an advanced tool called Resource Monitor.

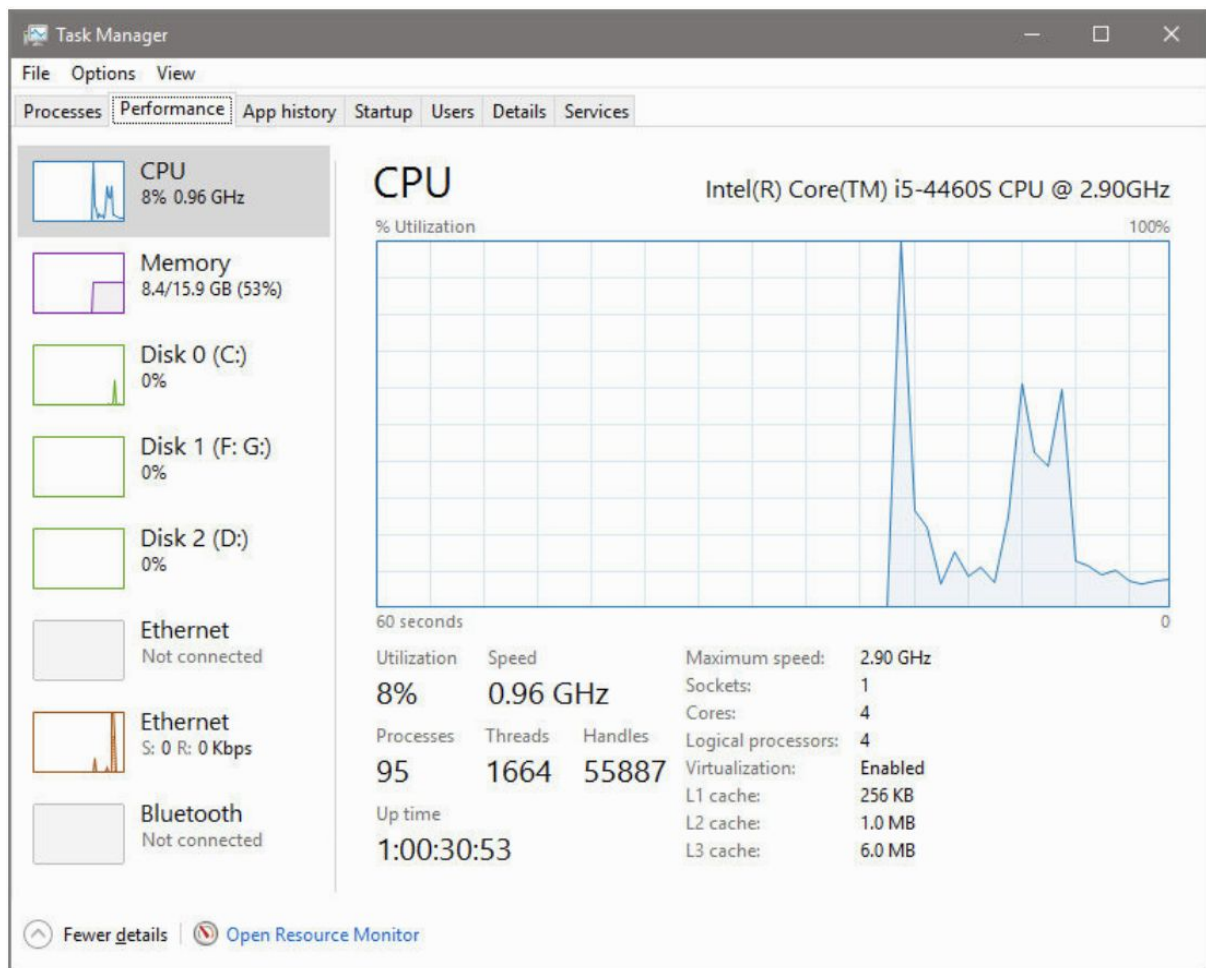
In combination, these tools help you to keep an eye on CPU, memory, disk, and network usage and give you the ability to isolate troublesome processes.

