- 1. 1. 1. Installing, configuring, and deploying Windows 10 -

Warm up

1. Let's review some educational vocabulary. How do you translate educational terms like "ESO", "Bachillerato", "FP", "DAM", "SI"...?
2. Which operating system do you use on your PC at home?
3. Have you used other operating systems?
4. In your opinion, which Windows version has been the best one?
5. And the worst one?
6. Which things do you like about Windows?
7. Which things you don't like about Windows?
8. Which are the most important things in order to develop a succesful operating system?
9. Have you had to reinstall Windows on your PC? How many times?
10. Did you pay for your Windows license?
11. Which is the future of Windows?

If you're lucky, your Windows 10 upgrade or clean install will be uneventful and the results will be trouble free.

You can increase the odds of this ideal outcome by taking some common-sense precautions first.

At the top of this list is checking the hardware on which you plan to install Windows 10 to confirm that it meets the minimum requirements (note that this list is unchanged from the system requirements for Windows 7):

- Processor: 1 gigahertz (GHz) or faster.
- RAM: 1 gigabyte (GB) (32-bit) or 2 GB (64-bit).
- Free disk space (system drive): 16 GB.
- Graphics card: Microsoft DirectX 9 graphics device with WDDM driver

The free disk space requirement varies, and Microsoft is continuing to work on improving upgrade scenarios for low disk space.

On devices with small amounts of built-in storage, you might be able to upgrade with as little as 10 free gigabytes.

As you approach that threshold, however, you might find that setup fails in unpredictable ways.

Those are fairly modest requirements, and virtually every PC sold in the past six years with Windows 7 or a later version preinstalled should qualify.

Note that some older devices that are at or near the minimum for one or more of these hardware components might not perform acceptably.

For online upgrades to Windows 10, you also need internet access.

A Microsoft account is recommended but is not required.

Back up your data and settings

Having an up-to-date backup of important files is, of course, good advice for any time.

But it's especially important when you're upgrading or installing an operating system.

The simplest way to back up files is to sync them to the cloud.

OneDrive sync capabilities are built in to Windows 8.1 and Windows 10.

Move or copy your files into the OneDrive folder and wait for them to be fully synchronized before proceeding.

With large file collections or slow internet connections—or if you just prefer not putting your files in cloud storage—a sufficiently large USB flash drive or an external hard drive makes a perfectly good target for a local backup.

If you're upgrading from Windows 7, you can use its built-in backup program; individual files and folders from those backups can be restored in Windows 10 by using the helpfully labeled Backup And Restore (Windows 7) option in Control Panel.

If you're upgrading from Windows 8.1 and you signed in with a Microsoft account, your personalized settings are already being synced to OneDrive.

Build (or buy) installation media

For every Windows 10 installation scenario, you need access to installation media.

To do a clean install on modern hardware, the most common choice is a bootable USB flash drive or, on older hardware, a bootable DVD.

For upgrades and reinstallations, you can use the same physical media or download an ISO file, which you can then mount directly or use to create your own installation media.

Types of licenses

If your goal is to purchase a physical or electronic copy of Windows for installation on a new PC or in a virtual machine, you can choose from the following license types:

- Retail. A retail license is sold directly to consumers as an electronic distribution or a packaged product. With a retail license, Windows can be installed on a computer that was not sold with Windows originally, or it can be used as an upgrade. A retail license can be transferred to a different computer as long as the underlying copy of Windows is no longer being used in the original location.
- OEM. An OEM (original equipment manufacturer) license is one that's included with a new computer. This license is locked to the computer on which it's installed and cannot be transferred to a new computer. OEM System Builder packages are intended for use by small PC makers but are often used by consumers and hobbyists in place of a more expensive full license.
- Volume. Volume licenses are sold in bulk to corporate, government, nonprofit, and educational customers and are typically deployed by using enterprise-management tools.
- Digital license. PCs that were upgraded from Windows 7 or Windows 8.1 during the year-long free upgrade offer of Windows 10 received a digital entitlement that is associated with the upgraded hardware on Microsoft's activation servers. The details of a digital license can be linked to a Microsoft account.

Installing Windows 10

If you already have an ISO file and a PC running Windows 10, you can create your own installation media with ease.

You can't simply copy installation files to a flash drive and use it to perform a clean install.

First, you have to make the disk bootable.

When creating a bootable drive, you need to consider two factors:

- Partitioning scheme: MBR (Master Boot Record) or GPT (GUID *Partition* Table)? You can use either scheme with a Unified Extensible Firmware Interface (UEFI) system; older BIOS-based systems might be able to recognize only MBR partitions.
- Disk format: NTFS or FAT32? If you plan to install Windows on a modern UEFI-based system (such as the Microsoft Surface Pro and Surface Book families), the boot files must reside on a FAT32 partition. If the drive is formatted using another file system, the PC will not recognize the device as bootable.

One of the simplest ways to create a bootable install drive is to use the built-in Recovery Media Creator tool, RecoveryDrive.exe.

Just as in previous Windows versions, this tool is able to create a bootable drive that includes the recovery partition provided by the OEM.

If you perform a clean install or remove that recovery partition for space purposes, the recovery drive can be used only for simple repair operations.

To run the tool, search for the Create A Recovery Drive option in Control Panel or Settings.

If you downloaded an ISO file containing the Windows installation files, you can burn that file to a DVD (assuming the target system has an optical drive from which it can start).

Or you can create a blank recovery drive using Windows 8.1 or Windows 10, skipping the option to copy system files to the drive; then double-click the ISO file to mount it as a virtual DVD.

Use File Explorer to drag all files and folders from the virtual DVD to the USB recovery drive.

Although it's not necessary for most purposes involving Windows 10, some people and organizations want maximum flexibility in creating installable media.

If that description fits you, it is recommend to use the free, open source utility Rufus, available at https://rufus.akeo.ie/.

It allows precise control over partitioning, formatting, and copying installation files to a USB flash drive.

Choose your installation method for Windows 10

Microsoft strongly encourages in-place upgrades for anyone running Windows 7 (with Service Pack 1) or Windows 8.1.

An upgrade retains all your data files, installed programs, and settings, at the risk of creating some compatibility issues.

But you also have options when you perform an upgrade by starting Windows Setup from within an earlier Windows version.

These options allow you to start from scratch, with or without your personal data files; you need to reinstall your programs and re-create or transfer settings from another system.

You need to boot from the Windows 10 media and choose a custom installation if either of the following conditions is true:

- You need to adjust the layout of the system disk. The Windows 10 installation program includes disk-management tools you can use to create, delete, format, and extend (but not shrink) partitions on hard disks installed in your computer. Knowing how these tools work can save you a significant amount of time when setting up Windows.
- You want to install Windows 10 alongside another operating system. If you want to set up a multi-boot system, you need to understand how different startup files work so that you can manage your startup options effectively.

If the system on which you plan to install Windows 10 is already running Windows 7, Windows 8.1, or Windows 10, you can start the setup program from within Windows.

When running setup from within Windows, you can upgrade from Windows 7 or Windows 8.1, transferring settings and desktop programs to the new installation — provided that the Windows 10 edition is equivalent to or newer than the currently installed Windows edition.

If you attempt an unsupported upgrade path, you have the option to transfer personal files only.

Starting Setup from within Windows does not offer the option to perform a custom install.

However, performing an upgrade and choosing Nothing from the list of what you want to keep has the same effect as performing a clean install.

After Windows 10 is installed, the Reset option is the preferred way to accomplish the task of repairing a Windows installation that isn't working properly.

Windows licensing and activation

For more than a dozen years, desktop versions of Windows have included a set of anti-piracy and anti-tampering features.

The various checks and challenges in Windows 10, in essence, are enforcement mechanisms for the Windows 10 license agreement, which is displayed during the process of installing or deploying the operating system: you must provide your consent to complete setup.

Product activation happens shortly after you sign in on a new PC running Windows 10.

Typically, this involves a brief communication between your PC and Microsoft's licensing servers.

If everything checks out, your copy of Windows is activated silently, and you never have to deal with product keys or activation prompts.

The activation process is completely anonymous and does not require that you divulge any personal information.

If you choose to register your copy of Windows 10, this is a completely separate (and optional) task.