Monitoring performance with Task Manager

The Performance tab of Task Manager gives you a quick overview of your system's performance as measured in multiple dimensions, including CPU, memory, disk, and network usage.

The small thumbnail graphs at the left report current data in real time; clicking any of these thumbnails displays a much larger version, with additional information below the chart.

The following picture shows the performance data for a desktop PC, roughly 30 seconds after opening Task Manager:



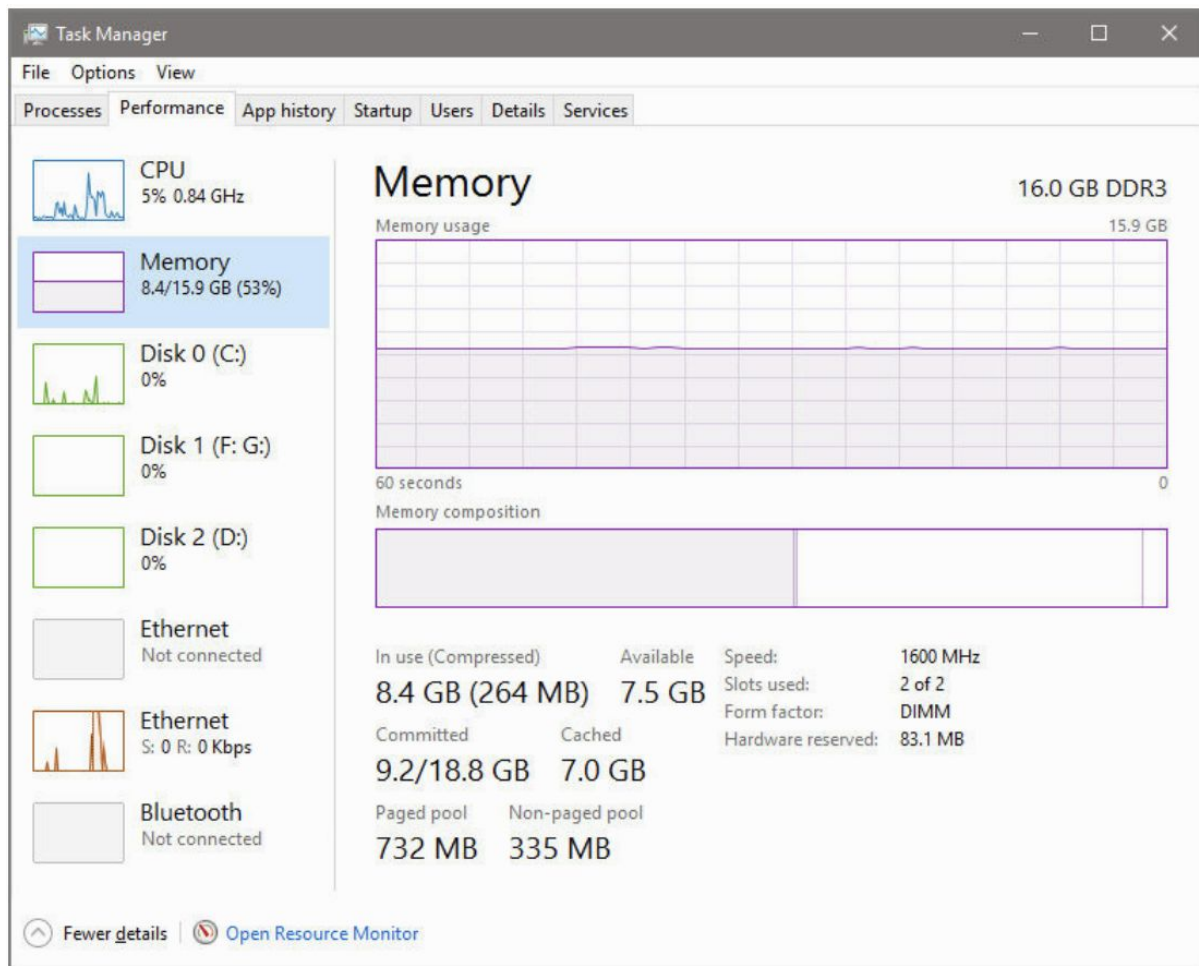
The graphs to the right show 60 seconds' worth of data, with updates at one-second intervals.

In the previous figure, for example, the CPU graph shows a large spike to 100 percent usage (which occurs, ironically, when you open Task Manager), followed by several additional spikes as other activities make demands on the CPU.

By keeping this pane open as you work, you can see what the impact of a given activity is.

For example, you might monitor CPU usage when encoding a video file to see whether the operation pins CPU usage at 100 percent; if so, that might be evidence that you need to upgrade your desktop PC to one with a more powerful CPU that's capable of doing the same work faster, generating less heat, and allowing you to do other things while the task completes in the background.

The Memory option offers a snapshot of memory usage, as shown in the next image:

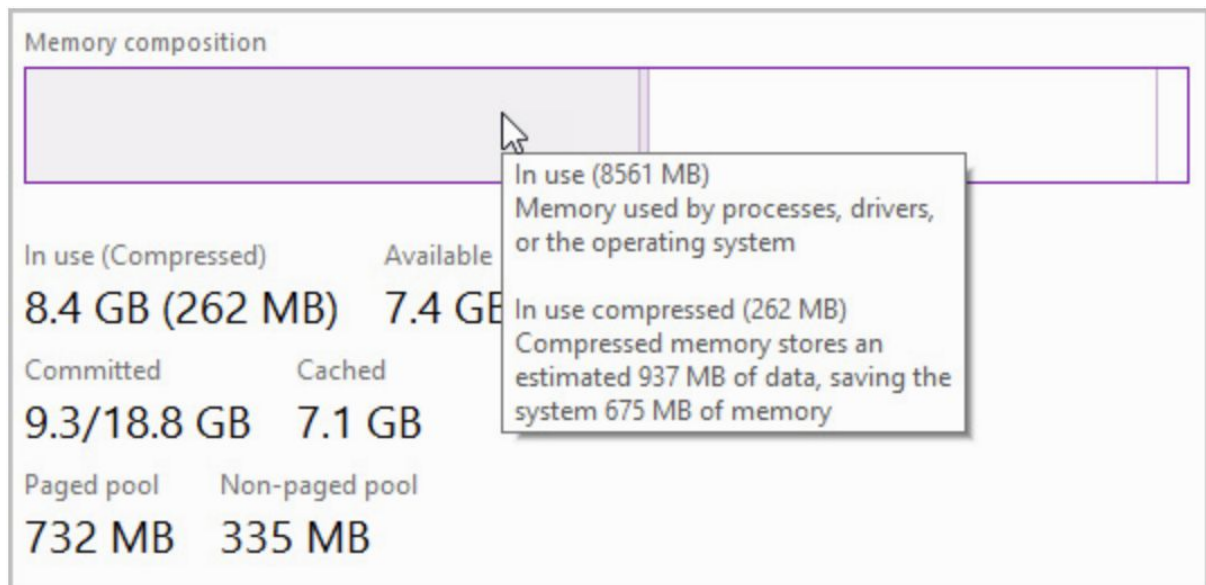


Note that the total amount of memory is visible above the graph, with details about the physical memory itself (number of sticks and slots, for example) below, alongside the amount of RAM in use and the amount available.

On this page, a detailed Memory Composition bar chart appears below the main graph.

At first glance, it appears to be just an alternate view of the main Memory Usage chart, but hover the mouse pointer over any segment to see its real purpose.