After you successfully activate your copy of Windows 10, you're still subject to periodic antipiracy checks from Microsoft.

This process, called validation, verifies that your copy of Windows has not been tampered with to bypass activation.

It also allows Microsoft to revoke the activation for a computer when it determines after the fact that the activation was the result of product tampering or that a product key was stolen or used in violation of a volume licensing agreement.

Validation takes two forms: an internal tool that regularly checks licensing and activation files to determine that they haven't been tampered with and an online tool that restricts access to some downloads and updates.

If your system fails validation, your computer continues to work, but you'll see some differences: personalization options are unavailable, an "activate now" reminder on a black desktop background tells you that your copy of Windows is "Not Genuine," and an "Activate Now" dialog box appears periodically.

In addition, your access to Windows Update is somewhat restricted; you won't be able to download optional updates, new drivers, or certain other programs from the Microsoft Download Center until your system passes the validation check.

The activation mechanism is designed to enforce license restrictions by preventing the most common form of software piracy: casual copying.

Typically, a Windows 10 license entitles you to install the operating system software on a single computer.

If you're trying to activate Windows 10 using a product key that has previously been activated on a second (or third or fourth) device, you might be unable to activate the software automatically.

The activation rules associated with the distinct types of Windows 10 licenses are:

- OEM license. On new PCs sold with Windows 10 preinstalled by large system makers, information about the edition is stored in the system firmware. Activation of that edition is automatic. System Builder OEM licenses are available from smaller PC makers and require a product key.
- Retail license. This type of package, which is available with or without installation media, requires a product key to activate. It can be used on a new PC or as an upgrade on a PC running an older version of Windows.
- Volume license. For large customers, Microsoft sells upgrades to Enterprise and Education editions. These can be activated by a product key.
- Digital license. PCs that were upgraded from Windows 7 or Windows 8.1 during the year-long free upgrade offer of Windows 10 received a digital entitlement that is associated with the upgraded hardware on Microsoft's activation servers. The details of a digital license can be linked to a Microsoft account.

Managing digital licenses

In the first year after the initial release of Windows 10, Microsoft made upgrades from Windows 7 and Windows 8.1 free.

As part of that year-long campaign, it also added a new license type: the digital license.

On PCs upgraded using that free offer, the Windows activation server generated a Windows 10 license certificate (Microsoft calls it a digital entitlement) for the corresponding edition (Home or Pro).

That digital license is stored in conjunction with your unique installation ID on Microsoft's activation servers.

The unique installation ID is essentially a fingerprint of your PC, based on a cryptographic hash derived from your hardware.

That hash, reportedly, is not reversible and not tied to any other Microsoft services.

So although it defines your device, it doesn't identify you.

But it does make it possible to store activation status for that device online.

Once that online activation status is recorded, you can wipe your drive clean, boot from Windows 10 installation media, install a clean copy (skipping right past the prompts for a product key), and at the end of the process you'll have a properly activated copy of Windows 10.

At any time, you can check the activation status of your device by going to Settings > Update & Security > Activation.

Troubleshooting activation problems

When you install Windows 10 on a new PC, it attempts to contact Microsoft's licensing servers and activate automatically within three days.

If the activation process fails, you can activate Windows by connecting to a Microsoft activation server over the internet or by making a toll-free call to an interactive telephone activation system.

Under most circumstances, activation over the internet takes no more than a few seconds.

If you need to use the telephone, the process takes longer because you have to enter a 50-digit identification key (either by using the phone's dial pad or by speaking to a customer service representative) and then input the 42-digit confirmation ID supplied in response.

Windows 10 introduces an additional option—an activation troubleshooter.

If Windows doesn't activate automatically, you're reminded of this fact with a "Windows Is Not Activated" link at the bottom of every page in Settings.

The activation troubleshooter can resolve some simple problems and is especially well suited for activation errors that result from hardware changes or from situations where you inadvertently installed the wrong Windows edition (Home instead of Pro, for example).

In fact, if the troubleshooter is unable to resolve your issue, it offers an "I Changed Hardware On This Device Recently option".

What happens if you upgrade the hardware in your computer?

When you activate your copy of Windows 10, a copy of the hardware fingerprint is stored on your hard disk and checked each time you start your computer.

If you make substantial changes to your system hardware, you might be required to reactivate your copy of Windows.

You can upgrade almost all components in a system without requiring a new license.

Replacing the motherboard on a PC is the most certain way to trigger the activation mechanism, because the activation server assumes you tried to install your copy of Windows on a second computer.

If you replaced a defective or failed motherboard with one that is the same model or the manufacturer's equivalent, you do not need to acquire a new operating system license and you should be able to reactivate your copy of Windows.

To help with this scenario, the activation troubleshooter relies on another feature that's new: the capability to save a digital license for Windows 10 and link it to your Microsoft account.

This step isn't mandatory, but it's handy if you make major changes to a system with a digital license and need to reactivate.

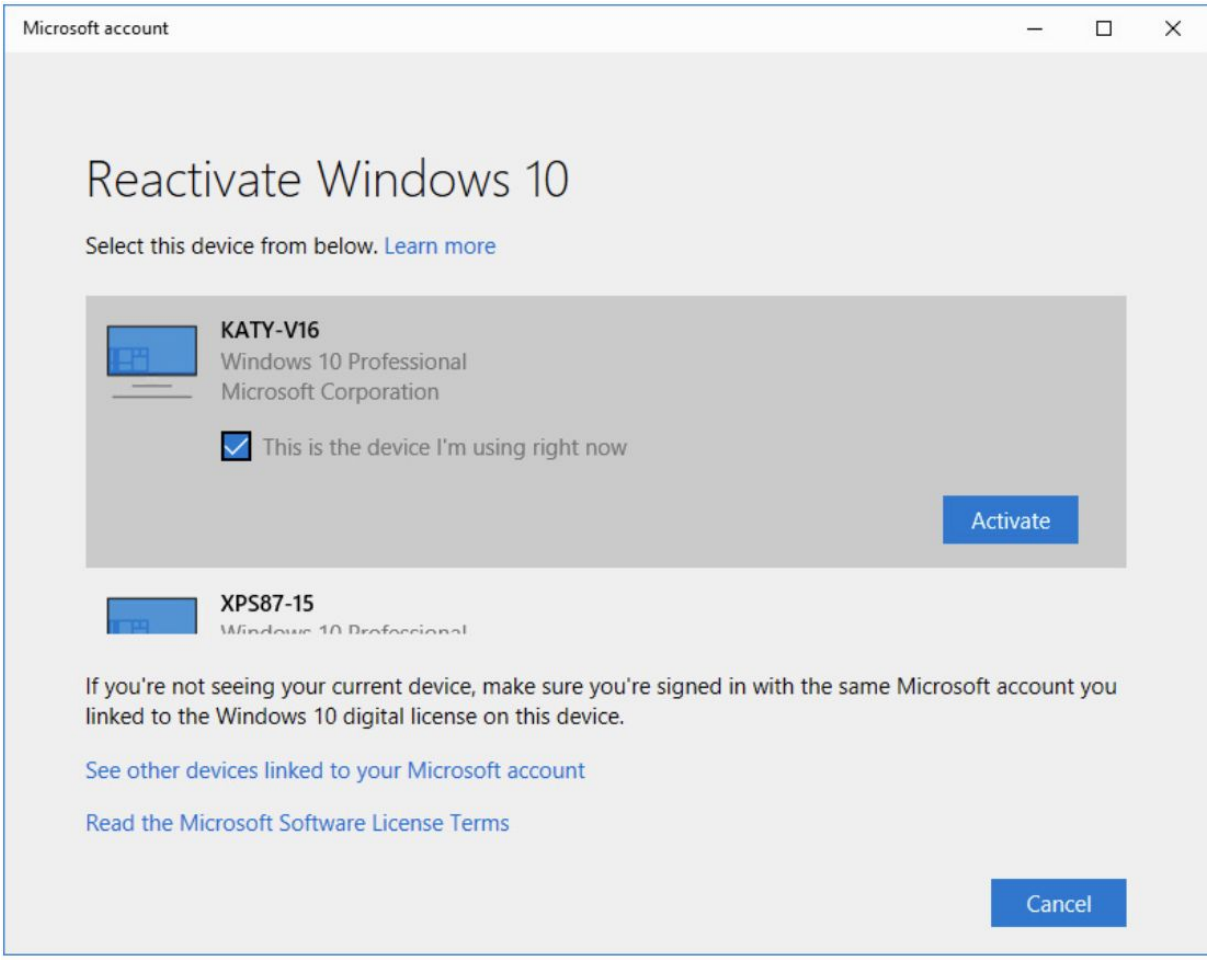
If the PC in question has a valid digital license that has been previously associated with a Microsoft account, you can run the activation troubleshooter to make the match that Microsoft's activation servers can't.

Click the Troubleshoot link at the bottom of that Settings page to launch a tool that tries to find the activation record for the PC you're using.

If you're not signed in with a Microsoft account, you need to do so, using the account you used previously to activate this PC.

After signing in with the Microsoft account to which the previous device activation was linked, you'll see a list of linked devices.

Select the name associated with the device you're having troubles with and then click "Activate".



If all else fails, your only remaining option is to contact the telephone-based activation support center, explain the circumstances, and—assuming that the support representative accepts your claim—manually enter a new activation code.

If you upgrade your PC with a new motherboard, that is considered a new PC and might require a new license.

How Windows 10 Setup works

The Windows 10 Setup program works in multiple stages, the details of which vary depending on whether you're performing an in-place upgrade or a clean install.

The process is extremely robust and is capable of recovering from a failure at any stage.

Setup performs basic system compatibility checks to confirm that the system has sufficient free disk space for both the installation and recovery options, that required CPU features are available, and that both memory and graphics hardware meet minimum requirements.

During this phase, Setup also inventories hardware and confirms that critical drivers are available (storage and networking, for example).

If any critical drivers are unavailable, setup stops and rolls back.

In either type of installation, the lengthiest stage occurs with Setup running offline in the Windows Recovery Environment, during which it backs up the previous Windows installation (if one exists) into a Windows.old folder and applies the new Windows 10 image.

The final stages of installation run after a restart, with the final stage consisting of the user signing in and either creating a new profile or migrating an existing one as part of the upgrade.

Setup does its magic using two folders:

- C:\$Windows.~BT is a hidden folder that contains the files used during both the online and offline phases of setup. When you launch Setup from installation media, such as a mounted ISO file or a bootable DVD or USB flash drive, the initial phase of setup creates this folder and copies the setup files to it for temporary use, eliminating the possibility of a setup failure caused by prematurely removing or unmounting the installation media.
- C:\Windows.old is created only when you perform an upgrade or do a clean install on a volume that already contains a Windows installation. This folder does double duty. During upgrades, it's used as a transfer location to hold files and settings that are moving from the old installation to the new one. After

setup is complete, this folder holds system files from the previous Windows installation as well as any user files that were not migrated during setup.

Upgrading to Windows 10

No major upgrade is ever risk free, of course, but the Windows 10 installer is designed to be robust enough to roll back gracefully in the case of a failure.

When you kick off a Windows 10 upgrade, the setup program performs a series of tasks.

First, it runs a compatibility check, which determines whether your PC, peripheral devices, and installed Windows apps will work with Windows 10.

Using Windows installation media

When you start an online upgrade from within Windows 8.1, the upgrade keeps all your data files and migrates settings, Windows apps, and desktop programs.

Upgrades from Windows 7 preserve data files and desktop programs but do not migrate personalized settings such as your desktop background.

If you have Windows 10 installation media, you can also start the upgrade process from within Windows.

Open the DVD or USB flash drive in File Explorer and double-click Setup.

The resulting wizard walks you through several steps that aren't part of the streamlined online upgrade.

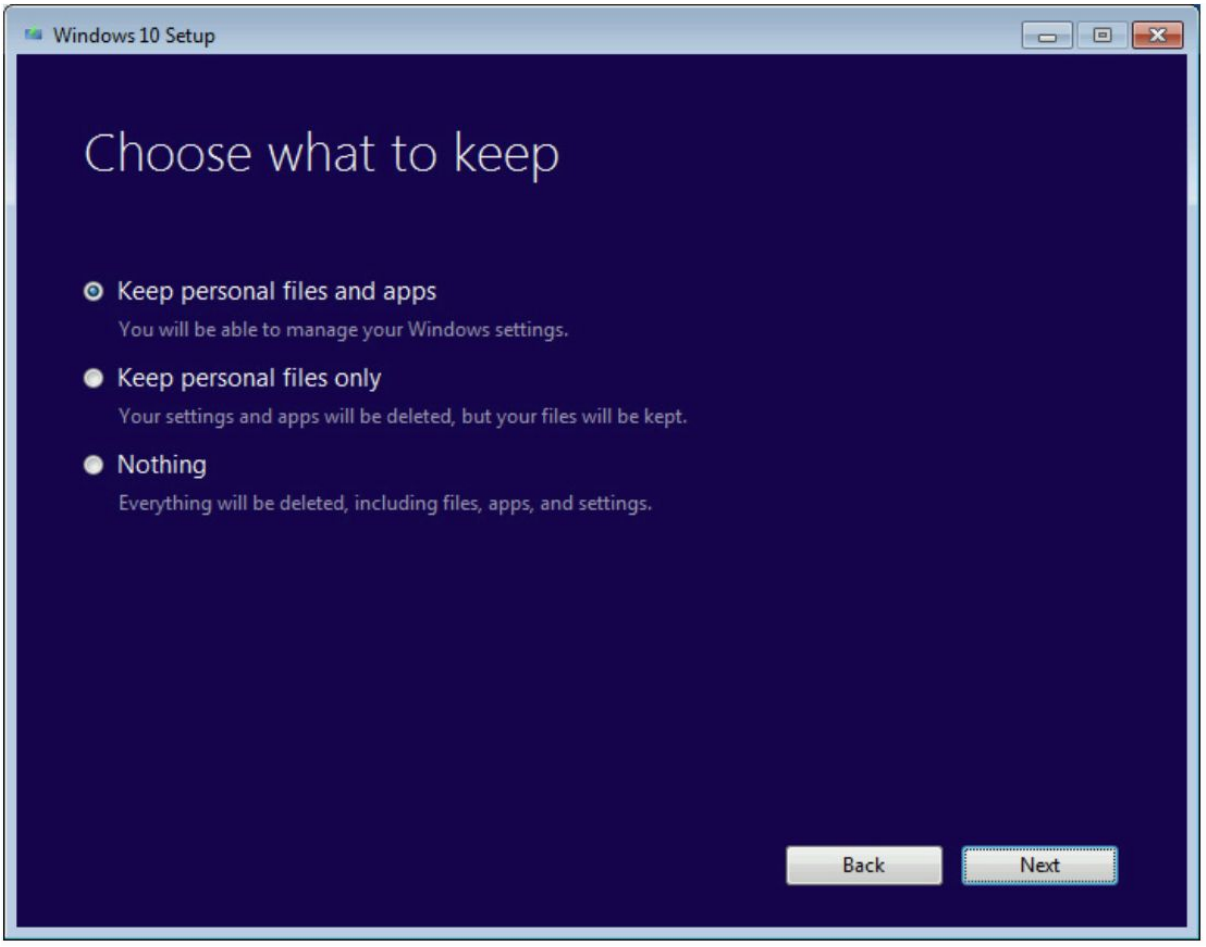
The most important of these is the option to transfer files, apps, and settings.

Transferring files, apps, and settings

When you upgrade to Windows 10 on a volume that already contains a copy of Windows, you must choose what you want to do with user files, settings, and apps.

To choose an alternative option, run Setup from installation media or an ISO file.

Next image shows your options when upgrading from Windows 7 to Windows 10:



Here's what happens with each option:

- Keep Personal Files And Apps. All Windows desktop programs and user accounts are migrated. After the upgrade is complete, you need to sign in with your Microsoft account to install apps from the Windows Store and sync saved settings. When upgrading from Windows 8.1, this option includes the capability to preserve settings.
- Keep Personal Files Only. This option is the equivalent of a repair installation. Each user's personal files are available in a new user profile that otherwise contains only default apps and settings.
- Nothing. Choose this option if you want to perform a clean install, with your existing installation moved to Windows.old. Note that the descriptive text, "Everything will be deleted," is misleading. Your personal files, as well as those belonging to other user accounts in the current installation, are not deleted. Instead, they are moved to the Windows.old folder, where you can recover them by using File Explorer.