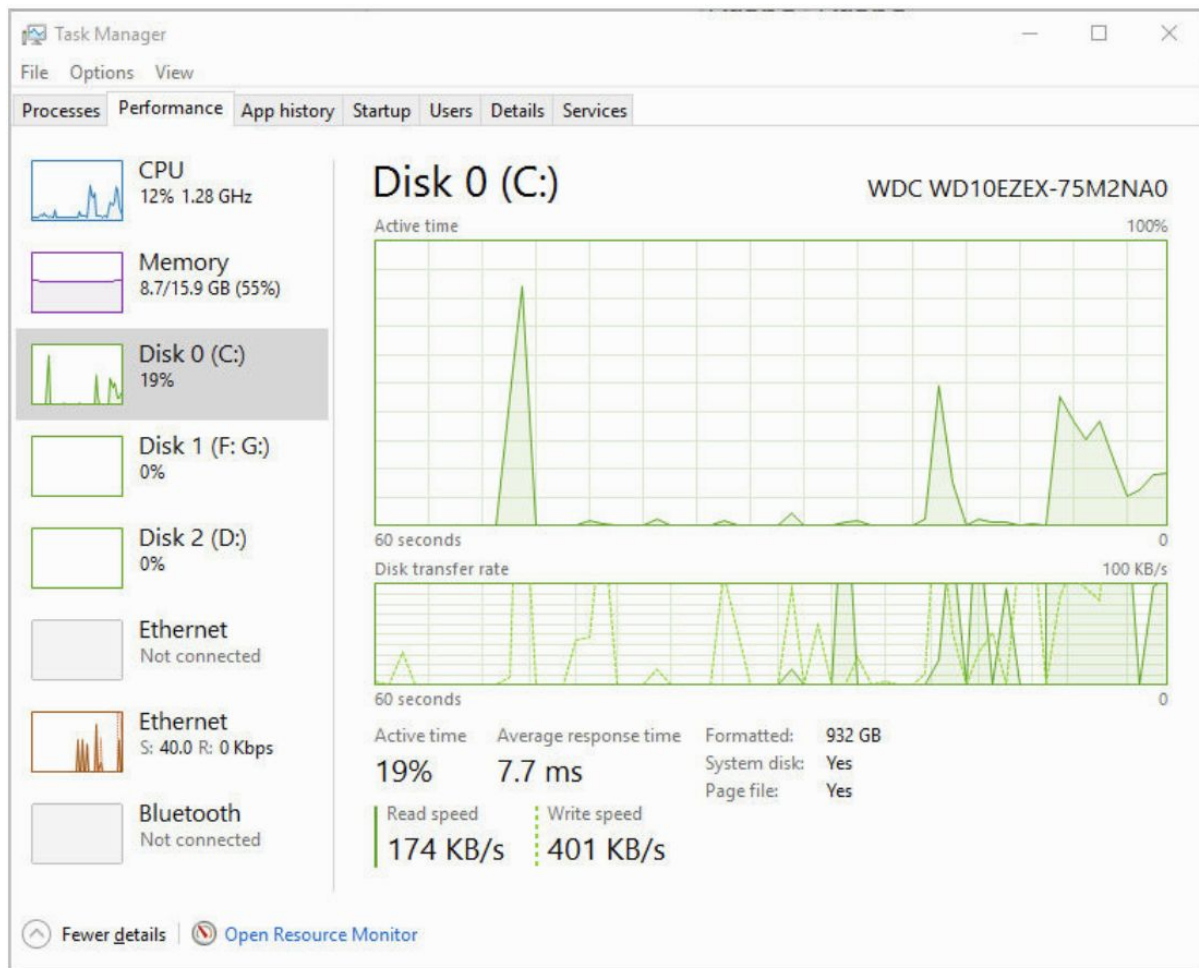
The ScreenTips that appear over each segment explain what each one represents.