After the initial prep work, Setup restarts in offline mode, displaying a progress screen that is simpler than the one from the initial release of Windows 10.

In this mode, you can't interact with the PC at all.

Your PC is effectively offline as the following actions occur.

Windows Setup first moves the following folders from the existing Windows installation on the root of the system drive into Windows.old:

- Windows.
- Program Files.
- Program Files (x86).
- Users.
- ProgramData.

During this offline phase, Setup extracts registry values and program data from the Windows.old folder, based on the type of upgrade, and then prepares to add this data to the corresponding locations in the new Windows 10 installation.

Third-party hardware drivers are also copied from the old driver store in preparation for the new installation.

Next, Setup lays down a new set of system folders for Windows 10 using the folder structure and files from the compressed Windows image.

After that task is complete, Setup moves program files, registry values, and other settings it gathered earlier.

Moving folders minimizes the number of file operations that have to take place, making upgrade times consistent even when individual user accounts contain large numbers of files.

To further speed things up, Windows 10 Setup uses hard link operations to move files and folders from the transport location to the new Windows 10 hierarchy.

Not having to physically move the file improves performance and also allows for easy rollback if something goes wrong during setup.

This activity is accompanied by several restarts and can take as long as a few hours, depending on your hardware, although an upgrade on most modern hardware goes much faster.

By signing in with a Microsoft account, you can continue setting up Windows 10 by using synced settings.

The most current version of each preinstalled app is downloaded and installed from the Store before you sign in.

If you’re upgrading from Windows 7 or from a Windows 8.1 PC that was configured to use a local user account, you need to sign in using the credentials for that account.

After that, you’ll have the option to link your account to a Microsoft account or to continue using a local account.

Performing a clean install

For some veteran Windows users, a clean install is the only option worth considering.

Historically, that option means starting up from a bootable USB flash drive containing the Windows 10 installation files and removing all traces of the currently installed Windows version before proceeding with setup.

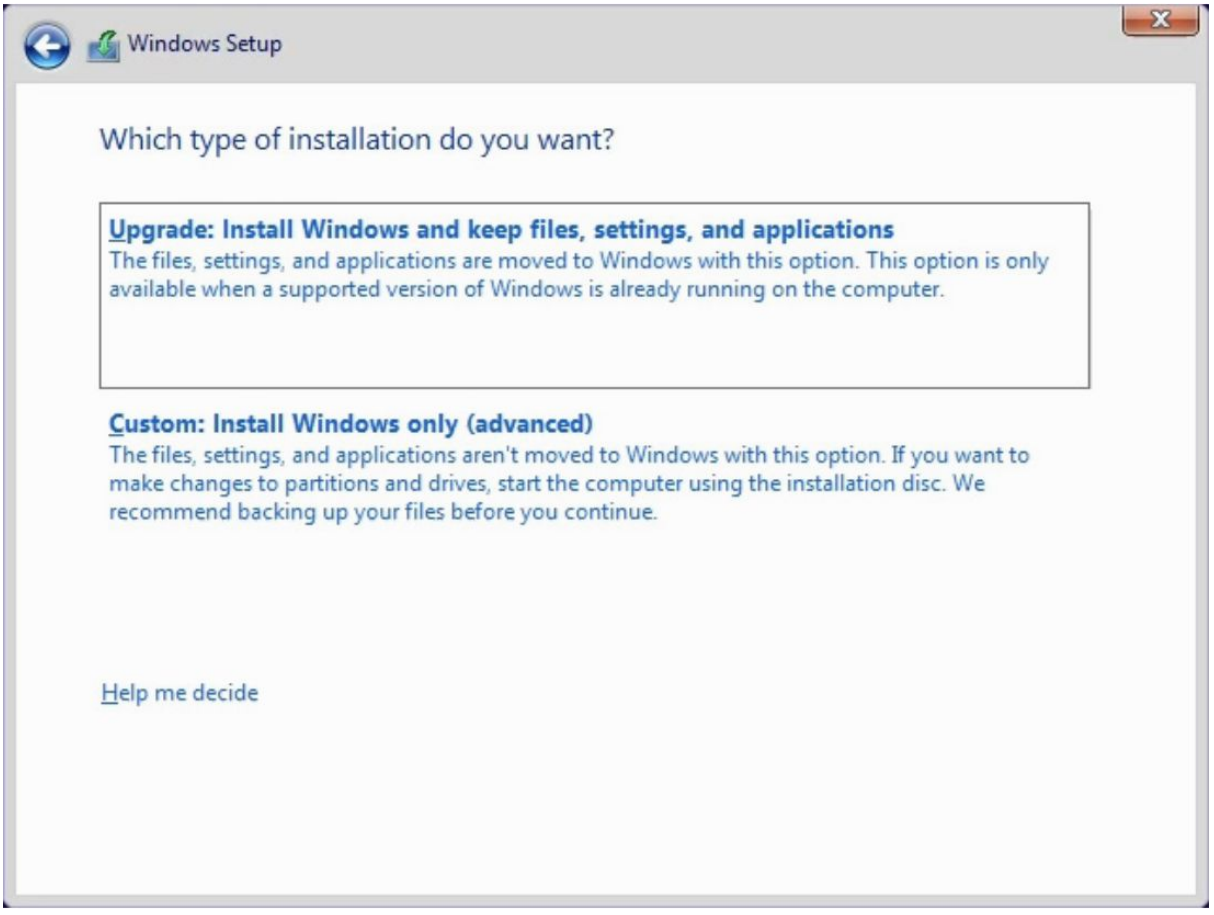
This is still a perfectly valid installation method, one we'll describe in more detail shortly.

But it's no longer the only option, nor is it always the best.

For a system that's already running any modern version of Windows, you'll find it much easier to start Setup from within Windows, choose an upgrade install, and choose the option to keep Nothing.

After you use Disk Cleanup Manager to remove the old Windows installation, the result is virtually identical to an old-fashioned clean install.

When you boot from a Windows installation media device, you pass through a few introductory screens—choosing a language, accepting a license agreement—and eventually reach the Windows Setup window shown in the next image:

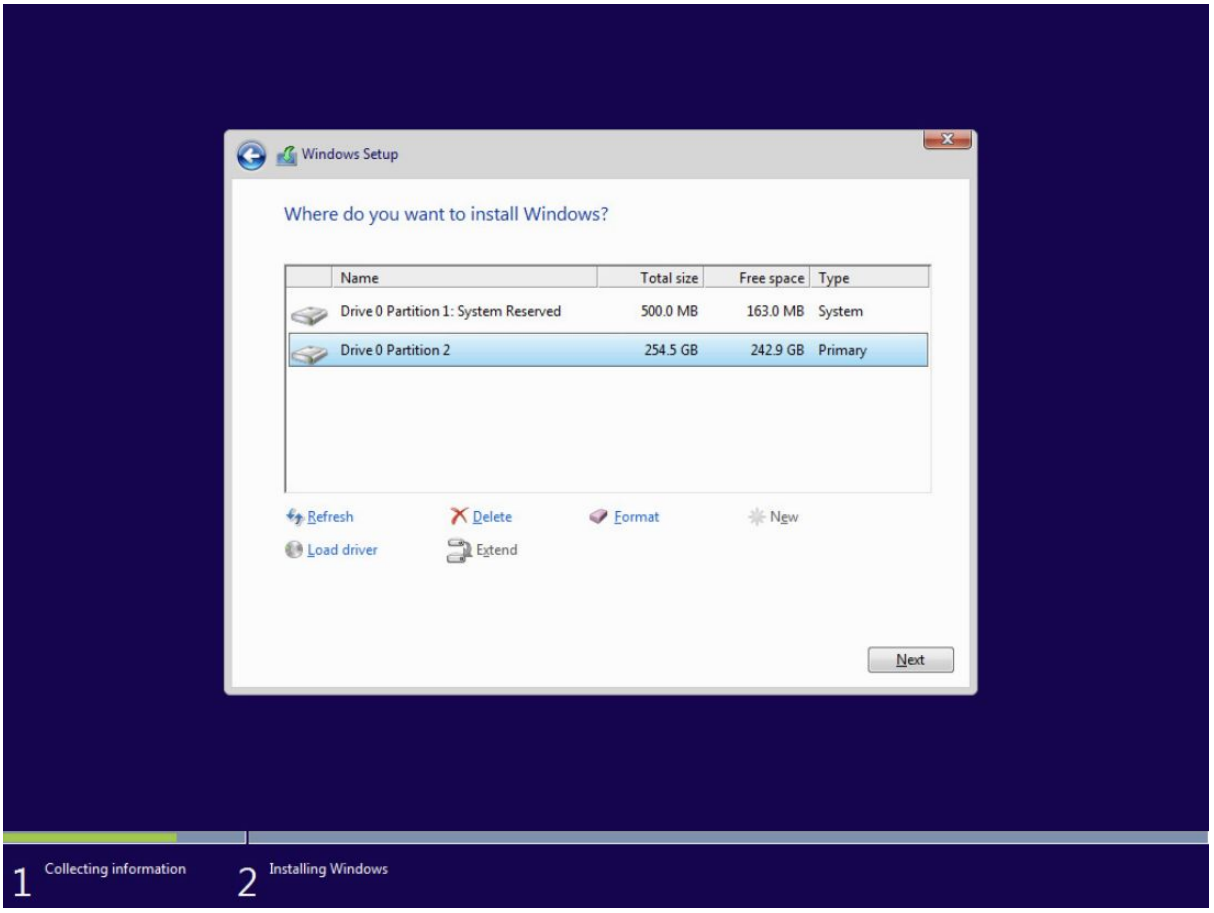


Although you're prompted to choose an installation type—Upgrade or Custom—that's actually a trick question.

Choosing the "Upgrade" option raises an error message; you can upgrade Windows only if you start Setup from within Windows.

The "Custom" option allows you to continue, and you're presented with a list of available disks and volumes.

Next figure shows what you see on a system with a single drive that already contains an installation of Windows 10:



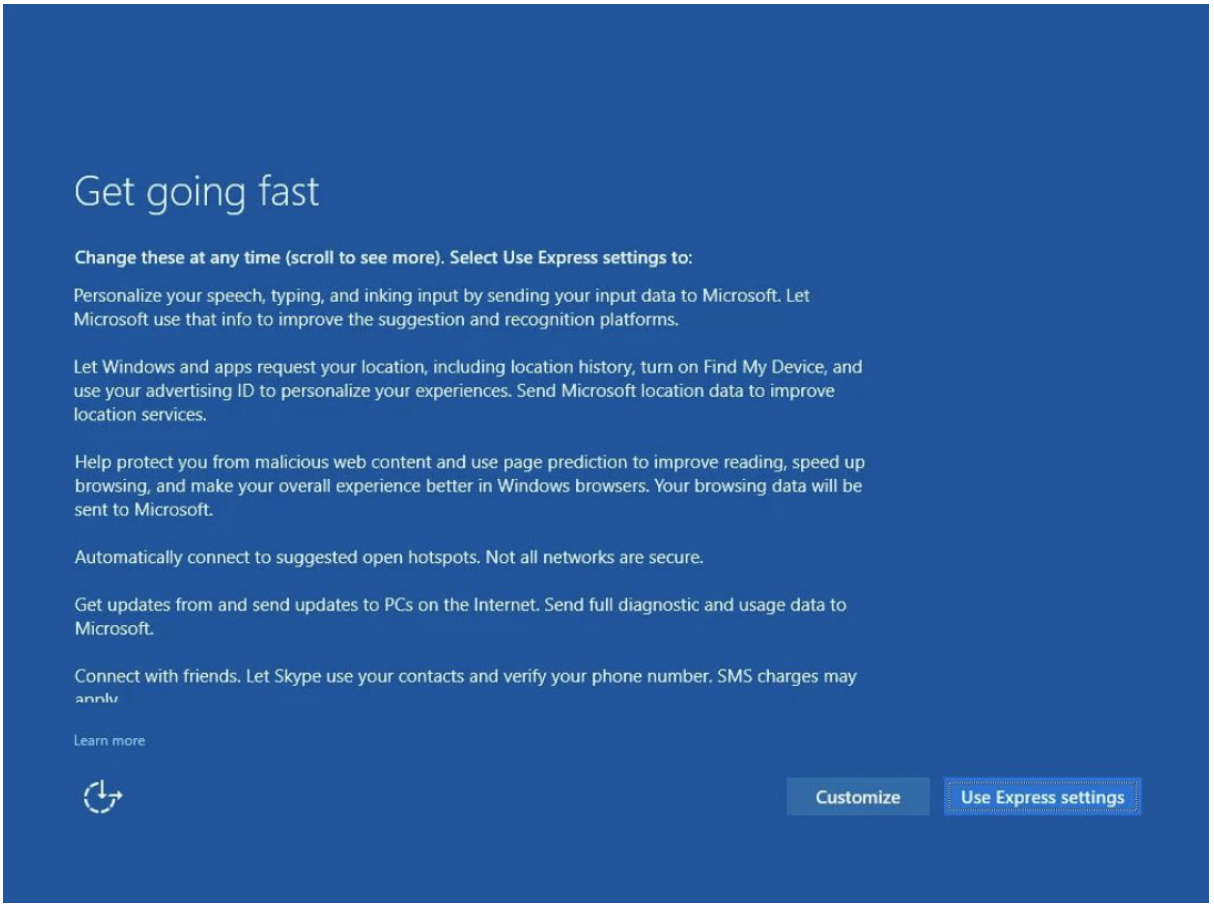
You can use the tools beneath the list of available drives to manage partitions on the selected drive.

You can use these tools to delete an existing partition (for a truly fresh start on a drive that already contains files), create a new partition, format a partition, or extend a partition to include adjacent unallocated space.

When you click Next, the setup process switches into a lengthy unattended phase in which it lays down the clean Windows 10 image.

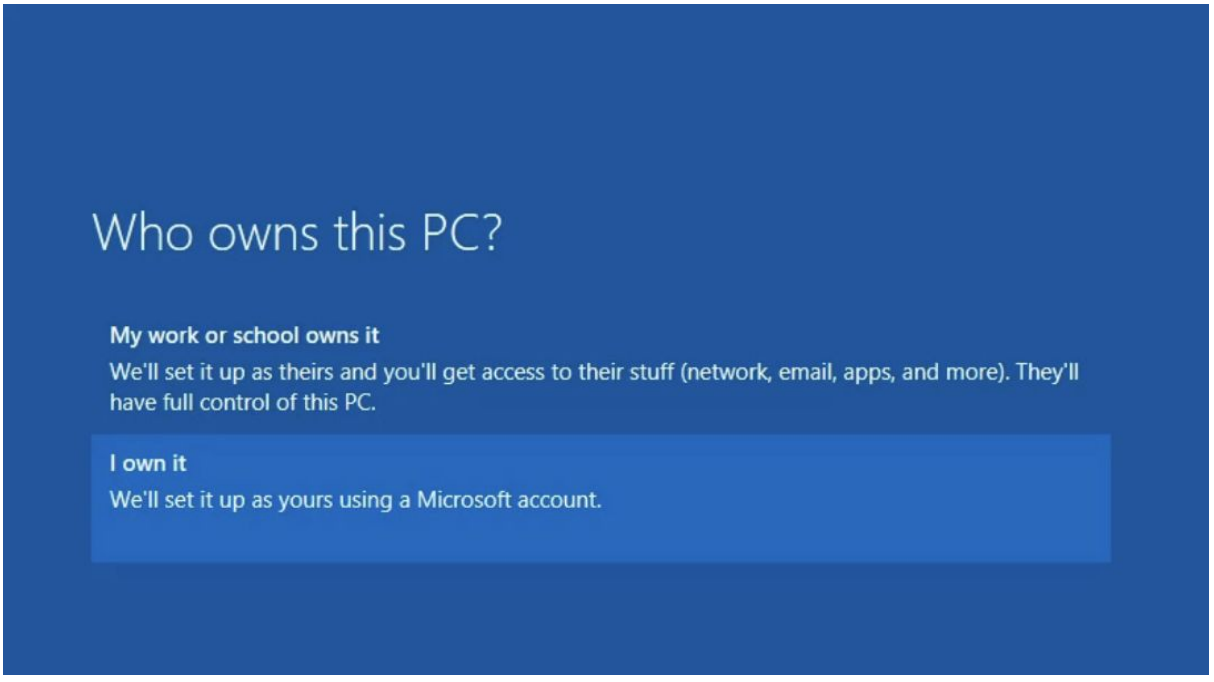
When that's complete, you get to choose default settings for all new accounts.