The Disk options, likewise, graph the performance of all nonremovable disks on the current system.

Each disk gets its own entry on the left side, with details about the selected disk's performance on the right, as shown in the next figure.

The top graph depicts the percentage of time the disk is busy processing read or write requests; the bottom graph shows the disk transfer rate.



Using Resource Monitor to pinpoint performance problems

Like the Performance tab in Task Manager, Resource Monitor gives you both instantaneous and recent-history readouts of key performance metrics.

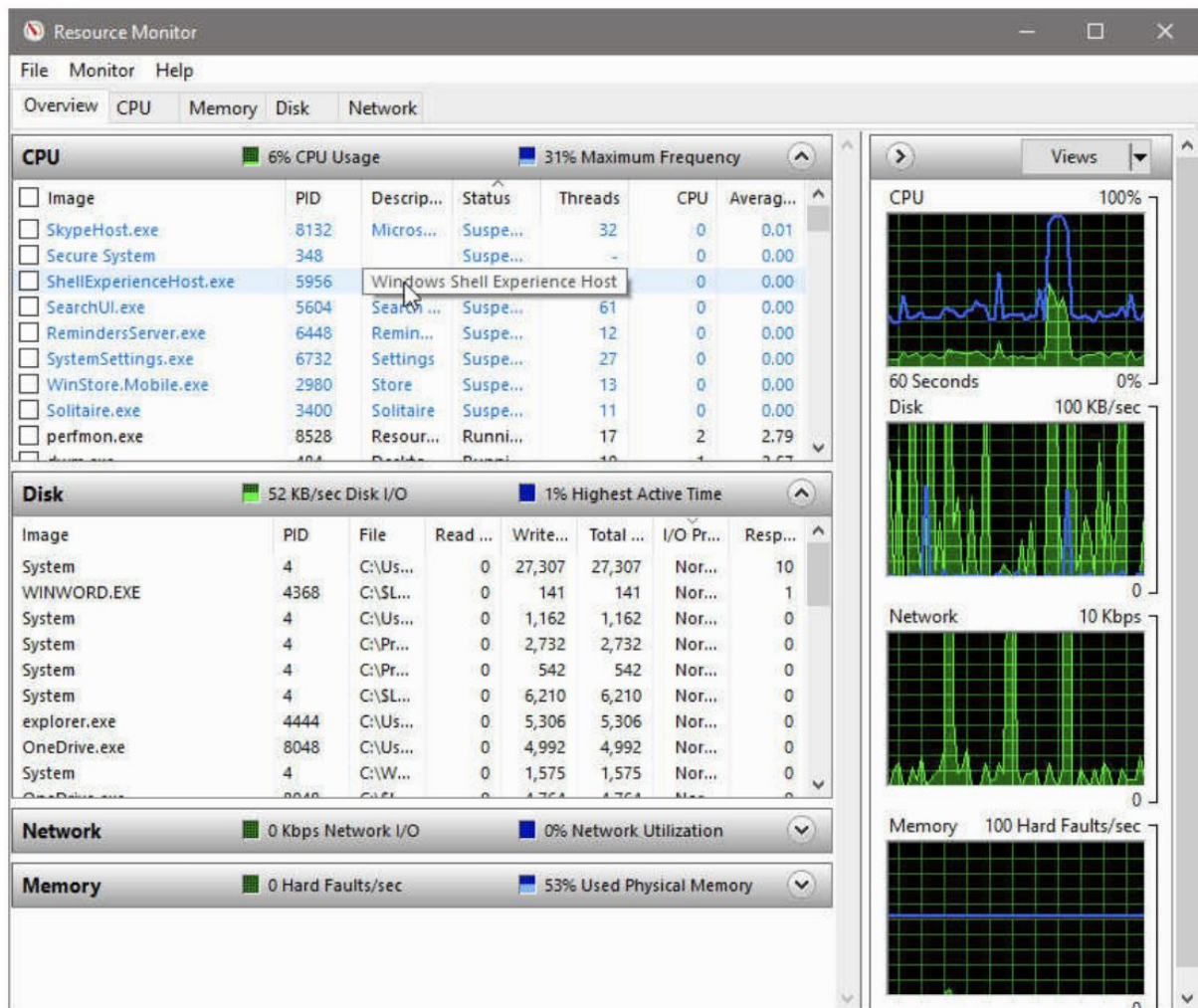
Also like Task Manager, Resource Monitor can show you, in excruciating detail, what each process is doing.