The default settings are explained in detail in the following screen, which encourages you to click Use Express Settings to move on quickly. Click the Customize button to open additional pages where you can adjust any of these settings:



If you do a clean install using bootable media for Windows 10 Pro, you're faced with one additional choice immediately after this phase of setup.

The dialog box shown in the next figure asks you who owns your PC:

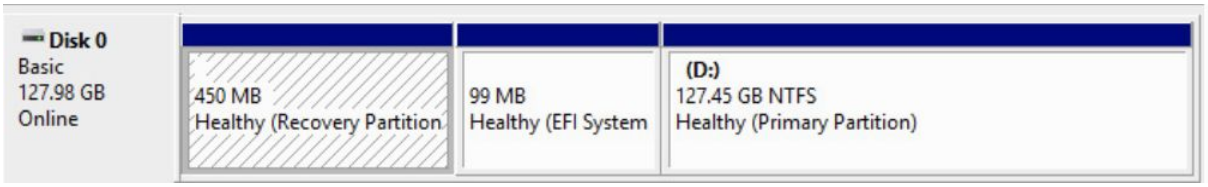


If you own the device, or if it is a company PC that will be joined to a Windows domain managed by your organization, choose the I Own It option.

How Windows 10 divides a disk

If you install Windows 10 on a UEFI-based system with a single unformatted disk, Setup creates a default disk layout.

Three of its partitions are visible in the Disk Management console, as shown here:



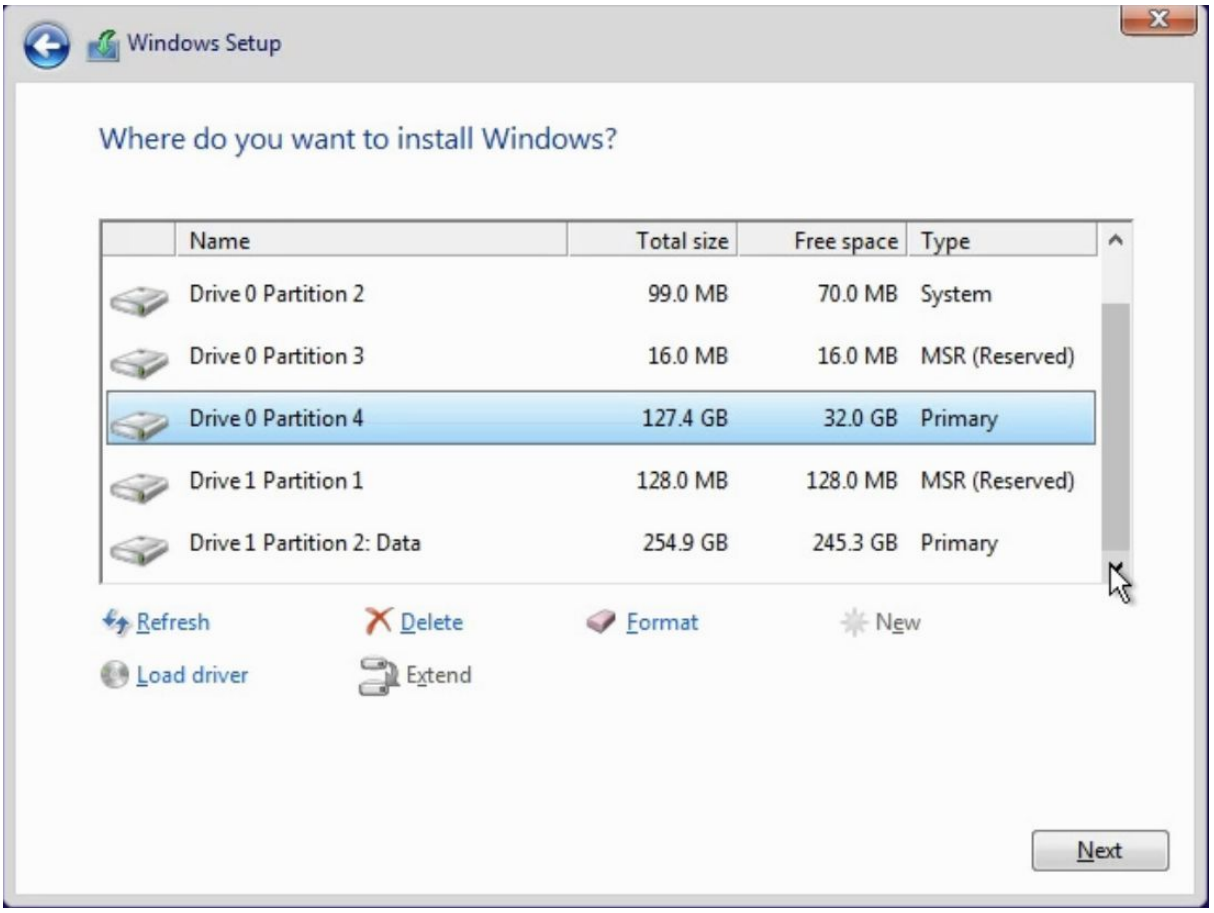
1. The small (450-MB) recovery partition at the start of the disk in this example (which might be different on your PC) contains the Windows Recovery Environment, which allows the system to boot for repair and recovery operations.
2. The EFI system partition is even smaller, at 99 MB. It contains the files required for the system to start up, including the Windows Hardware Abstraction Layer and the boot loader (NTLDR).
3. The largest partition is the primary partition, formatted using NTFS, which contains Windows system files, the paging file, and all user profiles.
4. A fourth partition, required for every GPT disk, is hidden and not visible in Disk Management. This partition, labeled MSR (Reserved), resides between the EFI system partition and the primary partition and is used for post-installation tasks, such as converting a basic disk to a dynamic disk. It's visible when you use DiskPart or the partitioning tools available with a custom installation.

PC makers have the option to add custom OEM partitions to this layout, with those volumes containing files that are part of a custom installation.

In addition, some PCs contain a second recovery partition, at the end of the drive, that contains files you can use to restore the original system configuration.

To make adjustments to existing disk partitions, boot from Windows 10 installation media (DVD or bootable USB flash drive) and run through Windows Setup until you reach the "Where Do You Want To Install Windows?" page of the Windows Setup window, shown earlier.

The collection of tools below the list of disks and partitions is shown in the next figure:



You can use the disk-management tools in this phase of the Windows 10 setup process to manage disk partitions for more efficient data storage and multi-boot configurations.

The system shown in the previous figure includes two physical disks.

The first, Drive 0, has a standard partition layout, with a Windows installation on Partition 4.

The second physical disk, Drive 1, has been partitioned but still has most of its space free.

You can accomplish any of the following tasks here:

- Select an existing partition or unallocated space on which to install Windows 10. Setup is simple if you already created and formatted an empty partition in preparation for setting up Windows, or if you plan to install Windows 10 on an existing partition that currently contains data or programs but no operating system, or if you want to use unallocated space on an existing disk without disturbing the existing partition scheme. Select the partition or unallocated space, and click Next.
- Delete an existing partition. Select a partition, and then click Delete. This option is useful if you want to perform a clean installation on a drive that

currently contains an earlier version of Windows. Because this operation deletes data irretrievably, you must respond to an “Are you sure?” confirmation request. After deleting the partition, you can select the unallocated space as the destination for your Windows 10 installation or create a new partition. Be sure to back up any data files before choosing this option.

- Create a new partition from unallocated space. Select a block of unallocated space on a new drive or on an existing drive after deleting partitions, and click New to set up a partition in that space. By default, Windows Setup offers to use all unallocated space on the current disk. You can specify a smaller partition size if you want to subdivide the disk into multiple drives. If you have a 4-TB drive, for example, you might choose to create a relatively small partition on which to install Windows and use the remaining space to create a second volume with its own drive letter on which to store data files such as music, pictures, documents, and videos or TV shows.
- Extend an existing partition by using unallocated space. If you’re not happy with your existing partition scheme, you can use the Extend option to add unallocated space to any partition, provided that space is immediately to the right of the existing partition in Disk Management, with no intervening partitions. If you originally divided a 128-GB notebook hard disk into two equal volumes, you might decide to rejoin the two partitions to give your system drive more breathing room. After backing up your data files to an external drive or to cloud storage, delete the data partition, select the partition you want to make larger, and click Extend. Choose the total size of the extended partition in the Size box (the default is to use all available unallocated space), and click Apply. You can now continue with your installation, restoring your data files after setup is complete.

Alert observers will no doubt notice that one option is missing from that list.

Unfortunately, Setup does not allow you to shrink an existing disk partition to create unallocated space on which to install a fresh copy of Windows 10.

The option to shrink a volume is available from the Disk Management console after Windows 10 is installed, but if you want to accomplish this task before setup, you need to use third-party disk-management tools.

Caution!

In both the Disk Management console and the disk-management tools available via Windows Setup, it can be confusing to tell which partition is which.

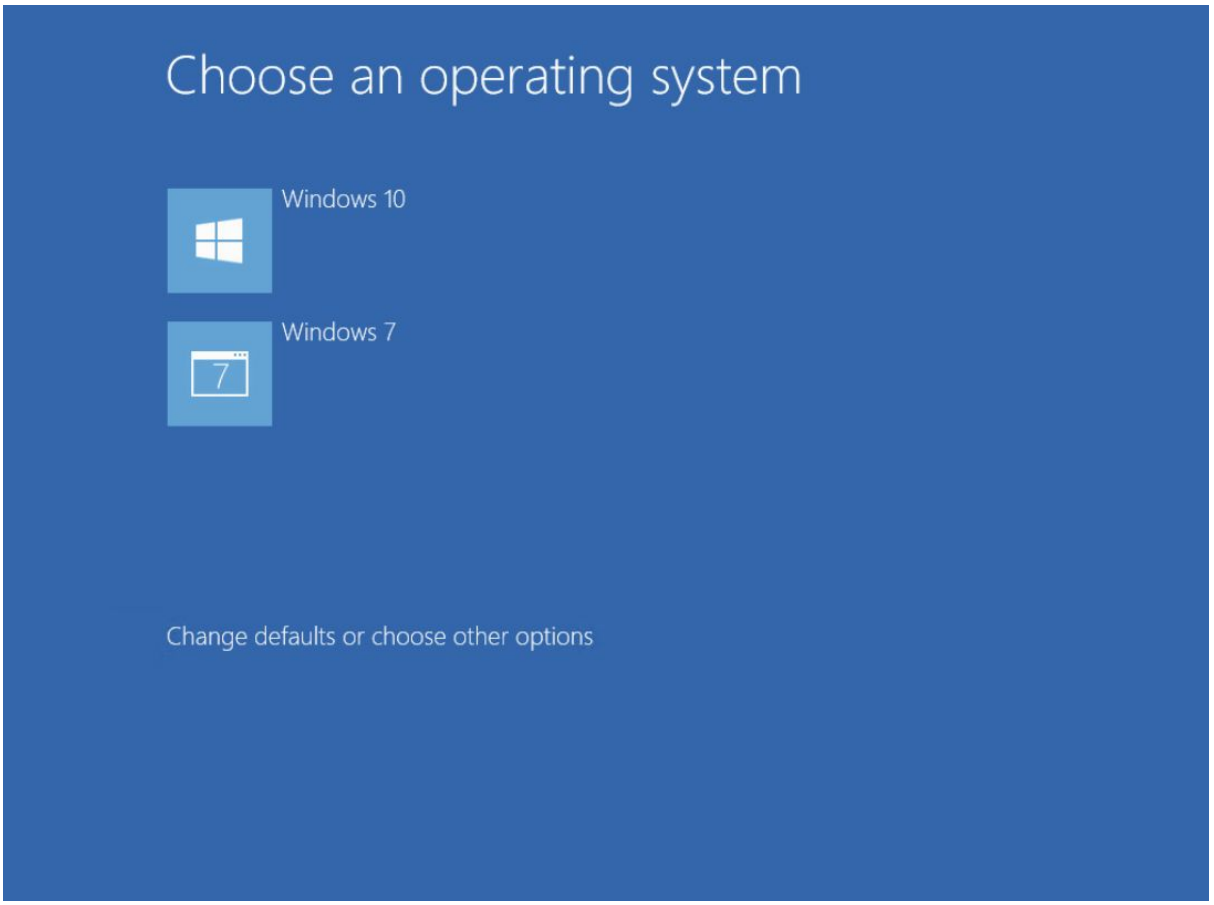
Confusion, in this case, can have drastic consequences if you inadvertently wipe out a drive full of data instead of writing over an unwanted installation of Windows.

One good way to reduce the risk of this sort of accident is to label drives well.

Configuring a multi-boot system

If your computer already has any version of Windows installed and you have a second disk partition available (or enough unallocated space to create a second partition), you can install a clean copy of Windows 10 without disturbing your existing Windows installation.

At boot time, you choose your Windows version from a startup menu, like the one shown in the following figure:



Although this is typically called a dual-boot system, it's more accurate to call it a multi-boot configuration, because you can install multiple copies of Windows or other PC-compatible operating systems.

Having the capability to choose your operating system at startup is handy if you have a program or device that simply won't work under Windows 10.

When you need to use the legacy program or device, you can boot into your earlier Windows version without too much fuss.

This capability is also useful for software developers and IT professionals who need to be able to test how programs work under different operating systems using physical (not virtual) hardware.

The preferred way to build a multi-boot system is to install the most recent version last.

Installing Windows 10 and Linux in a multi-boot configuration

It's possible to install Windows 10 and Linux in a multi-boot configuration that works much like the Windows multi-boot setup described before.

You can set it up to use the Windows 10 boot menu, or you can use a Linux boot loader (most commonly, GRUB) if you prefer.

The procedure is a bit more complex than the procedure for installing another version of Windows, and it varies somewhat depending on which Linux distribution you use and which Linux tools (such as partition editors, boot loaders, and the like) you prefer.

It's generally easier to set up such a system if the Windows partition is set up first, but it can be done either way: Windows and then Linux, or Linux and then Windows.

Tweaking and tuning your Windows 10 installation

When Windows Setup completes, you're signed in and ready to begin using Windows 10.

For upgrades and clean installs alike, we suggest following this simple checklist to confirm that basic functionality is enabled properly:

- Look for missing device drivers. Open Device Management, and look for any devices that have a yellow exclamation mark over the icon or any devices that are listed under the Other category. This is also a good time to install any custom drivers supplied by the device maker and not available through Windows Update.
- Adjust display settings. You'll want to confirm that the display is set for its native resolution and that any additional tasks, such as color calibration, have been completed.
- Check your network connection. If you skipped network setup during a clean install, you can complete the task now. Open the Network folder in File Explorer to switch from a public network to a private network and allow local file sharing.
- Verify security settings. If you use third-party security software, install it now and get the latest updates.

- Check Windows Update. You'll get the latest updates automatically within the next 24 hours. Doing the update manually lets you avoid a scheduled overnight restart.
- Change default programs. Use this opportunity to set your preferred browser, email client, music playback software, and so on.
- Adjust power and sleep settings. The default settings are usually good enough, but they're rarely a perfect match for your preferences. Now is a good time to adjust when your device sleeps and whether it requires a password when it wakes.