To open Resource Monitor, you can search for it from the Start menu or use its command line, **perfmon /res**, from an elevated Command Prompt window.

But the fastest way is to click the link at the bottom of the Task Manager Performance tab.

Start with a quick overview from Task Manager, and if you need more information, call on Resource Monitor.

When you first open Resource Monitor, you see the Overview tab shown in the next image, which provides both detailed tables and charts that summarize performance in four areas.



Using the tabs along the top of the Resource Monitor window, you can switch to a different context and focus on a specific type of resource usage.

The basic layout of each tab is similar and consists of a handful of common elements.

One or more tables contain details about the resource featured on that tab.

The first table on each tab is called the key table; it contains a list of all processes currently using the selected resource, with a check box to the left of each process you use to filter the data displayed in additional tables on the tab.

The key table at the top of the Overview tab lists all running processes in a display that is similar to the Processes tab of Task Manager.

Resource Monitor is overkill for most performance troubleshooting tasks.

But it shines when you want to see exactly which process or file is responsible for an unexplained burst of activity.

- Vocabulary -

- to wreak havoc: desatar el caos.
- to struggle: luchar / esforzarse.
- halt: parada.

- Exercises - 1. 3. 3. System maintenance and performance -

Open the following Google Document that you have created in a previous sub-unit:

"1. 3. System maintenance and troubleshooting - Apellidos, Nombre"

being "Apellidos, Nombre" your Last Name and Name.

Inside this Google Document you are going to copy and answer all the "Exercises" of this sub-unit:

1. Go to Settings -> Update & Security -> Windows Update:
 - Check if your device is up to date.
 - "Change active hours" from 9:00 to 21:00.
 - Check the "Advanced options" and select "Use my sign in info to automatically finish setting up my device after an update".
 - Click on "Choose how updates are delivered" and select getting "Updates from more than one place" and "PCs on my local network, and PCs on the Internet".
 - Check your "Update history" and click on "Uninstall updates".
2. Open the Task Manager and check the different tabs.
3. Open the Task Manager and check the "Start-up" tab. Add the following columns: "Disk I/O at start-up" and "CPU at start-up", and check which processes use more the hard disk and the CPU at the start-up.
4. Go to Settings -> System -> Storage:
 - Check the different categories in your your "Storage usage".
 - In the "Apps & games" category, sort the apps by size and check which are the bigger ones.
 - In the "Apps & games" category, uninstall any of the Windows 10 pre-installed games.
 - In the "Temporary files" category, check the disk space occupied by these files, and remove all the temporary files.
 - In the "Other" category, check for large or strange files.
 - Go back again to Settings -> System -> Storage, and check the "Save locations" area.
5. In File Explorer, open the Properties of your C: partition, and check in the "General" tab: Capacity, Used space and Free space. Click on the "Disk Clean-up" button, and later click on the "Clean up system files" button: check the files you can delete there.
6. Open the Task Manager, go to the "Performance" tab, and select all the items (CPU, Memory, Disk, Ethernet) to see the details, including the CPU "Up time".

In the “Memory” section, hover the mouse over the “Memory composition” graph to check the different ways Windows 10 is using your RAM memory.

7. Go to the Windows Search Box, open the “Resource Monitor” app and click on the different tabs (Overview, CPU, Memory, Disk, Network) to check the information provided.