- Vocabulary -

- Informática: IT (Information Technology).
- DAM (Desarrollo de Aplicaciones Multiplataforma): Cross-platform Applications Development.
- SI (Sistemas Informáticos): IT Systems.
- Programación: Programming / Developing / Coding.
- Base Datos: Databases (Management).
- Lenguaje de Marcas: Mark-up Language.
- Entornos de Desarrollo: Development Environments.
- Formación y Orientación Laboral: Workplace Guiding.
- Acceso a Datos: Data Access.
- Programación de Servicios y Procesos: Processes and Services Programming.
- Programación Multimedia y Dispositivos Móviles: Mobile Devices and Multimedia Programming.
- Desarrollo de Interfaces: Interfaces Development.
- Sistemas de Gestión Empresarial CRM / ERP: CRM (Customer Relationship Management) / ERP (Enterprise Resource Planning).
- Empresa e Iniciativa Emprendedora: Entrepreneurship.
- Proyecto: Final Project.
- FCT (Formación en Centros de Trabajo): Job Internship.
- Guardería: Kindergarten.
- Colegio: School.
- Instituto: High School.
- Universidad: University / College.
- ESO (Educación Secundaria Obligatoria): Secondary Education.
- Bachillerato: Baccalaureate / General Certificate of Education / Higher Secondary Education.
- FP (Formación Profesional): Vocational Training.
- ASIR (Administración de Sistemas Informáticos en Red): Networking and IT Systems Management.
- SMR (Sistemas Microinformáticos y Redes): Networking and Microcomputing Systems.
- threshold: límite.
- backup: copia de seguridad.
- built in: integrado.
- retail: al por menor / consumidor final.
- underlying: previo / existente.
- in bulk: en masa.
- entitlement: título / derecho / autorización.
- boot: arranque.
- bootable: autoarrancable.
- ease: sencillez, facilidad.
- issues: problemas.
- to start from scratch: empezar desde cero.

- to shrink: encoger, disminuir.
- within: dentro.
- current: actual.
- to tamper with: manipular / modificar.
- to sign in / to log in: loguearse / entrar al sistema / iniciar sesión.
- features: características.
- license agreement: acuerdo/contrato de licencia.
- to troubleshoot: solucionar problemas.
- to roll back: volver hacia atrás.
- misleading: engañoso / erróneo.
- to gather: reunir.
- genuine: original.
- entitlement: derecho / autorización / concesión / título.
- dot: "punto" .
- "at": "arroba" @
- colon: "dos puntos" :
- semi-colon: "punto y coma" ;
- forward slash: "barra hacia adelante" /
- backward slash / backslash: "barra hacia atrás" \
- prime / tilde: virgulilla ~
- files: archivos.
- data: datos.
- to tweak: retocar / ajustar.
- to tune: afinar.
- to look for: buscar.
- to wake: despertar / activar.
- to avoid: evitar.
- scheduled: programado.

- Exercises - 1. 1. Getting started with Windows 10 -

You are going to create a new Google Document inside the "1. Windows Client" folder of your Google Drive, named:

"1. 1. Getting started with Windows 10 - Apellidos, Nombre"

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

Share this Google Document with the teacher (jorge@iesdoctorbalmis.com) with "Edit" permissions.

Inside this Google Document you are going to answer to the exercises of the following sub-units:

- 1. 1. 1. Installing, configuring, and deploying Windows 10
- 1. 1. 2. Using Windows 10
- 1. 1. 3. Personalizing Windows 10
- 1. 1. 4. Networking essentials
- 1. 1. 5. Managing user accounts, passwords, and credentials
- 1. 1. 6. Securing Windows 10 devices

- Exercises - 1. 1. 1. Installing, configuring, and deploying Windows 10 -

Open the following Google Document that you have just created:

"1. 1. Getting started with Windows 10 - 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. The same Windows 10 setup program is used for both upgrades and clean installs, but which installation options can you find using each one?
2. Which are the minimum hardware requirements to install Windows 10?
3. Do you need a Microsoft account (Outlook, Live, Hotmail, ...) in order to install Windows 10?

4. If you upgrade to Windows 10, will all your apps work?
5. Is it a good idea to do a backup of your important files before you upgrade to Windows 10? How can you do that backup?
6. Which installation media should you use to clean install Windows 10? And to upgrade to Windows 10?
7. What is the Media Creation Tool?
8. Download the Media Creation Tool from https://www.microsoft.com/es-es/software-download/windows10 and check it out.
9. Which license types can we choose with Windows 10?
10. Create a bootable USB Flash drive with Windows 10 using the built-in Recovery Media Creator tool, RecoveryDrive.exe.
11. Create a bootable USB Flash drive with Windows 10 using Rufus.
12. What does it mean to “activate” your Windows 10?
13. What is the “validation” process?
14. If your validation process fails, what happens to your Windows 10?
15. What is a Windows 10 “digital license”?
16. Go to Settings -> Update & Security -> Activation, and check your Windows 10 Activation.
17. What is the activation troubleshooter?
18. What can happen if you replace your computer’s motherboard?
19. Can you transfer a retail copy of Windows 10 to another computer? How?
20. Can you transfer an OEM copy of Windows 10 to another computer? How?
21. How does the Microsoft Volume Licensing program work?
22. Which two special folders are created during the Windows 10 installation?
23. When you upgrade from Windows 8 to Windows 10, the upgrade keeps ...
24. When you upgrade from Windows 7 to Windows 10, the upgrade keeps ...
25. With which accounts can you sign in after upgrading from Windows 7 or 8 to Windows 10?
26. Which option should you choose in the “Windows Setup” screen if you want to do a clean Windows 10 installation?
27. What can you do with your disks and partitions during a clean Windows 10 installation?
28. Can you shrink a partition during a clean Windows 10 installation?
29. What is a multi-boot computer?
30. When can it be useful to do a multi-boot Windows 10 installation?
31. Do you have an alternative to multi-booting to have different versions of Windows installed on your computer?
32. Which things should you check after installing Windows 10?
33. Install Windows 10 Pro (64-bit) in a Virtual Box machine with the following features:
    - 4 GB of RAM.
    - 60 GB (dynamic) hard drive.
    - Select the "Spanish" keyboard.
    - Select "I don't have a product key".
    - Select "Windows 10 Pro".
    - Accept the terms of the license.

- Select "Custom".
- Select "New" in order to create one partition using all the space of the hard disk (60 GB): an additional 500 MB Windows Recovery partition should be created.
- Format that 60 GB (approximately) partition: it will be formatted in NTFS.
- Select (with blue color) that 60 GB (approximately) partition and click on the "Next" button: the Windows 10 installation process should start now.
- After the Windows 10 installation process has finished, select "Use Express settings".
- Create a local user: name "alumno", password "alumno", password hint “clase”.
- Select "Use Cortana".
- Sign in to Windows 10 with the "alumno" user.

34. After the installation of Windows 10 has finished, configure your Windows 10 virtual machine with the following features:
    - Eject Windows 10 Virtual DVD.
    - Install Virtual Box Guest Additions.
    - Eject Virtual Box Guest Additions CD.
    - Change the virtual network adapter from NAT to Bridged.
    - Change the IP to 192.168.0.X, being X the IP of your real computer + 100.
    - Deactivate Windows Firewall of the virtual machine.
    - Deactivate Windows Firewall of the real machine.
    - Ping your partner's virtual machine and the teacher's real computer.
    - Check if you have to change the timezone of your Virtual Machine.
    - Check if you have to change the keyboard into Spanish.
    - Change the PC name to 1DAMA-X, being X the IP of your real computer + 100.
    - Set up the Proxy -> IP: 192.168.0.100, Port: 8080.
    - Open Microsoft Edge and check if your Internet connection is working.
    - Install Firefox and check if it has Internet connection. If you want, you can another web browser like Google Chrome.
    - Enable sharing the clipboard between the virtual machine and the real machine.
    - Enable drag and drop between the virtual machine and the real machine.
    - Create a shared folder between the real computer and the virtual machine.
    - Open File Explorer and check how many partitions you have. Modify everything needed in order to have a 50 GB (C:) "WINDOWS" labelled partition (for the Operating System and the Programs) and a 10 GB (D:) "DATA" labelled partition (for the Data). Maybe you will have to create and/or format the D: "DATA" partition using the "Disk Manager".
    - "Activate" your Windows 10 (KMS...).
    - Create a snapshot with Virtual Box.